CONTACT INFORMATION
Mining Records Curator
Arizona Geological Survey
3550 N. Central Ave, 2nd floor
Phoenix, AZ, 85012
602-771-1601
http://www.azgs.az.gov
inquiries@azgs.az.gov

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Form CQ2070 5M 3-19-47 WP

MAR 30 1948

ORE SETTLEMENT

PHELPS DODGE CORPORATION

UNITED VERDE BRANCH

REDUCTION WORKS, CLARKDALE, ARIZONA

Contract No. 715

BOUGHT OF Mayer Copper Co. c/o J. A. Kelly, Secretary & Asst. Treasurer.

ADDRESS Mayer, Arizona.

MATERIAL

SHIPPED FROM Mayer, Arizona

Date Received	CAR Initial	CAR Number	WEIGHT Wet	WEIGHT Moisture	WEIGHT Dry
3-18-48.	ATSF.	172067.	102,300.	1.00 (Min)	101,278

Smelter Lot No.	4907
Shipper's Lot No.	3.
Date Sampled	3-18-48.
E. & M. Journal Quotation Average for Week Ending	3-17-48.
N. Y. Copper	21.200. c per lb
London Copper	c per lb
Deduction	2.50. c per lb
N. Y. Silver	c per oz
U. S. Silver	c per oz
U. S. Gold Price	per oz
Deduction	per oz

PER TON OF 2000 LBS.

	Assay	Deduct	Pay For		Per Ton	Total
Gold	Tr. oz.	%		oz. @ $		
Silver	.36 oz.	%		oz. @ 18.700 c	10.14	10.14
Copper	3.21 %	= 64.2 lbs. less 10.	lbs. = 54.2.	lbs. @ c		
				Total Payments		

	Analysis	Deduct	Charge For	CHARGES		
		Alumina x 10 less Silica @ 1½¢		Treatment Base	3.50 .40	
		Silver - 10% of Payment				
Copper Penalty	10 lbs.	lbs.	lbs. @	c per unit		
Zn	0.1 %	%	% @	c per unit		
Fe	12.9 %		% @	c per unit		
CaO	1.5 %					
SiO_2	57.2 %			Total Treatment	3.90	
Al_2O_3	8.4 %		Pay For	LESS CREDITS		
S	5.7 %					
	%		% @	c per unit		
	%		% @	c per unit		
				Net Treatment		3.90
				Net Price per ton f. o. b. Clarkdale		6.24

Gross Proceeds 50.339. Dry Tons @ $ 6.24 per ton 315.9

Less Freight From Mayer On 51.15. Gross Tons @ $ per ton Pre-Paid.

Less

Paid to: Mayer Trucking Co., Mayer, Arizona. 52.68.
(Hauling 51.15 tons @ $1.00 per ton plus 3% Tax).

Francis R. & Samar N. Dennison, Mayer, Arizona 25.28. 77.96
(8% Royalty on Net Smelter Returns).

Balance Due Mayer Copper Co. c/o J.A. Kelly, Sec. & Asst. Treasurer. 238.0

Correct amg

Checked RHH

Approved JWB

FOR Gen. Supt.

Form CQ2070 5M 3-19-47 WP

ORE SETTLEMENT

JAN 3 1949

PHELPS DODGE CORPORATION

UNITED VERDE BRANCH Contract No. 739

REDUCTION WORKS, CLARKDALE, ARIZONA

BOUGHT OF R H Gemmill, Louis Dandrea, Grant Van Tilburg and C H Whitmarsh

ADDRESS Box 174

MATERIAL Mayer, Arizona SHIPPED FROM Mayer, Arizona

Date Received	CAR Initial	CAR Number	WEIGHT Wet	WEIGHT Moisture	WEIGHT Dry
12-23-48	ATSF	173395	102,300	5.98	96,182

Smelter Lot No. 5115
Shipper's Lot No. 1
Date Sampled 12-23-48
E. & M. Journal Quotation
Average for Week Ending 12-22-48
N. Y. Copper 23.200 c per lb
London Copper c per lb
Deduction 2.800 c per lb
N. Y. Silver c per oz
U. S. Silver c per oz
U. S. Gold Price per oz
Deduction per oz

PER TON OF 2000 LBS.

	Assay	Deduct	Pay For	PAYMENTS	AMOUNTS Per Ton	AMOUNTS Total
Gold	.005 oz.	%		oz. @ $		
Silver	.47 oz.	%		oz. @ c		
Copper	3.41 %	= 68.2 lbs. less 10	lbs. = 58.2	lbs. @ 20.400 c	11.87	
				Total Payments		11.87

	Analysis	Deduct	Charge For	CHARGES		
		Alumina x 10 less Silica at 1½¢		Treatment Base	4.50	
		Silver - 10% of Payment			.22	
Copper Penalty	10 lbs.	lbs.	lbs. @	c per unit		
Zn	0.1 %	%	% @	c per unit		
Fe	13.5 %		% @	c per unit		
CaO	2.5 %					
SiO_2	52.1 %			Total Treatment	4.72	
Al_2O_3	6.7 %		Pay For	LESS CREDITS		
S	7.8 %					
	%		% @	c per unit		
	%		% @	c per unit		
				Net Treatment		4.72
				Net Price per ton f.o.b. Clarkdale		7.15

Gross Proceeds		48.091	Dry Tons @ $ 7.15 per ton			343.85
Less Freight From Mayer	On	51.15	Gross Tons @ $ 1.442 per ton		73.76	
Less						
Paid to: Francis R. & Samar M. Dennison, Mayer, Arizona For Credit of Mayor Copper Co. 8 % Royalty on Net Smelter Returns					27.51	
Mayer Copper Company, Mayer, Arizona 2 % Royalty on Net Smelter Returns					6.88	108.15
Balance Due R.H.Gemmill, Louis Dandrea, Grant Van Tilburg & C.H.Whitmarsh						235.70

Correct amd Checked Approved

Gen. Supt.

Form CQ2070 5M 3-19-47 WP

(C O P Y)

ORE SETTLEMENT

PHELPS DODGE CORPORATION

UNITED VERDE BRANCH
REDUCTION WORKS, CLARKDALE, ARIZONA

Contract No. 739

BOUGHT OF R.H. Gemmill, Louis Dandréa, Grant Van Tilburg and C. H. Whitmarsh
ADDRESS Box 174
MATERIAL Mayer, Arizona SHIPPED FROM Mayer, Arizona

Date Received	CAR Initial	CAR Number	WEIGHT Wet	WEIGHT Moisture	WEIGHT Dry
1-14-49	ATSF	171820	111,700	2.22	109,220

Smelter Lot No. 5129
Shipper's Lot No. 3
Date Sampled 1-15-49
E. & M. Journal Quotation
Average for Week Ending 1-12-49
N. Y. Copper 23.200 ¢ per lb
London Copper ¢ per lb
Deduction 2.800 ¢ per lb
N. Y. Silver ¢ per oz
U. S. Silver ¢ per oz
U. S. Gold Price per oz
Deduction per oz

PER TON OF 2000 LBS.

	Assay	Deduct	PAYMENTS Pay For		AMOUNTS Per Ton	AMOUNTS Total
Gold	Tr oz.	%		oz. @ $		
Silver	.40 oz.	%		oz. @ ¢		
Copper	3.27 ✓ %	= 65.4 lbs. less 10	lbs. = 55.4	lbs. @ 20.400 ¢	11.30	
				Total Payments		11.30

	Analysis	Deduct	Charge For	CHARGES		
		Alumina x 10 less Silica at 1½¢		Treatment Base —	4.50	
		Silver - 10% of Payment			.28	
Copper Penalty	10 lbs.	lbs.	lbs. @	¢ per unit		
Zn	0.2 %	%	% @	¢ per unit		
Fe	11.7 %		% @	¢ per unit		
CaO	1.1 %					
SiO_2	57.4 %			Total Treatment	4.78	
Al_2O_3	7.6 %		Pay For	LESS CREDITS		
S	5.7 %					
	%		% @	¢ per unit		
	%		% @	¢ per unit		
				Net Treatment		4.78
				Net Price per ton		
				f. o. b. Clarkdale		6.52

Gross Proceeds		54.610	Dry Tons @ $ 6.52 per ton			356.06
Less Freight From	Mayer	On 55.85	Gross Tons @ $ 1.442 per ton		80.54	
Less Paid to:	Mayer Trucking Company, Mayer, Arizona Hauling 55.85 Tons at $1.03 Per Ton				57.53	
	Francis R. & Samar M. Dennison, Mayer, Arizona For Credit of Mayer Copper Co., Mayer, Arizona. 8% Royalty on Net Smelter Returns				28.48	
	Mayer Copper Company, Mayer, Arizona 2% Royalty on Net Smelter Returns				7.13	173.68
Balance Due	R.H.Gemmill, Louis Dandrea, Grant Van Tilburg, C.H.Whitmarsh					182.38

Correct amd Checked RSH Approved Gen. Supt.

Form CQ2070 SM 3-19-47 WP

FEB 25 19

ORE SETTLEMENT
PHELPS DODGE CORPORATION
UNITED VERDE BRANCH
REDUCTION WORKS, CLARKDALE, ARIZONA

Contract No. 739

BOUGHT OF ADDRESS MATERIAL: R.H. Gemmill, Louis Dandrea, Grant Van Tilburg, C.H. Whitmarsh
Box 174 Mayer, Arizona

SHIPPED FROM Mayer, Arizona

Date Received	CAR Initial	CAR Number	WEIGHT Wet	WEIGHT Moisture	WEIGHT Dry
2-17-49	ATSF	84465	95,000	1.00 (Min)	94,050

Smelter Lot No.	5141
Shipper's Lot No.	4
Date Sampled	2-17-49
E. & M. Journal Quotation	
Average for Week Ending	2-16-49
N. Y. Copper	23.200 c per l
London Copper	c per l
Deduction	2.000 c per l
N. Y. Silver	c per c
U. S. Silver	90.125 c per c
U. S. Gold Price	per c
Deduction	per c

PER TON OF 2000 LBS.	Assay	Deduct	PAYMENTS Pay For		AMOUNTS Per Ton	Total
Gold	.006 oz.	%		oz. @ $		
Silver	.68 oz.	%	.68	oz. @ 90.125 c	.61	
Copper	3.99 %	= 79.8 lbs. less 10	lbs. = 69.8	lbs. @ 20.400 c	14.24	
				Total Payments		14.8
	Analysis	Deduct	Charge For	CHARGES		
		Alumina x 10 less Silica @ 1½¢		Treatment Base	4.50	
		Silver - 10% of Payment			.25	
Copper Penalty	10 lbs.	lbs.	lbs. @	c per unit	.06	
Zn	0.9 %	%	% @	c per unit		
Fe	16.0 %		% @	c per unit		
CaO	2.3 %					
SiO_2	47.3 %			Total Treatment	4.81	
Al_2O_3	6.4 %		Pay For	LESS CREDITS		
S	10.4 %					
	%		% @	c per unit		
	%		% @	c per unit		
				Net Treatment		
				Net Price per ton		4.8
				f. o. b. Clarkdale		10.6

Gross Proceeds: Dry Tons 47.025 @ $ 10.04 per ton; Gross Tons 47.50 @ $ 1.442 per ton — 68.50 — 472.1

Less Freight From Mayer On 47.50

Less Paid to:

Mayer Trucking Co., Mayer, Arizona (Hauling 47.50 tons @ $1.03 per ton)	48.93	
Francis R. & Samar N. Dennison, Mayer, Arizona for credit of Mayer Copper Co., Mayer, Arizona (6% Royalty on Net Smelter Returns)	37.77	
Mayer Copper Co., Mayer, Arizona (2% Royalty on Net Smelter Returns)	9.44	164.6

Balance Due R.H. Gemmill, Louis Dandrea, Grant Van Tilburg, C.H. Whitmarsh — 307.6

Correct [signature] Checked [signature] Approved [signature] Gen. Supt.

Form CQ2070 5M 3-19-47 WP

MAR 23 1949

ORE SETTLEMENT
PHELPS DODGE CORPORATION

UNITED VERDE BRANCH — Contract 739

REDUCTION WORKS, CLARKDALE, ARIZONA

BOUGHT OF: R.H.Gemmill, Louis Dandrea, Grant Van Tilburg & C.H. Whitmarsh

ADDRESS: Box 174

MATERIAL: Mayer, Arizona — SHIPPED FROM Mayer, Arizona

Date Received	CAR Initial	CAR Number	WEIGHT Wet	WEIGHT Moisture	WEIGHT Dry
3-15-49	ATSF	171364	97,000	1.00 (Min)	96,030

Smelter Lot No.	5159
Shipper's Lot No.	6
Date Sampled	3-15-49
E. & M. Journal Quotation Average for Week Ending	3-9-49
N. Y. Copper	23.200 c per lb
London Copper	c per lb
Deduction	2.800 c per lb
N. Y. Silver	c per oz
U. S. Silver	c per oz
U. S. Gold Price	per oz
Deduction	per oz

PER TON OF 2000 LBS.	Assay	Deduct	PAYMENTS Pay For		AMOUNTS Per Ton	AMOUNTS Total
Gold	Tr oz.	%		oz. @ $		
Silver	.49 oz.	%		oz. @ c		
Copper	3.17 %	= 63.4 lbs. less 10	lbs. = 53.4	lbs. @ 20.400 c	10.89	
				Total Payments		10.89
	Analysis	Deduct	Charge For	CHARGES		
		Alumina x 10 less Silica at 1½		Treatment Base	4.50	
		Silver - 10% of Payment			.50	
Copper Penalty	10 lbs.	lbs.	lbs. @	c per unit		
Zn	0.2%	%	% @	c per unit		
Fe	15.3%		% @	c per unit		
CaO	2.6%					
SiO_2	47.5%			Total Treatment	5.00	
Al_2O_3	8.1%		Pay For	LESS CREDITS		
S	8.5%					
	%		% @	c per unit		
	%		% @	c per unit		
				Net Treatment		5.00
				Net Price per ton f. o. b. Clarkdale		5.89

Gross Proceeds: 48.015 Dry Tons @ $ 5.89 per ton = 282.81

Less Freight From Mayer On 48.50 Gross Tons @ $ 1.442 per ton = 69.94

Less Paid to:

Mayer Trucking Company, Mayer, Arizona
Hauling 48.50 Tons at $1.03 Per Ton — 49.96

Francis R. & Samar M. Dennison, Mayer, Arizona
For Credit of Mayer Copper Co., Mayer, Arizona
8 % Royalty on Net Smelter Returns — 22.62

Mayer Copper Company, Mayer, Arizona
2 % Royalty on Net Smelter Returns — 5.66 — 148.18

Balance Due R.H.Gemmill, Louis Dandrea, Grant Van Tilburg, C.H.Whitmarsh — 134.63

Correct: Amd

Checked: RSH

Approved: Gen. Supt.

Form CQ2070 5M 3-19-47 WP

APR 18 1949

ORE SETTLEMENT
PHELPS DODGE CORPORATION
UNITED VERDE BRANCH
REDUCTION WORKS, CLARKDALE, ARIZONA

Contract 739

BOUGHT OF R. H. Gemmill, Louis Dandrea, Grant Van Tilberg, C. H. Whitmarsh
ADDRESS Box 174
MATERIAL Mayer, Arizona — SHIPPED FROM Mayer, Arizona

Date Received	CAR Initial	CAR Number	WEIGHT Wet	WEIGHT Moisture	WEIGHT Dry
4-8-49	ATSF	173103	98,700	4.82	93,942.

Smelter Lot No. 5173
Shipper's Lot No. 7
Date Sampled 4-9-49
E. & M. Journal Quotation
Average for Week Ending 4-6-49
N. Y. Copper 22.950 c per lb
London Copper c per lb
Deduction 2.800 c per lb
N. Y. Silver c per oz
U. S. Silver c per oz
U. S. Gold Price per oz
Deduction per oz

PER TON OF 2000 LBS.	Assay	Deduct	PAYMENTS Pay For		AMOUNTS Per Ton	AMOUNTS Total
Gold	.01 oz.	%		oz. @ $		
Silver	.45 oz.	%		oz. @ c		
Copper	3.33 %	= 66.6 lbs. less 10	lbs. = 56.6	lbs. @ 20.150 c	11.40	
				Total Payments		11.40
	Analysis	Deduct	Charge For	CHARGES		
		Alumina x 10 less Silica at 1½¢		Treatment Base	4.50	
		Silver - 10% of Payment			.62	
Copper Penalty	10 lbs.	lbs.	lbs. @	c per unit		
Zn	0.2 %	%	% @	c per unit		
Fe	14.2 %		% @	c per unit		
CaO	2.9 %					
SiO_2	49.7 %			Total Treatment	5.12	
Al_2O_3	9.1 %		Pay For	LESS CREDITS		
S	7.2 %					
	%		% @	c per unit		
	%		% @	c per unit		
				Net Treatment		5.12
				Net Price per ton f.o.b. Clarkdale		6.28

Gross Proceeds		46.971	Dry Tons	@ $ 6.28 per ton		294.98
Less Freight From Mayer	On	49.35	Gross Tons	@ $ 1.442 per ton	71.16	
Less Paid to:						
Mayer Trucking Company, Mayer, Arizona Hauling 49.35 Tons at $1.03 per ton					50.83	
Francis R. & Samar M. Donnison, Mayer, Arizona For Credit of Mayer Copper Co., Mayer, Arizona 8 % Royalty on Net Smelter Returns					23.60	
Mayer Copper Company, Mayer, Arizona 2 % Royalty on Net Smelter Returns					5.90	151.49
Balance Due						143.49

Correct ..... Checked ..... Approved .....
Gen. Supt.

Form CQ2070 SM 3-19-47 WP

COPY

ORE SETTLEMENT
PHELPS DODGE CORPORATION

COPY

UNITED VERDE BRANCH
REDUCTION WORKS, CLARKDALE, ARIZONA

Contract No. 753

BOUGHT OF R. A. Naylor
ADDRESS 39 W. Adams Phoenix, Arizona
MATERIAL Ore
SHIPPED FROM Truck

Date Received	CAR Initial	CAR Number	WEIGHT Wet	WEIGHT Moisture	WEIGHT Dry
6-4-49	VTS	130 141	38,300 46,000 84,300	1.49	83,044

Smelter Lot No.	5208	
Shipper's Lot No.	1	
Date Sampled	6-4-49	
E. & M. Journal Quotation Average for Week Ending	6-1-49	
N. Y. Copper	17.325	c per lb
London Copper		c per lb
Deduction	2.200	c per lb
N. Y. Silver		c per oz
U. S. Silver	90.125	c per oz
U. S. Gold Price		per oz
Deduction		per oz

PER TON OF 2000 LBS.

	Assay	Deduct	Pay For	PAYMENTS	Per Ton	AMOUNTS Total
Gold	.0155 oz.	%		oz. @ $		
Silver	.67 oz.	%	.67	oz. @ 90.125 c	.60	
Copper	3.79 %	= 75.8 lbs. less 10	lbs. = 65.8	lbs. @ 14.525 c	9.56	
				Total Payments		10.1

	Analysis	Deduct	Charge For	CHARGES		
		Alumina x 10 less	Silica @ 1½¢	Treatment Base	4.50	
		Silver - 10% of Payment			.58	
Copper Penalty	10 lbs.	lbs.	lbs. @		.06	
Zn	0.0 %	%	% @	c per unit		
Fe	13.2 %		% @	c per unit		
CaO	1.9 %		% @	c per unit		
SiO_2	52.1 %			Total Treatment	5.14	
Al_2O_3	9.1 %		Pay For	LESS CREDITS		
S	5.7 %					
	%		% @	c per unit		
	%		% @	c per unit		
				Net Treatment		5.1
				Net Price per ton f.o.b. Clarkdale		5.02

Gross Proceeds 41.522 Dry Tons @ $ 5.02 per ton 208.44
Less Freight From On Gross Tons @ $ per ton
Less Paid to:

R. A. Naylor, 39 W. Adams - Phoenix, Arizona (Hauling 42.15 tons @ $3.50 per ton) 147.53

Francis R. & Samar M. Dennison, Mayer, Arizona for credit of Mayer Copper Co., Mayer, Arizona (8% Royalty on Net Smelter Returns) 16.68 164.21

Balance Due R. A. Naylor, 39 W. Adams Phoenix, Arizona 44.23

Correct _____ Checked _____ Approved _____

Gen. Supt.

CQ2070 4M 4-18-49 WP

JUL 5 1949

ORE SETTLEMENT
PHELPS DODGE CORPORATION
UNITED VERDE BRANCH
Contract 753

REDUCTION WORKS, CLARKDALE, ARIZONA

BOUGHT OF R. A. Naylor
ADDRESS 39 West Adams
MATERIAL Ore Phoenix, Arizona
SHIPPED FROM Truck

Date Received	CAR Initial	CAR Number	WEIGHT Wet	WEIGHT Moisture	WEIGHT Dry
6-23-49	VTS	132	68,000	1.00 (Min)	67,320

Smelter Lot No.	5215	
Shipper's Lot No.	2	
Date Sampled	6-23-49	
E. & M. Journal Quotation Average for Week Ending	6-22-49	
N. Y. Copper	15.800	c per lb
London Copper		c per lb
Deduction	2.800	c per lb
N. Y. Silver		c per oz
U. S. Silver	90.125	c per oz
U. S. Gold Price		per oz
Deduction		per oz

PER TON OF 2000 LBS.	Assay	Deduct	PAYMENTS Pay For		AMOUNTS Per Ton	AMOUNTS Total
Gold	.012 oz.	%		oz. @ $		
Silver	.67 oz.	%	.67	oz. @ 90.125 c	.60	
Copper	3.43 %	= 68.6 lbs. less 10	lbs. = 58.6	lbs. @ 13.000 c	7.62	
				Total Payments		8.2
	Analysis	Deduct	Charge For	CHARGES		
		Alumina x 10 less Silica at 1½¢		Treatment Base	4.50	
					.81	
		Silver - 10% of Payment			.06	
Copper Penalty	10 lbs.	lbs.	lbs. @	c per unit		
Zn	0.8 %	%	% @	c per unit		
Fe	14.3 %		% @	c per unit		
CaO	1.6 %			Total Treatment	5.37	
SiO_2	47.9 %		Pay For	LESS CREDITS		
Al_2O_3	10.2 %					
S	6.6 %		% @	c per unit		
	%		% @	c per unit		
	%			Net Treatment		5.3
				Net Price per ton f.o.b. Clarkdale		2.8

Gross Proceeds 33.660 Dry Tons @ $ 2.85 per ton 95.9
Less Freight From On Gross Tons @ $ per ton

Less

Paid To: Francis R. and Samar M. Dennison, Mayer, Arizona
For Credit of Mayer Copper Co., Mayer, Arizona
8 % Royalty on Net Smelter Returns 7.67 7.6

88.2

Mayer Trucking Co., Mayer, Arizona
Hauling 34 Tons at $4.00 Per Ton = $136.00 (See Note) 88.2

* Insufficient value to Pay all Hauling Charges
Due Mayer Trucking Company.

Balance Due R. A. Naylor None

Correct amd Checked Approved JWB
FOR Gen. Supt.

xerox copy of [illegible] office service

FORM [illegible] —MCGREW PRINTERY

AMERICAN SMELTING AND REFINING COMPANY

HAYDEN PLANT

Shipper: Toney Fernandez — Hayden, Arizona, April 4, 1955, 19....

Address: 226 W. Willis Street, [illegible] — Smelter Lot: 150

Shipping Point: Mayer, Ariz. — Class: Crude — Shipper's Lot: 1

CAR Number	CAR Initial	Gross	Tare	Net	H_2O	Dry Weight
65592	AT	143020	67120	76800	2.1	75187
			Tons	38.4000		37.5935

N. Y. QUOTATIONS	
Settlement Date	3/22/55
Bill Lading Date	3/14/55
Silver	
Less	
Net	
Copper	.32575
Less	.0[illegible]
Net	.[illegible]

PAYMENT FOR METALS

Elements	Assay Per Ton of 2000 Lbs.		Deducted	Net Assay	Equiv. in Lbs.	% Paid For	Net Paid For		Rate	VALUE Amount per Ton	VALUE Total Amount
Gold	.075	Oz.				100%	.075	Oz.	32.3185	2.42	
Silver	.1[illegible]	Oz.					No Pay	Oz.			
Copper	4.57	%	.4%	4.17	83.4	95%	79.23	Lbs.	.29495	23.37	
		%						Lbs.			

Total Payment of Metals — 25.7[illegible]

CHARGES AND CREDITS

	Debits	Credits
BASE CHARGE: F.O.B. Hayden for Metal Payments, not exceeding $ 15.00 per ton	4.50	
10 % of $ 10.79 excess over $ 15.00 per ton	1.08	
Bullion Trans. Tax .00037	.03	

Analysis			Deduction	Net				
Insoluble	60.8	%			%	@	cts.	
Silica	56.2	%			%	@	cts.	
Alumina	9.0	%	5.62	3.38	%	@ 25	cts.	.85
Zinc		%			%	@	cts.	
Sulphur		%			%	@	cts.	
Iron	8.0	%			%	@	cts.	
Lime	.4	%			%	@	cts.	
		%			%			

Total Deductions — [illegible]

Net Value Per Ton — 19.3[illegible]

Royalty

Value P.W.T. $6.43

			Debits	Credits
Total Value on 37.5935	Dry Tons @ 19.33	Per Ton		720.[illegible]
Less Freight on 38.4000	Wet Tons @ 3.08	Per Ton	118.27	
Tax				
Light Weight Weighing			3.55	
Tax			1.08	
Royalty of 10% to Shattuck Denn Mining Corporation			.03	
			60.36	
Balance Due Shipper			543.37	

PAID APR 5 1955
AMERICAN SMELTING & REFINING CO.
HAYDEN, ARIZONA
PER

Made by: MAB — Checked: HAC — Correct — Approved

FORM 5A—50M—8-50—MCGREW PRINTERY

AMERICAN SMELTING AND REFINING COMPANY
HAYDEN PLANT

Shipper Tony Hernandez Hayden, Arizona, May 10, 1955, 19

Address 226 W. Willis St. Prescott, Arizona Smelter Lot 217

Shipping Point Mayer, Arizona Class Crude Shipper's Lot 2

CAR Number	CAR Initial	WEIGHT IN POUNDS Gross	Tare	Net	H₂O	Dry Weight
65554	AT	148020	67100	80920	1.9	79383
			Tons	40.4600		39.6915

N. Y. QUOTATIONS

Settlement Date	4/28/5
Bill Lading Date	4/20/5
Silver	
Less	
Net	
Copper	.35575
Less	.0308
Net	.32495

PAYMENT FOR METALS

Elements	Assay Per Ton of 2000 Lbs.		Deducted	Net Assay	Equiv. in Lbs.	% Paid For	Net Paid For		Rate	VALUE Amount per Ton	Total Amount
Gold	.08	Oz.				100	.08	Oz.	32.3185	2.59	
Silver	.43	Oz.					no pay	Oz.			
Copper	3.51	%	.4	3.11	62.2	95	59.09	Lbs.	.32495	19.20	
		%						Lbs.			
									Total Payment of Metals		

CHARGES AND CREDITS

	Debits	Credits
BASE CHARGE: F.O.B. Hayden for Metal Payments, not exceeding $15.00 per ton		21.79
10 % of $6.79 excess over $15.00 per ton	4.50	
Bullion transportation tax .00037	.68	
	.02	

Analysis			Deduction	Net			
Insoluble	65.0	%			%	@	cts.
Silica	59.9	%			%	@	cts.
Alumina	9.2	%	5.99	3.21	%	@	25 cts.
Zinc		%			%	@	cts.
Sulphur		%			%	@	cts.
Iron	8.0	%			%	@	cts.
Lime	.4	%			%	@	cts.
		%			%		

Total Deductions .80

Net Value Per Ton 6.00

15.79

AMERICAN SMELTING & REFINING CO. HAYDEN, ARIZONA

Value per wet ton 4.45

			PER	Debits	Credits
Value on 39.6915	Dry Tons @ 15.79	Per Ton			626.73
Weight on 40.4600	Wet Tons @ 3.03	Per Ton			
tax				124.62	
to Mayor trucking Company Lot 150-1, $2.00 per wet ton				3.74	
tax				76.80	
to George Budick this lot 2.00 per wet ton				2.30	
tax				80.92	
to Francis H. and Sarah Donnison				2.43	
			Balance Due Shipper	33.59	
				302.33	

Checked HAC Correct Approved

AMERICAN SMELTING AND REFINING COMPANY
HAYDEN ARIZONA PLANT

SHIPPER Lucille Bennett DATE 4-6-67
ADDRESS 505 W. 17th Place, Tempe, Ariz. SMELTER LOT 175
SHIPPING POINT Florence, Ariz. SHIPPERS LOT 1
NAME OF MINE Copper Queen CLASS OF MATERIAL Smelt
TERMS - CONTRACT SCHEDULE (Rates Subject to Change Without Notice) 246

DATE RECEIVED	CAR NUMBER	CAR INITIAL	WEIGHT GROSS	WEIGHT TARE	WEIGHT WET	% H_2O	WEIGHT DRY	SETTLEMENT DATE 3-25-6 / METAL QUOTATIONS
3-25	36858	SP	141740	52400	89340	1.4	88086	Silver 1.239
								Less .025
								Net 1.214
								Copper .38023
								Less .035
								Net .34523
		TOTAL			89340		88086	

ASSAY CONTENT PER TON / ANALYSIS

	GOLD OUNCES	SILVER OUNCES		COPPER PERCENT	INSOL %	SiO_2 %	FE %	MN %	CAO %	ZN %	S %	AL_2O_3 %	AS %	SB %	BI %
Smelter		0.61		3.65	49.7	43.2	13.5		1.8		5.9	10.1			
Shipper															
Umpire															
Metallics															
Settle		0.61		3.65											

PAYMENT VALUE PER TON	PAY CONTENT	PRICE	AMOUNT	FREIGHT VALUE
Gold				
Silver - Less				
0.5 Oz. %	0.11	1.264	.14	.14
Copper - Less				
6 lbs. 5 %	61.75	.34223	21.13	6.30
Gross Value			21.27	6.44
Deductions			6.63	6.00
Freight Valuation			X X X	.144 = .43 Per Wet Ton
Net Value			14.64	@ 44.1430 Dry Tons

DEDUCTIONS	CHARGE	CREDIT
Base Charge "16.00"	6.00	
(Incl. Escolator Clauses)		
Additional Treatment		
Acc. Value Over 6.27 @ 10%	63	
SiO_2		
CaO		
Net Deductions	6.63	

	CHARGE	CREDIT
Less Freight On 44.7700 Wet Tons @ $1.77 Per Ton	80 14	
" Weighing — Cars @ Per Car	—	
" Hauling		
" Representation Umpires Sampling		
" Royalty 12½% to Charles H. Ward & James M. Ward	56 61	
" Withheld Pending Return Of Silver Affidavit		
Toll Metals		
Due Date		
Balance Due	509 50	

Checked: [illegible] Correct: [illegible] Approved: [illegible]

some ship in 40's

C O P Y of report made April 1956

COPPER QUEEN MINE
Yavapai County
Arizona

Big Bug District

OWNERSHIP - Samar M. Manly (formerly Dennison) Bumble Bee, Az.

LOCATION - State of Arizona, Yavapai County, Big Bug Mining District, 4 miles North and East of the City of Mayer.

[illegible] patented mining claims, taxes paid.

ACCESSABILITY - All weather road, maintained by the County.

TRANSPORTATION - Railroad siding, Humboldt, 9 miles distant. Air line service at Prescott, 30 miles to Northwest, excellent highway.

WATER - Agua Fria River on property, flows year around. Mine makes approximately 18,000 gallons per 24 hours. Large well drilled in bank of river on property.

POWER - Ample power from transmission line few thousand feet from property.

PERIOD OF OPERATION - Year around operation. Area subject to light snows which rarely last but a few days.

The following is a report on the condition of the mine, made April 1956, by one of the countrys leading Engineers.

CONDITION AT THE PROPERTY - I found the mine barren of equipment, the tunnels and drifts to be well planned and engineered with ample room for larger tonnage operation. The road is good all the way to the Agua Fria River, a very small stream, at which place fording was necessary. The bottom of this river is rock and gravel, large trucks cross this river at all times during the year except when there might occur flash floods. The gravel road from the Agua Fria River 3/4 of a mile, up to the mine is narrow and would require a little repair, however, I was able to drive to the mine portal with my auto. The deep winzes from the 400 level of adit # 2 in the Copper Queen is caved and would require a new collar set and possibly 50 to 75 feet of new timbering. The bins within the mine are usable and in most cases in excellent condition. The rise ladders, etc, are good but in places would require some repair.

SURFACE AND OUTCROP - The property lies along a narrow ridge extending North from the Agua Fria River and just east of the former town of

Stoddard. Its crest is marked by a very hard salicious zone of Yavapai schist which is almost quartzite. The strike is north and it dips west at an angle of about 60 degrees. Lying just west of this solidified schist are patches of black rock containing vesicles filled with iron oxide and greenish schist which contained malachite and azurite and calcopyrite.

The best copper outcrops, from the general appearance, occur near the north end of the property, just south of the Gracie claim and directly over the main adit or the 400 ft. level. Further south the solidification of the schist is also well marked, though not so prominent. There are numerous quartz veins showing oxidized copper mate[illegible]. On the Gracie claim, a basic dike which strikes east and west cuts [illegible] the cuoppings. This dike appears similar to a number that have been [illegible] the underground workings. These run in all directions and out across the ore without any noticeable effect or displacement.

The surface of this property is exceptionally interesting in that the mineralized areas there are great dikes of silicated black schist which have been cut through by the Agua Fria River. In this ore bearing black schist there is a chloritic schist always closely associated with the frequently encountered quartz and porphry making good values, with several small ryolite dikes making a gold bearing vein of some enrichment. Spar is found in abundance in the ore making materials and occasionally an altered granite is found but due to its inconsistency it appears of little consequence.

The impregnation of iron gives the formation a brown stain some times worn smooth and always mineralized. There appears to be a chief dike of this schist towards which the almost parallel veins tend coming together at the north end of the Gracie claim. At one point a dike of ryolite cuts sharply through the formation which abruptly altered the mineralized main vein 100 feet, altering one end of the break to the north. At this point the ryolite makes a chute or chimney of gold ore. Other intrusions have caused similiar, but lesser, disturbances. On the Copperopolis ground there was a rather large fault but did not alter the main vein but little.

The surface showing is exceptional, and to a geologist or engineer with experience in this area there is evidence of millions of tons of low grade ore which could be developed from an open pit. In al of this 350 acres there is little overburden which would have to be removed.

ORE BODIES - The ore bodies occur along fissures in the schist which are practically parallel to the cleveage. They are confined to the dark colored portions of the schist with a fine grained smooth texture. The prevailing type of schist is light colored and consists of crystals or pebbles of quartz enclosed in sericite and chlorite with associated pyrites. The principal ore body is longest on the #2 adit or 400 level, where its length is approximately 400 feet and its maxiumum width about 16 feet. This ore body is cut by a fault on the north end. In drilling thru this fault on approximately the 350 level a body which was the continuation of the original ore body, was encountered of increased value. A 40 ton shipment of this continuated body assayed 3.79 copper with .67 silver and .15 gold. This fault has a northwesterly strike and dips to the southwest. On the adit level its dip is about 28 degrees, while on the 500 level, 100 feet below,

it dips only 12 degrees. This ore body has probably been cut on the 700 level below the fault, as below the fault it is considerably increased in values. On the 200 and 300 levels its ore body is similar and approximately the same copper content as that on the 400 level but it is somewhat shorter. On the 500 level it is similar in length and values, but a little wider.

The considerable underground development shows the formation to be in place, and in depth gives the sam intrusions, the same cross-cut dike and same mineral-bearing materials. At depth, though, the mineralization is heavier and more general and while the sulphide shows above the water level at the epth, as seen at the hoist station of the deep winze in #2, a secondary enrichment was more uniform than above.

The surface shows apparently a number of mineralized dikes, but depth indicates a very large mineralizationed area where large tonnage will develop. This pertains to the copper. There are a number of gold-bearing quartz veins on the surface and in places quite persistent, which are about 3 feet wide on the average.

All the latter development work was done in Adit # 2. This was apparently a wise plan because the drift was driven in pay ore to the point where the joining of a number of semi-parallel veins made one big ore body. Transversing the crest of the ridge in a northeast direction, which is fully 200 feet in width, we found it heavily copper stained and, when broken into, azurite and malocite are found in quantity. The fact that the schist staining is verticle is an aid to carrying copper-impregnated waters downward to the water level. There it concentrated in the form of sulphites, causing a secondary enrichment. Because of the sulphides forming above the permanent water level, is here the case, the deep deposition has been so prominent, from the water level down that a superficial water level results, continually rising until the sulphide making material becomes blocked off. Thus the heavily mineralization on the surface make almost certain that at depth there is a large body of ore.

ORE RESERVES - There are ore reserves of the following nature: 33,000 tons on the 400 level and above adit # 2 which is now available for sampling and averaging approximately 2½ percent copper, a little silver and gold. Approximately 200,000 tons which is unavailable for sampling but which may be substantiated from attached reports of previous engineers, and excerpts from mining and engineering publications of the period when this work was done. Material was located primarily from the public library in Los Angeles and from the Charlotte Hall Museum of Prescott, Arizona. For instance, if one were to ~~many~~ rely upon Mr. Dinsmore's report (and incidentally Mr. Dinsmore is regarded as one of the best authorities during this period) in Adit # 1 (Mr. Dinsmore refers to our Adit #1 as Adit #3 in his reports) of the Little Ella claim, one could well derive several million tons of ore which would prove of milling values under prices of today.

Due to the extremely large area of mineralized schist which in this instance very probably would be considered ore, it would be impossible in the matter of the few days that I had to spend to ascertain exactly the value and amount of ore reserves. However, I was able to examine and take grab samples from numerous places. These are numbered on the attached map of the underground workings.

In traversing from the portal to apoint 450 feet inward, we encountered consistent walls of mineralized schist, beginning from a point about 170 to 180 ft. inward from the portal. We took grab-samples from the walls which is the sample marked # cross cut sample#. There is a 6 ft cross cut at this point that was driven north. This cross-cut is in the center of the vein which did not touch either wall. In this drift, about [illegible] ft is a stope from which we took a sample marked #[illegible] station# 1 stope#. A car load shipment from this stope was shipped to Phelps Dodge, Clarkdale 4/15/48 settlement sheet attached. Traversing back to the original drift to a point another 75 feet there is another drift angling again to the north. About 25 to 50 ft in this drift we took samples marked #Adit #2 Second Station". A car load shipment from this point was shipped from here to Phelps Dodge 4/1/48 as Lot No. 4920, settlement sheet attached. And from a point 60 ft north from the hoist station at the base of a rise and manway to the upper workings we took a sample marked "Last Stope #2). From this point a shipment of 84,3000 lbs was shipped to Phelps Dodge 6/1/49 under Lot No. 5208, settlement sheet attached. May the reader bear in mind the saples were not intended to be cross sampling of the stope ore vein, but only grab samples for the purpose of establishing an ore body or vein.

From a point where the adit cross cut intersects with the main ore body, there is a drift on the body approximately 500 ft. north. Every 50 to 100 feet there is a slight rise, in some instances stopes have been opened. Just beyond the hoist station there is a rise 100 ft to the 300 level. One hundred feet further is a slight rise to the upper workings. On the 300 level the ore is drifted from the second rise to just above the hoist station about 475 feet. It has not been developed further south where it intersects with a point above the adit drift.

The 200 level has a similar drift on the ore of approximately 400 ft. Thus the ore in this section is completely blocked by drifts and rises, which is available for complete sampling on all four sides. The tonnage in this area of the main vein would approximate 30,000 to 35,000 tons and available for immediate mining. Stopes and all development work necessary have been complted. As for the total amount of tonnages; or ore reserves, in this area, it would be necessary to quote from excerpts of the early mining journals and previous reports of engineers on the property and underwent an inspection during the time the property was under activation. However, on entering Adit # 2 on the 400 level, I was able to determine numerous veins and lenses from 4.5 and 6 feet wide of considorable enrichment above the normal ore-bearing schist. As I stated before 170 some odd feet in from the portal we ame upon mineralized schist. The value of this schist can be ascertained from the dump in as much as all the work, according to previous ecords, was done in developing, and entirely in ore. In sampling this dump the assay report showed $14.85 in copper, a trace of gold and a little pay in silver. This would indicate this mineralized schist is running approximately 1½% copper. However, our sample did not assay this mount when sampling the walls. This schist isapproximately 600 feet wide at this point, with backs of approximately 400 feet above the Adit. As per the reports on the 500, 700 and 900 levels, this same mineralized schist was encountered with continuous lenses of enrichment as was found on the 400, the 300 and 200 levels. All of this information indicates there is approximately 7,500 ft of workings within Adit #2 of this property. As for Adit #1 the Adit furthest south, according to reports, there is approximately 2,516 feet of workings.

In this work, al of the work with the exception of approximately 100 feet is said to have been done in ore. These two adits are 3,000 ft apart. In Adit #2 the total backs are approximately 600 ft. If we were to take the round figures of 700 ft backs, then this ore has been drifted on and developed 600 ft wide, 3000 ft long and 700 ft deep. This of course is low grade ore, approximately 1% plus or minus. The total tonnage of this ore would be well in excess of one hundred million tons.

There being little or no overburden to be removed, it would require no preliminary work other than a reassuring complete sampling program to determine the feasibility of a large open pit operation.

FUTURE ORE RESERVES - North of Adit # 3 there has been no development work other than shallow surface workings, and an examination of these workings show mineralized schist similar to that encountered in Adit # 2 and #3. On the extreme south end of the claims on the bank of the Agua Fria River, there is a drift about 200 ft. on the main lense. This drift was sampled in February of this year. A section 16 ft. wide showed 1.78% in copper, with a little gold and an ounce and half of silver. This is a point approximately 5,000 feet from the surface workings on the north end of the property. This would indicate the probability that this same mineralization continues through the entire Copper Queen claims. This would give total ore reserves and future prospects of a minimum of 600 ft, wide by 5,000 ft, long with a minimum depth of 600 ft. The surface showings are consistent over this belt.

DUMPS

DUMPS- On the Copper Queen property is a tailing dump from a mill formerly located on the adjoining property. This dump contains approximately 150,000 tons of tailings which assay about 1% copper. A flotation mill could be installed which would reclaim 80% or 18 pounds of copper per ton, with accompanying gold and silver. Therefore, one could treat these tailings for a handling charge of approximately $1.50 this leaving about $6.00 net per ton. This tailings dump would then show a profit of $900,000.00 in coppe plus silver and gold. As for chemical treatment of these tailings, the Kemo Mining Corporation controls a suitable process for this purpose. With it a possible extraction of about 98% could be obtained at a considerable lower cost per ton treated, and a complete installation could be installed for a figure not to exceed $30,000.00 for a 250 ton plant operating on a 24 hour basis. The first figures of provit are determined upon ordinary methods of treating, but if this Kemo process could be employed considerable more profit could well be expected. I recommend that a thorough study and test of this process be made on these tailings. If the results prove satisfactory, it could be very profitable.

IN CONCLUSIONS: In view of the excellent surface showings, the extensive underground development totalling 10,000 feet or more, all of this work apparently has been in ore of values considered profitable under present day prices. The resultsof this development demonstrates the existance of large bodies of enriched ore. One of the favorable things about thisproperty is that the major expense and gamble is in the past. I have seen or been through upwards of a million dollars worth of development work, and yet I cannot see where there has been but very little, if any, production from thisproperty. The history of this mine goes back to an extensive development program by a group of very wealthy Texans. Their program wasto develop vast tonnages of ore for a future large production. The only ores taken from this

property, or sold from this property, were taken from the actual development work and it has never been what one might consider a producing mine. During the course of years of World War II, etc, there has been some stoping done on the 400 level of Adit # 2. Other than this, it has been strictly a development program, and this million dollar development is now all a matter of history, with the gamble of developing in barren ground or running out of ore no longer a matter to be incurred by a new operator.

There are millions of tons of ore which are proven by 10,000 or more feet of workings. It is true the grade is low and the operator would have to have as efficient an operation as possible in order to show a substantial per ton profit, but there are other minesin the country operating with substantial incomes without nearly the potential that this property has. I don't believe that I have ever undergone an inspection of an unoperating property with more merit than this Copper Queen property demonstrates to me. With the proper management and adequate funds this could well be one of the big producing copper mines of our day.

The foregoing remarks, brief as they are, should convey to any person who is able to understand their meaning the fact that the Copper Queen mine offers to those who own it an investment seldom found in mining ventures. It is a project which has proven ore reserves the value of which is known. All that is required is equipment, organization, ability to organize the technical details of the project. The Binghampton mine, which adjoins the Copper Queen property was a big producer in its day and produced during one period over 8,000,000 pounds of copper, 33,000 ounces of silver and over 200 ouncesof gold.

(Signed) Sholto Douglas, D.SC.

OPERATIONS OF THE COPPER QUEEN GOLD MINING COMPANY ARIZONA

(Copied from The Mining & Engineering World, December 9, 1911)

The property of the Copper Queen Gold Mining Company is located 6 miles east of Humboldt, Arizona. The ore is chiefly copper with some gold and silver. Many thousands of feet of work has been done, and at the present time three phases are in ore while a millsite and the ever flowing Agua Fria River. Manager Louis Goldman has bought and is now patenting and holding in trust with a three year option to the Copper Queen Company 11 more contiguous claims. These give the company a large area and embrace the ore making ledges for several miles. The company is chiefly owned in Paris, Texas and it is practically a closed corporation; Louis Goldman is President and manager; R. F. Scott, Vice-President; William Frank, Secretary; Abe Goldman, Treasurer; Louis Goldman, R. F. Scott, William Frank, Abe Goldman, J. K. Dymaton, H. S. Betts, J. H. Gooch are the directors. R. I. Murphy, A. M. Rogers, C. A. Noyes are the Advisory Board. F. Engel of Colorado is chemist and engineer. All work is by contract. John C. Cain having charge of this department.

In the development of this property, President Goldman was given full charge, coming out from his home to give personal attention to the enterprise. He was not a mining man but the company had employed a couple of engineers to report and recommend and Mr. Goldman has absolutely followed their expert advice. The result being a well developed mine where all the work has been properly done and where every handling ALL THE TIME HAS BEEN IN ORE or as near so as possible. This situation makes it unnecessary to do expensive sinking for development. Nearly all exploitations of the vein system being by initial surface cuts and pits and then by crosscut tunnels, drifts, rises and winzes. The difference is seen in the fact that the 370 ft. of shaft costs $22 per foot, while the other work in all approximately 3233 ft. cost about $12 a foot and actually serves as well as the higher cost work done.

Tunnel #1 is about 800 ft south of the Gracie outcrop and is 200 feet long. At 180 ft in a drift was run 15 feet. There is a 44 foot winze with a 12 foot west crosscut at the bottom. All this work from 100 feet in is in mineralized ground. Vertical depth here is about 100 feet. Tunnel #2 is on the Little Ella penetrating the Copperopolis. It is 628 feet long, 90 ft from the portal. A drift is run 120 ft to the north. At 75 ft in is a crosscut east 20 ft and west 15 ft. At 96 ft in a shaft was sunk 370 ft. At 300 ft in this shaft a crosscut runs west 129 ft and east 494 ft, and from the bottom of the shaft is a drift 120 ft north. At 165 ft from the portal of tunnel is a drift 75 feet north with east and west crosscuts of 20 feet each. 475 ft from the portal is a south drift 50 ft with east and west crosscust of 20 ft each. At 583 ft from portal is a drift 120 ft north. 235 ft south and 60 ft on this drift is a crosscut east and west of 35 ft. There are backs here of 325 ft. In this work a 17 ft quartz dike is encountered running high grade in Calcopyrite, grey copper and glanze with some gold and silver. The balance of this group is the regular mineralized schists mostly solidified. The power plant is at #2 adit and consists of a Fairbanks Morris gasoline engine of 32 H.P. operating a three drill air compressor. The air is transmitted to #3 at which later point development is now concentrated. In all the work in #2 only a section 110 ft in width was found barren. This consisting of lime schists and shale which is thought to be a wall of the silicated schists and quartz.

Tunnel #3 is on the north end of the Little Ella and penetrating the Copper Queen is 540 ft long at date of writing. At 450 ft a drift is running northeast, now is 60 ft all the way in ore averaging from wall to wall over 4%. The 4 1/2 ft drift is in the center of the vein and does not touch either wall. The mineral is black Yavapai schist and quartz. This entire crosscut is in mineralized ground and crosses much territory carrying excellent values. A dike of porphry makes a rich ore body. Three cross veins from 20 to 60 ft in width are cut either of which would justify drifting and sinking. The drift is running

 in a heavy ore body. The face of the crosscut is all in ore. The

work here is pending toward the big outcrop of the Crucie grounds at which point the many veins seem to have come together, and where all probabilities are a great body of ore will be found. The 400 ft long, all mineralized. In the work in #2, the primary sulfide Calcophrite is found in massive bodies as well as the other sulfides. This feature is extremely interesting. On the surface the ore is strictly carbonate, principally azurite, while in the tunnel backs at the present time of 250 ft the sulfides have laid in large bodies.

There is a great amount of other work in the property mostly of a superficial or surface prospecting character. The idea is to determine concentrating ore bodies, and in above tunnel levels when a plant will be installed and development at depth be forwarded by a main workings shaft. This purpose is entirely feasible because the sulfides come in at such meager depths. The ore bearing schist is black usually and there is a chloritic schist always closely associated. The quartz and porphry frequently encountered makes fine ore. A small riolite dike makes a gold bearing vein of some enrichment. Considerable spar is found in the ore making materials. Occasionally an altered granite is found, but this is unusual.

COPY By HOWARD J. POTTER Made April 20, 1956

REPORT ON THE COPPER QUEEN GOLD MINING COMPANY'S GROUP

I have carefully examined that certain group of mining claims near Mayer, Arizona formerly owned by the Copper Queen Gold Mining Co., and the following represents the results of my examination.

HISTORY:

This district has a very favorable history of gold, silver and copper production. Much gold was mined around here in the early days. Practically all the gold production is a by product of the copper operations. The largest producer in the District, prior to the operation of the "Iron King" mine, operated by the Calumet and Hecla Mining Co., which is about 10 miles distant from your property was the Binghamton mine, which is reported to have produced over 8,000,000 pounds of copper and considerable gold. The ore bodies of the Binghamton and Copper Queen are practically one and the same.

A group of oil men from Texas began the development of the Copper Queen about the beginning of the twentieth century. The development was expertly done. With the exception of less than 200 feet at the portals of the adits all advancement is in mineralized ground. With the exception of a small tonnage milled in the Binghampton mill and the ore shipped by yourself in sampling the ore above the #2 adit level, the ore bodies are intact.

After World War 1 the price of copper broke sharply and stayed at a low level for many years. The properties in this district were abandoned and forgotten and many subsequently sold for delinquent taxes. Your property was one of these.

DESCRIPTION: This group is located in Yavapai County, Arizona and lies about 5 Miles easterly from the town of Mayer. Consists of 26 Patented claims, totaling 353.413 acres (See claim map) Following is an itemized list of the claims, their names, survey number and acreage area.

Name	Survey No.	Acreage
1- Lightening Bug	1854	20.661
2- Gracie No. 2	1854	11,035
3- Copper Queen	1854	17,861
4- Fraction	1854	6,188
5- Little Ella	1854	16,336
6- Copperopolis	1854	20,690
7- Highland Chief	1854	16,780
8- Fraction No. 2	2548	16,180
9- Fraction No. 3	2548	11,175
10- Gray Eagle	2958	20, 507
11- Pride of Yavapai	2958	11,964
12- Golden Star	2958	11,934
13- Iowa	2959	17,929
14- Robin	2959	20,548
15- Toughnut	2959	20,387
16- Missing Link	2959	9,609
17- Rabidoux	2959	8,632
18- Copper Bucket	2959	13,024
19- Surprise	2959	20,031
20- Copper Iron	2959	20,016
21- Louise	3429	5.013
22- Martin Fraction	3420	5.634
23- Martin Fraction Ex.	3430	0.244

Name	Survey No.	Acreage
24- No. Nineteen	1864	20,449
25- Kid	2543	9,980
26- Honeymoon	2543	20,660

GEOLOGY: The country rock of this district consists principally of various phases of Yavapai schist, mostly chloritic and sericitic. The writer observed near the No. 1 adit rocks of carboniferous slate suggesting sedimentary origin of the schists. The schists are cross fractured by dykes of rhyolit, basic felsites and quartz. Blowouts of bull quartz are frequent.

Mineralization is largely confined to the area of silicication. The mineral in the form of copper, iron, silver, and gold sulfides accompanied the siliceous solutions and were precipitated where the conditions were favorable. The silicified areas withstanding erosion more than the country rock stands up boldly and assumes the form of prominent reefs. There occurs some pre and post mineral faulting mostly the latter and the main fault which has a comparatively short throw, appears to flatten at depth as far as can be observed.

The strike of the ore body is northerly-southerly. The enriched portions of the zone appear as lenses of varying width and length and persist vertically. Some of the walls of these lenses are well defined and others are assay walls.

The geology of the Binghamton which is identical to that of the Copper Queen is described by Waldemar Lindgren in Bulletin #782, issued by the U.S.G.S. in 1926 "Ore Deposits of the Jerome and Bradshaw Mountain Quadrangle, Arizona".

DEVELOPMENT: The writer has not examined a mining property in the State of Arizona not in operation, with as extensive and rewarding development as the "Copper Queen". You have in your possession a map of the underground workings made for the former management of the property. This map covers the workings accessible from Adit #2.

For the purpose of this report I have designated the adits as follows: The lowest and most southerly, adit #1, the main adit, adit #2, the upper and highest in elevation, adit #3 to coincide with your map.

On adit #A, called #2, from a copy of a report made by Charles A Dinsmore, a mining engineer in the Mining and Engineering World of Dec. 9, 1911 the cross cut is 628 feet in length. Winzes, drifts, and cross cuts from this level are reported to have advanced a total of 2,516 feet. This adit was started on the southend of the "Little Ella" and cut into "Copperopolis" ground.

On this adit level a winze was sunk to the 900 foot level and rises run to the 200 ft level. Stations were cut at the 200,300,500,700 and 900 ft. level. This map shows cross-cutting and drifting on the adit level of 2,300 ft. Rises and winzes 700 ft. Drifting on the 200 and 300 about 400 ft. each. On the 500 ft level drifting and cross-cutting of 1,080 ft. On the 700 ft level, drifting and cross cutting of 2,258 feet and on the 900 ft. drifting and cross cutting of about 450 ft. A total of 7,588 ft of development on this adit level. On the #3 adit which was probably the earliest workings, cross cutting and drifting amounts to about 350 ft.

This totals to about 10,400 ft of development work from which very little ore has been extracted. In addition to the above systematic development, there are numerous cuts, shallow shafts and short tunnels on both sides of the ore body, totaling several thousand feet.

At today's costs, it is doubtful that this development could be done for less than half a million dollars. Much of the underground workings are inaccessible, but wherever the workings may be entered the map mentioned above has proven correct.

THE ORE BODY: The ore in the "Copper Queen" group may be divided into two classifications; ore of a grade which may be profitably treated in a small mill and low grade ore which may be quarried and milled on a large scale. According to sampling from actual shipments to the smelter made by you and the settlement sheets in your possession there is now available in the mine, from adit #2 over 33,000 tons of ore that will assay 2.3% copper and some silver. The writer considers that there should be ten times this amount of ore, of this grade or better, in the 500,700 and 900 ft. levels. The winze leading to these levels are now filled with water and the workings could not be inspected.

It is my opinion that the mineralization of the schists was coincident with the silicification. I was impressed with the presence of sulfide minerals, both chalcopyrite and pyrite, in the silicous schists, outside of the considered ore body. Inspection of the walls of the cross cut, from less than 100 feet from the portal of adit #2 reveals the presence of varying amounts of mineralization. It is a high probability that a core drill exploration program confining the exploration to the silicified areas of the mine would develop a very large tonnage of low grade copper ore as susceptible to quarry and pit operation.

If we consider the silicifed schists as possible ore, there would be a body 3,000 x600x700 feet which at 12 cu. ft to the ton would amount to over 100,000,000 tons.

METALLURGY: Most of the copper values in this property, as stated before, are in the form of sulfides, principally chalcopyrite, High recovery of copper sulfides by flotation is accomplished by standard milling practice and presents no problem.

CONCLUSION: Judging from the map of the underground workings, combined with various reports in your possession, the Copper Queen in its present state is a highly developed property with over 10,000 feet of development. You have positive reserves of over 33,000 tons of milling grade ore with evidence of many times this amount in other levels. There is a distinct probability that proper exploration should develop a very large body of low grade copper ore.

RECOMMENDATIONS: You have sufficient ore in sight to feed a flotation mill of 100 tons per 24 hours day capacity. Opening up caved drifts and de-watering winzes on the adits should furnish you with mill ore for many years. I recommend the installation of such a mill. I further recommend that as soon as practicable the inauguration of a core drilling program designed to develop a low grade ore body.

I am fully convinced that the operation of the "Copper Queen" will prove to be a highly profitable undertaking.

Respectfully submitted.

(Signed) HOWARD J. POTTER, Er

7110 Middleton St.
Huntington Park, Calif.

HOWARD J. POTTER, Engineer
Qualifications

TECHNICAL EDUCATION: University of Washington - Engineering
University of Southern California - strategic minerals, Class Lab.
University of Arizona - Scheelite recovery in University Mill & Lab.
Master Gunners School. U.S.Army World War 1, Surveying, map and mechanical drawing.

EXPERIENCE FROM 1915 to DATE.
Operated War Eagle Mine; Lead-Silver, near Bagdad.
Mined Manganese, Conception Bay, near Mulege, Baja Calif.
Engineer, Copper Dog Mining Co., near Patagonia, Az.
Exploration, Holcomb Valley Mines, San Bernardino Co. Gold
Engineer; field work and exploration for Charles Johnstone, former President, Guardian Corp. L.A.Calif.
Many intermittent field examinations for various clients in Calif, Arizona, Nevada, New Mexico.
Engineer for shipping chrome property in Tehana Co. Calif.
Operating Engineer for Kem Sierra Tungston Mine in the Southe Sierras Kern Co. Calif.
Operating Engineer for the Mountain Key Mine, gold-silver-lea and copper, near Silver City, N.M.
Since 1951 consulting engineer for the Allied Mines, Petroleu investment trust, Allied Royaltics and Atolia Tungston. All work on Scheelite properties.

REFERENCES:
Carder Livingston
Livingston Materials
Cherry St.
Long Beach, Calif.

Anson Murphy
Anson Construction Co.
Long Beach, Calif.

Ed. Eisenhaur, Jr.,
San Pedro St.,
Los Angeles, Calif.

C.R.Zapponi
Glamis, Imperial County, Calif.

George G. Moore
316 N. Norton St.,
Los Angeles, Calif.

McPHAR GEOPHYSICS

REPORT ON THE INDUCED POLARIZATION AND RESISTIVITY SURVEY IN THE COPPER QUEEN AREA YAVAPAI COUNTY, ARIZONA FOR COMINCO AMERICAN, INC.

1.0 INTRODUCTION

At the request of Cominco American, Inc., McPhar has completed an Induced Polarization and Resistivity Survey in the Copper Queen Area, Yavapai County, Arizona. The Copper Queen Area is situated in Sec. 6 and Sec. 7, T. 12N, R. 2E., and Sec. 36, T. 13N., R. 1-1/2E., within the Agua Fria Mining District.

The rocks within the Copper Queen Area are highly foliated meta-volcanics which belong to the Precambrian Yavapai Series. They strike northerly and dip steeply to the west. At the Copper Queen Mine copper sulphide mineralization occurs as disseminations and in bands with quartz within two veins, approximately 12 feet wide and 50 feet apart, which parallel the foliation.

The purpose of the Induced Polarization and Resistivity Survey was to prospect for possible massive sulphide bodies at depth. To accomplish this, measurements were initially made with 500-foot and 1000-foot dipoles along two

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The purpose of the Induced Polarization and Resistivity Survey was to prospect for possible massive sulphide bodies at depth. To accomplish this, measurements were initially made with 500-foot and 1000-foot dipoles along two

north-south reconnaissance lines parallel to the strike of the veins, and subsequently with 500-foot dipoles along six east-west lines.

The survey was planned and the results reviewed with Mr. Hugh Moore and Mr. Ken Brook of Cominco American. The work was performed by Mr. Juan Sainz, crew chief.

2.0 PRESENTATION OF RESULTS

The Induced Polarization and Resistivity Survey results are shown on the following data plots in the manner described in the notes which accompany this report.

Line	Electrode Intervals	Dwg. No.
0	500 feet	I.P. 5954-1
2	1000 feet	I.P. 5954-2
5N	500 feet	I.P. 5954-3
15S	500 feet	I.P. 5954-4
35S	500 feet	I.P. 5954-5
50S	500 feet	I.P. 5954-6
EE	500 feet	I.P. 5954-7
HM	500 feet	I.P. 5954-8

Also enclosed with this report is Dwg. I.P.P. 4850, a plan map of the Copper Queen Area at a scale of 1" = 500'.

In this report both percent frequency effect (PFE) anomalies and metal factor (MF) anomalies are shown on the plan map. Percent frequency effect is a measure of the intensity of polarization, and anomalies are classified as very weak to very strong. The percent frequency effect results indicate

polarizable areas without taking into account the resistivity of the areas. Metal factor (MF) is obtained by combining the percent frequency effect and the resistivity. A good conductor (low resistivity) that is strongly polarizable (high percent frequency effect) will give a well-defined or definite metal factor anomaly. Less well-defined metal factor anomalies are designated as probable or possible.

The percent frequency effect and metal factor parameters are complementary. The relative importance of each type of information depends upon the particular geophysical environment and the type of target expected. For example, a mineralized silicified zone will give a strong percent frequency effect anomaly, but may not give a definite metal factor anomaly. Alternatively, an oxidized ore zone may only give a weak percent frequency effect anomaly, but will give a definite metal factor anomaly pattern. Judicious consideration of both the percent frequency effect and the metal factor results permits a comprehensive evaluation of the geophysical environment.

The anomalies as shown on the data plots and plan map represent the surface projection of the polarizable zones. Contacts or faults inferred from the resistivity patterns are also shown. Anomaly boundaries and fault locations should be considered accurate to the electrode interval used.

The anomalies shown on the plan map are designated apparent depths of shallow, moderate, or deep. At larger dipole separations a greater volume of rock is averaged, in lateral extent as well as depth. Thus, the source of a deep-appearing anomaly detected along a single line may be at shallow depth to one side of the line. The data plots, therefore, cannot represent true depth. Depths can be calculated from the apparent resistivity data in the case of ideal horizontal layers, but even this calculation depends on an assumed resistivity contrast

between the zone at depth and the overlying rock. Although ambiguous, the simple depth designations are useful for correlating or comparing anomalous zones obtained on adjacent survey lines. Drill hole information from one or more zones frequently permits one to make a fair depth estimate for other zones. The following depth generalizations apply to porphyry copper and contact-replacement bodies:

	Apparent Depth (dipole separations)	Drill Hole Depth (in dipole lengths)
Shallow	1 - 2	1/2 - 1
Moderate	2 - 3	1 - 1-1/2
Deep	3 - 5	1-1/2 - 2+

Thus, a shallow zone is one detected at a one-to-two dipole separations and should be tested by a drill hole from a half-to-one dipole length deep.

An appendix on the interpretation of induced polarization anomalies from relatively small sources is enclosed in this report. It shows the desirability of detailing with shorter spreads when the anomaly is shallow and the source may be narrow.

The Induced Polarization method is a geophysical tool used to determine the electrical properties of the earth. The final evaluation of the Induced Polarization anomalies, e.g., which of the anomalies constitutes the most favourable exploration target, must be based on available geologic evidence and concepts.

3.0 DISCUSSION OF RESULTS

In order to aid the interpretation of the Induced Polarization and

Resistivity Survey results, laboratory measurements were made on a specimen of siliceous, mineralized schist obtained from the Copper Queen dump. The measurements were repeated after the specimen had soaked in tap water for five days.

Orientation	Resistivity	PFE	MF
perpendicular to schistocity	27,000	1.2	0.04
perpendicular to schistocity	16,600	2.0	0.1
parallel to schistocity	415	62	150
parallel to schistocity	428	44	102

The very high resistivity and corresponding low PFE perpendicular to the schistocity are due to fine quartz veinlets parallel to the schistocity that blocked conduction paths. The low resistivity and very high PFE parallel to the schistocity are due to a number of fine sulphide veinlets that parallel the schistocity.

As shown on the plan map, very weak-weak PFE anomalies and corresponding possible-probable metal factor anomalies were detected along the survey lines. The strongest PFE's were measured along Line 5N, Line 15S, and Line 50S. The highest metal factor response is shown by the probable anomaly at shallow-moderate depth along Line 5N. The resistivity and IP results obtained along each line are discussed in detail below.

Line 0

Line 0 was run parallel to the mineralization exposed in the Copper Queen Mine located at 0 + 00 along the line. High resistivities occur within the interval 0 + 00 to 20S. The resistivity low in the interval 50S to 60S(?) coincides with the Agua Fria River wash.

A very weak PFE anomaly occurs at shallow-moderate depth in the interval 0 + 00 to 5N. A deep, very weak single PFE anomaly also occurs in the interval 0 + 00 to 5S. These very weak anomalies occur in an anomalously high background of 1.5% that extends from 15N to 45 + 50S.

The possible metal factor anomaly at shallow-moderate depth in the interval 0 + 00 to 10N is due to a resistivity low in the interval 5N to 10N and very weak PFE's in the interval 0 + 00 to 5N. The deep, possible metal factor anomaly in the vicinity of 55S is due to an above-background PFE.

Line 2

Line 2 was run with 1000-foot dipoles parallel to Line 0 and down dip from the mineralization exposed along Line 0. The resistivity high associated with the interval 30N to 50N coincides with a ridge. A shallow resistivity high occurs in the interval 0 + 00 to 10S and a resistivity high occurs at depth in the interval 5S to 60S. The shallow resistivity low in the interval 40S to 60S(?) coincides with the Agua Fria River wash.

A very weak PFE anomaly occurs at shallow depth throughout the interval 10N to 60S (?). A separate, very weak PFE anomaly occurs at shallow-moderate depth in the interval 15N to 25N.

A possible metal factor anomaly occurs at shallow-moderate depth in the interval 10N to 15S. The anomaly is due to lower resistivities and very weak PFE's. The deep possible metal factor anomaly in the interval 15N to 25N appears to be a separate zone. The shallow, possible metal factor anomaly in the interval 40S to 60S(?) can be attributed in part to low resistivity alluvium and gravel in Agua Fria wash.

Line 5N

A very high resistivity zone that can be attributed to silicification occurs at shallow-moderate depth in the vicinity of 0 + 00. A contact is indicated in the vicinity of 5W, with a shallow resistivity low in the interval 5W to 10W. The resistivity low, which does not appear to be due to topography, persists in depth to the west.

The PFE results indicate a very weak-weak anomalous zone throughout the interval 5E to 30W. The zone is shallowest in the vicinity of 5W. The resistivity high at shallow-moderate depth in the vicinity of 0 + 00 is a PFE low, but the laboratory results indicate that this does not necessarily signify an absence of mineralization.

The probable metal factor anomaly in the interval 5W to 17 + 50W is due to both low resistivities and distinctly anomalous very weak-weak PFE's. The deep, probable metal factor anomaly in the vicinity of 25W and the deep possible anomaly in the interval 0 + 00 to 5E appear to be related anomalies.

Line 15S

The resistivity results indicate possible contacts in the vicinity of 10E and 10W, with higher resistivity material in between. The resistivity lows in the interval 10E to 15E and 10W to 15W may be valley topographic effects in part.

A very weak PFE anomaly occurs at shallow-moderate depth in the interval 15W to 20W. A very weak-weak PFE anomalous zone occurs at moderate depth throughout the interval 10W to 12 + 50E. The zone is strongest in the vicinity of 5W.

The probable metal factor anomaly at shallow-moderate depth in the interval 10W to 20W is due to lower resistivities and above-background very weak PFE's, as is the probable anomaly at moderate depth in the vicinity of 10E. The deep, possible metal factor anomaly in the interval 0 + 00 to 7 + 50E is due to lower resistivities and very weak PFE's.

Line 35S

Shallow resistivity lows occur in the intervals 0 + 00 to 5E, 5W to 10W, and 25W to 30W; these may be topographic effects. Resistivity lows also occur at depth in the interval 0 + 00 to 5W and in the vicinity of 10E; these do not appear to be topographic effects.

The very weak PFE anomalies are not as well developed as those along Line 5N and Line 15S. The metal factor results show that the PFE anomalies are associated with two zones: a probable anomaly at shallow-moderate depth in the interval 0 + 00 to 5E and a possible anomaly at moderate depth in the interval 10E to 15E.

Line 50S

The resistivity results indicate a contact in the vicinity of 20W, with higher resistivity material to the west. A shallow resistivity low occurs in the interval 0 + 00 to 20W.

A very weak - weak PFE anomaly occurs in the interval 5E to 10W. The anomaly is shallowest in the vicinity of 0 + 00. The deep, very weak PFE anomaly in the interval 15E to 20E is due to a single reading and, as such, should be suspect.

The probable metal factor anomaly at shallow-moderate depth in the interval 0 + 00 is due to low resistivities and very weak-weak PFE's. The

possible metal factor anomaly in the interval 20E to 25E is mainly due to low resistivities.

Line EE

Contacts are indicated in the vicinity of 0 + 00 and 30W. The resistivity low at shallow-moderate depth in the interval 0 + 00 to 5W does not appear to be due to topography.

A very weak PFE anomaly occurs at shallow-moderate depth in the vicinity of 30W; the anomaly does not appear to be due to the steel post fence at 35W. A deep, very weak PFE anomaly occurs throughout the interval 10W to 7 + 50E.

The probable metal factor anomaly at shallow-moderate depth in the interval 25W to 30W is due to lower resistivities and very weak PFE's. The shallow portion of the possible metal factor anomaly in the interval 0 + 00 to 10W is mainly due to low resistivities; the deep portion of the anomaly is due to very weak PFE's.

Line HM

A contact is indicated in the vicinity of 20E, with higher resistivity rock to the east. Contacts are also indicated in the vicinity of 5E and 5W, with low resistivity material in between.

A shallow, very weak PFE anomaly occurs in the interval 0 + 00 to 5W. The anomaly was double checked, and includes a mineral showing. The shallow, probable metal factor anomaly in the interval 5E to 5W is due to low resistivities and above-background very weak PFE's.

4.0 CONCLUSIONS AND RECOMMENDATIONS

The laboratory IP results demonstrate that the highest IP response is obtained when measurements are made parallel to a continuous network of sulphide veins. They also show that a weaker response is expected when measurements are made perpendicular to the veins, particularly when silicification has blocked the conduction paths. In light of this, and also the fact that the 500-foot dipole measurements average a large volume of ground, the very weak PFE anomalies and particularly the corresponding probable metal factor anomalies detected along the east-west lines perpendicular to the regional foliation should be of further exploration interest. The very weak PFE anomalies are twice background. The probable metal factor anomalies are three-to-four times background, and their patterns are quite distinct.

The best developed metal factor anomaly is the probable anomaly in the interval 5W to 17 + 50W along Line 5N. Since the anomaly appears at n = 1 and n = 2 and could be due to multiple sources, it should be detailed with 100-foot or 200-foot dipoles (See appendix on small sources). An increase in IP response at shorter spreads would provide encouragement for drilling.

The shallow, probable metal factor anomalies and very weak PFE anomalies detected along the remaining east-west lines should be closely examined for favourable surface indications and also considered for detailing. A possible deep target is the weak PFE anomaly in the vicinity of 5W along Line 15S.

McFEAR GEOPHYSICS INCORPORATED

Anthony M. Hauck III,
Geophysicist

Phillip G. Haller,
Geophysicist

Dated July 11, 1972

APPENDIX
THE INTERPRETATION OF INDUCED POLARIZATION ANOMALIES FROM RELATIVELY SMALL SOURCES

The induced polarization method was originally developed to detect disseminated sulphides and has proven to be very successful in the search for "porphyry copper" deposits. In recent years we have found that the IP method can also be very useful in exploring for more concentrated deposits of limited size. This type of source gives sharp IP anomalies that are often difficult to interpret.

The anomalous patterns that develop on the contoured data plots will depend on the size, depth and position of the source and the relative size of the electrode interval. The data plots are not sections showing the electrical parameters of the ground. When the electrode interval (X) is appreciably greater than the width of the source, a large volume of unmineralized rock is averaged into each measurement. This is particularly true for the large values of the electrode separation (n).

The theoretical scale model results shown in Figure 1 and Figure 2 indicate the effect of depth. If the depth to the top of the source is small compared to the electrode interval (i.e. d X) the measurement for n = 1 will be anomalous. In Figure 1 the depth is 0.5 units (X = 1.0 units) and the n = 1 value is definitely anomalous; the pattern on the contoured data plot is typical for a relatively shallow, narrow, near-vertical tabular source. The results in Figure 2 are for the same source with the depth increased to 1.5 units. Here the n = 1 value is not anomalous; the larger values of (n) are anomalous but the magnitudes are much lower than for the source at less depth.

When the electrode interval is greater than the width of the source, it is not possible to determine its width or exact position between the electrodes. The true IP effect within the source is also indeterminate; the anomaly from a very narrow source with a very large true IP effect will be much the same as that from a zone with twice the width and 1/2 the true IP effect. The theoretical scale model data shown in Figure 3 and Figure 4 demonstrate this problem. The depth and position of the source are unchanged but the width and true IP effect are varied. The anomalous patterns and magnitudes are essentially the same, hence the data are insufficient to evaluate the source completely.

The normal practise is to indicate the IP anomalies by solid, broken, or dashed bars, depending upon their degree of distinctiveness. These bars represent the surface projection of the anomalous zones as interpreted from the location of the transmitter and receiver electrodes

when the anomalous values were measured. As illustrated in Figure 1, Figure 2, Figure 3 and Figure 4, no anomaly can be located with more accuracy than the spread length. While the centre of the solid bar indicating the anomaly corresponds fairly well with the source, the length of the bar should not be taken to represent the exact edges of the anomalous material.

If the source is shallow, the anomaly can be better evaluated using a shorter electrode interval. When the electrode interval used approaches the width of the source, the apparent effects measured will be nearly equal to the true effects within the source. When there is some depth to the top of the source, it is not possible to use electrode intervals that are much less than the depth to the source. In this situation, one must realize that a definite ambiguity exists regarding the width of the source and the IP effect within the source.

Our experience has confirmed the desirability of doing detail. When a reconnaissance IP survey using a relatively large electrode interval indicates the presence of a narrow, shallow source, detail with shorter electrode intervals is necessary in order to better locate, and evaluate, the source. The data of most usefulness is obtained when the maximum apparent IP effect is measured for n = 2 or n = 3. For instance, an anomaly originally located using X = 300' may be checked with X = 200' and then X = 100'. The data with X = 100' will be quite different from the original reconnaissance results with X = 300'.

The data shown in Figure 5 and Figure 6 are field results from a greenstone area in Quebec. The expected sources were narrow (less than 30' in width) zones of massive, high-grade, zinc-silver ore. An electrode interval of 200' was used for the reconnaissance survey in order to keep the rate of progress at an acceptable level. The anomalies located were low in magnitude.

The very weak, shallow anomaly shown in Figure 5 is typical of those located by the X = 200' reconnaissance survey. Several anomalies of this type were detailed using shorter electrode intervals. In most cases the detail measurements suggested broad zones of very weak mineralization. However, in the case of the source at 20N to 22N, the measurements with shorter electrode intervals confirmed the presence of a strong, narrow source. The X = 50' results are shown in Figure 6. Subsequent drilling has shown the source to be 12.5' of massive sulphide mineralization containing significant zinc and silver values.

The change in the anomaly that results when the electrode interval is reduced is not unusual. The X = 50' data more accurately locates the narrow source, and permits the geophysicist to make a better evaluation of its importance. The completion of this type of detail is very important, in order to get the maximum usefulness from a reconnaissance IP survey.

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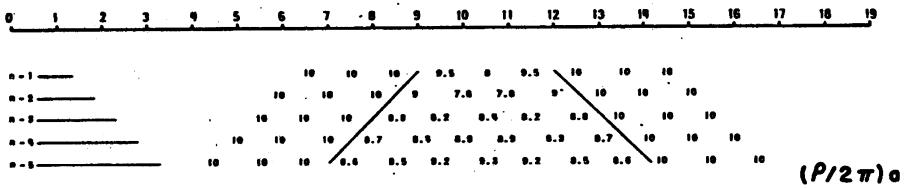
Theoretical Induced Polarization and Resistivity Studies

Scale Model Cases



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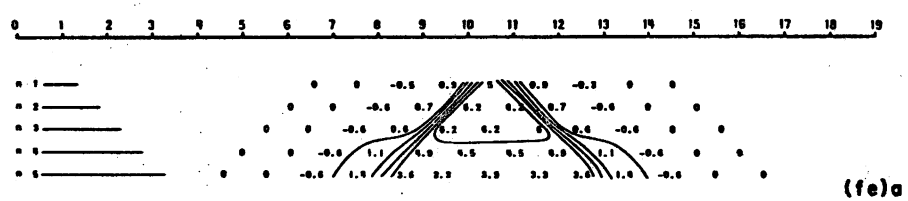

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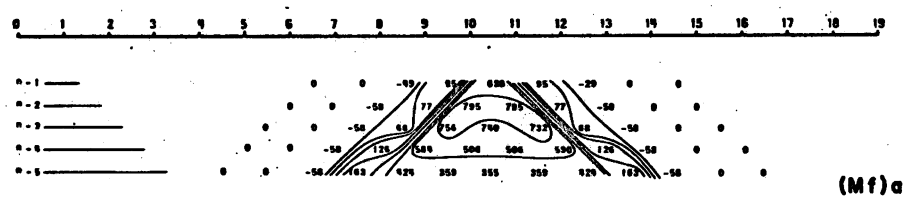

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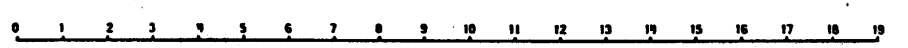

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$(Mf)_2 = 10000$

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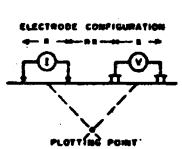
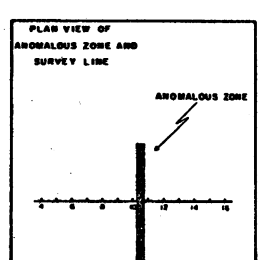


FIG. 1

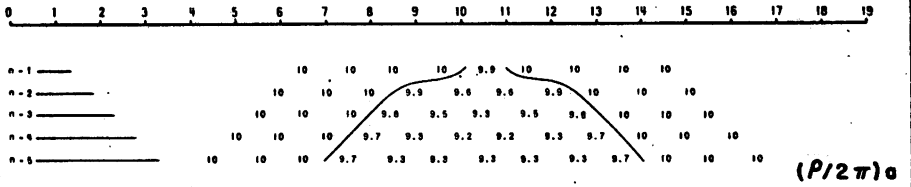


CASE II-0.5-BU-10-a

McPHAR GEOPHYSICS LIMITED

Theoretical Induced Polarization and Resistivity Studies

Scale Model Cases



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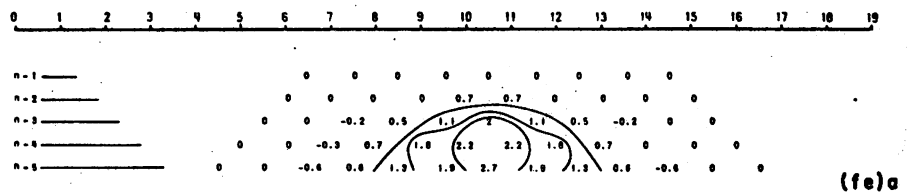

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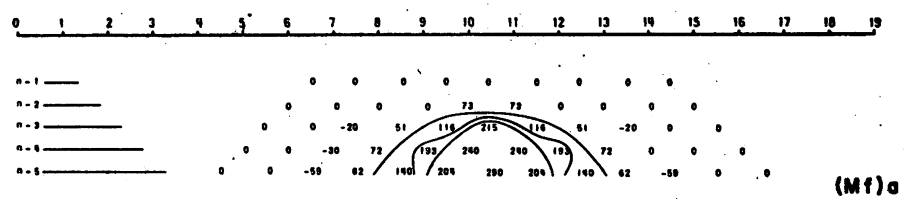

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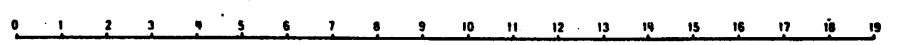


$(P/2\pi)_1 = 10$

$(Mf)_1 = 0$

$(P/2\pi)_2 = 2.6$

$(Mf)_2 = 9250$

$(fe)_2 = 24\%$

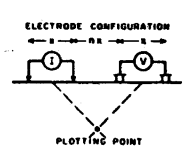
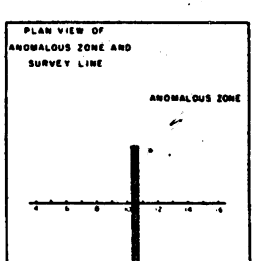


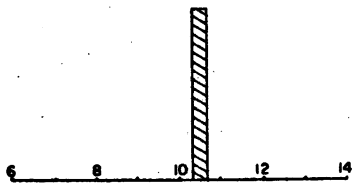
FIG 2

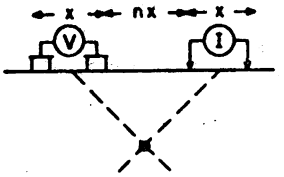


CASE II-1.5-BU-10-a

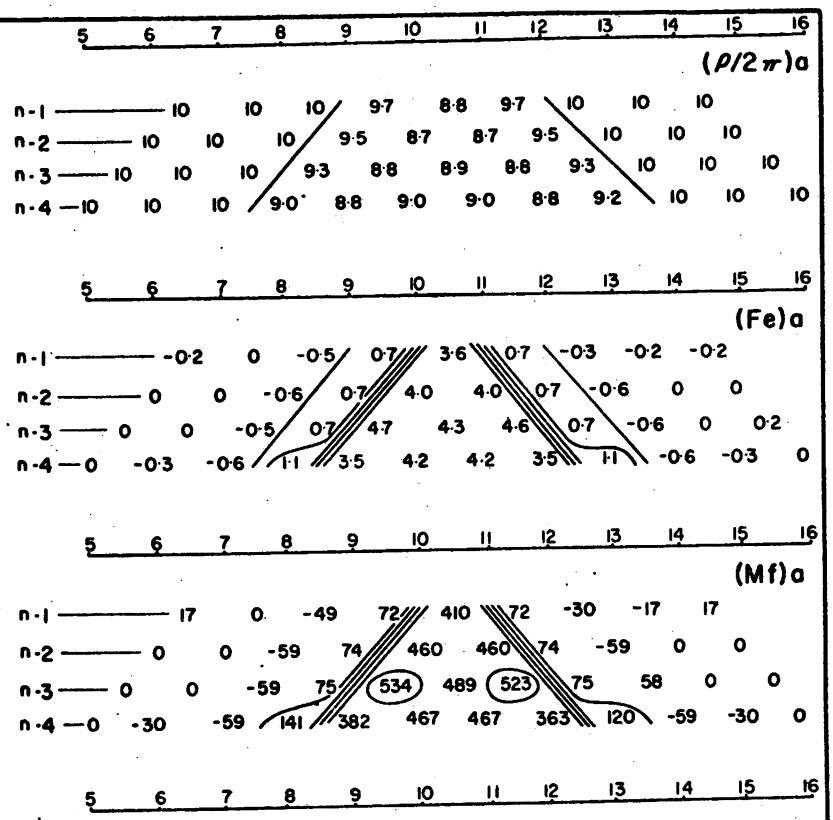
THEORETICAL INDUCED POLARIZATION AND RESISTIVITY STUDIES

SCALE MODEL CASE





X EQUALS 1 UNIT



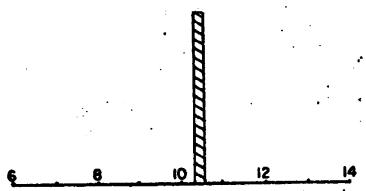
$(\rho 2\pi)_1 = 10$
$(Mf)_1 = 0$

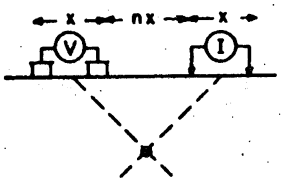
$(\rho 2\pi)_2 = 2.57$
$(Mf)_2 = 11700$
$(Fe)_2 = 30\%$

FIG. 3

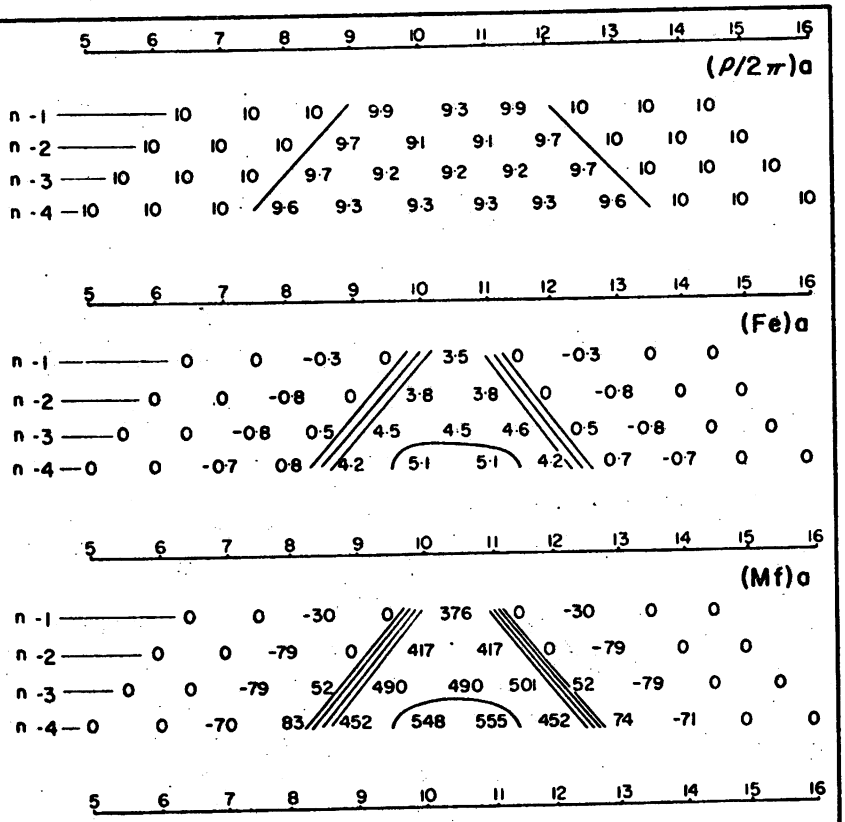
THEORETICAL INDUCED POLARIZATION AND RESISTIVITY STUDIES

SCALE MODEL CASE





X EQUALS 1 UNIT



$(\rho 2\pi)_1 = 10$
$(Mf)_1 = 0$

$(\rho 2\pi)_2 = 2.41$
$(Mf)_2 = 22800$
$(Fe)_2 = 55\%$

FIG. 4

INDUCED POLARIZATION AND RESISTIVITY RESULTS
BATCHELOR LAKE AREA, QUEBEC.

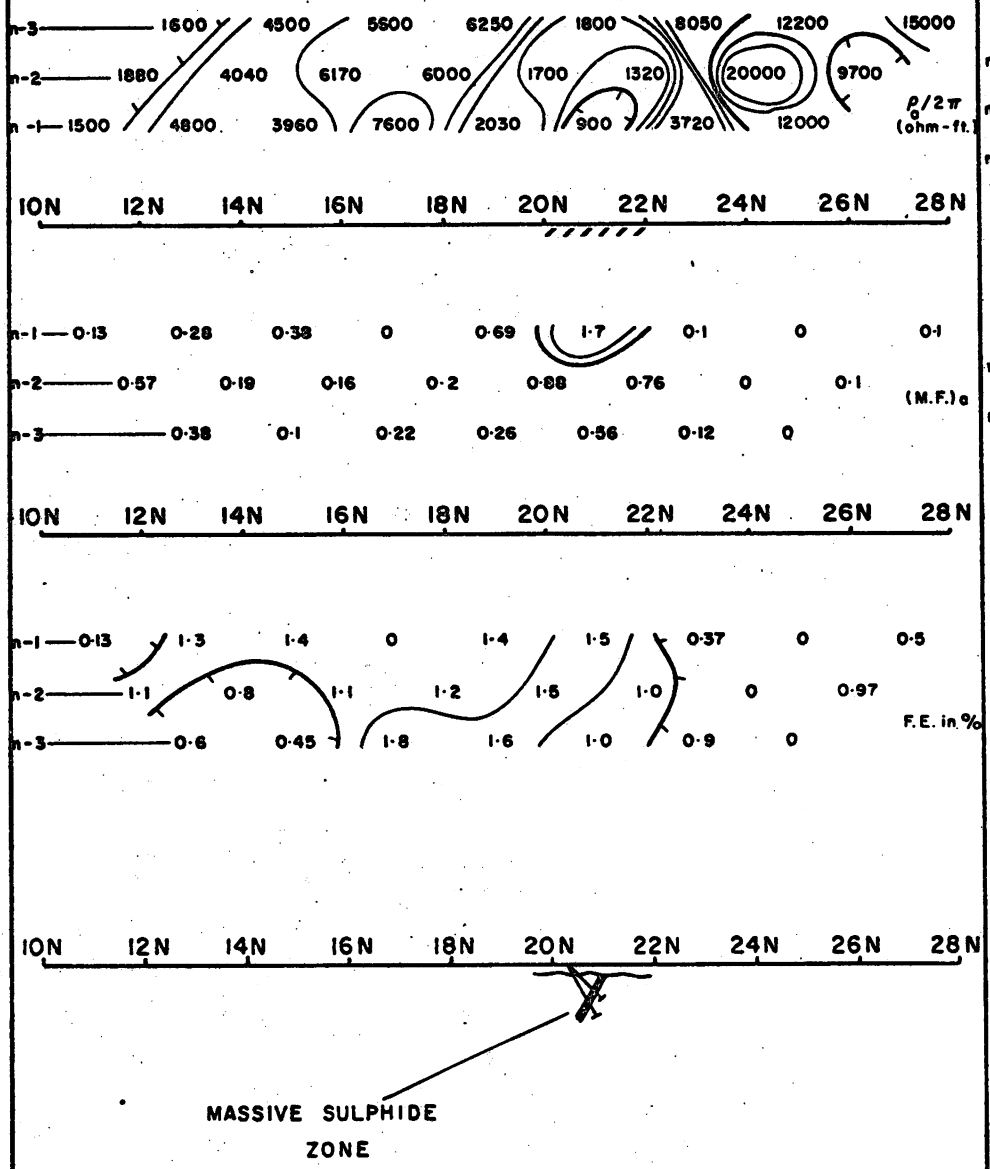


FIG. 5

INDUCED POLARIZATION AND RESISTIVITY RESULTS
BATCHELOR LAKE AREA, QUEBEC.

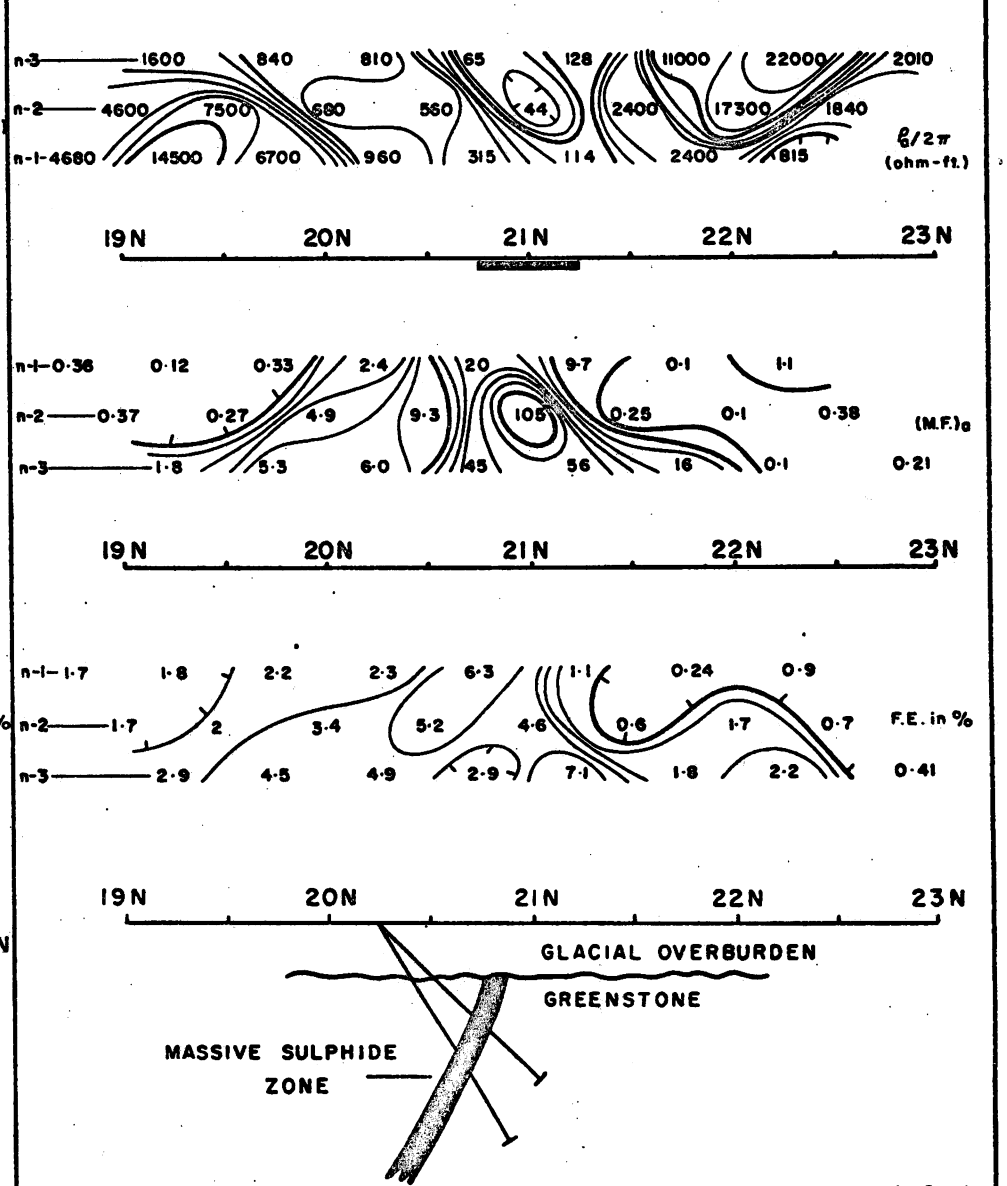


FIG. 6

McPHAR GEOPHYSICS

NOTES ON THE THEORY, METHOD OF FIELD OPERATION, AND PRESENTATION OF DATA FOR THE INDUCED POLARIZATION METHOD

Induced Polarization as a geophysical measurement refers to the blocking action or polarization of metallic or electronic conductors in a medium of ionic solution conduction.

This electro-chemical phenomenon occurs wherever electrical current is passed through an area which contains metallic minerals such as base metal sulphides. Normally, when current is passed through the ground, as in resistivity measurements, all of the conduction takes place through ions present in the water content of the rock, or soil, i.e. by ionic conduction. This is because almost all minerals have a much higher specific resistivity than ground water. The group of minerals commonly described as "metallic", however, have specific resistivities much lower than ground waters. The induced polarization effect takes place at those interfaces where the mode of conduction changes from ionic in the solutions filling the interstices of the rock to electronic in the metallic minerals present

in the rock.

The blocking action or induced polarization mentioned above, which depends upon the chemical energies necessary to allow the ions to give up or receive electrons from the metallic surface, increases with the time that a d. c. current is allowed to flow through the rock; i. e. as ions pile up against the metallic interface the resistance to current flow increases. Eventually, there is enough polarization in the form of excess ions at the interfaces, to appreciably reduce the amount of current flow through the metallic particle. This polarization takes place at each of the infinite number of solution-metal interfaces in a mineralized rock.

When the d. c. voltage used to create this d. c. current flow is cut off, the Coulomb forces between the charged ions forming the polarization cause them to return to their normal position. This movement of charge creates a small current flow which can be measured on the surface of the ground as a decaying potential difference.

From an alternate viewpoint it can be seen that if the direction of the current through the system is reversed repeatedly before the polarization occurs, the effective resistivity of the system as a whole will change as the frequency of the switching is changed. This is a consequence of the fact that the amount of current flowing through each metallic interface depends upon the length of time that current has been passing through it in one direction.

The values of the per cent frequency effect or F. E. are a measurement of the polarization in the rock mass. However, since the measurement of the degree of polarization is related to the apparent resistivity of the rock mass it is found that the metal factor values or M. F. are the most useful values in determining the amount of polarization present in the rock mass. The MF values are obtained by normalizing the F. E. values for varying resistivities.

The induced polarization measurement is perhaps the most powerful geophysical method for the direct detection of metallic sulphide mineralization, even when this mineralization is of very low concentration. The lower limit of volume per cent sulphide necessary to produce a recognizable IP anomaly will vary with the geometry and geologic environment of the source, and the method of executing the survey. However, sulphide mineralization of less than one per cent by volume has been detected by the IP method under proper geological conditions.

The greatest application of the IP method has been in the search for disseminated metallic sulphides of less than 20% by volume. However, it has also been used successfully in the search for massive sulphides in situations where, due to source geometry, depth of source, or low resistivity of surface layer, the EM method can not be successfully applied. The ability to differentiate ionic conductors, such as water filled shear zones, makes the IP method a useful tool in checking EM

anomalies which are suspected of being due to these causes.

In normal field applications the IP method does not differentiate between the economically important metallic minerals such as chalcopyrite, chalcocite, molybdenite, galena, etc., and the other metallic minerals such as pyrite. The induced polarization effect is due to the total of all electronic conducting minerals in the rock mass. Other electronic conducting materials which can produce an IP response are magnetite, pyrolusite, graphite, and some forms of hematite.

In the field procedure, measurements on the surface are made in a way that allows the effects of lateral changes in the properties of the ground to be separated from the effects of vertical changes in the properties. Current is applied to the ground at two points in distance (X) apart. The potentials are measured at two other points (X) feet apart, in line with the current electrodes is an integer number (n) times the basic distance (X).

The measurements are made along a surveyed line, with a constant distance (nX) between the nearest current and potential electrodes. In most surveys, several traverses are made with various values of (n); i. e. (n) = 1, 2, 3, 4, etc. The kind of survey required (detailed or reconnaissance) decides the number of values of (n) used.

In plotting the results, the values of the apparent resistivity, apparent per cent frequency effect, and the apparent metal factor

measured for each set of electrode positions are plotted at the intersection of grid lines, one from the center point of the current electrodes and the other from the center point of the potential electrodes. (See Figure A.) The resistivity values are plotted above the line as a mirror image of the metal factor values below. On a second line, below the metal factor values, are plotted the values of the per cent frequency effect. In some cases the values of per cent frequency effect are plotted as superscripts of the metal factor value. In this second case the frequency effect values are not contoured. The lateral displacement of a given value is determined by the location along the survey line of the center point between the current and potential electrodes. The distance of the value from the line is determined by the distance (nX) between the current and potential electrodes when the measurement was made.

The separation between sender and receiver electrodes is only one factor which determines the depth to which the ground is being sampled in any particular measurement. The plots then, when contoured, are not section maps of the electrical properties of the ground under the survey line. The interpretation of the results from any given survey must be carried out using the combined experience gained from field results, model study results and theoretical investigations. The position of the electrodes when anomalous values are measured is important in the interpretation.

In the field procedure, the interval over which the potential differences are measured is the same as the interval over which the electrodes are moved after a series of potential readings has been made. One of the advantages of the induced polarization method is that the same equipment can be used for both detailed and reconnaissance surveys merely by changing the distance (X) over which the electrodes are moved each time. In the past, intervals have been used ranging from 25 feet to 2000 feet for (X). In each case, the decision as to the distance (X) and the values of (n) to be used is largely determined by the expected size of the mineral deposit being sought, the size of the expected anomaly and the speed with which it is desired to progress.

The diagram in Figure A demonstrates the method used in plotting the results. Each value of the apparent resistivity, apparent metal factor, and apparent per cent frequency effect is plotted and identified by the position of the four electrodes when the measurement was made. It can be seen that the values measured for the larger values of (n) are plotted farther from the line indicating that the thickness of the layer of the earth that is being tested is greater than for the smaller values of (n); i. e. the depth of the measurement is increased. When the F. E. values are plotted as superscripts to the MF values the third section of data values is not presented and the F. E. values are not contoured.

The actual data plots included with the report are prepared utilizing an IBM 360/75 Computer and a Calcomp 770/763 Incremental Plotting System. The data values are calculated, plotted, and contoured according to a programme developed by McPhar Geophysics. Certain symbols have been incorporated into the programme to explain various situations in recording the data in the field.

The IP measurement is basically obtained by measuring the difference in potential or voltage (ΔV) obtained at two operating frequencies. The voltage is the product of the current through the ground and the apparent resistivity of the ground. Therefore in field situations where the current is very low due to poor electrode contact, or the apparent resistivity is very low, or a combination of the two effects; the value of (ΔV) the change in potential will be too small to be measurable. The symbol "TL" on the data plots indicates this situation.

In some situations spurious noise, either man made or natural, will render it impossible to obtain a reading. The symbol "N" on the data plots indicates a station at which it is too noisey to record a reading. If a reading can be obtained, but for reasons of noise there is some doubt as to its accuracy, the reading is bracketed in the data plot ( ).

In certain situations negative values of Apparent Frequency Effect are recorded. This may be due to the geologic environment or spurious electrical effects. The actual negative frequency effect value recorded is indicated on the data plot, however the symbol "NEG" is

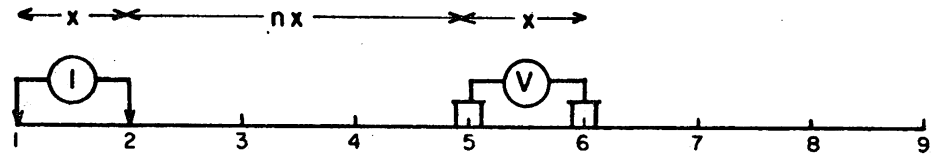
indicated for the corresponding value of Apparent Metal Factor. In contouring negative values the contour lines are indicated to the nearest positive value in the immediate vicinity of the negative value.

The symbol "NR" indicates that for some reason the operator did not attempt to record a reading although normal survey procedures would suggest that one was required. This may be due to inaccessible topography or other similar reasons. Any symbol other than those discussed above is unique to a particular situation and is described within the body of the report.

indicated for the corresponding value of Apparent Metal Factor. In contouring negative values the contour lines are indicated to the nearest positive value in the immediate vicinity of the negative value.

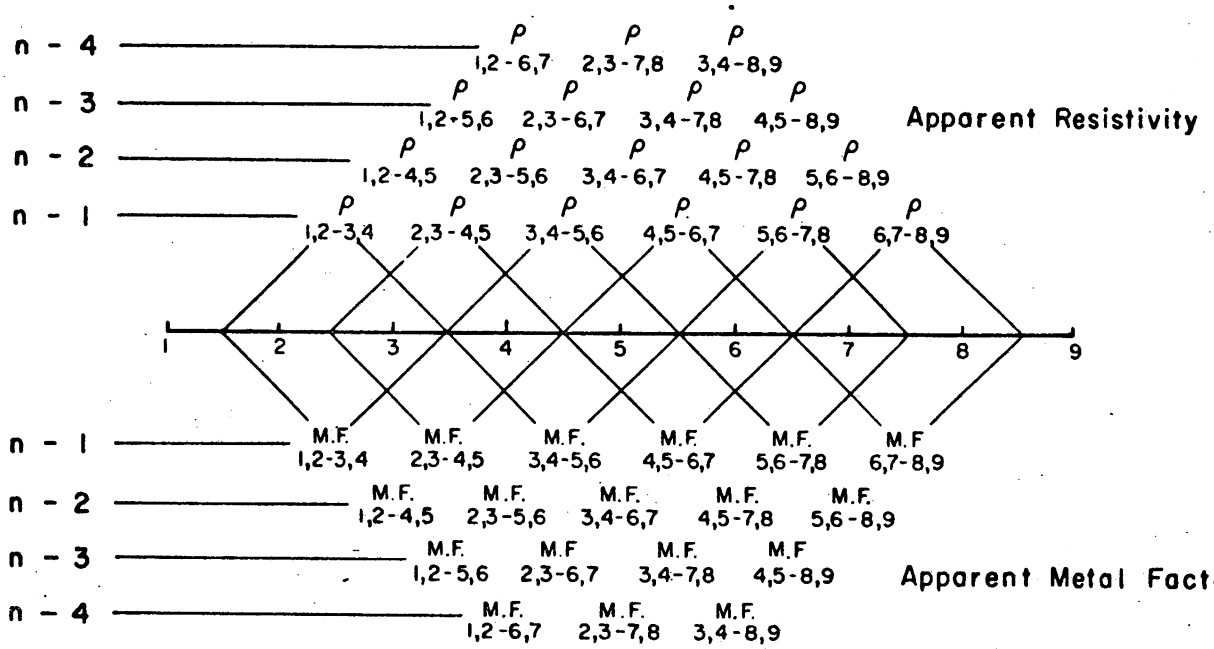
The symbol "NR" indicates that for some reason the operator did not attempt to record a reading although normal survey procedures would suggest that one was required. This may be due to inaccessible topography or other similar reasons. Any symbol other than those discussed above is unique to a particular situation and is described within the body of the report.

METHOD USED IN PLOTTING DIPOLE-DIPOLE INDUCED POLARIZATION AND RESISTIVITY RESULTS



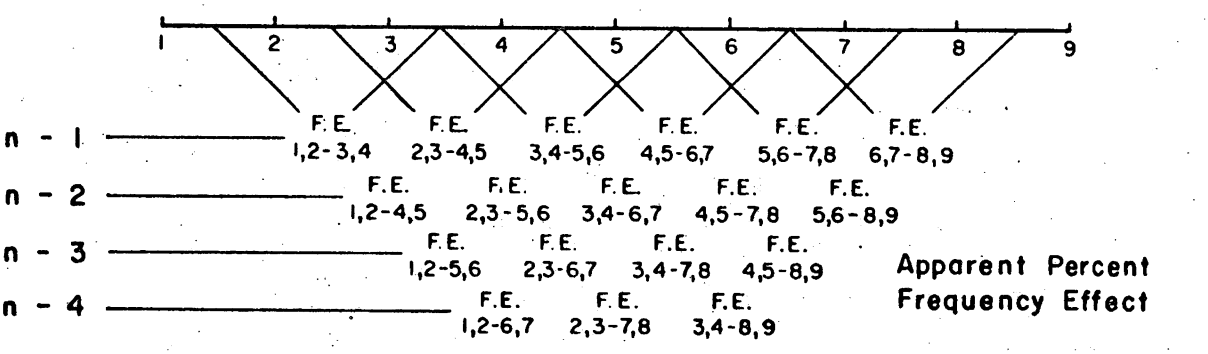
Stations on line

x = Electrode spread length
n = Electrode separation



Apparent Resistivity

Apparent Metal Factor



Apparent Percent Frequency Effect

Fig. A

Hole 1 Page 1

DRILL HOLE LOG

CAI-141

Property Copper Queen Length 434' Lat. -- Hor. component 250 Ver. component 375

District Agua Fria Bearing N 85 E Dep. -- Etch. at -- Total recovery 95 ± %

Commenced Oct. 24, 72 Dip -75° Elev. 4350 True Dip 75° - 28° Logged by KB

Completed Nov. 13, 72 Objective Test ore zone below 900 level Location N 500' north of portal, along road

FOOTAGE From	FOOTAGE To	Description	Sample number	Length ft.	ANALYSES %	%	%,	%	oz/t	oz
10	53	Oxide zone, some bleaching & Fe ox staining. Rock is fine grained, siliceous schist probably a rhyolite. 10-16 numerous oxidized veinlets ½ - 1/10" of vuggy quartz. Heavy goethite in large veins . No sulfides or Cu oxides 22 - 1½" vein of vuggy material, vugs have small xls of calcite? vein runs about 10" to axis of core. 27 - 6" zone of veins, solid qr core, Fe ox along edges. These veins seem to cut foliation which is 45° to core axis. Rock is units exposed in creek west of drill site.								
53	130.2	Rock takes on a light, gray-green color, fine grained & relatively uniform, no reconizable structures. Foliation planes are very sericitic as is most of rock. Phenocrysts are absent in this upper section, There are numerous, small 1/8 " q veinlets which cut core at various angles. No mineralization with them. Some larger, also barren ½" veins are parallel to foliation which is about 40* axis of core. 83 - White core with somewhat fragmental texture, white elongate masses surrounded by dark bands.								
130.2	233	Apparent contact, light gray-green unit with no phenocrysts and often a fragmental texture above & a dark gray unit with feldspar phenocrysts below. Contact parallel foilation. 133 - 3" Rose quartz vein parallel with foliation. Contacts are sharp. There are 3/4" fragments in the vein that could be bleached wall rock. 2 cubes of pyrite on one edge. Core grades downward into same basic rock type as before 130.2.								

Continuation of Drill Hole Log

FOOTAGE From	FOOTAGE To	Description	Sample number	Length ft.	ANALYSES %	%	%	%	oz/t	oz/t
		204 - Qtz veinlets, one set almost perpendicular to core axis, the other set at 45° to core axis & perpendicular to foliation.								
233	255	Core has obvious, flattened fragmental texture, minor disseminated pyrite and some cpy.								
		241 - Broken rubble zone								
255	267	Core has coarse obvious fragmental texture. Core is dark green due to increased chlorite siliceous bands & fragments common. Mineralization heavier around reddish-gray siliceous zones. Some scattered blebs of sulfides, numerous bands of py-cpy which are parallel foliation. Sulfide content varies greatly in core but overall 5%.								
267	272.3	Fragmental texture, minor to no sulfies								
272.3	307	Volcanic flows on tuffs. Now a white-purple sericite schist with abundant quartz phenocrysts . 276-277.5 Fault gouge zone								
		288-89 Clay gouge zone								
307	364.5	Heavy purple colored schist with quartz phenocrysts								
		362 - good fold in qtz vein								
364.5	388	White volcanic with abundant qtz phenos. - Core has fragmental texture near end of zone but with qtz phenos.								
388	394	Light colored, fragmental textured rock with qtz phenocryst abundance decreasing with depth.								
394	434	Dark gray, siliceous rock with white "feldspar" phenocryst. Some sections really show fragments well 418- sulfide content increased 422-24 - very heavy cpy & black metallic mineral. Sulfide zonea are grainey & banded & siliceous. 424 - minor sulfides to bottom of hole.								
434		Bottom of Hole								

Hole 2 Page 1

DRILL HOLE LOG

CAI-141

Property Copper Queen | Length 377' | Lat. | Hor. component 305' | Ver. component 230

District Agua Fria | Bearing N 80° E | Dep. | Etch. at | Total recovery 95 %

Commenced Nov. 21, 72 | Dip -45° | Elev. 4450 | True Dip | Logged by KB

Completed Dec. 1, 72 | Objective | Location Below 200 level portal

FOOTAGE From	FOOTAGE To	Description	Sample number	Length ft.	ANALYSES %	%	%	%	oz/t	oz.
Surface	172.1	White - Dark purple sericite schist with abundant quartz phenocrysts								
172.1	178	A very coarse, gray-green, fragmental textured (volc. breccia?) rock with qtz. phenos near contact.								
178	184	Dark green with fragmental (lensoidal shape) texture and white feldspar phenocrysts foliation is coincident with frag. boundaries & is almost perpendicular to core axis.								
184	184.5	Zone of heavy sulfides, generally bands parallel to foliation, some scattered ¼" blobs.								
184.5	200	Rock as above, scattered sulfide lenses, stringers & blebs. Rock has good Bx texture sulfides ⊥ fol. & around frags.								
200	221	A very fine grained, siliceous gray-green rock. Probably a rhyolite, some minor stringers of sulfide at 210. Stringers seem to outline fragments.								
221	221.5	White clay fault gouge with some Fe ox stains								
221.5	227.5	Dark green volc Bx, fragments & foliation almost ⊥ to core axis. Siliceous zone at 222 with band of sulfide, sulfides continue to 223.5								
227.5	231.9	Heavy sulfides in siliceous Bx, Black chlorite schist predominates.								
231.9	252.9	Dark green frag textured volc. Bx with occasional sulfide zone, 1" at 241 246 47.5 scattered stringers & blebs, 2" at 250								
252.9	262	White, stringy as well as fragmental textured rhyolite breccia with a fair amount of sulfides throughout the zone. Sulfides usually as blebs or stringers around frags. Good 3" zone at 257								

Continuation of Drill Hole Log

FOOTAGE From	FOOTAGE To	Description	Sample number	Length ft.	ANALYSES %	%	%	%	oz/t	oz/t
262	377	Green, siliceous frag. volc. Bx as before. Some zones are finer grained & show no fragments. 265.6 - 269.5 - Fair amount of scattered sulfides, mostly blebs 1" zone sulfides No. 6, a carbonate vein ½" runs ∥ to core axis at 275.								
		276 - 281 Sulfides mostly cpy 2" at 276.2, 5" at 279.5, 2" at 280.8 cpy surrounding frags								
		286 - Zone of large qtz - calcite vein, no sulfides								
		289 - Scattered sulfides lenses, small fracture parallel core axis offsets sulfide bands-Normal fault								
		306.8 - 308.8 Several sulfide zones								
		324 - Minor blebs								
		368 - 371.7 White, fragmented textured, volc, Bx with a fair amount of disseminated sulfides. Minor blebs also								
		371.7-377 - Green volcanic Bx.								
377		Bottom of Hole								

Hole 3 Page 1

DRILL HOLE LOG

CAI-141

Property Copper Queen | Length 365 | Lat. | Hor. component 285 | Ver. component 230

District Agua Fria | Bearing N 90° E | Dep. | Etch. at | Total recovery 95 %

Commenced Dec. 5, 1972 | Dip 45° | Elev. 4525 | True Dip | Logged by KB

Completed Dec. 14, 1972 | Objective | Location 300' NW of #2

FOOTAGE From	FOOTAGE To	Description	Sample number	Length ft.	ANALYSES %	%	%	%	oz/t	oz/
20	56	Oxide zone. Rock is bleached & stained with Fe ox. It appears sericitic but this is probably secondary due to weathering. Some remnant breccia texture is visible. Probably same as Bx below.								
		36-6" Heavy sulfide casts, most are cubic								
		36-42 Zone of abundant sulfide casts								
		43- 4" qtz vein, some ½" cubes of oxidized pyrite along edge								
		48-49 Rock composed of 50% sulfide casts								
		53-54 Minor Cu ox, CuCo3on foliation planes, some oxidized sulfide stringers								
56	96.5	Green volcanic breccia, fragments 1/8 - 1" , white rhyolite, chloritic matrix								
		65 - Distorted qtz vein with minor sulfides								
		73 - 3" zone 50 - 60% sulfide casts								
96.5	100	Dark, fine grained diabase dike, Brecciated zone filled with white calsite, upper contact weathered brown minor Cu ox in schist weathered zone.								
100	115.5	Dark, gray-green volcanic breccia, white rhyolite fragments in chloritic matrix								
		104- Scattered, fine grained stringers of sulfide, several % of cpy as disseminated grains and blebs.								
		106- Plane of movement, oxidized schist shows minor Cu Co3. 40% sulfide casts for 2". rock much more silicified								

Continuation of Drill Hole Log

FOOTAGE From	FOOTAGE To	Description	Sample number	Length ft.	ANALYSES %	%	%	%	oz/t	oz.
		107-108 Silicified Bx, 20 - 30% sulfide casts, heavy Fe ox gossan								
		112-115.5 Green Bx, average 10 - 20% sulfide casts, some zones 75-80% sulfide gossan. Some Cu ox.								
115.5	137	Rhyolite breccia, white silicified rhyolite, some fragments visible. Scattered blebs & stringers of sulfides, some obvious cpy. Oxidized 115.5-122.6 sulfides preserved below 122.6 probably 2-4% sulfides from 119-136 2" solid gossan 126.6								
		128 - Silicified white, approx 4% sulfides in some zones. occurrences as blebs & sheared stringers.								
137	147	Gouge-Fault zone, Fe ox stain gouge, lost 6' of core								
147	150	"moplike" texture in rhyolite, sulfides very minor, Fe ox stain zone 150								
150	163.5	Dark green black volcanic with feldspar phenocrysts & ghosts of white fragments. 150-150.5 Black Schist grades to other unit. Color gets light gray-green, mostly feldspar phenocrysts.								
163.5	164.5	Coarse Bx texture, sulfides around fragments								
164.5	152	Gray green finer grained volcanic, some feldspar phenocrysts scattered white, barren qtz veins 173-175 qtz or bleached silicified zone with heavy Fe ox staining 179 bedded look in green. Could be bedded zone on ridge top								
152	186	Oxidized gossan zone, heavy sulfide casts (75%) in some zones								
156	190	Diabase dike, 2' core lost at like-gossan contact								
190	192.5	Continued siliceous, bleached, oxidized gossan, sulfides 1-2%								
192.5	194	Bleached zone								
194	198	Gray green volcanic breccia, minor sulfides at 198								
198	358	Siliceous, white-gray rhyolite with quartz phenocrysts & small rounded rhyolite fragments. Some zones show flattening of fragments 214-217 Barren white quartz veins								
358	365	Darker green gray with coarse breccia texture, minor stringers of sulfide, 2" qtz seam at B.O.H with 1% sulfide								
	365	B.O.H.								

238 Very similar to hanging wall, 400 level, above the green w/ qtz phenos. above the ore zone

Hole 4 Page 1

DRILL HOLE LOG

CAI-141

Property Copper Queen | Length 805 | Lat. | Hor. component 670 | Ver. component

District | Bearing N 65° E | Dep. | Etch. at | Total recovery %

Commenced Dec. 16, 72 | Dip 45° | Elev. 4250 | True Dip | Logged by

Completed Jan. 6, 1973 | Objective Test southern extension of ore zone | Location approx. 350' down the creek from 400 portal

FOOTAGE From	To	Description	Sample number	Length ft.	ANALYSES %	%	%	%	oz/t	oz/t
0	30	No core								
30	44.6	Purple schist, some quartz phenocrysts but not abundant, heavy fragmental texture predominates. Thin bands are parallel foliation, foliation at 30° to axis of core.								
44.6	54.5	Diabase dike, fine grained, abundant small crystals of Biotite. 6" schist at 49.5 Diabase No biotite 49.5-54.5								
54.5	66	Purple schist, some deformed jasper stringers								
66	68	Mixed zone of green & purple & white fragments on layers								
68	83	Fault zone, white sericite gouge, broken white quartz with no sulfides 15/6 = Lost 9' core								
83	90	Light green fine grained matrix with large, white fragments								
90	95	(16' of core run markers show 8' ?) 5' by runmarker, 10' of actual core white, light purple, fine grained siliceous volcanic. Bleached along fault at 95.								
95	135.5	Volcanic breccia-purple-green-white fragments elongated & flattened. Foliation & bands at 20° core axis								
135.5	141	Diabase dike								
141	155	Green volcanics, some zones with large fragments, other zone have only feldspar crystals as phenocrysts. Phenos are nearly obliterated in areas along appearance of ghost phenocrysts like rock on 400 level near raises. 155-156.5 barren white quartz vein								
155	201	Light gray volcanic- some breccia texture, generally a stringy or ragy textured rhyolite. Fairly heavy sulfides in upper zone. Decreased to occasional bands down section. This rock could be the footwall of ore zone as on 400 level or it could be the sequence cut by the 400								

Continuation of Drill Hole Log

FOOTAGE From	FOOTAGE To	Description	Sample number	Length ft.	ANALYSES %	%	%	%	oz/t	oz/
251	404	A light gray green volcanic with a very subdued fragmental texture. Could be due to feldspar phenocrysts being elongated. Rock is very uniformly textured. foliation at 10° to core axis. Occasional streak or blebs of sulfide-mostly pyrite 339.5- 1" black schist seam with heavy clots of pyrite 364-66- Bleached zone showing deformation of banding 375-77 4-¼" bands of sulfides								
404	423	Some basic rock type as above - but bleached a light gray. Sulfide content, mostly small stringers, is higher in this bleached zone but still 1%. Sulfide bands have this zone of "black schist" with them. 415 fault gouge & rubble ±2½' lost								
423	479	Coarse textured, dark green volcanic breccia. Some feldspar phenocrysts. Some blebs of sulfides. 433.8-435.8 Zone of heavier sulfides. Large clot at 434 453.8 - 1" seam of sulfide - most appears to be cpy. 474 - Breccia texture very pronounced, heavy sulfides bands around fragments. 476 - Clot of sulfides								
479	645	Dark gray-green volcanic with abundant feldspar phenocrysts. Rock is med fine grained, Bx texture absent. Scattered throughout section are zones of bleached rock. They don't appear to be separate rock type as color change is gradational [illegible] Bleached zones are often spotted with small specks of pyrite There are numerous "semi-bleached" zones. Occasional band of strings of sulfide predominately pyrite. 536-540.5 Bleached section with sulfides split 552- 6" 5% pyrite grains, occasional zone of Bx texture 586- minor strings cpy 624.5 Minor strings cpy								
645	683	White, often raggy textured rhyolite. Some fragments, some feldspar phenocrysts no sulfides 656- fault gouge, no ore loss								
683	740.5	Dark green volcanic as before, some zones with Bx texture others with abundant white feldspar phenocrysts								
740.5	805	Intermixed zone of white-violet pink-green volcanics, most have a Bx texture no sulfides								
	805	B.O.H.								

Hole 5 Page 1

DRILL HOLE LOG

CAI-141

Property Copper Queen | Length 452 | Lat. | Hor. component approx 40-50' | Ver. component ?

District | Bearing N32W | Dep. | Etch. at | Total recovery 95 plus %

Commenced 11 Jan 73 | Dip 45° | Elev. | True Dip 45 - 65° | Logged by KB

Completed 16 Jan 73 | Objective | Location 900'W, 900'N of Sec. 6-36 Quarter corner

FOOTAGE From	FOOTAGE To	Description	Sample number	Length ft.	ANALYSES %	%	%	%	oz/t	oz/t
		A white and gray rhyolite with quartz and feldspar phenocrysts schistose. There are patches of white seperated by gray. The white could possibly be fragments in a darker, similarly compositioned ground mass or the color difference could be due to weathering. There are scattered patches of sulfides in some zones but the go san target was never reached as the hole went down and along schistosity planes rather than cutting them.								
		41- 6" zone of sulfides bands 56-58 scattered bands 82- fine grained pyrite 91- 4" sulfide bands 106- 2' sulfide around fracs 200-222 - gouge and broken core 222-230 - More silicified green rock scattered pyrite 257- Scattered sulfides-mostly pyrite 257-277 - Bleached zone - some Feox stains 277-281 - Diabase dike 281-290 - Bleached zone 330- 3" Bands of scattered sulfides - pyrite								
		some zones extremely sericitic, white and soft, others are silicified and show various textures from sericitic with quartz phenocrysts to a breccia.								

Hole 6 Page 1

DRILL HOLE LOG

CAI-141

Property Copper Queen | Length 317' | Lat. | Hor. component 158 | Ver. component 158

District Agua Fria | Bearing N80E | Dep. | Etch. at | Total recovery 95 plus %

Commenced 15 Jan 73 | Dip -45° | Elev. 4450 | True Dip | Logged by KB

Completed 24 Jan 73 | Objective Encounter Gossan Zone of Hole #3 below oxidation level | Location NW of 200 Adit at "y" in main road

FOOTAGE From	FOOTAGE To	Description	Sample number	Length ft.	ANALYSES %	%	%	%	oz/t	oz/t
10	122.5	Purple rhyolite with large quartz and K-feldspar phenocrysts weathering and oxidation stop at about 45'. Rock is foliated and foliation planes are at an angle of 30° to axis of core. Some sections 70-100 are bleached and discolored-probably due to fault gouge at 82'. No significant sulfides. One small qtz vein with sulfide casts at 34'.								
122.5	124.5	Fine grained diabase dike								
124.5	249	Fault gouge at diabase bontact, foliation planes at 70° to core axis. Light gray "rhyolitic" volcanic breccia. Some Bx fragments of jasper most are rhyolite in a rhyolite ground mass 141- Sulfides begin to appear as stringers and blebs between the fragments-minor only. 158- Sulfide bands and blebs up to 5% of core, avg. 2% or less.By 196 appreciable sulfide occurence is gone. 225-226.5 - minor sulfide 235-243 - "								
249	263	Dark gray green volcanic with white phenocrysts and a fairly even texture. Foliation at 80' to core axis. Occasional euhedral clot of pyrite.								
263	317	263 - Light gray color returns, texture and phenos about same as before. Possible return to subdued fragmental texture near 272. 272-278 - scattered sulfide Rock remains light gray with minor sulfide to BOH								
317	BOH									

CORE DRILLING
MINE DEVELOPMENT
MINING PROPERTIES

PHONE
602/632-7320

APACHE EXPLORATION CORPORATION
P. O. BOX 351
MAYER, ARIZONA 86333

March I5, I974

SXM
MAR 18 1974
RECEIVED

Mr. Grover Heinrichs
Essex International, Inc.
I704 West Grant Rd.
Tucson, Ariz. 85705

Dear Mr Heinrichs,

I am enclosing the old reports and the Comminco material on the Copper Queen. I believe the copper values shown on the old shipping reports are more representative of the ore than the Comminco assays. It is very hard to cut an accurate channel sample.

Please return this material as soon as you are finished with it.

Yours sincerely,

Rex Ricks

Rex Ricks

FORM 13 3-55 5M M 6035 K. P. S.

INTERNATIONAL SMELTING & REFINING COMPANY
MIAMI PLANT

Smelter Lot 406 Shipper Lot 1 DATE 12-7-55

BOUGHT OF E. R. DICKIE Date Received 11-28-55

Street ____ City Bagdad, Arizona

CAR Initial	CAR Number	WET WEIGHT	Moisture %	DRY WEIGHT
ATSF	65630	102,180	1.50	100,647

N. Y. QUOTATIONS

Copper (per lb.) 43.225¢

Less 4.0 = 39.225¢

Silver (per oz.) ____

Gold (per oz.) ____

ASSAY and ANALYSES	Copper %	Silver Oz.	Gold Oz.	Silica %	Alumina %	Iron %	Lime %	Sulpher %
	5.58	.69	.012	79.4	1.1	5.4	.7	1.3

PAYMENTS PER TON	DEBITS	CREDITS	Valuation For Freight
Copper 111.60 Lbs. per ton, less 10 % 100.44 Lbs. at 39.225¢ per Lb.	$ ____	$ 39.40	$ 9.74
Silver ____ Ozs. per ton, less ____ % ____ Ozs. at ____ per Oz.	____	____	____
Gold ____ Ozs. per ton, less ____ % ____ Ozs. at ____ per Oz.	____	____	____
79.4 less 17.1 = 62.3 units @ 5¢	____	3.12	3.12
Excess Metal Values $39.40 - 15.00 = 24.40 x 10%	2.44		
Treatment Charge $15.00 value	5.00		
TOTALS	7.44	42.52	12.86
Net Value per ton		35.08	5.42
Net Value for Freight Charges, per wet ton			$ 5.34

Royalty to be paid to
1/2 to Mr. & Mrs. Arthur R. Brashear
Humboldt, Arizona
1/2 to Mr. & Mrs. Philip W. Hoff
Rt. 3
Idaho Falls, Idaho

Trucking to be paid to

50.3235 Dry tons at $ 35.08		$ 1,765.35
Sampling ____ tons at ____		
Freight $255.45 + 7.66 tax		263.11
Trucking ____		
AMOUNT DUE SHIPPER		1,502.24
Less 10 % Royalty Smelter net after freight		150.22
NET AMOUNT DUE SHIPPER		$ 1,352.02

Correct [signature]

Approved [signature]

Jules Baumann in his early prospecting days

PROPERTY AND LOCATION.

Baumann Mines Company owns the well-known Baumann group of copper mines, comprising twenty-five claims, approximately 500 acres; situate in Agua Fria Mining District, Yavapai County, Arizona; about sixteen miles in air-line East of Prescott, County seat of Yavapai County, and twelve miles South of Senator Clark's famous United Verde Mine at Jerome. The Blue Bell and De Soto Mines, a few miles south of the Baumann, and Yaeger Canyon, Copper Chief, Equator and United Verde Extension to the North are all within the same mineral belt.

ACCESSIBILITY.

The town of Humboldt is situated on the Prescott & Eastern Railroad, (a branch line of the Santa Fe System) in Agua Fria Valley, named after the river that flows through its center. The large Custom Smelter of the Consolidated Arizona Smelting Company is located here. From Humboldt a good wagon road, built and owned by Baumann Mines Company, runs northeasterly two miles to Camp Baumann in the center of the property, and from there to the principal workings thereon.

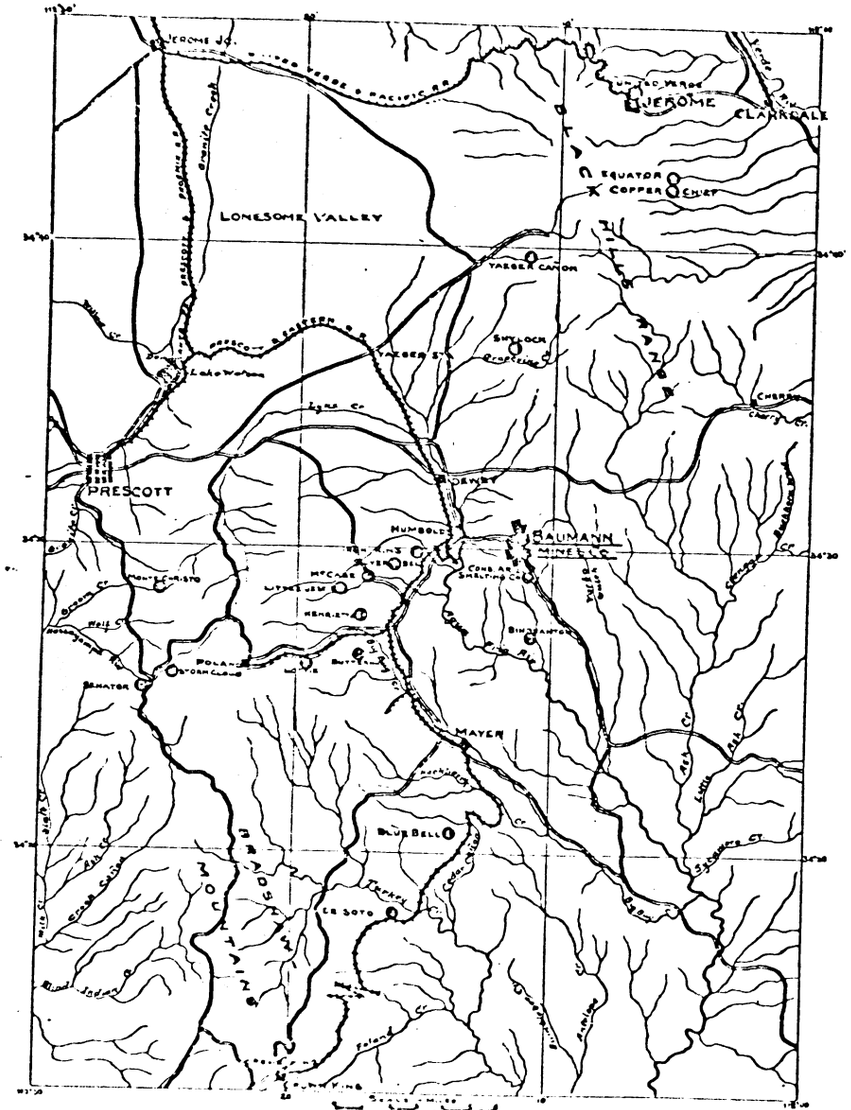
THE CLAIMS.

The following is a list of the twenty-five claims, all located by Jules Baumann and surveyed by the late R. C. Powers, United States Mineral Surveyor; "Loretta," "Red Cross," "Manzanita," "Laura," "Drill," "Pick," "White Cross," "Arrow," "Hidden Treasure," "Beebe," "Bend," "Alice," "Pivot," "Swiss Girl," "Bessie," "Baby," "Iron Cliff," "Iron Mask," "Diamond," "William Tell," "Winkelried," "Giant," "Tillie," "Berna" and "Arizona."

The notices of location are recorded in the Records of Mines of Yavapai County. The size of the claims is six hundred by fifteen hundred feet, or over twenty acres each. (See plat.)

DEVELOPMENT AND EQUIPMENT.

Development to date amounts to approximately 4,000 feet in 30 shafts, from 10 to 900 feet in depth, and five tun-

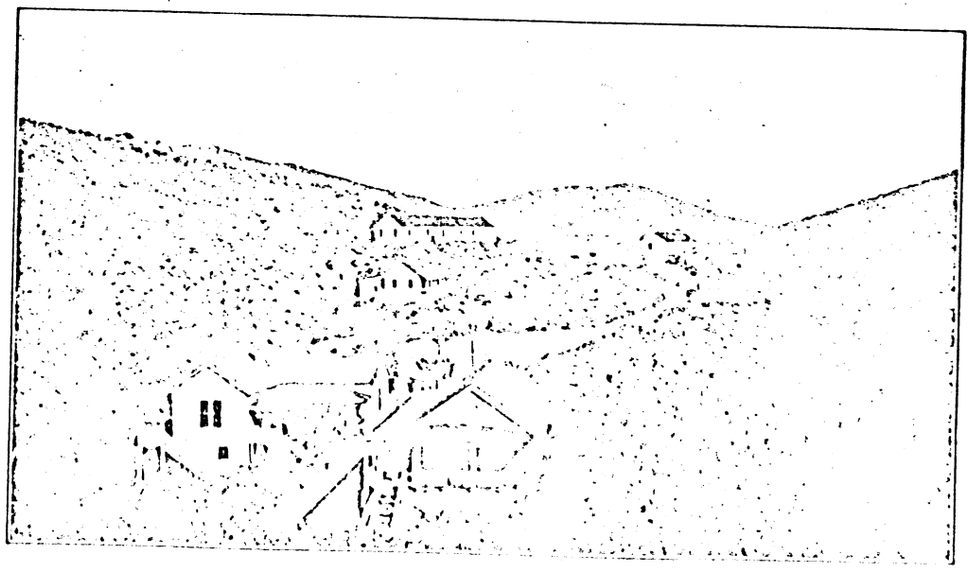


MAP OF CENTER PORTION OF YAVAPAI COUNTY, ARIZ.
SHOWING LOCATION OF PROPERTY OWNED BY
BAUMANN MINES COMPANY
AND SOME FEW OF THE MOST IMPORTANT MINES OF THAT SECTION

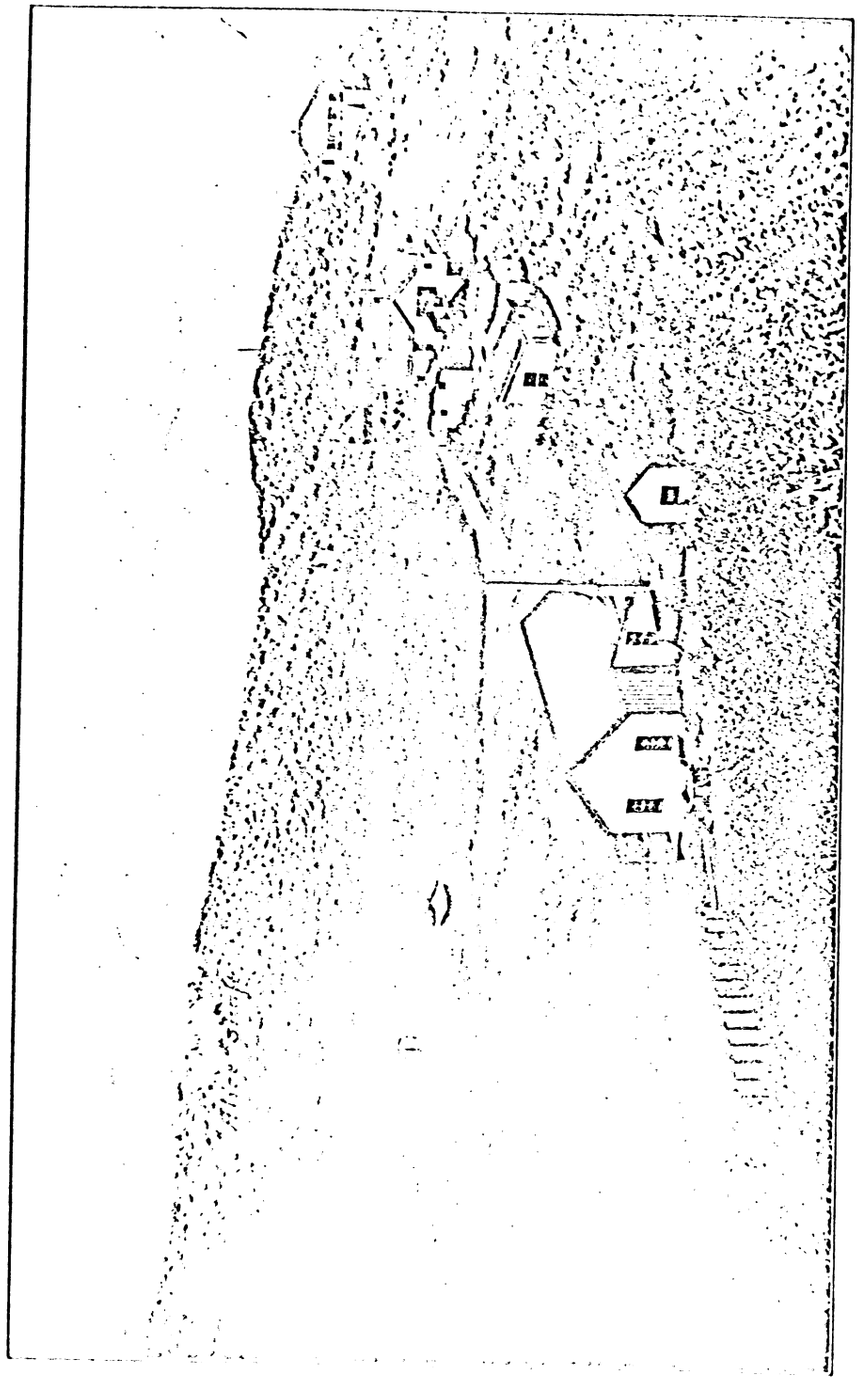
nels, from 10 to over 300 feet in length, scattered over the entire property. The majority of these workings are in ore. The deepest shaft is on the "Swiss Girl" Mine, (oldest location of the group) and is equipped with two 80-H. P. steam boilers; one hoisting engine, with ⅞-inch steel cable (capacity 1,500 feet in depth); one Sullivan air compressor, air receiver and machine drill; feed pumps; two large stationary pumps; engine house; galvanized iron water tanks; gallus frame; iron T rail track; ore skip and cars and a blacksmith shop.

This shaft, however, had to be abandoned for the reason that during the several years following the panic of 1907 and consequent inactivity in nearly all mining propositions of development stage, the ground water had practically destroyed it.

The shaft on the Laura Mine is over 300 feet deep, and is equipped with one 40-H. P. boiler; hoisting engine with ⅝ inch cable of 600 feet capacity; blower and necessary air pipe; one No. 7 Cameron sinking pump; gallus frame; iron T rail track; ore skip and cars; engine house; water tanks and blacksmith shop.



Camp Baumann Looking East



Camp Baumann—Looking West

Camp Baumann contains no shacks, but all fine substantial buildings and can accommodate a large force of men. It consists of one large rooming house (26 by 100 feet), one cook house and dining rooms, two six-room dwelling houses, one five-room house, one office building and two barns. The camp is connected by telephone with the outside world.

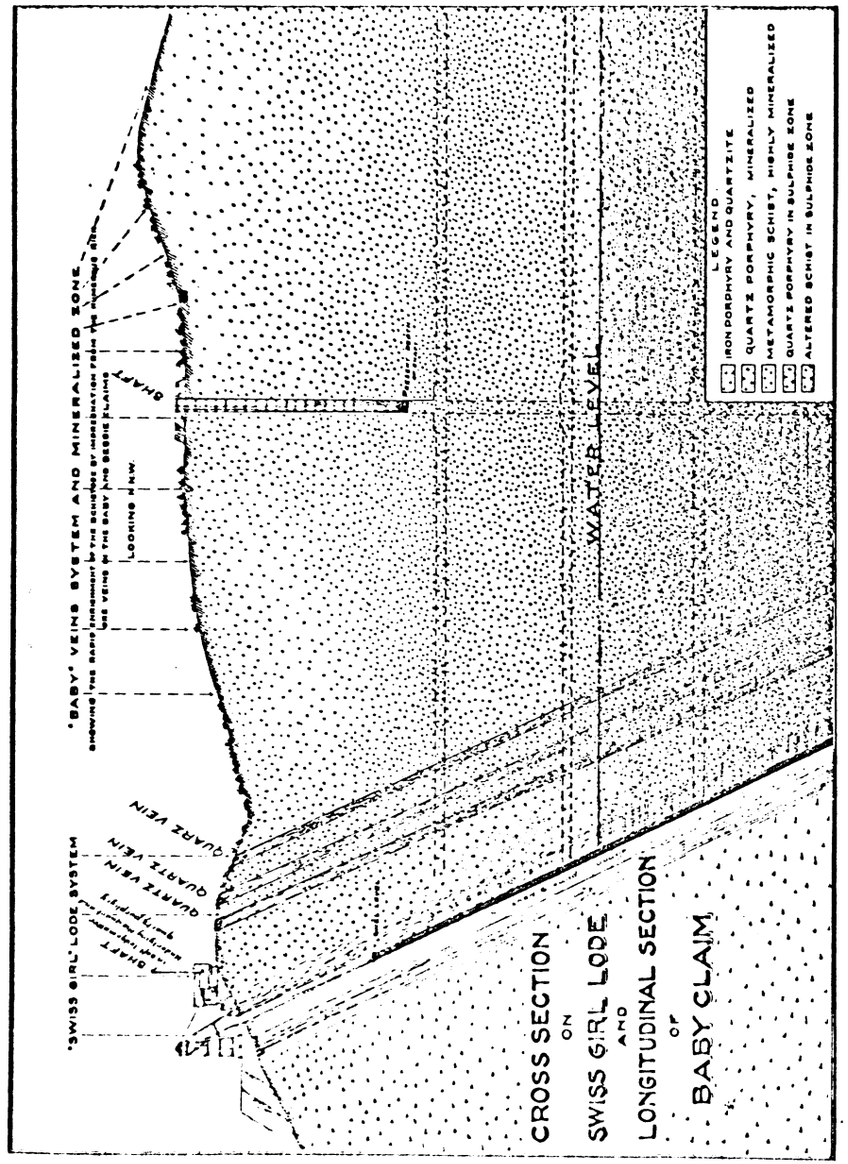
GEOLOGICAL FORMATION.

The geological formation of the Baumann is principally altered schist and porphyry, flanked on the west by slate and on the east by granite. The "Swiss Girl" Lode is the Mother Lode and of gigantic proportions. Its trend is north 20° west and its dip east 63° from the horizontal. A very highly mineralized iron prophyry forms the foot-wall to the "Swiss Girl" Lode, for fully one mile and over 1,500 feet in width, cut by several deep ravines and forms a prominent feature of the Baumann. It is these iron porphyry hills and cliffs that at once attract the attention of mining men as being the outcrop of an immense ore deposit.

The "Swiss Girl" Lode is constructed upon a large scale. Its gouge (soft ledge matter) measures 12 feet between the iron porphyry foot wall and the quartz and quartz porphyry hanging wall. A real hanging wall does not exist. This quartz porphyry extends eastward several hundred feet, and wherever it has been cut into by wagon roads it shows copper stain almost from the grass roots. The deep shaft mentioned is in this gouge which readily dissolves in water.

Numerous large quartz veins are seen cutting through the quartz porphyry; they have a northeasterly trend and southeasterly dip. These veins are more or less mineralized, being heavily impregnated with iron oxide and in places show green carbonate of copper (malachite) in the outcrops. They are all covered by the nine claims lying north and east of the Swiss Girl mine.

The "Baby" Mine shows exceptionally strong mineralization in its several veins, running almost at right angles to the "Swiss Girl" Lode. They are cross-veins; their outcrops are heavy iron ore containing 60 per cent iron, some gold and copper blossom. A 50-foot shaft has been sunk upon one of them in the center of the claim. Only a few feet below the



surface, kidneys or lenses of very rich malachite make their appearance, containing good gold values. The vein in its dip leaves the vertical shaft at 38 feet depth, the gold contents in the ore increase very rapidly with depth.

The formation between the veins of the "Baby" claim is altered to such extent as to make classification almost impossible. Some geologists call it the schist, others andesite, and we shall call it "schistose." Whatever it is, it is making ore very fast as depth is reached, although on the surface it shows no sign of any mineralization. Together with these many rich ore veins, the entire "Baby" claim and a large portion of the "Bessie" show convincing proof of the existence of a rich and extensive ore-body at not very great depth.

The "Pick" Lode is also a cross lode. It shows strong outcrops for several hundred feet. Its main feature is a magnificent solid vein of iron ore showing much copper blossom. This vein is at least 4 feet wide and dips to the southeast. The underlying formation is also highly mineralized and shows considerable iron and copper stain.

The "Loretta," "Red Cross" and "Laura" veins are strong, well defined quartz veins, from 5 to 20 feet wide, and show continuous croppings for 2,500 feet. Good ore is seen at several points in their very outcrops. There are five small shafts on the Loretta and joining Red Cross claims, all showing the veins to be very strong, well defined, with good ore in four of them.

The "Laura" Mine has a fully equipped shaft 300 feet deep, from which drifts run north on the vein several hundred feet on the 100 and 200-foot levels. This also is a large vein and thoroughly mineralized throughout. Shoots of very rich copper and gold ore are encountered in these workings, and several shipments have been made to different smelters. Crosscuts on the 100-foot level east and also west from the main vein have disclosed strong parallel blind veins, which means, they do not crop out on the surface, and they are also mineralized, but leached. Where cut into they show the same strength as the main lode, about nine feet in thickness.

The "Iron Mask" and "Iron Cliff" Claims are located over a mountain of black quartz porphyry, showing structure

and formation different from anything in the entire group; in fact, nothing like it exists for miles around. It is rather a coarse formation, much of it completely burnt out and leached, and no trace can be found therein of any precious metals. There is a shaft 26 feet deep in the center of "Iron Cliff." A few feet below the surface this formation becomes solidified and shows much iron sulphide and arceniccal iron, somewhat oxidized, assaying small values in gold, silver and copper. On the "Iron Mask" is a cross cut tunnel 275 feet long at the western base of the mountain. After passing through 120 feet of solid formation, this tunnel enters and penetrates 70 feet of soft material, similar to the gouge of the "Swiss Girl" Lode, which evidently extends through this ground, and then enters the same iron formation seen in the shaft on the "Iron Cliff."

The "Arizona" Lode is the furthest southern of the manifold system. The vein croppings show on the surface for about 600 feet, from 1 to more than 4 feet wide, as very lively looking gold quartz, with not a sign of copper. But the quartz porphyry walls, however, are full of copper blossoms, being disseminated by green carbonates of copper. There are two shafts and one small tunnel on this claim. The upper shaft is 67 feet deep. It exposes a veritable freak of nature in its first depth, in that the vein at the north end of the shaft is a honeycombed iron stained quartz, 2½ feet wide, asaying $28.00 gold per ton, and not a trace of copper, and at the south end less than one foot wide of solid ore assaying $9.00 gold and 23 per cent copper. With depth both metals become more evenly distributed and the vein gradually widens out, so that the five feet width of the shaft in the bottom is all in ore. When more depth is attained both walls will be also explored by cross-cuts, with expectation of finding the ore body even more extensive.

The lower shaft is 30 feet deep and so far still in gold quartz with occasional iron and copper sulphides.

The "Alice" Lode was originally located as a silver mine, its ores being rich in the white metal besides copper and gold. It lies directly west of that iron porphyry belt, has a northerly-southerly trend and dips to the west at an angle of 85° from the horizontal. Its hanging wall is schist (Prof. Furman called it a porphylitic slate or "talcose".) This vein is opened up by 208-foot shaft in the center of the claim, measures from 4 to 8 feet in width, is a hard massive quartz gradually diminishing with depth and softer material taking its place. It is very thoroughly mineralized.

The "Winkelried" and "Tillie" Lodes are a continuation of the Alice. They show strong and mineralized outcroppings.

The "Beebe" and "Giant" Claims lie west and south of and adjoin the "Alice." Their main feature is a gigantic dike of a redish jasper quartz, ("jasperoid"), from 60 to over 200 feet in width and continues the full length of the two claims. At the location monument in the center of the "Beebe" Claim a shaft of 40 feet has been sunk where some copper stain shows in the outcrop, but soon disappears in the shaft. At 20 feet depth two average samples of the entire mass gave results of $4.00 and $5.00 gold per ton. West of this great dike two other mineral veins crop out on the "Beebe" Claim, both showing rather large and loose veins with small stringers and bunches of very rich copper, gold and silver ore, in a small shaft and a 50-foot tunnel. These veins also dip to the west, and the schist hanging wall in a 65-foot shaft shows considerable copper stain. On the "Giant" claim we find east of the great jasperoid dike a vein of quartz about three feet wide. In a 30-foot shaft we find ore identical with that of the "Winkelried" and "Tillie" Lodes, showing that this vein is evidently a spur of the "Alice" Lode.

ORE.

As stated at the beginning this description of the Baumann property, ore is found not only in nearly all the openings made on the many veins and lodes, but in several instances in the very outcrops. The character of the ore changes with every vein system, and we find chalcopyrite, cuprite, (red oxide of copper) and chalcocite (copper glance) in the "Laura," "Loretta" and "Red Cross" Lodes; malachite (green carbonate) and azurite (blue copper carbonate) in the "Baby"; cuprite, chalcocite and pyrite in the "Swiss Girl"; malachonite (black oxide of copper), chalcocite, and chloride and bromide of silver in the "Alice" Lode and its spurs, and

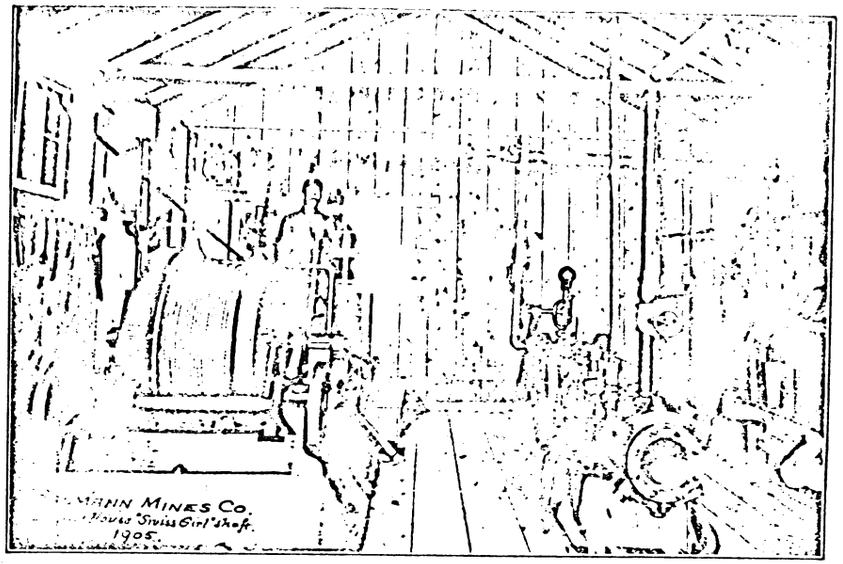
always more or less gold values in all these ores. There is practically no ore on any of the dumps, for the simple reason that it was usually shipped to various smelters as soon as sufficient quantities had accumulated to warrant a shipment, for one must remember, that Jules Baumann, the original locater and owner of this group, has worked and developed it single-handed and consequently in a limited way for a great many years, even before silver was demonetized; when Arizona was known as the "Land of Sunshine and Silver"; before we had railroads in that part of Arizona and ore had to be hauled by wagon a distance of 70 miles; when copper was worth less than 10 cents a pound, yet smelting charges were more than double what they are now; when the nearest smelters were Pueblo, Colo., and El Paso, Texas. Under such conditions exclusive copper ores were worthless and consequently thrown over the dumps with the waste, as was the case in the early workings of the "Swiss Girl" mine, which was then expected to make a silver mine like the "Alice."

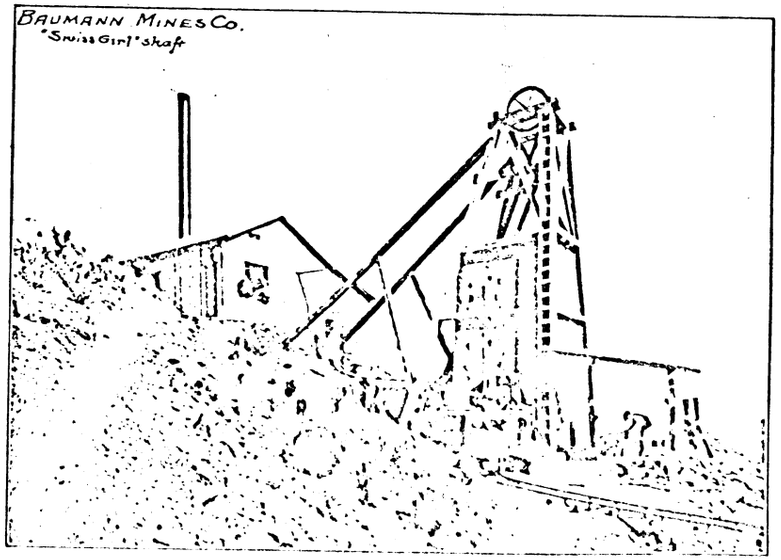
In later years railroads were built all through Arizona and many large smelting plants established within the state, the Humboldt plant practically at our very door; and every foot of road from the Baumann to the smelter is down hill.

The price of copper has doubled, smelting charges cut in half, and they now settle for all precious metals contained in the ore, where formerly nothing was paid for values under two dollars per ton for either gold or silver.

ORE SHIPMENTS.

Shipments of ore have been made from the "Alice" Mine to Pueblo, Colo., El Paso, Texas and to the former Arizona Sampling Works at Prescott, Arizona. The first shipment (to Pueblo) was a small lot of carefully hand sorted ore, 1 and ½ tons; it sampled 112 ounces silver, $2.70 gold and 29 per cent copper (580 pounds) per ton. Two later shipments of considerable tonnage to the Prescott Smelting Works sampled 36 ounces silver, $3.44 gold and 24 per cent copper, and 42 ounces silver, $2 gold and 14 per cent copper respectively. Still later 100 tons of refuse ore was purchased by the Val Verde Smelter people (Val Verde stood where the Humboldt smelter stands today; it was destroyed by fire during 1904) at





five dollars per ton on the dump. At the same time, they also bought all the ore taken out of the deeper shaft of the "Arizona" claim, and paid same price, five dollars per ton on the dump and immediately thereafter opened negotiations for the purchase of that claim; this lot was 35 tons.

More than 100 tons of sorted ore from the "Laura" Mine sampled 20 per cent copper, $1.10 gold and 1½ ounces silver a ton, and one carload of unsorted ore gave returns of 6.4 per cent copper, one dollar gold and ½ ounce silver per ton.

A shipment of a few tons from the "Baby" Mine contained 26 per cent copper and $5 gold per ton, and a car load from the "Swiss Girl" Mine sampled 15 per cent copper, trace of gold and 0.7 ounce silver, while many tons of equally as good and even richer ore is mixed with waste in the two large dumps.

A small batch of ore from the western vein of the "Beebe" Claim ran over $100 per ton in gold and silver and 10 per cent copper.

To show the richness of some of the ores it is well to mention the sampling of a few small lots to ascertain the values of the best:

100-pound lot from "Swiss Girl" shaft, of oxidized ore: 67 per cent copper, trace gold, 6 ounces silver. This sample contained considerable native copper.

100 pounds from the "Swiss Girl" tunnel, of sulphide ore; 32.41 copper, no gold and trace of silver.

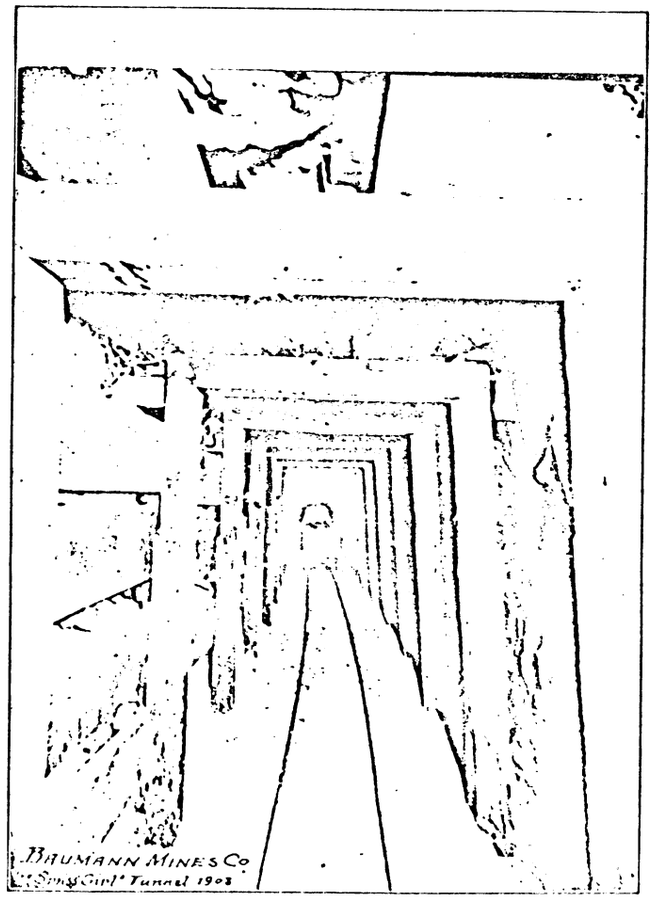
80-pound lot from "Alice" Mine: 36 per cent copper, $5.00 gold and 84 ounces silver.

50-pound lot from stope in "Laura" mine: 27.5 per cent copper, $14.00 gold and 2.2 ounces silver.

50 pounds from same stope: 54 per cent copper, $6.00 gold and 1.5 ounces silver.

100-pound lot from "Baby" shaft, sampled 7 per cent copper, $34.50 gold and 2 ounces silver.

The highest assays were obtained from specimen from the "Alice" mine, from the shaft: 18 per cent copper, $3.50 gold, and 312.2 ounces silver; and one from the "Well" (a 30-foot shaft sunk on a small stringer of iron sulphide): trace copper, $72.00 gold and 11 ounces silver.

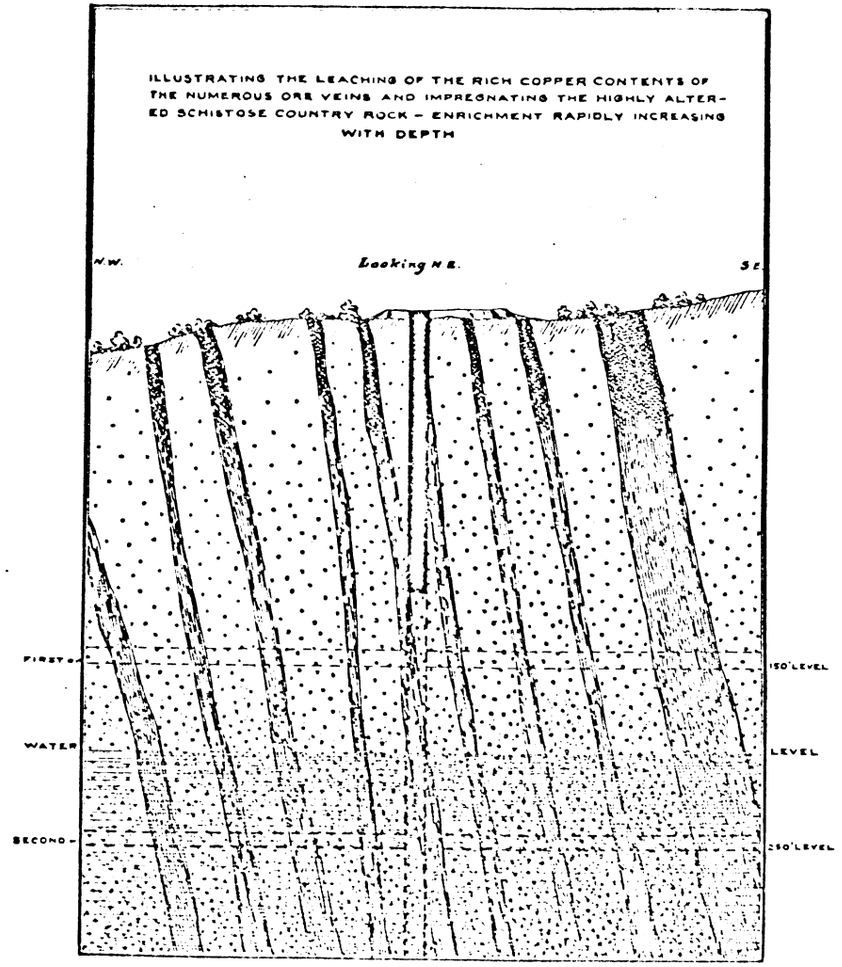


The hills at Camp Baumann are mostly covered with chaparral (scrub oak), mountain mahogany and squawberry brush, and during extreme dry seasons some years ago they were all burnt around the camp to safeguard against a possible loss of the buildings.

While the ground was bare one of the miners discovered the outcrop of a "suspicious looking" vein of about six inches in width, knocked a chunk from it and brought it in;—but he failed to mark the spot. This piece of quartz showed all over finely powdered yellow ochre like iron oxide and was later broken up in Prescott, when Lo, the inside was marvelously rich in native gold. Several pieces had to be pulled apart being held together by gold. Most of these samples were distributed to friends, and one big piece "loaned" to a pretended mine promoter from Kansas City. This ore would run tens of thousands of dollars per ton. The vein has never been rediscovered since, and the brush allowed to grow rank all over the place, making Camp Baumann the acknowledged beauty spot: "The prettiest and cleanest seen anywhere." To be sure we shall look out for this "suspicious looking" vein, when this ground is being explored by crosscuts from the shafts, when greater depth is attained. The same promoter also "borrowed" several beautiful native copper specimens, which were taken from the "Swiss Girl" tunnel floor not very far from the entrance.

WORKING PLAN.

Few properties, if any, are as favorably situated as the Baumann for economical operation. The many rich ore veins will enable the Baumann to make even development work pay big, when once fairly launched, by shipping the high-grade ores to the smelter while opening up and blocking out the extensive bodies of commercial ore. The "Baby" shaft being sunk among a veritable nest of veins that produce such rich copper ores, has clearly demonstrated that extensive ore bodies lie nearer the surface here than had been expected, and was therefore selected by the management as best suited for the main working shaft. Its present depth is 130 feet. It is so far the only vertical shaft on the entire property and is in rock or solid formation. The "Baby" Mine can be developed into a



CROSS SECTION
"BABY" MINE

big paying proposition in a very short time. We feel confident that we can begin making regular ore shipments within a few months after the machinery is installed. Similar facilities exist at the "Laura" shaft, through which the "Loretta" and "Red Cross" Lodes will be explored, and this and all the other mineral centers of the Baumann will receive our attention after the "Baby" has been put on a paying basis and dividends are paid to stockholders.

That the Baumann is looked upon locally as the coming great mine is proved by the fact that all available ground surrounding it has been located.

NOT WHAT WE SAY, BUT WHAT OTHERS SAY.

With reference to the Baumann Mines Company mines, they bear a splendid reputation among mining men and are considered the coming great mines of our section. Having gone over the ground and into the workings, the results of my observations being, that I am satisfied of the immense value of the property and am now a heavy stockholder.

GEO. H. SCHUERMAN, Chairman,
Board of Supervisors, Prescott, Ariz.

The stockholders of the Baumann Mines Company are assured of an intelligent and economical management, the officers being well known men of unquestionable ability and integrity. Have visited the mines several times and believe the conditions are right for the making of one of the largest copper mines in the United States. I must agree that an investment in stock of the Baumann Mines Company is a good one with indications of resulting in very large profits.

ALFRED QUETU, Catholic Pastor,
Prescott, Jerome and Congress, Arizona.

To investors who want to invest in mines whether for $500 or $5,000 and want to place their money in a proposition that has a present and future, I unhesitatingly recommend the Baumann Mines stock —I personally know their properties and methods of management.

GEO. L. YOUNG, Examiner of Investments,
Former Secretary of Arizona, now Mayor of Phoenix, Ariz.

As evidence of our confidence in the value of the Baumann copper mines with our ability to economically treat their ores to great advantage and enormous profit to them, we will install a 100-ton daily capacity up-to-date smelter on the property and take stock at market price in full payment for same. We have investigated the merits of the proposition thoroughly and seen the rich sulphide copper ores which are unusually rich in copper and warrant this proposition.

UNITED STATES SULPHIDE SMELTING FURNACE CO.,
Toledo, Ohio.

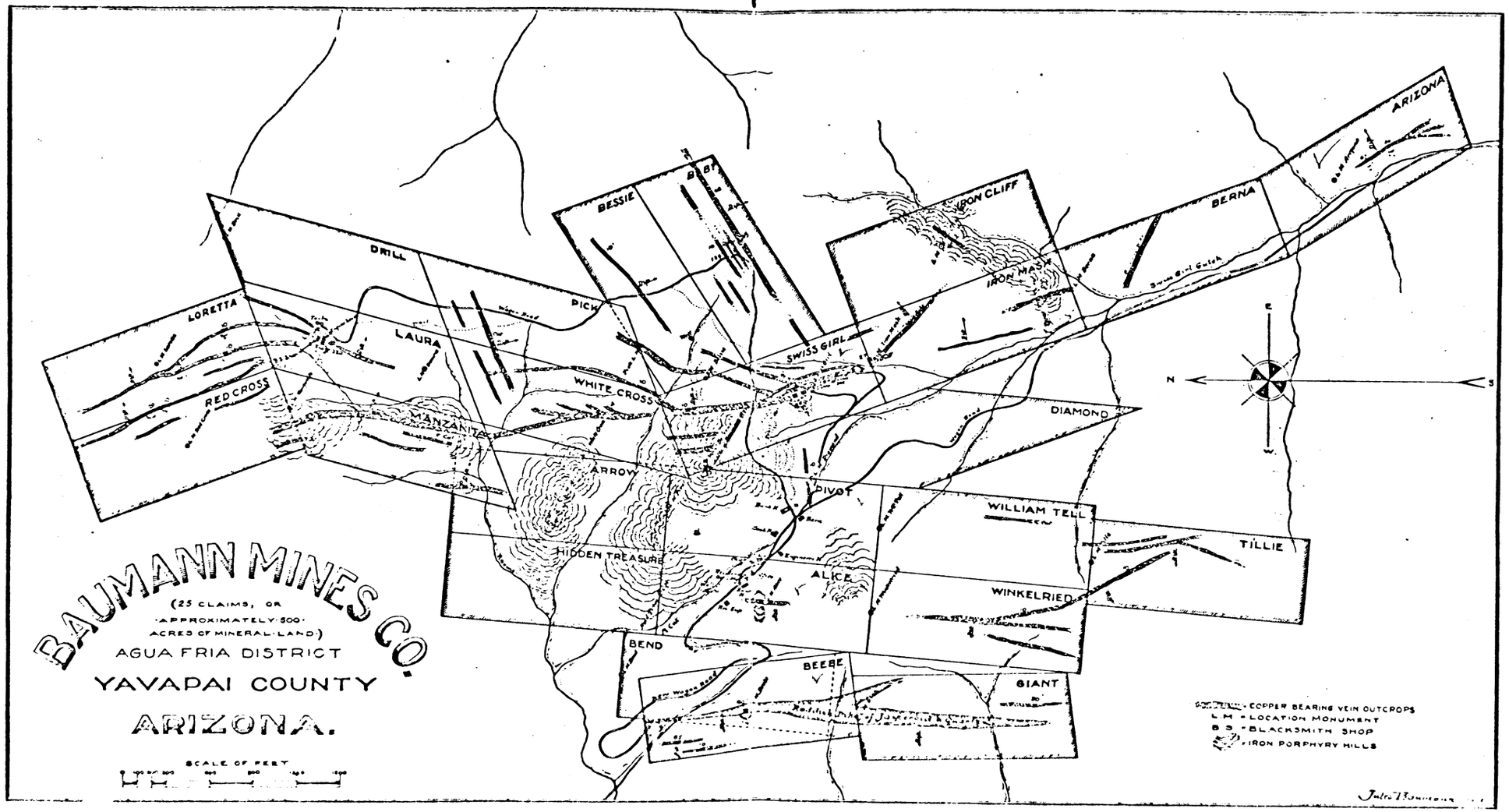
CONCLUSION.

It is well nigh impossible to exaggerate on the Baumann proposition. One can not get away, however, from using superlatives in plenty when describing the great and wonderful property, its many advantages, superior facilities and immense possibilities. The fact that in the Baumann we have not only the making of a great mine, but several of them, proven by unquestionable evidences, ought to make the stock of Baumann Mines Company one of the best mining investments ever offered.

We have opened an office at No. 518 Manhattan Building, Duluth, Minn., and herewith invite the public in general and those looking for a growing and most profitable mining investment especially to call and investigate. The many credentials from the highest local and state authorities of Arizona, reports from eminent mining engineers, photographs and maps of the property, and above all the largest and most varied exhibit of copper ores ever seen here from the Baumann Group of Mines, will prove highly interesting.

Respectfully,
BAUMANN MINES COMPANY,
No. 518 Manhattan Bldg.

N. B.—The copper contents in ore are expressed in weight; one per cent copper means 1 per cent of 2000 pounds, or 20 pounds of copper, worth $4.00 at present market value of 20 cents per pound.


BAUMANN MINES CO.
(25 CLAIMS, OR
APPROXIMATELY 500
ACRES OF MINERAL LAND)
AGUA FRIA DISTRICT
YAVAPAI COUNTY
ARIZONA.
SCALE OF FEET
LORETTA
RED CROSS
LAURA
DRILL
PICK
BESSIE
BEST
MANZANITA
WHITE CROSS
SWISS GIRL
IRON CLIFF
IRON MASK
BERNA
ARIZONA
DIAMOND
ARROW
PIVOT
HIDDEN TREASURE
ALICE
WILLIAM TELL
TILLIE
WINKELRIED
BEND
BEEBE
GIANT
N
E
S
W
COPPER BEARING VEIN OUTCROPS
L M = LOCATION MONUMENT
B S = BLACKSMITH SHOP
IRON PORPHYRY HILLS