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Cleveland Cliffs

265-9312

11-12 N
16 + 17 W Yuma Co.

SE of Parker 20 miles

Mr. Alcott 265-9312

Survey Map of Iron Reserves of Planet Mine in Yuma County, AZ.

T 11+12 N Yuma County
R 16+17 W

Southeast of Parker 20 miles

265-9312

Mr. Alcott
Survey Map of Iron
Reserves of the
Planet Mine in
Yuma (Pima) Co., Arizona.

622
U53

Cop. 2

DUPLICATE

R. I. 3932

DECEMBER 1946

UNITED STATES
DEPARTMENT OF THE INTERIOR
J. A. KRUG, SECRETARY

BUREAU OF MINES
R. R. SAYERS, DIRECTOR

REPORT OF INVESTIGATIONS

EXPLORATION OF NEW PLANET IRON DEPOSIT

YUMA COUNTY, ARIZ.

BY

JOSEPH B. CUMMINGS

R.I. 3982
December 1946

REPORT OF INVESTIGATIONS

UNITED STATES DEPARTMENT OF THE INTERIOR - BUREAU OF MINES

EXPLORATION OF NEW PLANET IRON DEPOSIT, YUMA COUNTY, ARIZ.[1]

By Joseph B. Cummings[2]

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INTRODUCTION

The property was first examined by an engineer[3] of the Bureau of Mines in December 1942 and was later investigated by the same engineer in January and February 1943. Prominent outcrops and underground exposures of high-grade iron ore, together with mention of sizable intersections of

1/ The Bureau of Mines will welcome reprinting of this paper, provided the following footnote is used: "Reprinted from Bureau of Mines Report of Investigations 3982."
2/ Mining engineer, Bureau of Mines.
3/ Thomas L. Chapman.

hematite in logs of four widely scattered churn-drill holes, indicated the possible occurrence of a substantial tonnage of iron ore at this old copper producer.

From March to May 1943, detailed topographic and geologic mapping of the property was done by the Federal Bureau of Mines, the Federal Geological Survey, and the Arizona Bureau of Mines.

Funds were allotted for exploration of the property by churn and diamond drilling. This work was started in December 1943 and completed in June 1944.

ACKNOWLEDGMENTS

In its program of exploration of mineral deposits, the Bureau of Mines has as its primary objective the more effective utilization of our mineral resources to the end that they make the greatest possible contribution to national security and economy. It is the policy of the Bureau to publish the facts developed by each exploratory project as soon as practicable after its conclusion. The Mining Branch, Lowell B. Moon, Chief, conducts preliminary examination, performs the actual exploratory work, and prepares the final report. The Metallurgical Branch, R. G. Knickerbocker, Chief, analyzes samples and performs beneficiation tests. Both these branches are under the supervision of Dr. A. S. Dean, Assistant Director.

With respect to this report, special acknowledgment is due to J. H. Hedges, district engineer, and S. R. Zimmerley, regional engineer, of the Western Region of the Bureau. Work on the project was facilitated by the assistance of Eldred Wilson, of the Arizona Bureau of Mines, and Arthur P. Butler, Jr., of the Federal Geological Survey, who mapped the geology of the area.

Chemical analyses included in this paper were performed at the Bureau's laboratory, Reno, Nev., under the direction of A. C. Rice, acting supervising engineer.

LOCATION AND ACCESSIBILITY

The property is on the south bank of the Bill Williams River 12 miles above its junction with the Colorado River, in the Planet mining district, and the northwest corner of Yuma County, Ariz. (fig. 1). It is 28 miles north of Bouse, which is on the Atchison, Topeka & Santa Fe Railroad and may be reached from Bouse by a dirt road, 18 miles of which is graded county road and 10 miles unimproved desert road.

PHYSICAL FEATURES AND CLIMATE

At the property the Bill Williams River has a permanent flow. The topography is rugged. Hills, 100 to 500 feet high, are cut by numerous small canyons with steep walls, and there is little soil on the slopes. The average altitude at the property is 800 feet. The climate is hot and dry in summer but mild in winter. Vegetation is scant, except along the river bottom, where brush and cottonwood trees are plentiful. There is no timber on the property suitable for mining operations.

DIAMOND-DRILL-HOLE ASSAY VALUES

HOLE NO. 1

Coordinates: Latitude, N. 6093; Departure, E. 12252
Elevation of collar: 803

FOOTAGE			CORE Percent				SLUDGE Percent				ADJUSTED AVERAGES Percent			
From	To	Feet	Fe	Cu	SiO_2	S	Fe	Cu	SiO_2	S	Fe	Cu	SiO_2	S
0.0	3.4	3.4	48.55	0.010	29.27	0.028					48.55	0.010	29.27	0.028
3.4	8.6	5.2	48.17	.010			55.40	0.020	9.90	0.91	54.74	.019	9.90	.91
8.6	13.8	5.2					60.19	.014	8.16	.16	60.19	.014	8.14	.16
13.8	18.8	5.0	42.19	.003			55.91	.006	15.77	.072	53.96	.006	15.77	.072
18.8	23.8	5.0					59.80	.010	11.40	.026	59.80	.010	11.40	.026
23.8	28.8	5.0					56.12	.013	17.81	.028	56.12	.013	17.81	.028
28.8	34.8	6.0					64.71	.010	5.42	.036	64.71	.010	5.42	.036

FOOTAGE			CORE Percent			SLUDGE Percent			ADJUSTED AVERAGES Percent		
From	To	Feet	P	Al_2O_3	CaO	P	Al_2O_3	CaO	P	Al_2O_3	CaO
0.0	3.4	3.4	0.034	0.30	0.69				0.034	0.30	0.69
3.4	8.6	5.2				0.025	1.01	3.45	.025	1.01	3.45
8.6	13.8	5.2				.020	.93	1.75	.020	.93	1.75
13.8	18.8	5.0				.020	.63	1.37	.020	.63	1.37
18.8	23.8	5.0				.015	.19	.83	.015	.19	.83
23.8	28.8	5.0				.035	.29	.48	.035	.29	.48
28.8	34.8	6.0				.038	.18	.66	.038	.18	.66

DIAMOND-DRILL HOLE ASSAY VALUES

HOLE NO. 2

Coordinates: Latitude, N. 2169; Departure, E. 12229
Elevation of collar: 806

FOOTAGE			CORE Percent				SLUDGE Percent				ADJUSTED AVERAGES Percent			
From	To	Feet	Fe	Cu	SiO_2	S	Fe	Cu	SiO_2	S	Fe	Cu	SiO_2	S
0.0	3.0	3.0					51.20	0.003	15.31	0.13	51.20	0.003	15.31	0.13
3.0	8.0	5.0	26.00	0.005			32.29	.043	40.20	.15	31.16	.036	40.20	.15
8.0	13.0	5.0	56.70	.017			61.30	.013	10.13	.040	60.47	.014	10.13	.040
13.0	18.0	5.0					65.74	.004	4.63	.056	65.74	.004	4.63	.056
18.0	23.0	5.0					66.60	.003	4.02	.040	66.60	.003	4.02	.040
23.0	28.0	5.0					64.25	.006	7.17	.020	64.25	.006	7.17	.020
28.0	30.0	2.0					57.93	.009	13.34	.018	57.93	.009	13.34	.018
30.0	35.0	5.0					55.00	.022	19.28	.022	55.00	.022	19.28	.022
35.0	40.0	5.0					55.02	.025	19.98	.018	55.02	.025	19.98	.018
40.0	42.0	2.0					66.30	.055	12.93	.046	66.30	.055	12.93	.046

FOOTAGE			CORE Percent			SLUDGE Percent			ADJUSTED AVERAGES Percent		
From	To	Feet	P	Al_2O_3	CaO	P	Al_2O_3	CaO	P	Al_2O_3	CaO
0.0	3.0	3.0				0.015	0.78	5.28	0.015	0.78	5.28
3.0	8.0	5.0				.025	.41	.80	.025	.41	.80
8.0	13.0	5.0				.021	.31	.42	.021	.31	.42
13.0	18.0	5.0				.012	.24	.15	.012	.24	.15
18.0	23.0	5.0				.010	.40	.39	.010	.40	.39
23.0	28.0	5.0				.024	.14	1.46	.024	.14	1.46
28.0	30.0	2.0				.033	.59	1.12	.033	.59	1.12
30.0	35.0	5.0				.020	.40	1.16	.020	.40	1.16
35.0	40.0	5.0				.012	.36	.23	.012	.36	.23
40.0	42.0	2.0									

DIAMOND-DRILL-HOLE ASSAY VALUES

Hole No. 3

Coordinates: Latitude, N. 6165; Departure, E. 12206
Elevation of collar: 798

FOOTAGE			CORE Percent				SLUDGE Percent				ADJUSTED AVERAGES Percent			
From	To	Feet	Fe	Cu	SiO_2	S	Fe	Cu	SiO_2	S	Fe	Cu	SiO_2	S
0.0	3.5	3.5												
3.5	8.5	5.0	20.50	0.010			37.48	0.036			33.57	0.024		
8.5	13.5	5.0	22.32	.002			53.07	.009	22.52	0.003	22.32	.002	22.52	0.003
13.5	18.5	5.0					67.82	.013	1.16	.030	67.82	.013	1.16	.030
18.5	23.5	5.0	53.84	.008			66.46	.005	3.38	.054	65.55	.005	3.38	.054
23.5	27.5	4.0					65.60	.021	4.38	.066	65.60	.021	4.38	.066
27.5	30.8	3.3					65.12	.019	5.10	.056	65.12	.019	5.10	.056
30.8	39.2	8.4												

FOOTAGE			CORE Percent			SLUDGE Percent			ADJUSTED AVERAGES Percent		
From	To	Feet	P	Al_2O_3	CaO	P	Al_2O_3	CaO	P	Al_2O_3	CaO
0.0	3.5	3.5									
3.5	8.5	5.0				0.017	0.43	0.22	0.017	0.43	0.22
8.5	13.5	5.0				.026	.36	.32	.026	.36	.32
13.5	18.5	5.0				.018	.38	.18	.018	.38	.18
18.5	23.5	5.0				.032	.33	.21	.032	.33	.21
23.5	27.5	5.0				.017	.17	.61	.017	.17	.61
27.5	30.8	3.3									
30.8	39.2	8.4									

DIAMOND-DRILL-HOLE ASSAY VALUES

HOLE NO. 4

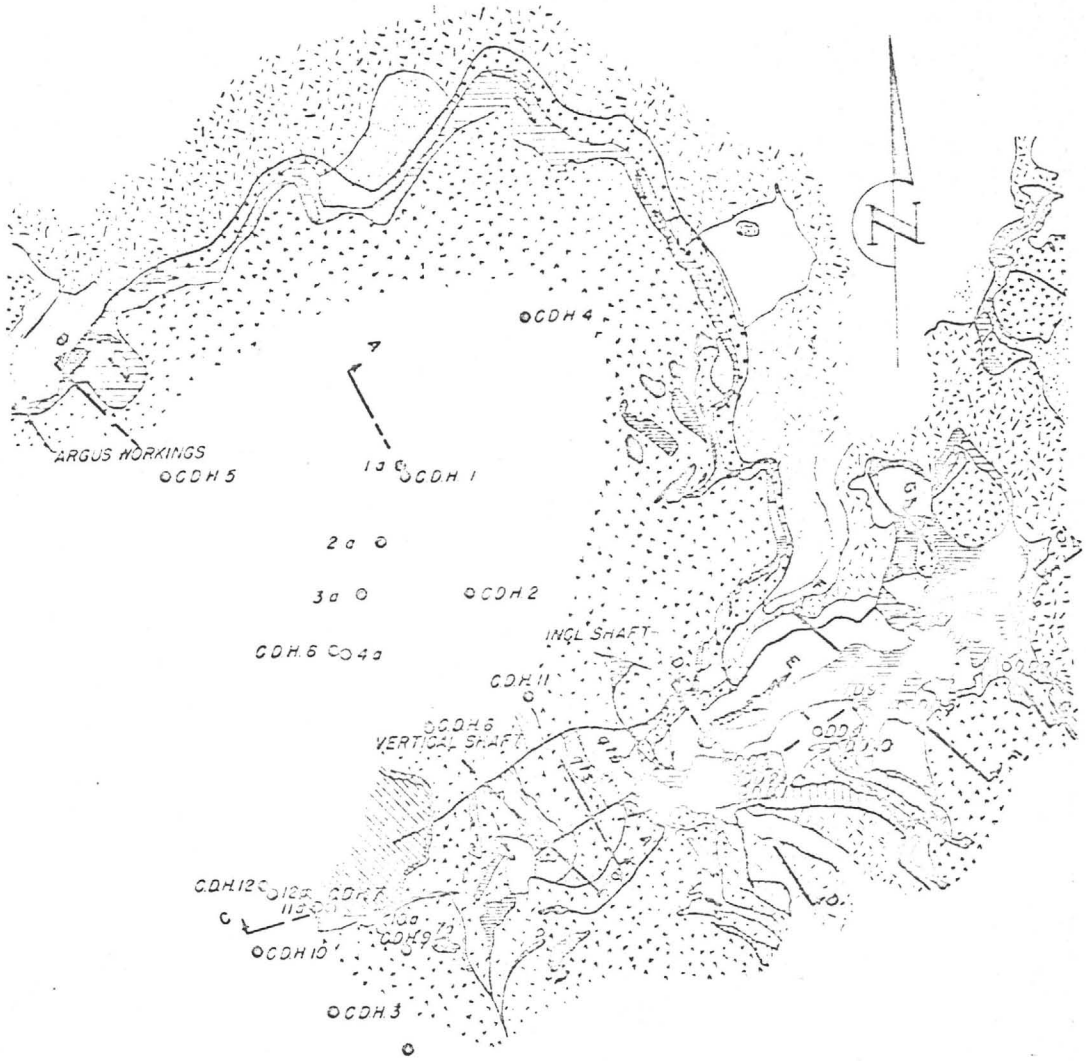
Coordinates: Latitude, N. 6255; Departure, E. 12475
Elevation of collar: 851

FOOTAGE			CORE Percent				SLUDGE Percent				ADJUSTED AVERAGES Percent			
From	To	Feet	Fe	Cu	SiO_2	S	Fe	Cu	SiO_2	S	Fe	Cu	SiO_2	S
0.0	6.8	6.8												
6.8	11.7	4.9	36.81	0.221			21.34	0.421			22.78	0.390		
11.7	14.2	2.5					36.41	.274	37.03		36.41	.274	37.03	
14.2	16.7	2.5					60.00	.085	8.69	0.092	60.00	.085	8.69	0.092
16.7	21.7	5.0					61.90	.030	8.14	.099	61.90	.030	8.14	.099
21.7	26.7	5.0					59.71	.021	11.95	.10	59.71	.021	11.95	.10
26.7	31.7	5.0					61.40	.089	9.79		61.40	.089	9.79	
31.7	34.4	2.7					63.13	.001	6.36	.074	63.13	.001	6.36	.074
34.4	41.0	6.6	46.38	.009	32.54		58.04	.019	11.75	.008	57.29	.018	13.08	.008
41.0	47.0	6.0	37.71	.010	44.80		66.87	.004	2.59	.010	65.12	.004	5.12	.010
47.0	52.0	5.0	53.31	.001	22.39		59.88	.004	3.76	.092	58.60	.004	5.34	.092
52.0	54.0	2.0					67.25	.002	1.59	.040	67.25	.002	1.59	.040
54.0	59.0	5.0	50.72	.003	26.25	0.060	65.18	.009	2.10	.079	64.46	.009	3.31	.078
59.0	62.3	3.3					65.02	.026	3.06	.075	65.02	.026	3.06	.75

FOOTAGE			CORE Percent			SLUDGE Percent			ADJUSTED AVERAGES Percent		
From	To	Feet	P	Al_2O_3	CaO	P	Al_2O_3	CaO	P	Al_2O_3	CaO
0.0	6.8	6.8									
6.8	11.7	4.9									
11.7	14.2	2.5				0.024	0.98	1.66	0.024	0.98	1.66
14.2	16.7	2.5				.023	0.76	1.13	.023	.76	1.13
16.7	21.7	5.0				.018	0.83	1.05	.018	.83	1.05
21.7	26.7	5.0									
26.7	31.7	5.0				.023			.023		
31.7	34.4	2.7				.019	1.60	1.89	.019	1.60	1.89
34.4	41.0	6.6	.9			.007	.45	.62	.007	.45	.62
41.0	47.0	6.0				.011	3.88	4.25	.011	3.57	3.92
47.0	52.0	5.0	.010	0.25	0.36	.008	.61	.85	.008	.61	.85
52.0	54.0	2.0				.009	1.19	1.81	.013	1.14	1.73
54.0	59.0	5.0	.015	.27	.32	.013	1.23	1.38	.013	1.23	1.38
59.0	62.3	3.3									

1257

Figure 1. - Location map, New Planet iron project, Yuma County, Ariz.



LEGEND

- IRON ORE, 50% PLUS Fe
- WEAK IRON MINERALIZATION, 35% TO 50% Fe
- FERRUGINOUS MATERIAL, LESS THAN 35% Fe
- GNEISS
- SILICEOUS BRECCIA
- SCHIST
- MICA SCHIST
- RHYOLITE SCHIST
- LIMESTONE
- HORNFELS & NOVACULITE
- QUARTZITIC SCHIST
- BRECCIATED QUARTZITE
- ALLUVIUM, TALUS, SAND
- 1a OLD CHURN DRILL HOLES
- CDH 1 BUREAU OF MINES CHURN DRILL HOLES
- D.D. 1 BUREAU OF MINES DIAMOND DRILL HOLES
- FAULTS
- SHAFTS

Note: Geology by Arizona Bureau of Mines and Federal Geological Survey

0 200 400 800
FEET

Figure 2. - Geologic map, New Planet iron mine, Yuma County, Ariz.

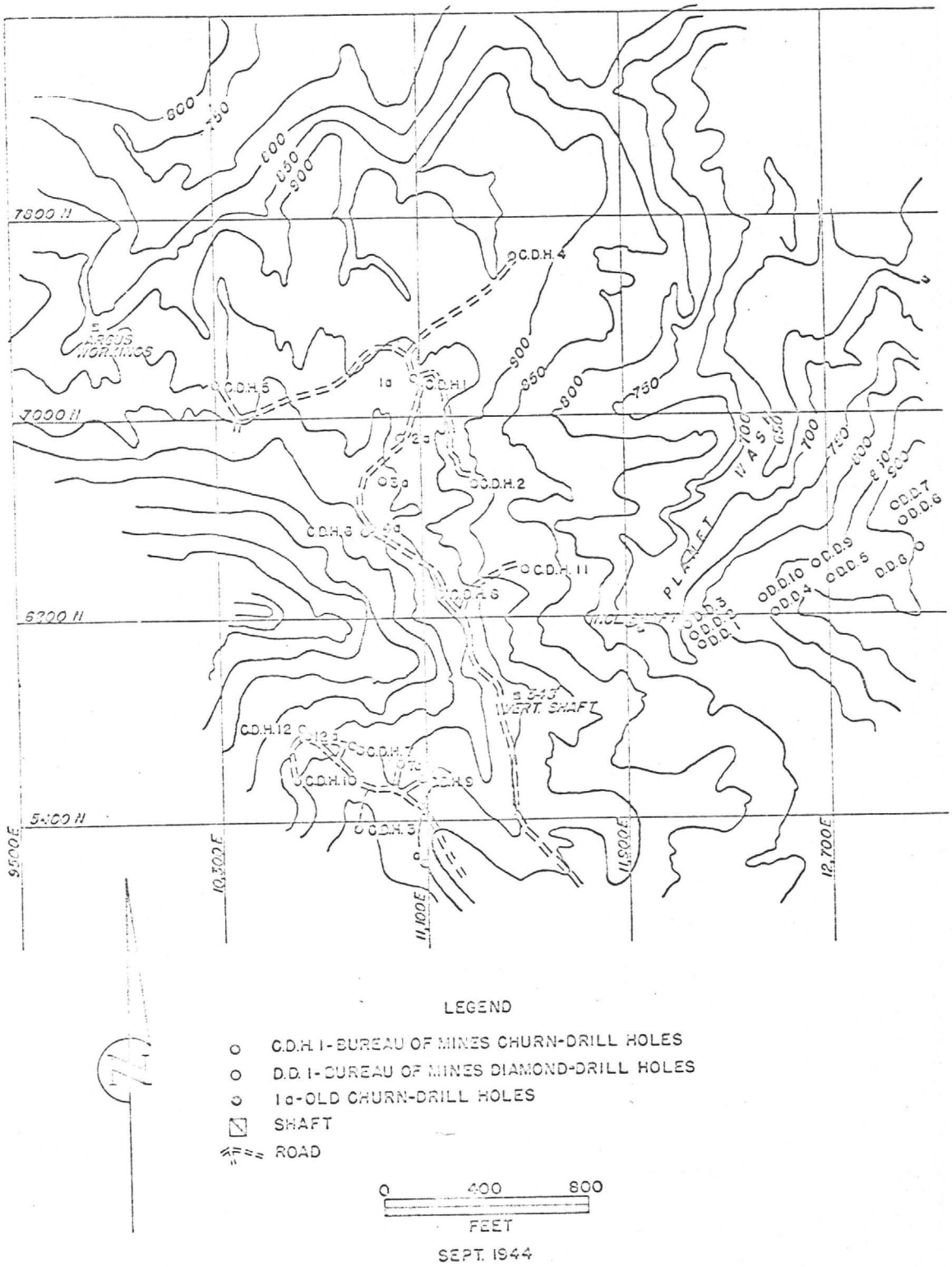


Figure 3. - Topographic map, New Planet iron project, Yuma County, Ariz.

Figure 6. - Longitudinal section through churn-drill hole 7 and diamond-drill holes 2, 4, 7, and 9.

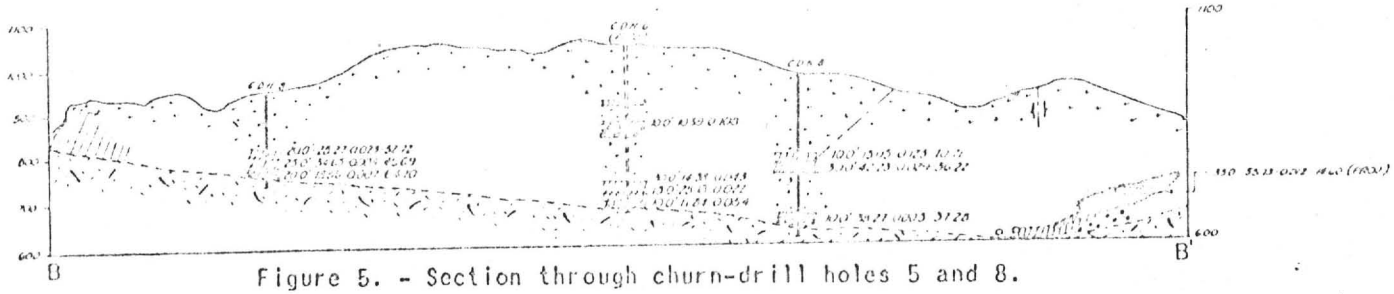


Figure 5. - Section through churn-drill holes 5 and 8.

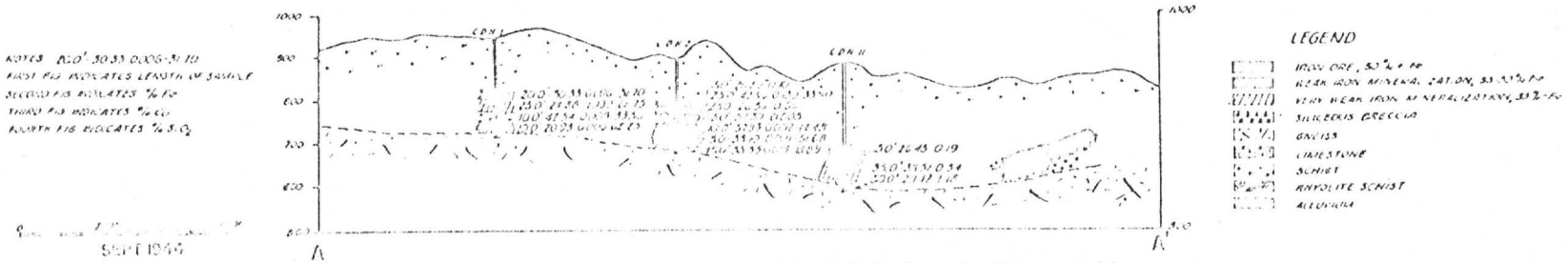


Figure 4. - Section through churn-drill holes 1, 2, and 11.

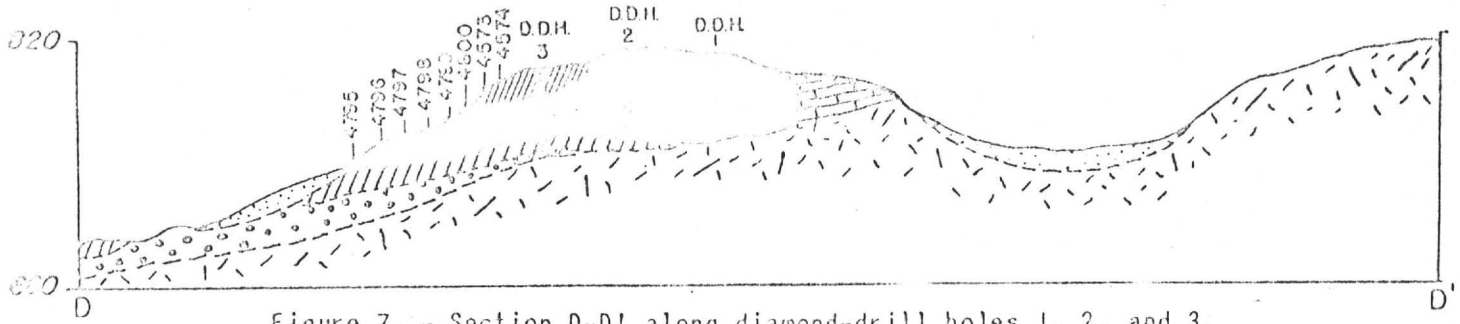


Figure 7. - Section D-D' along diamond-drill holes 1, 2, and 3.

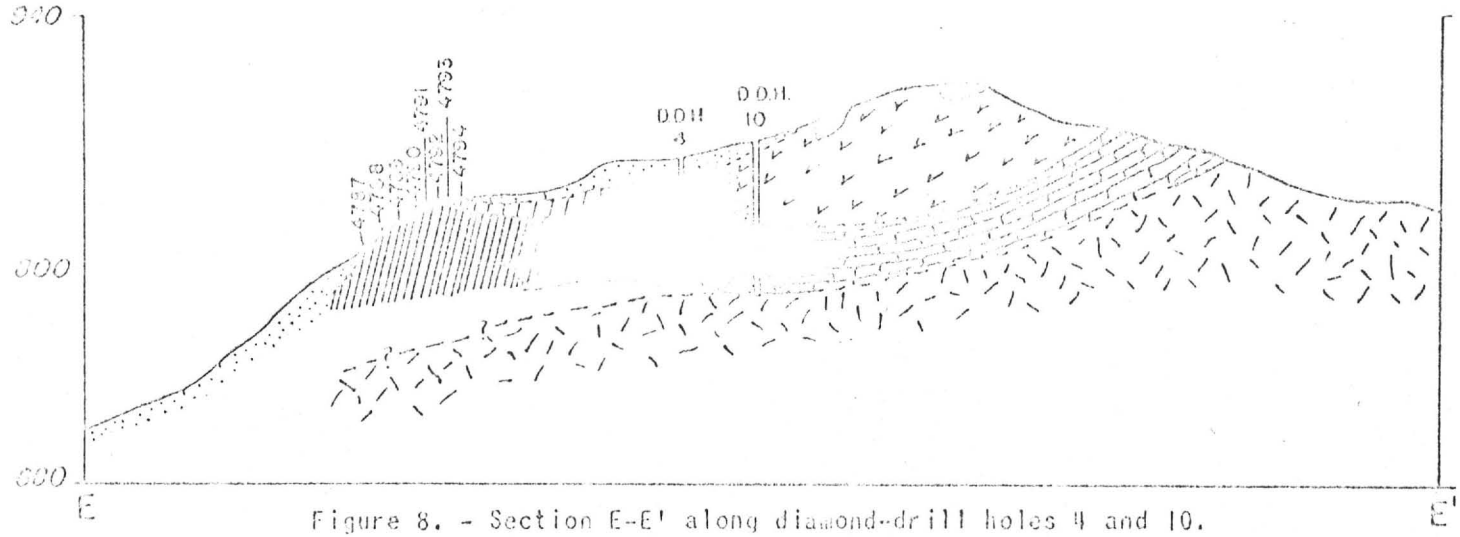


Figure 8. - Section E-E' along diamond-drill holes 4 and 10.

LEGEND

IRON ORE, 50% PLUS Fe
IRON MINERALIZATION, 35-50% Fe
FERRUGINOUS MATERIAL, LESS THAN 35% Fe
ALLUVIUM
LIMESTONE
SCHIST
GNEISS
SAMPLE NUMBER

SEPT. 1955

0 50 100 200
Feet

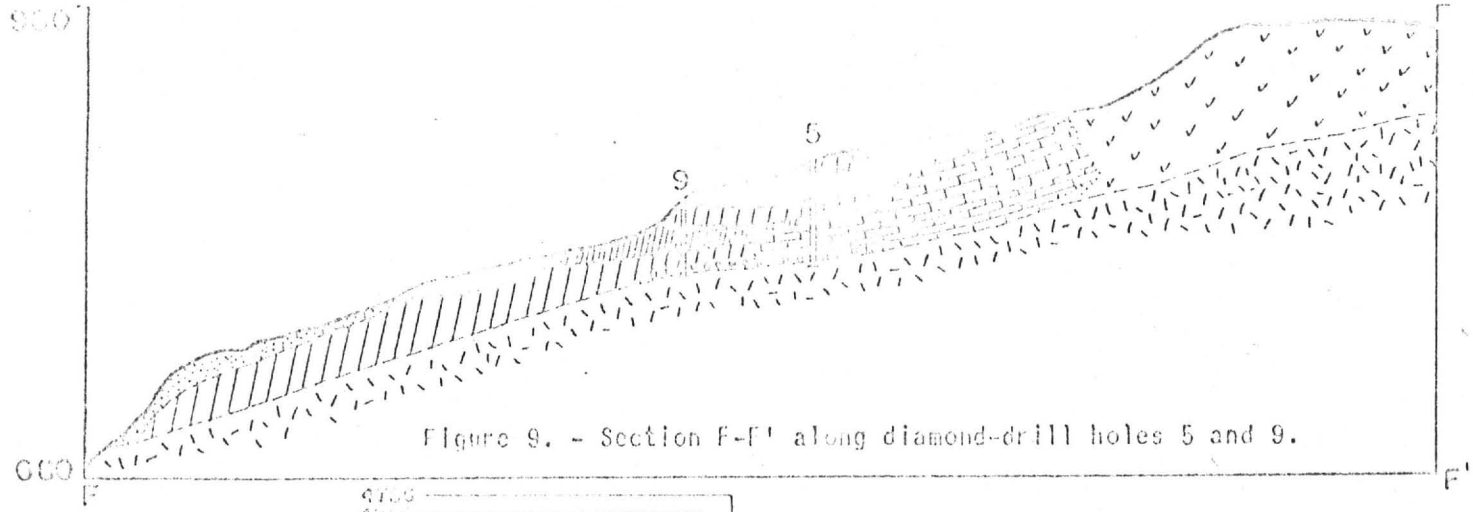


Figure 9. - Section F-F' along diamond-drill holes 5 and 9.

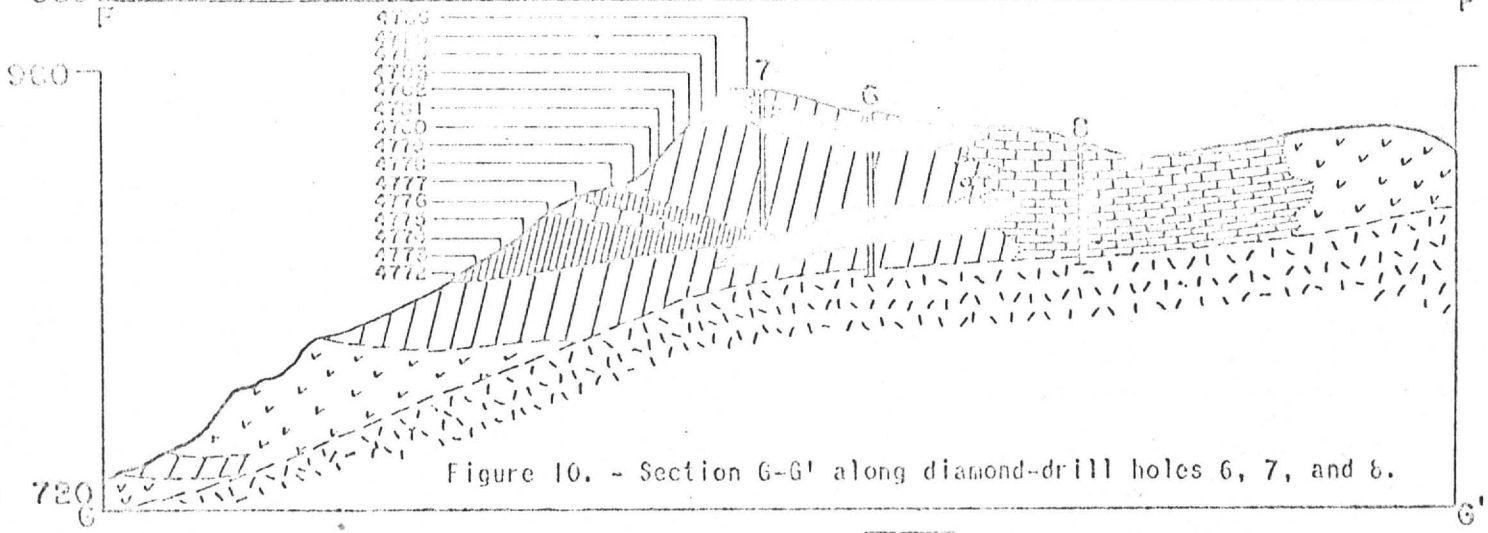


Figure 10. - Section G-G' along diamond-drill holes 6, 7, and 8.

IRON ORE, 50% PLUS Fe

IRON MINERALIZATION, 35-50% Fe

FERRUGINOUS MATERIAL, LESS THAN 35% Fe

SILISEOUS breccia

GNEISS

LIMESTONE

ALLUVIUM

SCHIST

4706 SAMPLE NUMBER

0 50 100 200

FEET

SEPT 1944

NEW PLANET IRON PROJECT 551, YUMA COUNTY, ARIZONA

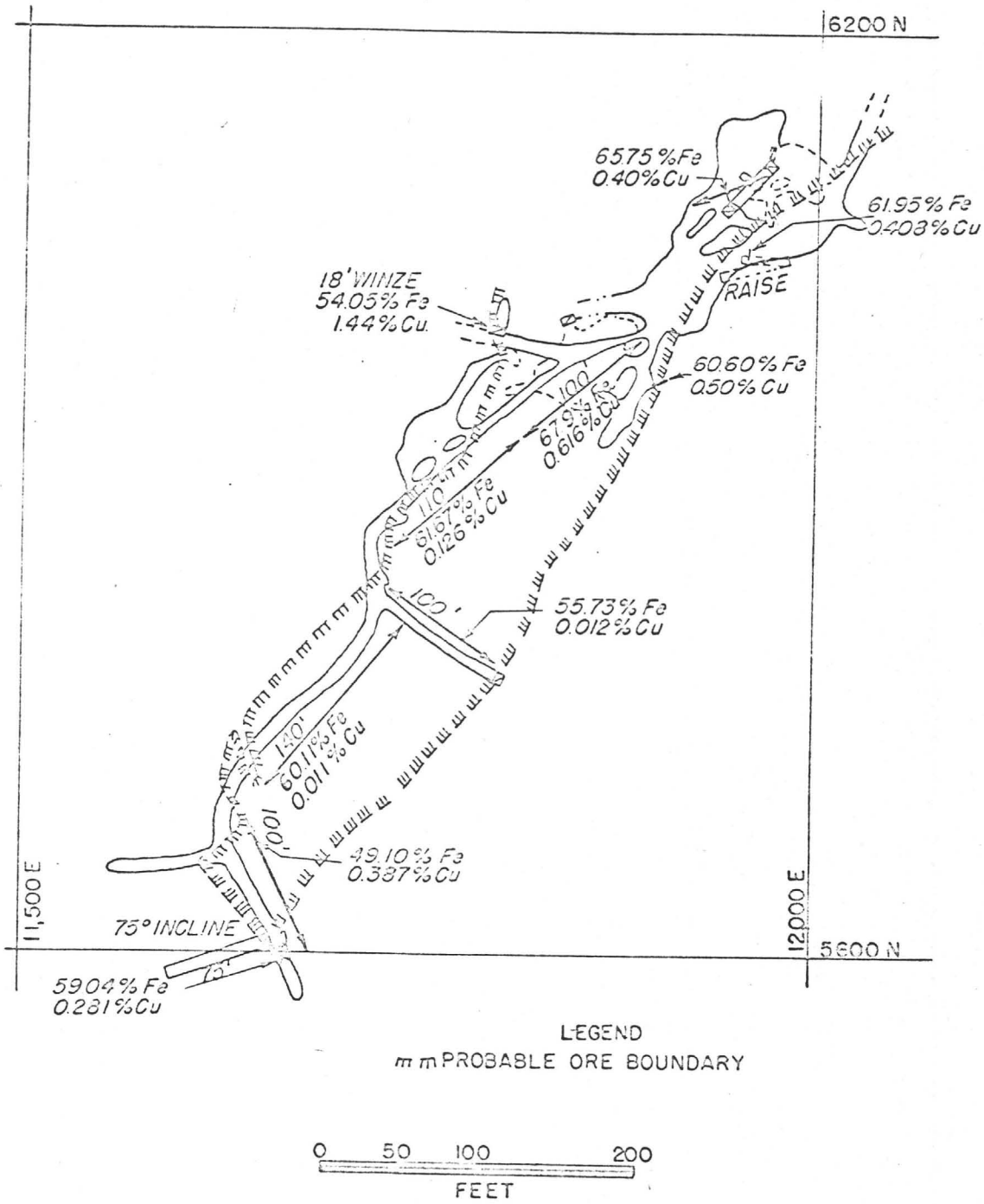


Figure 11. - Plan of drift level, New Planet iron project, Yuma County, Ariz.

THE CHASE MANHATTAN BANK
National Association

1 Chase Manhattan Plaza, New York, New York 10015

October 22, 1968

Mr. Earl Alcott
1213 West Indianola Avenue
Phoenix, Arizona 85013

Dear Mr. Alcott:

Mr. Donald L. Cenis, the Bank's Technical Director - Mining Industry, and I plan to pass through Phoenix on business during the latter part of the last week of October or the first week of November. We would like to take this opportunity to meet you and visit New Planet's Claims. If you are available, we would appreciate it if you would notify us. Looking forward to meeting you, I remain

Sincerely,

Francis D. Wells, Jr.
Second Vice President

ld

552-2622
552-3077
Mr O'boskey

CORPORATION

4715 EAST FORT LOWELL ROAD TUCSON ARIZONA 85716

October 1, 1969

Mr. Earl R. Alcott
1213 N. Indianola Rd.
Phoenix, Arizona 85013

Re: New Planet Mine
Yuma Co., Ariz.

Dear Earl

Enclosed is a copy of the "promised" report that I promised not to send you but relented at the last minute and am sending it anyway.

I hope to settle down by the beginning of next week and get some work done on the New Planet. I have received copies of D. Beck's report and map and find it conflicts with Duval's map. If and when I get this straightened out, I will be in a better position to evaluate our data and determine what to do next.

Sorry to have taken so long to get in touch with you but I haven't been around much of the time.

Sincerely

Joe Wilkins
by ssb

Joe Wilkins

JW:ssb

Enclosure

Assuming 10.5 cubic feet per ton and an average thickness for the mineralized zone of 50.25 feet, eight widely spaced drill holes indicate that approximately 21,000,000 tons of ferruginous material with an average iron content of 35.33 percent and a silica content of 40 percent plus might be expected to underlie the area. However, because of the irregular distribution of mineralization throughout, closely spaced drilling would be necessary to arrive at a definite estimate of tonnage and grade of the ferruginous zone.

Reserves indicated by core drilling and sampling of surface exposures and mine workings. - These reserves are divided into five blocks, described as follows:

Block A is a part of the tabular ore body that outcrops east of Planet Wash and extends to a point approximately 125 feet southwest of the line along which holes 5 and 9 were drilled.

Block B is the extension of block A from the line of holes 1, 2, and 3 to and including the mine workings.

Block C is a lenticular ore body exposed at the surface between holes 5 and 9 and intersected by hole 5.

Block D is an irregular ore body intersected by holes 6 and 7 and exposed at the surface southwest of hole 6, northwest from hole 7, and northeast of the line along which holes 6 and 7 were drilled.

Block E is a lenticular ore body exposed in the escarpment northeast of the line along which holes 6 and 7 were drilled. Hole 6 passed through this ore body, and hole 7 penetrated it for 10.1 feet and is bottomed in the ore zone.

TABLE 1. - Total indicated ore

Block	Tons	Percent						
		Fe	SiO_2	Cu	S	P	CaO	Al_2O_3
A	349,125	57.87	11.67	0.031	0.097	0.028	1.89	0.77
B	614,625	56.96	12.67	.014	.109	.020	1.11	.86
C	60,000	51.40	21.42	.019	.23	.060	-	-
D	35,625	47.97	24.77	.025	.124	.044	-	-
E	60,750	53.75	16.05	.149	.300	.078	-	-
Total . . .	1,120,125	-	-	-	-	-	-	-
Average . .	-	56.42	13.39	0.027	0.123	0.029	1.39	0.83

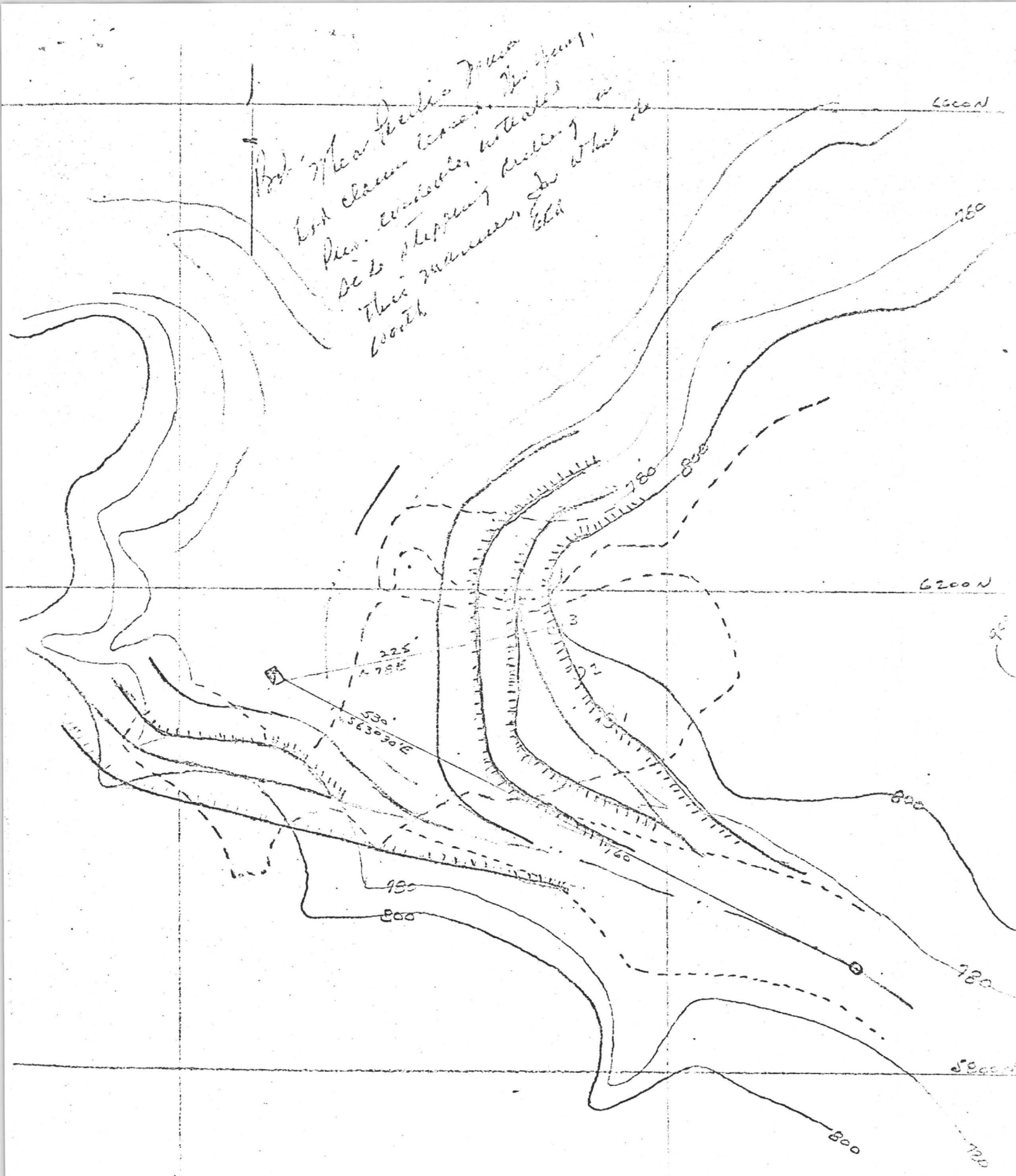
TABLE 2. - Indicated ore that can be mined by open-pit method

Block	Tons	Percent						
		Fe	SiO_2	Cu	S	P	CaO	Al_2O_3
A	349,125	57.87	11.67	0.031	0.097	0.028	1.89	0.77
1/3 of B. .	204,875	56.96	12.67	.014	.109	.020	1.11	.86
C	60,000	51.40	21.42	.019	.23	.060	-	-
D	35,625	47.97	24.77	.025	.124	.044	-	-
Total . . .	649,625	-	-	-	-	-	-	-
Average . .	-	56.33	13.60	0.024	0.115	0.028	*1.60	*0.80

* Average for blocks A and B only.

GROVER J. HOLT

Mr. Holt has officially retired as assistant to the president of The Cleveland-Cliffs Iron Company at Ishpeming, Michigan, and will be taking up new residence at 403 Magdalena Avenue, San Clemente, California. Mr. Holt, 1956 president of American Institute of Mining and Metallurgical Engineers, will be on a consultation basis for Cleveland-Cliffs and will be doing other consulting work in connection with mining and metallurgical treatment of iron ores.



Proposed Excavations

Note: Excavated material to be hauled ± 1000' and stacked.

Sketch of Bucks
Scale 1" = 100'
Exploration Company

Anamet Testing & Inspection, Inc.
845 CARLETON STREET • BERKELEY 10 CALIFORNIA • THORNWALL 1-5771

CONSTRUCTION MATERIALS
INDUSTRIAL MATERIALS

LABORATORY NO: 52-T-361 March 28, 1961

SUBJECT: Sample of Iron Ore Marked Argus Working Arizona #A-109

REPORT TO: Overseas Central Enterprise, Inc.
310 Sansome Street
San Francisco, California

CHEMICAL ANALYSIS

Iron (Fe) 69.22%

Respectfully submitted,

ANAMET TESTING & INSPECTION, INC.

By_____

November 5, 1968

Mr. Francis D. Wells, Jr.
Second Vice President
The Chase Manhattan Bank
1 Chase Manhattan Plaza
New York, New York 10015

Dear Mike:

As per our conversation while you were here, you will find enclosed reduced scale map, that I believe you will find self-explanatory, of the properties in question. The map in its reduced size does show with reasonable clarity most detail including those fractional claims that were located within and adjacent to your claims at the time of negotiation with Miami Copper. This was done at their request and the required location and assessment work has been done.

It is, of course, a foregone conclusion that in any instance where our located claims may be in so-called conflict with your patented claims, we will yield without further question.

We may or may not, when the chips are down, be able to upset the patented Golden West claims of James E. Halden. An advisor and ex-officer of the Bureau of Land Management seems to feel that on the basis of what would appear to be fraudulent statements submitted at the time of patent, that it is within the realm of possibility.

I can't tell you how much we enjoyed having you here and how much we appreciate your coming here.

Please extend my sincere sympathy and best wishes to Mr. Cenis.

Best personal regards.

Sincerely,

VIA AIR MAIL

THE CHASE MANHATTAN BANK

1 Chase Manhattan Plaza, New York, New York 10015

August 19, 1968

Mr. E. R. Alcott
1213 West Indianola
Phoenix, Arizona

Dear Mr. Alcott:

New Planet Cooper Mining
Company

Thank you for your letter of August 14 explaining your position with respect to New Planet.

I agree that it would be to our mutual advantage to maintain close contact with one another if we are to develop these properties. I suggest, therefore, that you contact me if anything develops.

As Mr. Bright explained, though we are desirous of seeing the Company's claims developed, we wish to deal only with principals.

Sincerely,

Francis D. Wells, Jr.
Second Vice President

212-552-2222

ld

Mr Curtis G. Callan

Jd

drilled within a period of one year from the execution of the option agreement, then in that event the option agreement shall terminate and Miami Copper shall pay to my clients the sum of $25,000.00 as liquidated damages. By the same token, of course, Miami Copper at any time during the option period shall have the right to exercise the option by the payment of the full purchase price with any monthly option payments being applied toward that purchase price. After considerable discussion and consideration we have all agreed that the end purchase price to be called for in the option agreement shall be $1,750.000.00.

It is assumed that the general provisions of the option will provide that the work which Miami Copper performs on these claims, to-wit, the drilling of the hole, shall be used by our clients as and for assessment work. It is also assumed that there will be a provision providing that no ore shall be mined from the property until such time as the option to purchase shall be exercised.

If these provisions are agreeable with you and the Board of Directors of Miami Copper, please have Bud Malott draft the option agreement and submit the same to me for review.

If you have any questions or desire additional information, please do not hesitate to call upon me.

Kindest personal regards.

Yours very truly,

A. Michael Bernstein

AMB:jk

cc: James R. Malott, Jr.
G. L. Gibbons
Earl Alcott
A. P. Buzard

YANKEE & BERNSTEIN
ATTORNEYS AT LAW
1327 GUARANTY BANK BUILDING
PHOENIX, ARIZONA 85012

A. MICHAEL BERNSTEIN
JAMES A. YANKEE

264-4891

December 2, 1966

COPY

Miami Copper Co.
P. O. Box 100
Miami, Arizona

Attention: B. R. Coil, Vice President,
General Manager

Re: G. L. Gibbons, Earl Alcott, A. P. Buzard
Mining claims, Yuma County, Arizona

Dear Mr. Coil:

The principals owning the above claims have conferred with me and I have reviewed with them our conference of November 22, 1966. They are willing, and I am authorized to submit to you the following as terms for an agreement of option to purchase the claims.

They are willing to allow Miami Copper 90 days from the date of the execution of the option agreement to drill one hole, as you proposed, to a maximum depth of 1,500 feet on one of their claims. The logs and information from the drilling of this hole is to be made available to my clients as the information is acquired by you and they desire to have one of them or a representative of them on the property at the time of the drilling with that representative having full access to information from the hole as it progresses. After 90 days has expired, we desire that payments be made at the rate of $1,000.00 per month for the next 9 months, during which time you will be authorized to drill other holes or conduct other exploration. Thereafter and for a period of one year we will accept the sum of $2,000.00 per month and during the third year, $5,000.00 per month. Miami Copper shall have the right at any time to terminate the option agreement and cease making the monthly payments, however, in the event that the proposed one hole is not

Miami Copper Company
Division Tennessee Corporation
Miami, Arizona

B. R. Coil
Vice President and General Manager

P.O. Box 100
Zip Code 85539

December 13, 1966

Mr. Earl Alcott,
1213 West Indianola,
Phoenix, Arizona.

Dear Earl:

I inclose the map of your Planet claims which you so kindly loaned me. I will keep the copy for my files as you suggested.

Thank you,

Very truly yours,

W. W. Simmons
Chief Geologist

WWS:mes

YANKEE & BERNSTEIN
ATTORNEYS AT LAW
1327 GUARANTY BANK BUILDING
PHOENIX, ARIZONA 85012

A. MICHAEL BERNSTEIN
JAMES A. YANKEE

264-4891

December 19, 1966

Messrs. G. L. Gibbons
Jack Buzard
Earl Alcott

Gentlemen:

Find enclosed a copy of the letter which I received from Miami Copper Co. I assume that the intent in that letter is to allow 180 days without payment of any sort and thereafter to have payments made to us at the rate of $1,000. per month for the next 6 months, and for the second year at $2,000. per month, and for the third year at $5,000. per month. Please call and let me know what you think we should do in this regard.

Merry Christmas and a Happy New Year!

Yours very truly,

A. Michael Bernstein

AMB:jk

COPY

PLANET COPPER MINE.

GENERAL DESCRIPTION OF THE MINE.

Location and means of access.—From the viewpoint of natural surroundings most conducive to mining operations the deposits worked by the Planet Copper Company are situated in one of the most favorable parts of central western Arizona. Williams River, less than a quarter of a mile from the company's office, affords a plentiful supply of water, and the large trees growing upon the banks of this stream will furnish the necessary mine timber for some time to come. The Swansea smelter at Swansea is only 9 or 10 miles distant in an air line and may afford fairly convenient smelting facilities. The wagon haul between the two places over the present roads is, however, of the most difficult nature.

Planet is situated on the north bank of Williams River, 21½ miles north of Bouse, the distance by wagon road being considerably greater (28 miles). At present the transportation facilities between the two places are of the crudest kind, a stage making the trip to Planet three times a week, coming one day and returning to Bouse the next. It is hoped that the Arizona and Swansea Railroad will make the problem of transportation a simpler and cheaper one than it has been in the past.

History.—The workings at Planet have been referred to by various authors who have written on the mineral wealth of Arizona, and these deposits seem to have been among the best known in the early days of mining in this territory. According to Patrick Hamilton[a] the Planet mine was discovered in 1863, and by the year 1881 had shipped over 6,000 tons[b] of high-grade copper ore to San Francisco. This ore was hauled to Aubrey on Colorado River and was then shipped down that stream to its mouth, most of the ore being sent from there to San Francisco, Cal., although some of it was transported to Swansea, Wales.

One of the oldest smelters in Arizona is located at Planet, having been erected in 1884. Previous to this an adobe furnace had been used to some extent in smelting the ores. The slag dumps from both furnaces are reported to contain upward of 5 per cent copper.

Claims.—Thirty-one lode claims, 3 placers, and 2 mill sites constitute the land holdings of the Planet Company. Survey for patent was being carried on in April, 1909.

Development.—The principal development work on the Planet properties consists of an inclined shaft, No. 1, the first 40 feet of which pitches 45° and the remainder about 15°. This shaft has an

[a] The resources of Arizona, 1881, p. 249.

[b] According to R. C. Hodge the shipments to San Francisco up to 1877 amounted to 8,000 tons of copper ore. See Arizona as it is, p. 69.

Mineral Resources of the Llano-Burnet Region, Texas, with an Account of the Pre-Cambrian Geology

U.S. Government Printing Office, 1911

elevation of 750 feet at the collar, and is 700 feet long, with short drifts north and south of it, one drift 465 feet long southwest, and crosscuts and stopes, making up a total of about 2,500 feet. Shaft No. 2, started at an elevation of 950 feet, is a double compartment vertical shaft 9 feet by 4½ feet in the clear, and has been sunk to a depth of 350 feet from the top of the ridge into which the inclined shaft penetrates, connection affording good ventilation being made with the inclined shaft workings by an upraise from one of the south drifts (No. 7) near the end of the incline.

Numerous other shafts and inclines have been sunk, drifts and crosscuts run, and a great many open cuts made.[a] These are a valuable aid to the study of the geology of the region, but they do not show very much of the ore bodies which they have been started to develop.

Equipment.—The machinery consists of two gasoline hoists (one 22 horsepower and the other 12 horsepower), a diamond drilling plant, and a 5-drill air compressor and engine. The 36-inch blast furnace, which was erected in 1884, has not been operated for some time nor has it been dismantled, and it appears to be in fairly good condition. A photograph of this smelter is shown on Plate II, *A*.

TOPOGRAPHY.

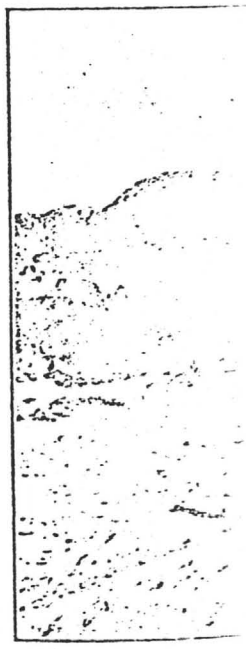
Viewed southward from a point a short distance north of Williams River, the hills in the vicinity of the Planet workings are seen to form a series of three long, narrow ridges all pointing northwestward and separated from each other by steep-sided canyons draining in the same direction. The ridges increase in height from the most northeasterly, which is low and rises only 100 feet or so above the river, to the last ridge on the southwest, which culminates in Jones Peak, the top of which has an elevation of 1,200 feet, or 600 feet above Williams River. The steep sides of these ridges afford admirable exposures of the geological relationships existing in the locality, and are also valuable as an aid in the exploration of the ore bodies, although in the erosion of the area large parts of the deposits have no doubt been destroyed.

GEOLOGY.

Rocks.—The rocks in the vicinity of Planet are considered to be pre-Cambrian. The lowest formation is granite gneiss, which is overlain by thin bands of limestone intercalated with amphibolite, on top of which rest massive limestone and a series of arenaceous shales, metamorphosed into fine-grained quartz-mica schists. The general lithologic similarity in the sections near Signal and Planet is a feature worthy of remark. A geologic and topographic map and a cross section in the Planet locality are given in figures 5 and 6.

[a] In the prospectus issued by the company 6,000 feet of underground development work are claimed.

U. S. GEOLOGICAL SURVEY



B. MOUNTAIN OF

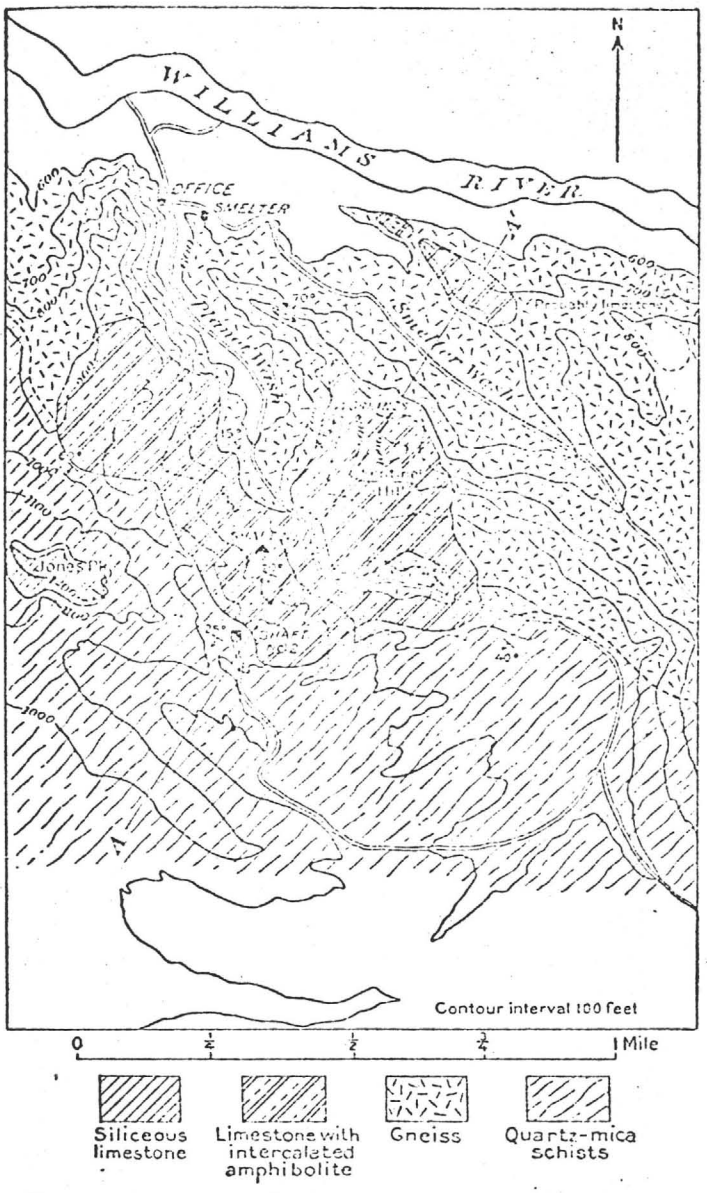


FIGURE 5.—Topographic and geologic sketch map of the vicinity of Planet.

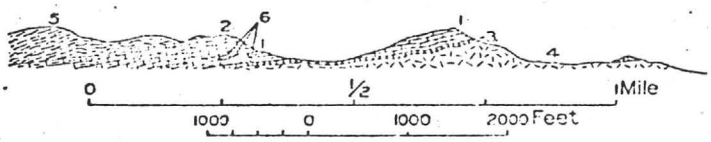


FIGURE 6.—Cross section of the hills in the vicinity of Planet along the section line A-A' of figure 5: 1, Limestone; 2, limestone with intercalated amphibolite; 3, conglomerate; 4, gneiss; 5, quartz-mica schists; 6, known ore bodies in this section, extent undetermined.

Gneiss.—Reference to the same figures will show the distribution of gneiss in the immediate vicinity of the Planet deposits, where it extends south from the river for a distance of several miles and is the basal rock throughout this section; in places it forms prominent mountains, as may be seen by reference to Plate II, *B*. Here the foliated structure is very pronounced in places and the general dip of the lamination planes is between 15° and 30° SE. The rocks are locally both fine grained and extremely coarse grained, the gradations from one type to the other being imperceptible. Chloritization seems to have been extensive in some of the gneisses and epidote is present in large amounts. Quartz and feldspar crystals form the main part of the rock, and the color of the gneiss seems to be due in large part to the kind and amount of the latter mineral present. Some coarse-grained pink gneisses are very prominent in this locality, although the whitish fine-grained rock is the more prevalent. Some faulting has taken place in these rocks, but not nearly as much as would be supposed from a cursory examination of the relation of the overlying sediments to the older gneisses. Before the limestone and the arenaceous shales were deposited on top of the gneiss erosion had trenched the crystalline rock, and contact between the two formations is therefore decidedly irregular and when viewed in a section along the strike of the sediments shows apparent but deceptive evidence of faulting. In general these are simply unconformable contacts, although at one place on the Ella Belle claim there may be some displacement in the series. When the land was submerged, the sediments deposited filled up these depressions in the surface of the gneiss, and subsequent stream erosion has exposed many of the irregularities of the old surface, so that now it is possible to see in places the irregular contact between the two formations. Erosion has been so active, however, that much of the sedimentary series is entirely removed, and with it the evidence of its former continuity and presence in the old dissected lines of drainage.

Aplite and diabase dikes are universally present in the gneiss series.

Limestone with intercalated amphibolite and fine-grained quartz-mica schist.—A series of metamorphosed sediments with intercalated amphibolite rests unconformably on top of the eroded surface of the older granite gneiss. The whole sedimentary complex strikes northwest, dips 15° to 60° SW., and occupies in this vicinity all of the area southwest of the Planet workings, where the total thickness of the series is approximately 900 feet. The lower 200 feet of this complex is composed of thin bands of limestone with intercalated amphibolite resting upon a limestone conglomerate 20 or 30 feet thick, which is locally silicified and composed mainly of bowlders of limestone, quartz, and gneiss. Resting unconformably on top of this series is about 100 feet of a more massive limestone which seems to be free

from amphibolite and in which no ore values were noted. Above the massive limestone is a series of fine-grained quartz-mica schists about 600 feet thick, which dips 60° SW. near the base of Jones Peak, but gradually flattens near the top of this peak and southeast along the strike, so that the dip is approximately 20° to 25° SW. in the vicinity above the workings. These schists are likewise slightly unconformable upon the underlying rock, which in the center of the area near the workings is the massive limestone; to the northwest and the southeast the basal gneiss lies directly below the schists.

The limestones are brownish in color, are of fine texture, and the massive variety contains 44.63 per cent lime (CaO) and 2.11 per cent magnesia (MgO). The schists are all fine grained, vary in color from silvery white to gray, red, brown, and green, and are composed chiefly of quartz and white mica, much of the latter presumably having been developed by the alteration of the feldspars. Much chlorite is present in some of the schists, giving them a decidedly greenish tone; some of them might possibly be classed as chlorite schists. Iron oxide has stained other schists in various ways, so that the series presents a variegated appearance. The amphibolite has varying green colors and is usually rather soft, being composed largely of some amphibole mineral associated with a little quartz and much chlorite and talc. Small quartz veins are present in all of the rocks, and an iron cap of hematite is found in many places associated with the limestones. These show only partial replacement by iron and frequently almost entire replacement by silica.

Other geologic features.—Quartzite is found west of Planet Wash, three-fourths of a mile southeast of the inclined shaft No. 1, at an elevation of 700 feet, where it dips southwest at an angle of 40°. Gold is reported as having been found in this formation in values as high as $5 per ton, this presumably occurring along the joints of the quartzite, where occasional copper stains are visible. The rocks in this area dip approximately 40° S. 40° W., and the sequence is as follows: Amphibolitic schists rest on top of the gneiss. These are covered by massive limestone free from amphibolite, over which is found siliceous limestone. Upon this is a conglomerate of quartzite and siliceous schist fragments, over which occurs the quartzite. The section varies considerably along the strike, and parts of it are lacking in places, probably due to deposition upon old erosional surfaces, and, locally, under shallow water conditions.

ORE DEPOSITS.

General statement.—The main developed ore bodies occur just above the contact of the underlying gneiss with limestone, the latter being replaced by hematite, which carries uncertain amounts of copper. In thickness the deposits vary from a few inches to several

feet, depending upon the amount of replacement which has taken place in the limestone.

Vertical shaft (on Bill Williams claim).—According to the log of the new vertical shaft on the Bill Williams claim three distinct ore bodies were cut in sinking 350 feet through the metamorphosed sediments, which dip 20° to 25° SW., all of them being above the contact with the crystalline gneiss. As the shaft was timbered, an examination of these ore bodies was impossible, and so the information on distances, vertical extent of ore bodies, and assays has been taken from the prospectus issued by the company.

The first body of ore was encountered 170 feet below the collar of the shaft, where about 5 feet of "iron lime" is recorded. This is probably partly replaced limestone. Below this the company took a sample from the interval between 175 feet and 180 feet, which they record as containing 5.56 per cent copper and 48 per cent iron. From the distance 180 feet below the collar to 185 feet the ore body is reported as containing 3.4 per cent copper. Specimens found on the dump from this shaft showed that this first ore body is composed almost entirely of highly replaced limestone, containing hematite in large quantities and a little chrysocolla associated with limonite deposited in the fractures of the ore. Malachite is present in small quantities.

The second ore body cut in the vertical shaft was penetrated at a depth of 230 feet below the collar. At this place the management report 7 feet of ore, averaging 4.77 per cent copper and $1 in gold per ton, and from 237 feet to 254 feet the assay is given as 8 to 9 per cent copper and gold ranging from a minimum of 40 cents to a maximum of $3.30 per ton. A sample of this ore from the dump shows almost massive hematite partly altered to limonite, with copper stains on slickensided surfaces; the remnant of the replaced rock is highly siliceous, and a little quartz is present in the ore.

At a depth of 290 feet the log of the shaft shows a massive body of iron ore, which is 20 feet thick and which caps a 15-foot body of ore running from 5 to 8 per cent copper. This last body has the same relation to the underlying gneiss as have the rest of the developed ore deposits of the Planet group. Specimens of this ore show massive hematite with a scattering of malachite, and also a very siliceous breccia cemented by the various oxides of iron, with a small amount of copper carbonate.

Although these ore bodies were cut in sinking the shaft, no development has been done on them, and therefore the principal consideration will be devoted to parts of the Planet group which have been more or less thoroughly prospected.

Two analyses of the clear slag from the old dump are reported as follows:

Analyses of slag from inclined shaft No. 1, Planet copper mine, Yuma County, Ariz.

	1.	2.
Silica	34.5	38.0
Iron oxide (FeO)	48.8	45.2
Copper	5.2	5.7
Alumina	10.0	10.6
Lime (CaO)	1.2	1.5
Magnesia	None.	None.

A level started at the base of the steep 40-foot incline and driven almost due south for a distance of 160 feet is, beyond the 120-foot station, where a short incline is sunk, entirely in hematite. Apparently this ore body is a short distance above the basal gneiss and represents a complete replacement of the limestone strata which lie on the gently southward dipping surface of the gneiss. Some 60 feet west this level is prolonged from the west branch and extends for a distance of 480 feet southwest, the whole of the drift being in hematite, analyses of which have been made by the Colorado Fuel and Iron Company and the results published in a report to the Planet Company by H. A. Keller. Two of their analyses are as follows:

Analyses of hematite from inclined shaft No. 1, Planet copper mine, Yuma County, Ariz.

[H. A. Keller, analyst.]

	1.	2.
Iron (Fe)	65.48	60.42
Iron (Fe_2O_3)	93.54	86.31
Silica (SiO_2)	7.00	12.87
Phosphorus	.031	.018
	100.571	99.198

Other workings.—More or less development exists on numerous other claims, all of which show the deposits to be of a very similar nature, being replacements in limestone by iron and copper minerals. The latter, however, are more siliceous in the workings on Sentinel Hill and farther east than those found in the ore body opened by shaft No. 1, chrysocolla forming the principal copper ore in the Blue Bird, the Palmetto, and the Sentinel Hill deposits. Specularite is present in large amounts, with malachite and the black oxide of manganese forming an important part of some of the surface exposures. A mineral was noted in a specimen from the dump of the Palmetto prospect which very closely resembles the description of morencite, a mineral discovered by Lindgren in the Clifton-Morenci district.[a]

Origin of the ores.—The chief ores in these deposits consist of aggregates of foils of specularite (part of which is probably primary), a little limonite, some malachite, and an occasional speck of pyrite.

[a] Lindgren, Waldemar, Prof. Paper U. S. Geol. Survey No. 43, 1905, pp. 115-116, 178.

Inclined shaft No. 1 (on Planet claim).—The inclined shaft started on the Planet and run through the Mark Hanna and the Bill Williams claims represents the most continuous development done on any of the Planet deposits. As already stated, this shaft has, with the various laterals, 2,500 feet of underground workings. For the first 40 feet the incline pitches 45°, and then the dip changes rather abruptly to 15° SW., which is the grade for the rest of the 700 feet to the end of the shaft. Throughout the present incline the main values occur in a limestone conglomerate, locally silicified and containing bowlders of limestone, quartz, and gneiss, and resting on top of the old eroded gneiss, the surface of which apparently dips about 15° S. or SW. The sediments rest on top of this gneiss and dip 20° to 25° SW., and the incline follows the general line of contact between the two formations. Hematite is prominent and seems to contain considerable copper, the latter being present both as carbonate and sulphate. Occasional crystals of pyrite ranging in size from $\frac{1}{32}$-inch up to $\frac{1}{2}$-inch cubes, and the omnipresence of the sulphate of copper form very noticeable features of the deposit. The ore body ranges in thickness from a few inches up to 6 or 7 feet, as shown by the various upraises and winzes cut from the short laterals of the incline, and extends for a known distance of 700 feet southwest of the shaft collar and presumably continues along the contact to a greater distance. Ore from the dump of this incline shows principally hematite, with considerable malachite, some azurite and chrysocolla, and the black oxide of manganese being prominent on some specimens.

Mr. H. A. Keller sampled these workings in 1907, and the results have been published by the Planet Company. These show that the average copper content of the ore body varies from 2 to 6 per cent with occasional values of 11 per cent.

Two general samples from the ore dump of the inclined shaft, according to Mr. Keller, gave the following analyses:

Analyses of ore from inclined shaft No. 1, Planet copper mine, Yuma County, Ariz.

	1.	2.	Average.
Copper (Cu)	6.29	5.30	5.8
Silica (SiO_2)	39.91	38.81	39.36
Iron (Fe)	32.00	30.62	31.31
Alumina (Al_2O_3)	.....	.....	1.83
Lime (CaO)	.56	.20	.38
Sulphur (S)	4.07	3.85	3.96
			82.64

Mr. Keller gives the average width of the ore body as 4 feet 3 inches and its average copper content as 5.90 per cent. The accuracy of this statement seems well supported by an examination of the property.

With the exception of the minute quantity of pyrite and the still smaller quantity of bornite and chalcopyrite seen in a few of the specimens, the deposits are formed of oxidized material, a large part of which has presumably resulted from the alteration of pyrite and chalcopyrite. This theory is upheld by the omnipresence of crystals of soluble sulphates found scattered throughout the ore body and probably resulting from the action of the sulphuric acid (liberated from pyrite in its decomposition) upon limestone, which is itself in places almost completely replaced by ore minerals. There is a total lack of contact metamorphic silicate minerals, as well as an absence of any intrusive (other than the rock which now forms amphibolite) of later date than the limestones, and it seems highly improbable that these deposits are of contact metamorphic origin.

The deposits seem to follow the bedding planes of the limestone and the general line of contact between this formation and the underlying gneiss. It is possible that during the long-continued alteration which these ancient rocks have undergone the iron and copper values, which occur in normal diabases and associated basic rocks, were concentrated or at least taken into solution and subsequently replaced the limestone with which the amphibolite is so intimately associated in this as well as in similar deposits within the area. The occurrence of fairly large bodies of hematite, almost invariably associated with the silicates and carbonates of copper in rocks which are essentially limestones with intercalated amphibolite, and the total absence of any intrusives (other than the rock which now forms amphibolite) of later date than the limestones, are all indicative of a local origin for the ores.[a] Although the extent of the ore deposits varies considerably in geologic sections of this sort, similar relations were observed in the following places: Planet, Swansea, Carnation, Battleship Mountain, Limestone Mountain, and Pride prospect.

MINERAL HILL DEPOSITS.

GENERAL DESCRIPTION.

These deposits are situated on the slope just west of Mineral Wash, 2½ miles from Planet and over a mile up the wash from Williams River. The group of claims comprising the Mineral Hill deposits which are to be discussed have been prospected in a general way, although there is no permanent camp located at the place, and no active development was going on at the time of the writer's visit. The upper workings are admirably situated for tunneling, and shafting would not be a necessary feature of the operations above the wash level. Water has to be hauled from Williams River, timber is practically absent in the immediate vicinity, and fuel would have to be hauled for large operations.

[a] For a discussion of the genesis of these ores see page 41.

The Continental prospects, which are in this vicinity, were not examined for lack of time.

Means of access.—The Mineral Hill deposits are almost as difficult of approach as the Planet. Bouse and Parker are nearly equidistant from Mineral Hill in an air line, the former being 21½ miles due south and the latter 17½ miles southwest. By wagon road, however, the distance to both places is increased at least 4 or 5 miles. The completion of the Arizona and Swansea Railroad makes it possible to shorten the wagon haul considerably, and, in the future, should the property become productive, no doubt a route to this railroad will be chosen for transportation.

TOPOGRAPHY.

Near the deposits Mineral Wash has an elevation of a little over 500 feet. On the west of the wash, hills rise somewhat steeply to an

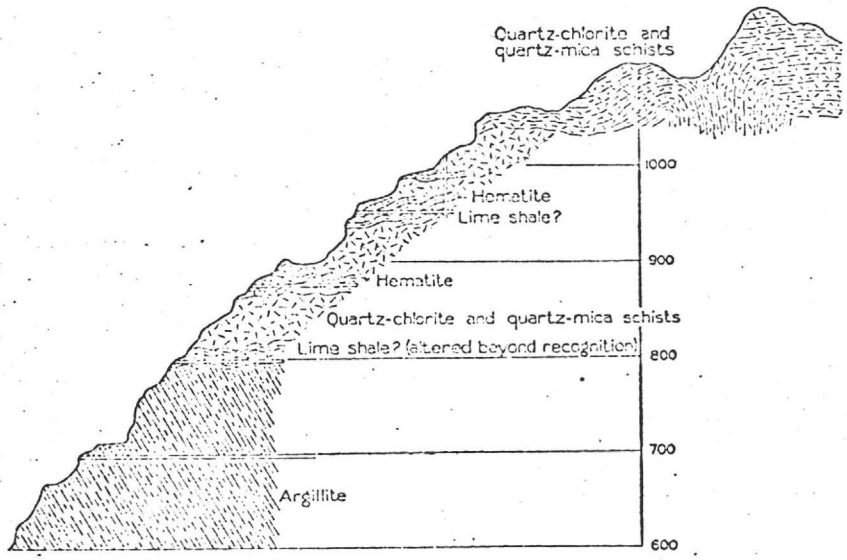


FIGURE 7.—Ideal section of Mineral Hill.

elevation of 1,100 feet, and in one of these hills the deposits occur. The topography in the vicinity is characterized by steep-sided but shallow canyons and isolated hills. A short distance farther west at an elevation of 1,500 feet a basalt-covered plateau extends toward Colorado River.

GEOLOGY.

The rocks at Mineral Hill (see fig. 7) are a basal series of argillite having a thickness of several hundred feet, upon whose eroded surface rests a series, 300 feet thick, of arenaceous shales, metamorphosed into fine-grained, quartz-mica schists of various colors, interlaminated with a small amount of very impure limestone. Intimately associated with these schists is a metamorphic rock which resembles a quartz chlorite

just above an eroded surface of the schists, and the roof is composed of material which in the field greatly resembles a very much altered and silicified locally brecciated limestone.

A third adit is located at an elevation of 875 feet, and the 100 feet of tunneling exposes a small deposit of hematite in a conglomerate of exceedingly impure lime shale and quartz chlorite schist fragments. So much alteration has taken place that the fragments referred to as lime shale may represent other rocks, the original character of which it is impossible to determine. The ore body here is intimately associated with the conglomerate, and hence of an impure nature. About 25 feet above this level there is another thin band of hematite which occurs between walls of quartz chlorite schist.

At an elevation of 950 feet is found the most promising of the deposits on the north slope of the hill. Here the drift is run about 100 feet, having specularite for a roof and a much-altered, iron-stained rock resembling shale for a floor. An upraise of 40 feet to the surface cuts, above the hematite, quartz chlorite schist which contains a thin layer of lime shale about 25 feet above the level. The specularite and the much-altered shaly rock both contain chrysocolla and malachite in fairly large proportions; in both instances, however, the copper minerals fill fractures which have cut across the iron ore and the altered rock.

A short distance above the highest workings described the schists are greatly contorted, twisted, and buckled. In many places within the area small folds were seen, but not in any other locality were similar results noted on such a large scale. Quartz veins are developed on a small scale throughout the whole series. These are in part lenticular, lying in the planes of lamination, although they generally cut the formation.

Ore bodies exposed by workings on the Mohave Chief and the Norma claims.—A short distance south and west of the openings on the north slope of the hill occurs the deposit opened on the Mohave Chief claim. One of the workings here is a small open cut, the top of which is at an elevation of 950 feet. The work at this point has been done just over the contact of the lime shale with the quartz chlorite schist, and no regularity exists in the deposit. The mineralization occurs in scattered patches. Chrysocolla intimately mixed with brochantite is associated with a jaspery gangue. Just west of the open cut and 25 feet lower there are several small workings which have been started in lime shale or limestone, which is more massive than the greater part of that seen in the vicinity and which is intimately associated with the green quartz chlorite schist rock.

On the Norma claim an adit started in lime shale at an elevation of 800 feet shows a little mineralization in fissures which cut across the country rock in the general direction of N. 20° W. These fissures are

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CLARA CONSOLI

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of Swansea. At the t
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have been completed
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schist, the field relations suggesting intrusion of the rock into the series. Microscopic examination of thin sections shows, however, that the chloritic rock is of unquestionable clastic origin, so that its intrusive appearance is manifestly deceptive. A satisfactory explanation of the relations existing here is difficult. This metamorphic rock occupies about four-fifths of that portion of Mineral Hill which is above the elevation of 700 feet.

It is possible that during the period of regional metamorphism when the schists were folded and faulted, the pressure upon them was so great that they assumed locally, before recrystallization, the relation to the quartz chlorite schist which makes the latter rock appear as an intrusion into them. It seems scarcely possible for the quartz chlorite rock to have become so plastic that it could have been squeezed into fractures formed in the quartz-mica schists.

The strata which form Mineral Hill are undoubtedly continuous with those resting on the gneiss in the vicinity of Planet, and both series were probably lifted and deformed at the same time. Figure 7 represents an ideal section of the geology of this vicinity.

In general the dip varies from 30° to 50° SW., although above the elevation of 800 feet where the quartz chlorite and quartz-mica schists overlie the eroded argillites the dip is comparatively flat and remains so up to an elevation of 1,050 feet, where the most extreme twisting and contorting of the schists is seen and where the dip changes every few feet.

ORE DEPOSITS.

Workings.—Although only a small amount of development has been done on the ore bodies in this hill, and this of a very scattered nature, there exist nevertheless enough workings to exhibit in a general way the relationship between the geology and the ore deposits in the vicinity.

On the north slope of Mineral Hill there are four short adits, 200 feet or less in length, separated from one another by vertical distances of 100 feet or more. From the upper adit a 40-foot upraise to the surface has been driven. The Mohave Chief and the Norma workings on the southeast slope of the hill were examined in a cursory way, the time being very limited and the developments meager.

Ore bodies exposed by workings on the north slope of Mineral Hill.—An adit started at the elevation of 700 feet and driven 200 feet S. 45° W. passes through surface conglomerate for a short distance; the remainder of the adit cuts fine-grained schists, which dip rather steeply southwest. At right angles to the dip of the schists occur several minor slips which are mineralized to a small extent by chrysocolla.

The second adit in this series is driven 100 feet higher up on the hillside and is 100 feet long. The floor of this working seems to be

only a few inches wide and not many of them are present in that portion of the rock exposed by the adit.

Paragenesis of the ores.—As at the Planet mine the sulphides have been almost wholly oxidized, and it is difficult to say what the original condition may have been. Here too, probably, some of the specularite is primary, and it is believed that it was associated with pyrite and chalcopyrite. At Mineral Hill the oxidized copper ores appear to be later than the specularite and were in large part deposited in fractures in this iron ore; at the Planet they occur distributed throughout the specularite.

CLARA CONSOLIDATED MINING COMPANY'S PROPERTIES.

PROPERTIES AND LOCATION.

The properties examined belonging to the Clara Consolidated Mining Company are the Signal, the Moro, and the Clara. The last two represent deposits of nature different from that of the Signal, and they are located some little distance to the southeast in a different geologic formation.

Swansea, the name of the locality in which the Signal deposits occur, is the center of the mining and smelting activity of the Clara Consolidated Mining Company. Here the company has recently erected a 700-ton smelter; it has also built railroad connections with its near-by properties and with the town of Bouse, situated on the Arizona and California Railroad about 23 miles a little west of south of Swansea. At the time of the writer's first visit to the properties a few bunk houses, offices, and a store constituted the town. No doubt at the time of writing (March, 1910) Swansea is a more substantial place, for the railroad from Bouse and the smelter have been completed since the prospects were examined in April, 1909. Water is pumped to the property from Williams River, 4 or 5 miles distant, through a 6-inch and a 3-inch main, and timber is shipped in from the outside.

TOPOGRAPHY.

The road from Bouse to Swansea ascends the gentle slopes of the foothills of Williams Mountains, which are so thoroughly covered by débris that only low, gently sloping ridges project above the detrital masses. About 3 miles south of Swansea the country breaks off toward Williams River and the descent of 500 feet to the Signal property is through a rough country, where the rocks are well exposed. In the immediate vicinity south of the Signal deposit a hill of gneiss capped by limestone rises to an elevation of 1,800 feet. Several similarly formed hills are a noticeable feature about 1 mile west, where they attain an elevation of 200 to 400 feet above the surrounding desert, which slopes gradually in the direction of Williams River.

MOUNTAINS
COPPER BASIN
Monument Peak
VIATI MINING CO
RIVER
WILLIAMS
MINERAL HILL
PLANET 600
Tunnel Peak
CARNATION CAMP
BILLY MACKS
QUARTZ KING
W AND O PROSPECT
PRIDE 1275
Planet Peak
Squaw Peak
ODDEN PROSPECT
Swansea
SIGNAL
Clara Peak
CLARA
MORO
probably tuff and other volcanic material
RIVER
COLORADO
Parker
Black Peak
Delmy
Battleship Pk 7499
CHICAGO
Corona
MAMMOTH
SANTA FE
PRESCOTT
AND
ARIZONA
Bouse Wash
Linskey
LITTLE BUTTE
Bouse 963.20
Cunningham
Wash
Foropaw
IRON MINE
CORRALES

ARIZONA TESTING LABORATORIES

A DIVISION OF CLAUDE E. McLEAN & SON LABORATORIES, INC.
PHONE 254-6181 817 WEST MADISON ST. P. O. BOX 1888 PHOENIX 85001

For Mr. E. R. Alcott
1213 West Indianola
Phoenix, Arizona

Date January 3, 1966

Sample of Ore

Received: ----

Submitted by: Same

ASSAY CERTIFICATE

Gold figured at $ 35.00 per ounce

Silver figured at $ 1.29 per ounce

LAB. NO.	IDENTIFICATION	GOLD		SILVER		PERCENTAGES	
		OZ. PER TON	VALUE	OZ. PER TON	VALUE	COPPER	
156331	#3 Planet Mine					5.85 %	

Respectfully submitted,

ARIZONA TESTING LABORATORIES

Claude E. McLean, Jr.

6 FORD

Three diamond drill holes were put down to the west and [illegible] of the Ashley and Bill Williams workings.

These holes were from 400 to 900 ft distant from the other workings. The logs of these holes are incomplete, but some data can be gleaned from the following logs:

Hole No. 1: Total depth 700 ft - 215 - 255' diorite. Only encountered copper in one sampling which ran 0.4% copper. Went through a body of iron ore 30' thick (depth not given). Hole stopped at 700' and found nothing but iron.

Hole No. 2: Total depth 441 ft - abandoned account of [illegible].

Hole No. 3: Total depth 207 ft - No data - hole caved.

Hole No. 4: Total depth 340 ft. Ended in gneiss. No copper found - hole in 30' of specular hematite. No depth given - probably from bottom.

Hole No. 5: Total depth 700 ft.

[illegible]-340' - gneiss (probably diorite)
[illegible]-415' - sandstone
[illegible]-433' - 1.2 - 1.0% copper carbonates in schist.
[illegible]-[illegible]' - traces to 0.4% copper, schist & sandstone.
[illegible]-[illegible]' - traces to 1.0% copper & quartzite.
[illegible]-[illegible]' - traces to 0.33% copper.
Bottom of hole in diorite from and traces of copper.
No mention made of iron ore in hole.

Hole No. 6: Total depth 313' - drilled through schist all the way. (No mention is made of iron ore altho the statement is made in the log of Hole No. 12 that iron ore cut in this hole was not contrasted with the iron ore cut in Hole No. 10.

Hole No. 12: Total depth 503 ft.
[illegible]-[illegible]' - schist
[illegible]-[illegible]' - iron ore
[illegible]-[illegible]' - gneiss; carried a little copper in specs
[illegible]-[illegible]' - schist; 10' iron ore & bottom in clear gneiss. Highest assay found was 1.10% copper. Pyrite noted in nearly all samples.

Hole No. 12: Total depth 400 ft.
0-[illegible]' - soil
[illegible]-[illegible]' - Iron ores to 1.1% copper. Iron ore was [illegible] at 350' near the bottom and a little diorite showed in the sludge. A bed of hematite 10-20' thick was cut at 340'. This lined up with the bed of iron ore cut in Hole No. 11 but not with that cut by Hole No. 14.

At Argus mine about 2500' west of Planet workings iron has been cut in sufficient quantity for 500' or more and an incline & x-cut [illegible] from 20-30' of high grade specular hematite. A NW & SE fault [illegible] down from one lies about 500' to the NE. A NW & SE fault [illegible] Sentinel Hill cuts the one from Sentinel Hill about 300' to the NE. Several small faults of the same nature occur between this point & the Copper Hill shaft.

The General Development Co. sank the No. 2 vertical shaft from [illegible]' and drove a x-cut 500' to the west all in [illegible]. In that point they put up an 87' raise to the Limestone [illegible]. They did not mine any copper ore and did not state whether they cut any iron ore but which should have been encountered in that raise.

The future of this area lies in the production of iron ores.

Indicated & inferred reserve tonnage Argus, Hecla Hanna, Planet workings, Ashley, Allentia, Sentinel Hill, Shelter Gulch, Ohio Bank, Chester, Chemung & Copper Hills totals 13,375,000 tons calculated [illegible] to cubic ft vol

Judging from the comparatively few samples taken, this ore will average 57% iron or better. The phosphorous & sulpher content is unusually low and the ore is excellent for steel making, provided that the copper content would not be injurious.

While some of the iron ore samples contain approx. [illegible] copper, it is believed that the average copper contents will

be much lower since all development work was done along the walls of the iron ore beds in search for copper ore and nearly all samples were cut near these walls where there was selective deposition of copper.

There is little question that a geological survey of this district would indicate that a greatly extended area is underlain by the iron ore beds. The same type of specular hematite is found in the swamps area, 3 miles distant.

The hematite when exposed to the air became quite hard but is soft and friable where covered. A good part of it would have to be hand-picked or briquetted for blast furnace feed.

Several million tons of the present ore showing can be mined by steam shovel or drag line with little or no stripping. This would be worth at least 75¢ per ton (1943)

Samples: The following samples were taken from the property:

No.	Location		% Cu	% Fe
100	In face of old Otape 100' of bottom of Ameline 70' level	6'	0.21	62.2
101	15' west of 2100 face of drift	4'	4.35	50.0
102	70' Level, 75' NE of bottom of Ameline on junction of drifts	5'	2.83	40.3
103	70' Level N4702 55' in 100' N cut East			58.6

101 This sample was taken across the vein in the 100' N-cut east of the iron drift on 70' level. Sample from footwall to hanging wall 21' thick. 03/ of sample was sent to S.L.C. lab.

Sample	Cu	Au	Ag	Pb	Zn	CaO	Fe	MgO	Insol.
101	10.4	0.1	0.01	1.2	0.05	0.20	NAT	0.034	NAT	1.0

3 Samples # 127 - 129 and averages

Sample	Zn	Pb
[illegible]	[illegible]	[illegible]

[illegible] Samples Area including Co sampled # 1 - 4 incl averaged

[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	.[illegible]	[illegible]

[illegible] Fuel [illegible] Co published in Geological Survey Bulletin 451

No.	Fe%	SiO2	Zn
1	55.[illegible]	7.0	.081
2	56.[illegible]	10.07	.019

It is believed that most of the iron ore contains little or no copper but since the underground development work was done [illegible] it was necessary to take samples where the copper content was unusually high. Hence, some of these samples [illegible] higher copper content than would be found in the [illegible] of the ore body.

([illegible] Summary Mr. Stewart)

Probable Total

[illegible]	[illegible]	Remarks
1	7[illegible]	Went thru 30' of iron ore, depth not [illegible]. The hole found nothing but iron.
4	5[illegible]	Intersected 30' of specular hematite. Depth not stated.
12	500	From 385-395' iron ore. An additional 10' of iron ore just above bottom of hole.
14	[illegible]	Definitely at 310' thickness of between [illegible] & 20' of hematite was cut. Some hematite intersected at about 300'.

The future of the mine lies in the mining & marketing of the iron deposits. Up to the present time there has been no [illegible] for this ore on the west coast. The mine is too far from [illegible] plants of Colo & Utah for shipment to that market. Should [illegible] an economic value now shipping to Fontana.

The indicated iron content is 60% or better and the ore

low in phosphorus, sulphur and most other elements that would be detrimental in the making of steel but some of it, at least, has an unusually high copper content.

The ore body has a dip of about 15° and is from 20-30' thick. Being easy and with a caveating system of mining the ore could be extracted cheaply and with little loss. Underground mining costs should not exceed $1.00 per ton (1943)

A complete survey of all surface & underground workings by a competent surveyor of the area being made by Bureau of Mines. (Now finished by an, thus by Michael D. Wilson).

Possible economic ways for further exploration:

1. Detail sampling of an extensive area to determine size & tonnage of probably, ore deposits.

2. Diamond drilling a selected area by the Bureau of Mines (which engineer who is determine amount needed to prepare the for block furnace size.

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Maps & reports by G. M. Gallowaysnessee, Mining Engr. Phx.

Maps & related data furnished by New Planet Mining Co.

U. S. Geological Survey Bulletin #451 (Reconnaissance of the ore deposits in northern Yuma Co by Howland Bancroft)

H. A. Kellam, sampled in 1937 - results have been published by the Planet Co.

R. 17 W. | R. 16 W.

T. 11 N. T. 10 N.

SECTION 36
SECTION 1

BILL WILLIAMS DISTRICT
SECTION 30
SECTION 6
HARQUVAR DISTRICT

EXPLANATION

- Qal — ALLUVIUM, TALUS
- Fe — SPECULAR HEMATITE, 25 TO +50% Fe
- COPPER OXIDE OCCURRENCE / OCCURRENCE IN PROSPECT PIT
- BRECCIATED QUARTZITE
- SILICEOUS BRECCIA
- Pzls — PALEOZOIC LIMESTONE, HIGHLY ALTERED AND MARBELIZED
- PCh — HORNFELS AND HORNFELSIC SCHIST
- PCq — QUARTZITE SCHIST AND BRECCIA
- PCms — MICA SCHIST
- PCv — VOLCANICS, RHYOLITIC AND ANDESITIC BRECCIAS
- PCgn — GNEISS

NOTE: UNITS ARE PROBABLY PRECAMBRIAN BUT MAY BE MESOZOIC

- FAULT ZONE
- DIAMOND DRILL HOLE
- CHURN DRILL HOLE
- ROTARY DRILL HOLE

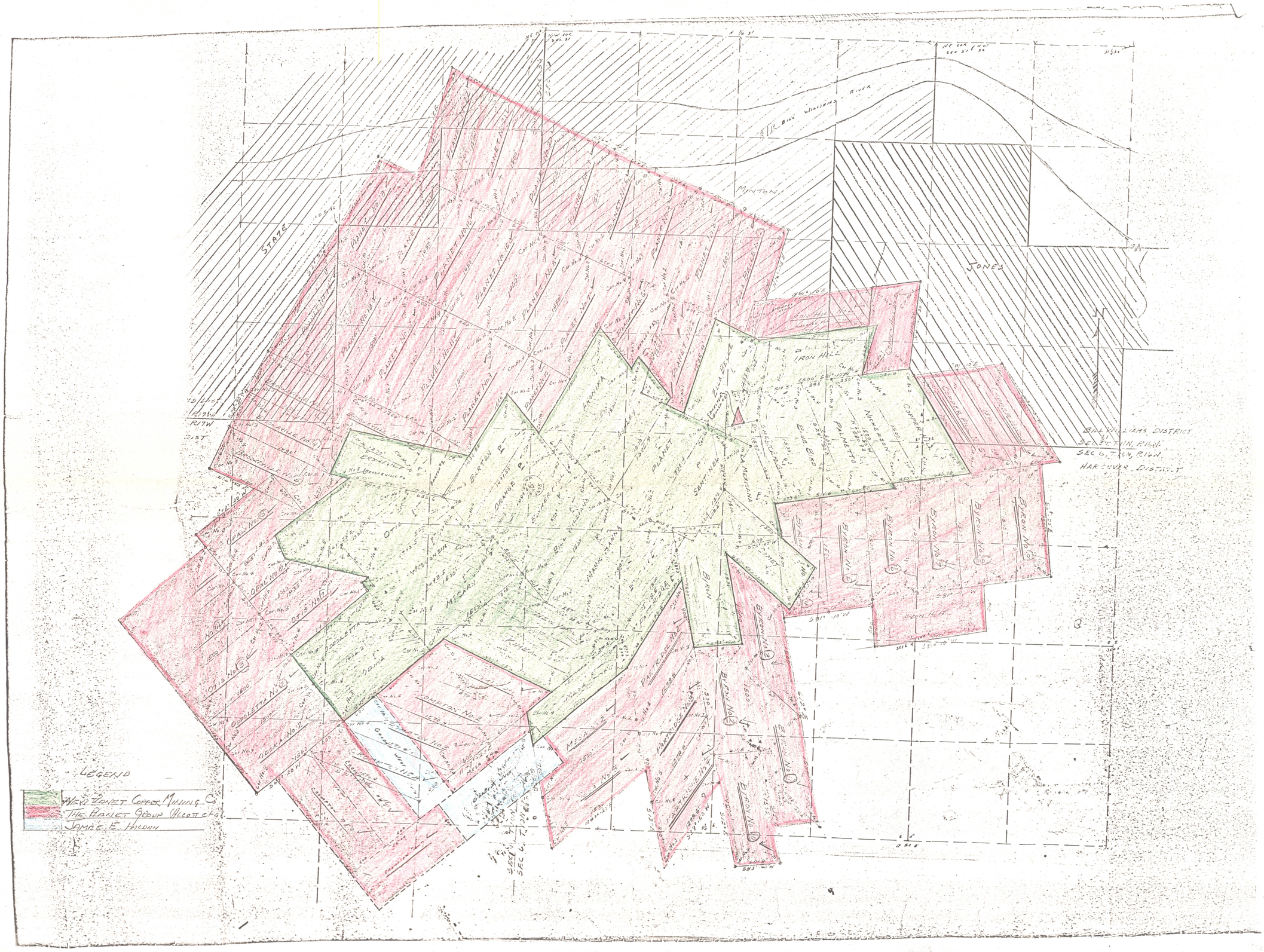
STATE	ARIZONA
COUNTY	YUMA
TOWNSHIP & RANGE	10,11 N / 16,17 W
MAP NO.	B 2708
PLATE NO.	2

NEW PLANET MINE

GEOLOGIC MAP

/22/69

H1-8-2


STATE
MINTON
JONES
IRON HILL
PLANET
ANDINA
BARTON
ORANGE
MCCARY
BLEEDON
PARTRIDGE
MESA
BILL WILLIAMS DISTRICT
SEC 27 T1N, R1W
SEC 6 T1N, R1W
HARCUVAR DISTRICT
LEGEND
NEW PLANET COPPER MINING CO.
THE PLANET GROUP ALLOTTED
JAMES E. HALDEN