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Arizona Geological Survey
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Tucson, Arizona 85701
520-770-3500
http://www.azgs.az.gov
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James Doyle Sell Mining Collection

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3-22-67

File Flux – Trench Cores

TRENCH – FLUX CORE SKELTONIZED FROM ORIGINAL BOXES AND IN STORAGE AT MISSION UNIT:

FS – 5	ENTIRE	INTERCEPT	WHICH	WAS	CORED		
FS – 23	"	"	"	"	"	"	– 15.50 Sec
FS – 34	"	"	"	"	"	"	– 33.25 sec.
FS – 37	"	"	"	"	"	"	– 38.00
FS – 39	"	"	"	"	"	"	– 15.50
FS – 46	"	"	"	"	"	"	– 42.00
FS – 48	"	"	"	"	"	"	– 32.00
FS – 51	"	"	"	"	"	"	– 27.50
FS – 52	"	"	"	"	"	"	E. of end @ 15.50
SU – 1	"	"	"	"	"	"	
SU – 2	"	"	"	"	"	"	
SU – 3	"	"	"	"	"	"	

NPW

(Paid 11/19 - Vo# 11-81)
Flux Claims

J. H. C.

DEC 1 1969

Whatley DRILLING CO

1512 WEST PRINCE ROAD
TUCSON, ARIZONA 85705

AREA CODE 602
PHONE 887-3310

TDV

K.V.D.S.
NOV 17 1969

November 13, 1969

DRILLING STATEMENT
JA 207

American Smelting & Refining Co.
Post Office Box 5795
Tucson, Arizona 85703

Purchase Order # T-8345
Flux Group Mining Claims
near Patagonia, Arizona

Hole No. F 2	Nov. 7 thru Nov. 11, 1969	Total Depth 125 Ft.
RIG TIME:		
33.5 hours	@ $ 35.00 per hour	$ 1,172.50
BITS:		
1 - 5½" bit (50% of total cost)	276.45	276.45
	TOTAL HOLE NO. F 2	$ 1,448.95

STATEMENT TOTAL $ 1,448.95

(signed) Leon Whatley

(approved) J. H. Courtright

Has already been approved
T.D.V.

Mr. COURTRIGHT,

Attached are the results of a composite sample for the assessment hole at the Flux property

A.D.V.

Flux claims

3226 East 46th Street

Phone 624-0049

AMERICAN ANALYTICAL and RESEARCH LABORATORIES

ASSAYERS - CHEMISTS - METALLURGISTS

TUCSON, ARIZONA 85713

SAMPLE SUBMITTED BY American Smelting & Refining Company
Tucson Office-Mr. Tony Dalla Vista

DATE Nov. 15, 1969

SAMPLE MARKED	GOLD OZ./TON	SILVER OZ./TON	PER CENT COPPER	PERCENT LEAD	PERCENT ZINC	PERCENT MOLYBDENUM	PERCENT IRON	
Composite F2-10 - F2-130	.002			0.05		.039		

J. H. C.

DEC 1 1969

K.V.D.S.

DEC 1 1969

Compositing Charges $2.60
7.75

CHARGES $ _____

REGISTERED ASSAYER
CERTIFICATE NO.
6852
PETE S. FLORES
Date Signed
Arizona U. S. A.

ASSAYER - CHEMIST

3226 East 46th Street

Flux claims

Phone 624-0049

AMERICAN ANALYTICAL and RESEARCH LABORATORIES

ASSAYERS - CHEMISTS - METALLURGISTS

TUCSON, ARIZONA 85713

SAMPLE SUBMITTED BY American Smelting & Refining Company
Tucson Office- F. Tony Bella Vista

DATE Nov. 15, 1969

SAMPLE MARKED	GOLD OZ./TON	SILVER OZ./TON	PER CENT COPPER	PERCENT LEAD	PERCENT ZINC	PERCENT MOLYBDENUM	PERCENT IRON	
F2-10		0.15						
F2-20		0.27						
F2-30		0.14						
F2-40		0.13						
F2-50		0.12						
F2-60		0.05						
F2-70		0.13						
F2-80		0.12						
F2-90		0.21						
F2-100		0.16						
F2-110		0.07						
F2-120		0.16						
F2-128		0.13						

J. H. C.
DEC 2 1969

K.V.D.S.
NOV 18 1969

Accesment hole Flux mine

REGISTERED ASSAYER
CERTIFICATE NO.
6852
PETE S.
FLORES
Date Signed
Arizona U.S.A.

CHARGES $ 26.00

ASSAYER - CHEMIST

please copy for BM 11-12-69 JAB

J. H. C.

NOV 12 1969

AMERICAN SMELTING AND REFINING COMPANY
Tucson Arizona

November 12, 1969

To: J. H. Courtright, Chief Geologist

From: A. Dalla Vista

FLUX CLAIMS
SANTA CRUZ COUNTY

Assessment work on the subject area for approximately $1,200.00 was started on November 7 and completed on November 10, 1969.

One rotary hole (F2) was drilled to a depth of 128 ft.

Drilling was contracted to Whatley Drilling Co. of Tucson and was done using an H.D. Mayhew 1000. Whatley personnel involved were: Jack Sullivan, tool pusher; Bob Shaw, driller; and Tom Dougam, helper.

Due to the hard and massive andesite, drilling proceeded very slowly, with an average rate of penetration of about 8 to 10 ft. per hour.

Location, geological description and direct drilling cost of the hole are given below.

Location

Lat. 13,500 N. Dep. -2970 E. Elev. 4903 ft.

(These figures were scaled from a 1951 flux mine topographic map by A.H. Haworth.)

Geology

0 - 15	Cretaceous quartzite. Limonitic boxworks after pyrite.
15 - 45	Cretaceous andesite. Strongly silicified and with moderate chlorite and clay alteration. Weak limonite after pyrite. Fractured.
45 - 128	As above. Massive. Traces of finely disseminated pyrite.

Direct Drilling Cost

Drilling time	19 hrs @ $35.00/hr	$ 665.00
Rig up and down	5 hrs @ $35.00/hr	175.00
Moving from Tucson and return, approx.	11 hrs @ $35.00/hr	385.00
Total	35 hrs	$1,225.00

Samples were taken at 10-ft. intervals and duplicates have been stored at our Hardshell house.

A. Dalla Vista

ADV:mt

cc: S.I.Bowdich

AMERICAN SMELTING AND REFINING COMPANY
EXPLORATION DEPARTMENT
SOUTHWESTERN UNITED STATES DIVISION
P. O. BOX 5795, TUCSON, ARIZONA 85703

J. H. C.
NOV 14 1969

S. I. BOWDITCH
PROPERTY MANAGER

November 13, 1969

1150 NORTH 7TH AVENUE
TELEPHONE 602-792-3010

Santa Cruz County Recorder,
Nogales, Arizona.

Dear Sir:

Enclosed is an Affidavit of Labor for the Flux Claims, and our check in the amount of Two Dollars ($2.00). Will you please record this and return it to me.

Yours very truly,

ORIGINAL SIGNED BY
S. I. BOWDITCH

SIB/mps
encl. 2
cc: JHCourtright
RBMeen
KvdSteinen

file

Whatley DRILLING CO

1512 WEST PRINCE ROAD
TUCSON, ARIZONA 85705

AREA CODE 602
PHONE 887-5742

November 3, 1969

Flux mine Area
Trench Unit
J. H. C.
NOV 4 1969

J. H. Courtright
ASARCO
P. O. Box 5795
Tucson, Arizona 85703

Dear Sir:

As per our telephone conversation we do hereby agree to furnish equipment, men, and materials to complete approximately $ 1200.00 worth of drilling on your Flux property East of Patagonia, Arizona.

Equipment will be charged at the rate of $35.00 per hour while operating and moving from Tucson, Arizona to the project location and return to Tucson.

All materials used in the hole including bits, mud, lost circulation materials, cement, casing, and chemicals, etc., will be charged to ASARCO at cost F.O.B. job site.

The equipment used will include, but not necessarily be limited to the following;

1 - HD Mayhew 1000 with 25 foot Kelly, 5 X 6 Mud pump, 600 low pressure Compressor, 3 1/2" drill collars, 2 7/8" drill pipe, mounted on a 220 IHC truck.

1 - Gardner-Denver Model HP 600, 150 psi, 600 CFM Compressor, mounted on an IHC truck.

1 - Geolograph Recorder

1 - Down-the-hole Hammerdrill

1 - 1500 gallon capacity water truck.

Certificates of Insurance will be furnished as required.

Sincerely,

Leon Whatley

LEON WHATLEY

LW/wlf

Ca 19.16.6

J. H. C.

OCT 24 1969

MEMORANDUM

To: J. H. Courtright

From: S.I. Bowditch

Subject: Trench Unit - Flux Claims October 23, 1969

On October 22, I investigated the records at the Santa Cruz County Courthouse and found no evidence of any mining claims which had been located since September 1st in the area of the Flux claims. Of course, this really doesn't mean very much because any locator has 3 months after he has made his location before he is required to record his claims.

Therefore, today, October 23, I went over the ground in the area of the Flux claims and could find no evidence whatever of recent staking. Many of the old Flux corners are still in place but there were no new notices of any kind that I could see. One possible exception was a notice of a drilling for location work of the Bluebird 6 and 7 claims which I found next to the road leading north from Flux approximately opposite the end of the Flux 20 claim. These were dated July, 1968 and if they should overlap Flux 20 and 25 claims they would not take in this ground because at that time our claims were still in good standing.

Unless in the meantime somebody should decide to stake this area, we can revive any or all the claims by starting drilling. I believe that the 12 claims for which we did assessment work in 1968 are all that you feel are necessary to continue in good standing but we did have 4 claims to the east of the one line of claims which runs to the northeast of the road which leads to Alum Creek and it may be worthwhile to revive these as long as Kerr McGee is working in the Alum Creek area.

S.I. Bowditch

S.I. Bowditch

SIB:lm
cc: RBMeen

J. H. C.

AMERICAN SMELTING AND REFINING COMPANY
SOUTHWESTERN EXPLORATION DEPARTMENT
P. O. BOX 5795, TUCSON, ARIZONA 85703

1150 NORTH 7TH AVENUE
TELEPHONE 602-792-3010

SEP 6 - 1968

September 6, 1968

Santa Cruz County Recorder
Court House
Nogales, Arizona

Dear Sir:

Enclosed is a Proof of Labor for the Flux group of claims, and our check for $2.00. Will you please record this and return it to me.

Yours very truly,

ORIGINAL SIGNED BY
S. I. BOWDITCH

S. I. Bowditch

SIB:kc
Enclosure
cc: JHCourtright
ACHall
KvdSteinen

Copy to RBM 8/30/68

AME[redacted]CAN SMELTING AND REFINING COMP[redacted]
, Tucson Arizona

August 30, 1968

J.H.C.

AUG 30 1968

TO: Mr. S.I. Bowditch

FROM: Mr. J.D. Sell

Assessment Drill Hole
Flux Mine Area
Santa Cruz County, Arizona

An assessment drill hole was started and completed, as follows, for the Flux Claim group on August 26-28, 1968.

Location: From drill hole: approximately 250 feet, N $52\frac{1}{2}^{o}$E, to northeast corner of Flux #18 claim. On small saddle, east side of main Flux Canyon Road.

Depth: 222 feet.
Hole Size: $5\frac{1}{2}$ inches
Drill-bit Type: Down-the-hole air hammer.
Rock Type: Alum Canyon Andesite.
Contractor: J.O. Barnes Drilling Company, Casa Grande, Arizona.
Drillers: Joe Golden and Christino Figueroa
Helpers: Bobby Stepp and Chuck Green
Water: Initially encountered at 87 feet with heavy secondary flow at 121 feet.
Plug: Hole was plugged at the surface, no casing, with a wooden 12" x 12" tapered plug extending approximately two feet above the rock surface.

Contractors Time and Approximate Cost:

Rigging up and laying down: $4\frac{1}{2}$hrs. @$30.00/hr.	=	$135.00
Drilling: 30 hrs. @ $30.00/hr.	=	900.00
Footage: 222 feet @$1.00/ft.	=	222.00
Total		$1,257.00

James D. Sell

JDS:ir
cc: JHCourtright
JRWojcik

Tr-7.7
63-64

J. H. C.
JAN 17 1966

January 17, 1966

Morse Bros. Machinery Company
1400 West Evans Avenue
Denver, Colorado 80223

Attention: Mr. Harold N. Grimes

Gentlemen:

Trench Unit Core Shed

In your letter to me of January 12 you inquired regarding the garage building located at the Trench Mine property, currently in use as a diamond drill core shed.

We hope to have removed that core which we wish to retain within the very near future. Just as soon as this has been accomplished, I will advise you. In the meantime we will appreciate the continued use of the building.

Very truly yours,

ORIGINAL SIGNED BY
A. C. HALL

A. C. HALL
Assistant Manager

ACH:cmr

bcc: HCourtright

July 23, 1965

Mr. Art Barber
Geology Department
Anaconda Company
151 S. Tucson Blvd.
Tucson, Arizona

Dear Art:

Enclosed are logs and drill hole sections for 3 diamond drill holes situated on the east side of the summit of the Patagonia Mountains and well up on the west slope of Flux Canyon.

I believe these are the holes which Dick Baker telephoned about recently.

Yours very truly,

J. H. COURTRIGHT

JHC/kw
Enclosure

MR. WES STB

READ AND RETURN

PREPARE ANSWERS HANDLE

FILE ✓ INITIALS

W.E.S.

SEP 7 1965

New York, N. Y., September 3, 1965

J. H. C.

S. I. B.

SEP 9 1965

SEP 7 1965

Mr. C. E. Nelson

The following is an extract from the minutes of the meeting of the Advisory Committee held on September 1, 1965:

Trench Unit, Arizona

At the meeting of the Advisory Committee held on August 25, 1965 there was authorized the dropping of 12 flux mining claims which do not warrant the required assessment work, located on the fringe area of the company's Trench Unit in Santa Cruz County, Arizona. It was reported that after further study, the company's geologists recommend that five additional claims be dropped for the same reason. After discussion, there was authorized the dropping of the following additional claims at the Trench Unit, Santa Cruz County, Arizona:

Flux No. 8
Flux No. 20
Flux No. 12
Flux No. 13
Flux No. 14

Harold Howe

CFPollock
HLGoodenough
HMRose
TABredden
REHeen
JHCourtright ✓

MR. ..... New York, N. Y., September 3, 1965

READ AND RETURN .....

PREPARE ANSWERS ..... HANDLE .....

FILE ✓ ..... INITIALS .....

J. H. C.

SEP 7 1965

Mr. C. E. Nelson

The following is a corrected extract from the minutes of the meeting of the Advisory Committee held on August 25, 1965.

SEP 7 1965

Trench Unit, Arizona

On December 19, 1957, Asarco granted James P. Nash and E. W. McFarland a five-year lease on 29 flux mining claims at the Company's Trench Unit in Santa Cruz County, Arizona. An extension of the lease to December 31, 1966, was approved by the Advisory Committee at the meeting held on September 2, 1964.

It was reported that Nash and McFarland relinquished the 29 claims early this year after having performed about half of the required assessment work for this year, and that the Company's geologists recommend that 12 of the fringe claims be dropped since they do not warrant the expense of the required exploration. After discussion, there was authorized dropping of the following claims at the Trench Unit, Santa Cruz County, Arizona:

Flux No. 7	Terminal
Flux No. 22	Flux No. 17
Flux No. 6	Flux No. 19
Flux No. 21	Flux No. 24
Flux No. 10	Flux No. 26
Flux No. 27	Flux No. 9

S. I. B.

SEP 9 1965

Harold Howe

CPPollock
HLGoodenough
HWGrose
TASnedden
RDMeen
JHCourtright

TR7.7.63.64

S. I. B.

AUG 25 1965

J. H. C.

AUG 25 1965

MR. [signature]

READ AND RETURN .....

PREPARE ANSWERS ..... HANDLE .....

FILE C INITIALS .....

AMERICAN SMELTING AND REFINING COMPANY
Tucson Arizona

August 25, 1965

Mr. T. A. Snedden, General Manager
United States Mining Department
American Smelting and Refining Company
P. O. Box 5795
Tucson, Arizona 85703

TRENCH UNIT
Flux Claims

Dear Sir:

This is with reference my letter to you of August 19th entitled as above.

Mr. McFarland telephoned me yesterday to the effect that only approximately $1,285.00 had been expended during the current assessment year.

This, then, means that out of the twenty-nine (29) claims involved in the group, seventeen (17) must be dropped. A further review with Mr. Courtright has resulted in his recommendation that the following claims be dropped:

Flux No. 7	Flux No. 24
Flux No. 22	Flux No. 26
Flux No. 6	Flux No. 9
Flux No. 21	Flux No. 8
Flux No. 10	Flux No. 20
Flux No. 27	Flux No. 12
Terminal	Flux No. 13
Flux No. 17	Flux No. 14
Flux No. 19	

Yours very truly,

ORIGINAL SIGNED BY
A. C. HALL

A. C. Hall
Assistant Manager

ACH/mg
cc: CENelson
JNCourtright

J.H.C.

SEP 3 1965

New York, N. Y., August 25, 1965

W.E.S.

AUG 31 1965

Mr. C. E. Nelson

The following is an extract from the minutes of the meeting of the Advisory Committee held today:

Trench Unit, Arizona

On December 19, 1957, Asarco granted James P. Nash and E. W. McFarland a five-year lease on 29 flux mining claims at the Company's Trench Unit in Santa Cruz County, Arizona. An extension of the lease to December 31, 1966, was approved by the Advisory Committee at the meeting held on September 2, 1964.

It was reported that Nash and McFarland relinquished the 29 claims early this year after having performed about half of the required assessment work for this year, and that the Company's geologists recommend that 12 of the fringe claims be dropped since they do not warrant the expense of the required exploration. After discussion, there was authorized dropping of the following claims at the Trench Unit, Santa Cruz County, Arizona:

Flux No. 7	Flux No. 18
Flux No. 20	Flux No. 17
Flux No. 6	Flux No. 19
Flux No. 21	Flux No. 24
Flux No. 10	Flux No. 26
Flux No. 3	Flux No. 5.

Harold Howe

GFPollock
HLGoodenough
EWGrose
TASnedden
REMason
JHCourtright ✓

J. H. C.
AUG 20 1965

August 20, 1965

Mr. C. E. Nelson, Vice President
ASARCO - New York Office

TRENCH UNIT
Flux Claims

Dear Sir:

Attached are your two copies of a letter written to me by A. C. Hall, dated August 19, recommending that 12 of our 29 Flux Claims be abandoned. These claims are to the extreme North, South, and West of the main Flux Group.

I concur with the recommendation of dropping these claims.

Yours very truly,

ORIGINAL SIGNED BY
T. A. SNEDDEN

T. A. Snedden
General Manager

TAS:lc
encl. (2)

cc: JHCourtright
RBMeen

S. I. B.

AUG 20 1965

AMERICAN SMELTING AND REFINING COMPANY
Tucson Arizona

August 19, 1965

AUG 23 1965

J. H. C.

AUG 19 1965

MR. [illegible]
READ AND RETURN
PREPARE ANSWERS ___ HANDLE ___
FILE ___ INITIALS ___

Mr. T. A. Snedden, General Manager
United States Mining Department
American Smelting and Refining Company
P. O. Box 5795
Tucson, Arizona 85703

TRENCH UNIT
Flux Claims

Dear Sir:

As you know, Nash-McFarland relinquished the 29 claims, Flux 1 through Flux 27, Terminal, and Rockney, earlier this year.

We are now in the process of terminating the Nash-McFarland lease in its entirety and have exercised the option to re-acquire the surface rights corresponding to the nine patented mining claims, approximating 158.5 acres.

Several weeks ago I wrote McFarland, inquiring as to the amount of labor which they might have performed prior to relinquishment of the Flux Group. He has now reported, verbally, that he estimates only about half of the required labor has been done to maintain the concession on the 29 claims.

In view of all of the above, I inquired from Mr. Courtright whether he could recommend any fruitful work to make up the difference, corresponding to the assessment year ending September next. In the event that Mr. Courtright was unable to recommend bona fide exploration in the amount needed, it was suggested to him that he then furnish his recommendation with respect to which of the claims should be dropped.

Mr. Courtright has reviewed the problem in the absence of the exact amounts of labor expended, which Mr. McFarland has promised to forward promptly. He recommends dropping the following claims to the extent required, in the order noted:

Flux No. 7	Flux No. 18
Flux No. 22	Flux No. 17
Flux No. 6	Flux No. 19
Flux No. 21	Flux No. 24
Flux No. 10	Flux No. 26
Flux No. 3	Flux No. 9

You and I have studied this situation and are generally in agreement. The procedure suggested involves dropping off fringe claims and preserving those that form the central core. This is illustrated on the attached sketch.

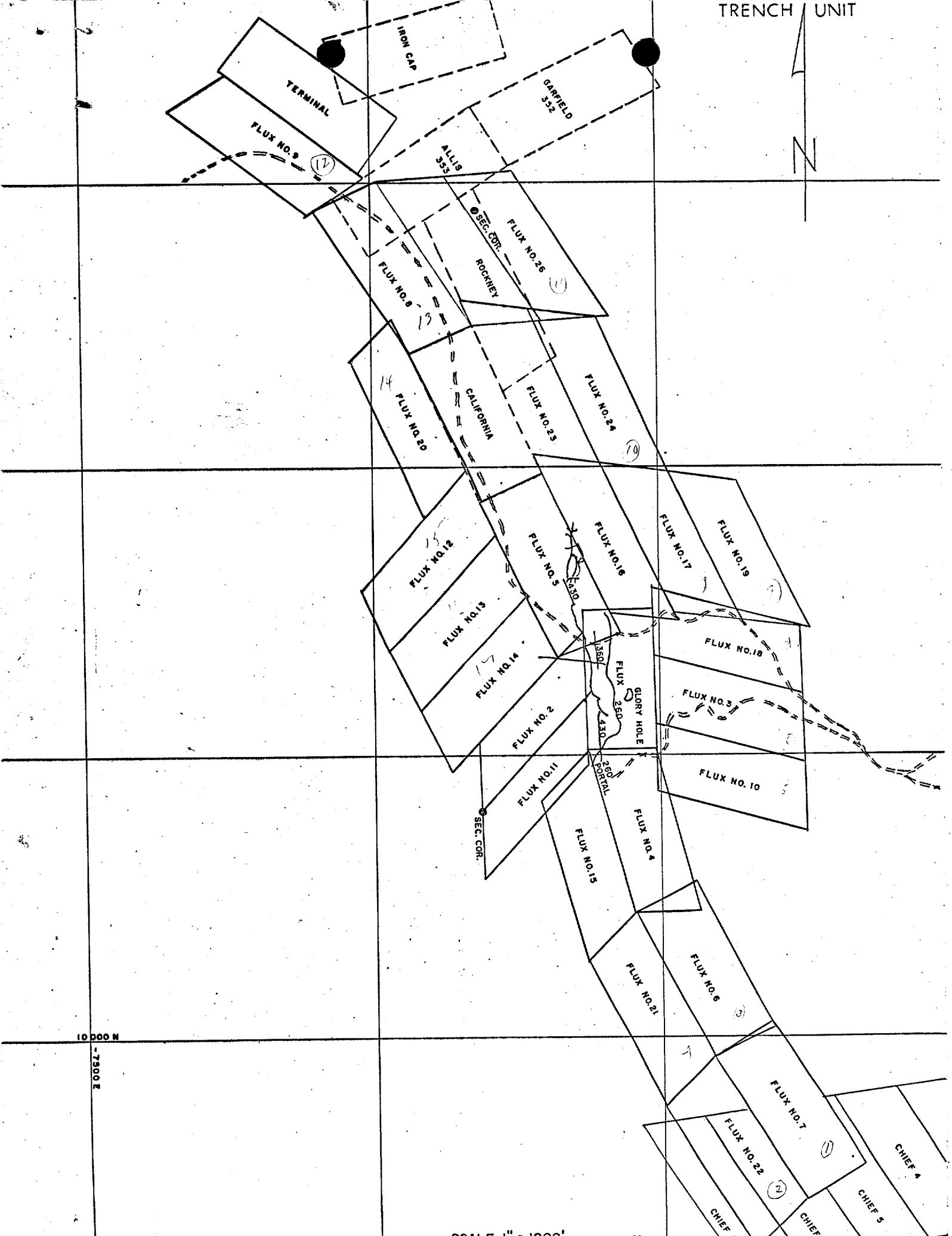
Kindly secure the necessary authorization, whereby the unpatented mining claims above noted may be dropped to the extent necessary, depending upon the amount of labor expended by Nash-McFarland during the current assessment year.

Yours very truly,

ORIGINAL SIGNED BY
A. C. HALL

A. C. Hall
Assistant Manager

ACH/jah
Enc.
cc: CENelson (2)
JHCourtright


TRENCH / UNIT
N
IRON CAP
TERMINAL
FLUX NO. 9
GARFIELD 352
ALLIS 353
SEC. COR.
ROCKNEY
FLUX NO.26
FLUX NO. 8
CALIFORNIA
FLUX NO.23
FLUX NO.24
FLUX NO.20
FLUX NO.12
FLUX NO.13
FLUX NO.14
FLUX NO. 5
FLUX NO.16
FLUX NO.17
FLUX NO.19
FLUX NO.18
FLUX NO. 3
GLORY HOLE
FLUX
FLUX NO. 2
FLUX NO.11
SEC. COR.
FLUX NO.15
FLUX NO. 4
FLUX NO. 10
FLUX NO.21
FLUX NO. 6
FLUX NO. 7
FLUX NO.22
CHIEF 4
CHIEF 5
CHIEF
10 000 N
-7500 E

May 9, 1962

Mr. Frank S. Simons
Stradling Ranch
Patagonia, Arizona

Dear Frank:

We were pleased to learn by your letter of May 6 that you will have time to stop over for a couple of days in Tucson. Thinking that you might like to check some of our interpretations of the geology in the vicinity of the Flux Mine before coming to Tucson, I am enclosing a report on the area. You may return this at your convenience.

A fossil or two was found between the Flux and Chief Mine; however, Stoyanow examined these and did not regard them as being useful. In the matter of the lime zones in the Flux Mine, we regard this and other occurrences between the Chief and the Flux as being clastic in origin. That is, small lenticular masses formed by the accumulation of limestone debris in local depressions. There are a number of outcrops of limestone which are made up entirely of limestone pebbles.

The thinly laminated rock which you have noted is quite extensive in the area and is associated with extensive metamorphism of the sediments. Originally I referred to these thinly laminated rocks, and the associated metamorphics, as zones of silicification. However, a few chemical analyses failed to show any good evidence of introduced silica. I now use the term "ribbon rock", or metaclastics to designate such occurrences, which by the way are quite common along a north-northwest trending belt through the Twin Buttes district and on through the Silver Bell district.

We will be looking forward to seeing you here in the office Monday, May 21, unless you advise us otherwise.

Yours very truly,

J. H. COURTRIGHT

JHC - personal

AMERICAN SMELTING AND REFINING COMPANY
Tucson Arizona

August 16, 1965

Mr. A. C. Hall
Building

Flux Claims

Dear Sir:

McFarland has advised that approximately half the work necessary for the assessment year on Flux claims has been done. Accordingly, it is suggested that the following claims be dropped:

(from South to North)

Flux No. 7
" 22
" 6
" 21
" 10
" 3
" 18
" 17
" 19
" 24
" 26
" 9

J. H. COURTRIGHT

JHC:bam

IN REPLY REFER TO:

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY
Stradling Ranch
Patagonia, Arizona
May 6, 1962

J. H. C.
MAY 8 1962

Mr. J. H. Courtright
American Smelting and Refining Company
Valley National Bank Bldg.
Tucson, Arizona

Dear Harold:

I'll be winding up my field season about the 19th or 20th and will be in Tucson for a couple of days after that. Now that I have seen a little of the country around the Flux and Chief mines (I confess that I don't entirely understand the geology yet), I would like to discuss some of the problems with you.

I am curious about the geological results of drilling around the Chief and Volcano mines, although I don't know whether AS&R did that drilling or whether you have the results. The geology near the Chief is similar in several respects to that at the Flux, although the outcrop of limestone (probably Earp formation) is smaller than that of the Flux (have you found any fossils at the Flux?) What are your ideas on how the Flux limestone got there? - do underground data establish the nature of the contacts? The Volcano is completely different geologically, and I am very uncertain about the nature of some of the rocks there. The mine is interesting in that it apparently produced quite a bit of chalcocite ore.

I'm also interested in the peculiar finely laminated rock exposed intermittently along the Flux Canyon road north of the Flux mine and down the gulch below the Blue Eagle mine. The layering resembles flow layering in lava but doesn't look quite right. However, I haven't looked at it very carefully yet and it may turn out to be just that.

Another puzzle to me has been the northward extension of the sizeable fault that passes through the Bender and Black Eagle mine area southwest of Harshaw - I can trace it with varying degrees of accuracy asffar as the old Alta shaft but lose it there unless it becomes the Red Bird-January structure, which seems to be a much smaller one.

I'll probably be in Tucson on the 21st and 22nd, and will telephone you on the 21st to see if we can get together for a while (incidentally I visited the Little Hatchets with Bob Zeller in March and am sure of one thing - the geology is much more complex than one would surmise from a casual study of Lasky's map. I would need a lot more than the 2 days we spent there to conclude anything definite about the relation of the Hidalgo volcanics and Ringbone shale to the rest of the section). Best regards.

Sincerely,

Frank

Frank S. Simons

JHC File

July 20, 1959

Dr. Royal R. Marshall
University of Bern
Bern, Switzerland

Dear Dr. Marshall:

Reference is made to your letter of July 15th in which you inquire as to whether or not the paper by Paul Eimon was published. This paper was prepared for the exclusive use of our Company and has not appeared in any publication.

Very truly yours,

J. H. COURTRIGHT

S

UNIVERSITÄT BERN
Physikalisches Institut

BERN, den July 15, 1959

J. H. C
JUL 20 1959

Mr. J. H. Courtright
Southwestern Mining Department
American Smelting and Refining Company
813 Valley National Building
Tucson, Arizona
U. S. A.

Dear Mr. Courtright:

Thank you very much for your letter of June 22nd (re: Tr-10.102/Flux Geo.) and the copy of the paper by Paul Eimon. The information which you have provided is very helpful. I wonder if this paper (or an abstract) has appeared in a journal? I cannot find any reference to it in the bibliographies, which go through 1955. Unfortunately, many journals (such as the Trans. A.I.M.E.) are not available in Bern, so I cannot check more recent likely sources. If you could send me the journal reference (if any) to Eimon's article, I should be very grateful.

Sincerely yours,

Royal R Marshall

Dr. Royal R. Marshall

RRM/ccg

Tr-10.10.2
Flux Geo.

June 22, 1959

T A.S.
JUN 22 1959

Dr. Royal R. Marshall
University of Bern
Bern, Switzerland

Dear Dr. Marshall:

Mr. Snedden has asked me to reply to your letter of May 26, 1959.

I am sorry to advise you that there is no one here who is sufficiently familiar with the mineralogy of the Flux Mine to supply you with any useful information regarding the typical crystal habit of the galena. Also, I might add that the Company turned operation of the mine over to private interests (Nash-McFarland) early in 1958.

For your information on the general geology of the Flux deposit, I am enclosing a copy of a paper by Paul Eimon. In brief, the principal sulphides, sphalerite, galena and pyrite, occur as selective replacements of limestone and limy mudstone beds in a series of Cretaceous sediments. Chlorite, quartz and calcite are the most common gangue minerals. Garnet is present, but not common. I presume the deposit would be classed as pyrometasomatic.

Yours very truly,
Original signed by
J. H. Courtright

J. H. COURTRIGHT

JHC:S
Encl.

UNIVERSITÄT BERN
Physikalisches Institut

BERN, den May 26, 1959

MR. Richard
READ AND RETURN
PREPARE ANSWERS HANDLE
FILE INITIALS

T A S
JUN 1 1959

MINING DEPT.
MAY 29 1959
TUCSON

J. H. C.
MAY 2 5 1959

J. H. C.
JUN 1 - 1959

Mr. T. A. Snedden, Manager
Southwestern Mining Department
American Smelting and Refining Company
Tucson, Arizona, U. S. A.

Dear Mr. Snedden:

In January of 1957 I stopped at your office to inquire about collecting some galena crystals from Company properties near Tucson. I appreciate very much the opportunity you provided for me to collect in the Flux Mine. The spectrographic analyses of the sample from that mine and of one from Duquesne, among a number of others, have been completed recently. I am trying to relate certain trace elements to crystal habit; so far, the tentative results are very encouraging.

I found a few small cubes modified with fairly well-developed octahedral faces on the 430' level of the Flux Mine. At the Holland Mine at Duquesne, I located only some fragments with octahedral parting; these were on the dump. My general impression, however, is that the cubic form is more prominent in areas farther away from Duquesne. Again, the deposits are rather different. That at the Holland Mine is a contact metamorphic zone with a rather wide and prominent ore mineral assemblage, while the Flux ore is simpler and seems to be in (relatively) slightly disturbed calcareous sediments. The ore deposits of these two mines, however, are probably genetically related. If you could add to or correct these impressions of the geology of these deposits, I should appreciate it very

I also wish to obtain a better idea of the typical crystal habit in the Flux Mine, particularly in comparison to that of the Duquesne area. Perhaps you or some member of your staff has observed typical suites of crystals from these areas. I know that even within a single mine the crystal habit varies widely, but I should appreciate having your general impressions in this regard, as a kind of statistical integration. The enclosed sketch of crystal variations may help in indicating approximate classes, in lieu of the more quantitive measurements I have been able to make for other areas. (Where time and sampling conditions have permitted, I have measured a number of ratios of the cube edge to the length of the intersection of the octahedral and cube faces.)

I hope to be able to assemble these data soon into a preprint, and I shall be glad to send a copy to you when one is ready. Thank you very much.

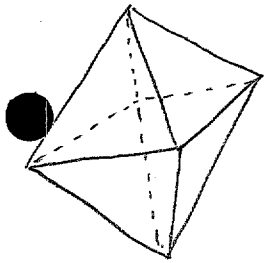
Sincerely yours,

Royal R. Marshall

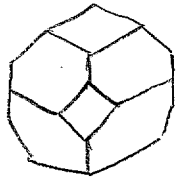
(Dr.) Royal R. Marshall

RRM/ccg

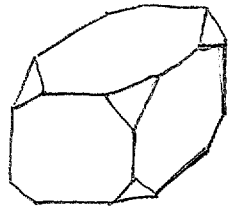
1. 2. 3. 4.



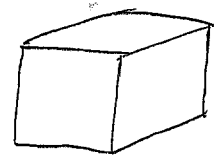
octahedron



octahedron modified by cube faces



cube modified by octahedral faces



cube

UNIVERSITY OF UTAH
SALT LAKE CITY

COLLEGE OF
MINES AND MINERAL INDUSTRIES

DEPARTMENT OF
MINING AND GEOLOGICAL ENGINEERING
321 MINES BUILDING

January 20, 1958

Mr. J. H. Courtright
American Smelting & Refining Co.
Tucson, Arizona

Dear Harold:

We enjoyed receiving your Christmas card and I was also happy to have that followed by the rock specimens which I received recently.

David Duke, one of our graduate students in Chemical Engineering, will make a thin section of each of the samples. By that time I will have a chance to have read the written information that was received from you. As soon as I have a chance to describe the rocks, I shall send you my biased opinion (it will undoubtedly be that) regarding their probable origin.

Extend our regards to Kenny and his family.

Sincerely yours,

Matt

Matthew P. Nackowski
Professor Mining and
Geological Engineering

MPH:cc

AMERICAN SMELTING AND REFINING COMPANY
Tucson Arizona

January 8, 1958

FLUX
French

Mr. M. P. Nackowski
Geological Department
University of Utah
Salt Lake City, Utah

Dear Matt:

You will recall my mentioning the igneous-appearing rocks which occur in Arizona. For lack of a better term, I referred to these as "silicified zones" or "ribbon rock zones." Under separate cover I am sending you four core specimens, as follows:

No. 1 Typical footwall conglomerate (lower Cretaceous)
FS 242 @ 145 feet

No. 2 Typical footwall conglomerate (location missing)
polished by diamond drill bit

No. 3 Typical "ribbon rock" from footwall of ore zone.
F 599 @ 317 feet

No. 4 Contact of conglomerate and dark speckled rock which makes up part of "silicified zone", or ribbon rock complex. (Thin sections of specimens similar to No. 4 showed microscopic banding). F 326 @ 125 feet.

I might mention that since working on the Flux area, have found numerous similar occurrences, in the Tucson Mountains, at Silver Bell and elsewhere, including our new project, the East Pima, 20 miles south of Tucson. Nearly all geologists regard these as igneous rocks, without question, either flow or intrusive. The field evidence against a flow origin is incontestible, against an intrusive origin, not too good in many cases. I still believe that these rocks are derived from the sedimentary rocks (so far, they have not been found cutting known igneous formations) by some process. The easiest picture for me to visualize (not necessarily supported by physics or chemistry) is fusion along deep seated zones of weakness, promoted by lowering of pressure? introduction of gases?. At any rate, if these odd-ball rocks are intrusive, I think they belong in a class by themselves.

Hope some time you will be able to manage a visit down here and have a look.

Regards to Kay.

Very truly yours,

Original signed by
J. H. Courtright
J. H. COURTRIGHT

JHC/ds
cc: KERichard

GEOLOGY AND ORE OCCURRENCES AT FLUX MINE SANTA CRUZ COUNTY, ARIZONA

The Flux Mine, first known as the Goshen, is reported to have been located in the early eighteen-fifties, and by 1861 was producing lead for the Confederate forces in the Civil War. The mine is located in the northern part of the Patagonia Mountains, 7-1/2 miles by road in a southwesterly direction from the town of Patagonia, Arizona. This paper describes briefly the geology of this somewhat unique deposit operated in the past few years by the American Smelting and Refining Company. Most of the mine's production has come in this period since 1940. The Flux has the largest production record of any mine in the Patagonia and Santa Rita Mountains. About 150 tons of lead-zinc-silver ore are now being mined daily.

The Patagonia Mountains consist of granitic intrusives (alaskite, monzonites, and related rocks) which make up the core and western part of the range, with sediments and volcanics comprising the eastern and northern flanks. Sedimentary rocks exposed are Paleozoic, Cretaceous, and early Tertiary in age; the igneous rocks are late Cretaceous and early Tertiary in age.

The Flux ore deposits are somewhat lenticular lead-zinc sulphide replacement bodies occurring in a limy mudstone horizon within a westerly dipping series of the Cretaceous sedimentary rocks. This sedimentary series is intruded on the west by granitic rocks and is unconformably overlain on the east by sediments and volcanics.

The Flux sedimentary series, listed oldest to youngest, includes the Lower Conglomerate, Flux sediments, Middle Sediments, California Shale, and the Upper Sediments. This nomenclature is of local origin.

The Lower Conglomerate is characterized by poorly sorted, principally angular fragments in a silty, sometimes chloritic matrix. Occasional sub-rounded boulders can be seen, and some small mudstone lenses are evident in the formation. Nowhere is the base of the Lower Conglomerate exposed, and no drill penetration has been

made stratigraphically below it.

Flux Sediments is a term used to denote a poorly defined horizon consisting principally of mudstone with lenticular, discontinuous beds of limestone. Extremely variable in thickness, this formation is underlain by the Lower Conglomerate and overlain by the Middle Sediments. Other rocks found in minor amounts within the Flux Sediments include quartzite and conglomerate. Hydrothermal effects have largely obscured bedding attitudes and contacts within the area of the mine. These beds have been folded and faulted on a minor scale. The extent and nature of deformation in detail is largely obscured by the effects of silicification, chloritization, and sulphide mineralization, and by the lack of definite marker beds. All of the commercial ore at Flux has been found as replacement bodies within the Flux Sediments or along the Flux vein system.

The upper contact of the Flux Sediments with the Middle Sediments is sometimes gradational, but locally within the mine it is marked by mineralized bedding plane faults called the Flux vein system.

The Middle Sediments consist of a coarse arkose or grit with considerable quartz and some chlorite.

Lying stratigraphically above the Middle Sediments, the California Shale formation is a black carbonaceous shale with some interbedded limestone and chloritic sandstone beds. Lead-zinc mineralization, although not of commercial value, occurs in limy lenses in this formation. Bedding is clearly evident in the shale, while in the other members of the series it is for the most part indistinct or absent.

Exposed west of Flux Mine, the Upper Sediments is in general a silicified arkose showing, where silicification is weak, detrital grains and angular feldspar fragments in a silty matrix.

Very few fossils have been found in this series and those few found in the limestone were not preserved well enough for identification. This sedimentary series

was probably formed in an area of rugged topography with periods of quiescence during which the finer grained clastics and limestones were deposited.

The westward tilting of the sediments likely resulted from disturbances preceding or accompanying the emplacement of the alaskite to the west, as there is little concordance between the form of the intrusive masses and the attitude of the sedimentary rocks.

An angular unconformity separates the Flux Sedimentary series and the overlying Chief Conglomerate. The Chief Conglomerate is composed of angular fragments with a fine-grained, partly pyroclastic, matrix. The fragments are mainly quartzite and chert or chalcedony ranging around 1/2 inch in diameter. This formation often shows areas of strong alteration and silicification. In the north part of the Flux mine area the Alaskite Conglomerate of similar age is found which differs only by the character of the fragments which, as the name implies, are predominantly alaskite. These conglomerates accumulated on a rugged erosion surface cut in Cretaceous and Paleozoic sediments and intrusive alaskite. This unconformity appears to represent an erosional interval in the Laramide Igneous sequence.

Volcanic flows unconformably overlie the Chief and Alaskite Conglomerates as well as the Flux Sedimentary series. Although pre-mineral in age, these volcanics cover much of the Flux vein system and most of the favorable rocks of the Flux sediments.

Andesite porphyry dikes and irregular masses cut the volcanic flows and are therefore the youngest rocks of the area. A very small exposure of this andesite porphyry is the only evidence of igneous activity in the immediate vicinity of the mine.

ORE OCCURRENCES

The ore occurs as replacement bodies of sphalerite, galena and pyrite in lenses of limy mudstone or impure limestone within the Flux Sediments. These ore bodies vary in size, shape and attitude throughout the mine. The most continuous,

though not the largest, is a tabular, thin body along the Flux vein system aligned with the general bedding attitude. The forms of the ore bodies and their distribution show a lack of continuity or systematic pattern. Ore limits can be very sharp, or gradational. Some ore bodies show an irregular pyrite halo.

Gangue minerals include quartz, chlorite and calcite. Little or no garnet is present with the ore. Typical ore consists of galena, sphalerite, pyrite, chlorite and calcite, with minor quartz and sericite. Banding is sometimes evident but does not necessarily coincide with the bedding.

Small veins are found throughout the mine but follow no particular pattern. Cross-breaking veins appear to have exerted some control on the deposition of the ore in the sedimentary beds. Though close control is not evident locally, the area of alteration roughly coincides with the horizontal extent of the ore-bearing zones.

The paragenesis of ore minerals and associates is generally recognized as follows:

First deposited was chlorite, with minor sericite followed by calcite, quartz, pyrite, sphalerite and galena.

The zinc-lead ratio of ore produced is approximately 2:1 with minor silver associated with the galena. Minor amounts of chalcopyrite are usually present.

Mine exploration is generally directed toward areas of the Flux Sediments and their projections. As the favorable formations outcrop only in a small area, surface exposures offer little help in exploration. An attempt is made to concentrate drilling in areas of lesser silicification, but due to the erratic nature of silicification no area is entirely overlooked. Lack of recognizable local ore controls makes close-spaced diamond drilling often necessary.

SILICIFICATION

"Silicification" is a term used here to denote replacement by aluminous silicates of many of the rocks of the area. It is very pronounced in the mine and also shows up on the surface as bold resistant ribs or nobs. So complete is the

replacement that certain areas within the mine have been classified as igneous by some geologists in the past. However, identifiable sedimentary rocks show a gradual loss of sedimentary texture as strength or degree of silicification increases.

Where silicification is intense a banded appearance is sometimes evident. This is locally called "ribbon rock". The banding varies greatly in direction and does not necessarily follow bedding. It is believed due to rhythmic variations in the quantity of colloidal magnetite.

Sedimentary rocks have generally been more receptive to silicification than the igneous rocks. Under the microscope heavily silicified rocks appear to be essentially devitrified glass. The quartz and feldspar grains occasionally show evidence of detrital origin when they are not obscured by this silicification.

Margins of silicification are often irregular and unpredictable, although, in part, bedding or fault structures appear to have guided the replacement. Zones of Silicified rocks are usually unfavorable to sulphide mineralization.

Many of the sediments at Flux show abundant chlorite or epidote, the epidote generally occurring along small fissures or fractures.

Acknowledgment is made to previous C$_o$mpany geologists who have contributed much to the concepts presented in this paper. Special acknowledgment is made of the work of Harold Courtright who developed the basic picture presented, and contributed most of the surface mapping of the Flux area. The author is also indebted to the American Smelting and Refining C$_o$mpany for permission to present this paper.

PAUL I. EIMON
Resident Geologist
Trench Unit

AMERICAN SMELTING AND REFINING COMPANY
WESTERN MINING DEPARTMENT

D. J. POPE, GENERAL MANAGER
L. H. HART, ASSISTANT MANAGER
W. R. LANDWEHR, CHIEF GEOLOGIST
J. FRED JOHNSON, MANAGER OF OPERATIONS
NORMAN WEISS, MILLING ENGINEER

600 PACIFIC NATIONAL LIFE BUILDING
SALT LAKE CITY, UTAH

December 5, 1950

PERSONAL

Mr. J. H. Courtright
Trench Unit
American Smelting and Refining Company
Patagonia, Santa Cruz County,
Arizona

ARIZONA, SANTA CRUZ COUNTY
HARSHAW DISTRICT
TRENCH UNIT - FLUX MINE

Dear Harold:

I was glad to get your letter and to learn of your progress in unraveling Flux geology. I was sure it was a mess, but perhaps it is worse than I thought.

In the short time that I spent on the property I found a number of seeming anomalies; for example, the rock mass forming the footwall of the limestone exposed from the road up to the glory hole. This looked like an intrusive contact, not a fault contact, and yet when one studies the rock where exposed in road cuts east of there, it has all the characteristics of a flow breccia or agglomerate. I believe this rock mass is penetrated by the 430 drift south, but I did not have time to locate or study the contact there.

Your idea of the andesite flow lying unconformably upon the sediments to the north of the glory hole could be a good explanation of a relationship which I couldn't explain. In following the sediments up the ridge above the upper road, they seem to be terminated a short distance above the road by a fresh andesite which looked intrusive. Further to the north, roughly east of the top of the ventilation raise near the two diamond drill stations, the sediments were also terminated by igneous rock. The contact strikes about N.75°W. and seems to dip, I believe, 80°. This also appeared to me to be an intrusive contact, not a fault contact; yet we know that underground the sediments extend for a considerable distance north of this point. Furthermore, on the hillside and ridge to the east of the outcrop of the sediments and above the upper road, the igneous rocks on the whole have the appearance of rather flat-lying flows. Perhaps your unconformity explains these apparent anomalies.

It is probably of considerable importance to know that the andesite cover is pre-mineral, and contains fissures along which there is mineralization and alteration. I presume the vein upon which the little shaft was sunk, at about coordinate 14,000 N. and -2500 E. on Wilson's surface map, is one of these. They might be of importance in judging the ore possibilities in the underlying sediments.

Flux mine
December 5, 1950

In your letter you did not mention the breccia, which Ken and Bogue interpreted as being a conglomerate, and which I quite positively believe to be intrusive. I would like to know whether or not you have had an opportunity to study it, and have any opinion as to its origin.

I also feel quite strongly that most if not all of the rhyolite (or aplite), such as the mass exposed to the southeast of the glory hole, is intrusive, judging by the flow structure developed at the contact. I also found contacts underground which I am sure are intrusive.

I knew you were getting into an interesting problem, and I also knew that it could not be worked up in a few weeks. However, its solution is well worth any time spent on it, for there may be a chance of developing a considerable amount of additional ore, perhaps in the footwall of some of the present stopes, or on strike, or dip. I am looking forward to going over the thing with you sometime after the first of the year.

All of this, of course, will be kept in confidence until you have had an opportunity to give the thing more study.

Mrs. Ivers says she thinks you would make an excellent Arab sheik, but don't let the movie companies entice you away from your geology!

My foot seems to have recovered properly, except that on cold mornings I sometimes develop a limp.

Very truly yours,

Walt

W. R. Landwehr

WRL:si

November 27, 1950

AIR MAIL

Mr. F. V. Richard, Manager
Southwestern Mining Division
American Smelting and Refining Company
813 Valley National Building
Tucson, Arizona

ARIZONA, SANTA CRUZ CO.
HARSHAW DISTRICT
TRENCH UNIT - FLUX MINE

Dear Sir:

In studying over the various monthly reports on the Flux mine, which I have not heretofore seen, I have been pleased to note the intercepts of mineralization in the various holes drilled in the northern part of the No. 6 area from the 590 and 510 levels, as they all seem to indicate a continuation of the mineralized zone to the north. I have in mind particularly hole No. F-202 drilled from the 590 level in Section 34; and holes F-211 in Section 33.75 and F-198 in Section 35.25, both drilled from the 510 level.

Judging from the results of this drilling, it is my opinion that the entire limestone series is present and will extend northward for a considerable distance. In other words, the intrusive breccia in the footwall and the rhyolite in the hanging wall do not seem to have invaded the series as much as I feared.

In view of this, it seems to me that without waiting for Mr. Courtright to complete his examination, rather extensive drilling could be carried on in this area to advantage, as stated by Mr. Waidler in his monthly letter to you of August 11. This should have as an objective exploration of the limestone northward, as far as is practical, from the present workings, and also exploration on dip from the 510 below the 590. In planning the drilling, I think you should bear in mind that the footwall of the limestone is exposed in the back of the footwall drift on the 590 level in approximately Section 32.20. Short up-holes from this drift will adequately test the limestone above this level, assuming that such drilling has not already been done. If holes are drilled toward the footwall from the hanging wall drifts of either level, they should be long enough to determine the position of the intrusive breccia.

Very truly yours,

ORIGINAL SIGNED BY
W. R. LANDWEHR

W. R. Landwehr

WRL:si
cc:L.K.Wilson
J.H.Courtright (Trench)

November 1, 1950

AIR MAIL

Mr. F. V. Richard, Manager
Southwestern Mining Division
American Smelting and Refining Company
813 Valley National Building
Tucson, Arizona

ARIZONA, SANTA CRUZ COUNTY
HARSHAW DISTRICT
TRENCH UNIT - FLUX MINE

Dear Sir:

The following are the comments and recommendations resulting from my recent trip to the Flux mine:

The studies made at your request by Messrs. Wilson and Bogue have added materially to our geological knowledge of the deposit, and have resulted in plans and sections which aid in directing exploration. However, in reviewing the work I reached certain opinions regarding the geology, which if borne out by detailed study will throw considerably more light upon the results of past exploration and should be of additional aid in directing exploration in the future. These are briefly discussed in the following paragraphs.

The deposits are replacements of limestone of the contact metamorphic type. As such, assuming that geological conditions are favorable, the general mineralization should extend to considerable depths.

There are three, and possibly four, types of intrusive rocks which occur as irregular masses: diorite (?), exposed in the southernmost mine workings and extending southward an unknown distance; intrusive breccia, occurring along the mineralized zone in three separate masses; and rhyolite, irregularly distributed throughout the area. Although the two latter types are on the whole crosscutting, in places they appear to be parallel to the bedding of the sedimentary rocks, particularly the rhyolite. It is possible that a fourth intrusive rock mass, possibly a fine-grained diorite, may exist northeast of the mine workings. Although both diorite masses have many characteristics of flow rocks, the southern mass I believe to be intrusive, and it is possible that the northerly mass is likewise so.

The sedimentary rocks in which the ore bodies occur form a belt trending slightly west of north along the westerly contact of the intrusive masses. They in general have a westerly dip ranging from 35 to 55 degrees.

It seems quite likely that the ore deposits occur in three limestone beds, only one of which is exposed at the surface. The uppermost of the three beds has been most extensively developed. It contains the No. 1, No. 2, No. 2 North, No. 5, and No. 6 Hanging Wall, ore bodies. The lowermost of the three limestone beds contains the No. 6 Footwall ore body.

The existence of the middle limestone bed is somewhat questionable, although indications of such a bed are found on the 510 level in the No. 6 area. If it exists, it has, to my knowledge, produced no ore but may be the host for some of the mineralization cut in diamond drill holes.

The three limestones are exposed in the No. 6 area and also in the 1-3 crosscut of the 430 level in sections 18 and 19. In the block intervening, only the hanging wall limestone has been explored by mine workings, but it is possible, although according to your statement not likely, that the two lower beds may have been explored to some extent by diamond drilling. This block, therefore, may deserve a considerable amount of prospecting. However, rhyolite is present both to the north and south of the 2-1 winze and appears to be in part sill-like and in part crosscutting; consequently the limestones may be largely absent. A study of all available data should throw considerable light upon this problem.

A number of mineralized fissures, in evidence at the surface and in near-surface workings on the ridge in the vicinity of the glory hole, probably have been responsible for the ore bodies in that area. The fissures and the workings should be carefully mapped as a possible aid in exploring the lower limestones. The mapping should be done on 40-scale, to correspond to the mine maps, and should cover all the mine area. The topographic mapping of the area should also be completed as an aid to the geological work.

We know nothing of the stratigraphic sequence below the lowest exposed limestone bed. It is possible that other limestones may exist at minable depths, although here again there are indications that the space may be largely occupied by igneous rocks.

Until the detailed study is completed, exploration should be limited to short-range projects based upon extensions of known mineralization. Drifting northerly along the mineralized zone in the No. 6 area is in this category, although even here it would be better to await the results of the work. The 432 south drift is, in my opinion, in intrusive diorite (?); consequently further exploration there should likewise await the results of the work.

As lead-zinc mineralization was encountered in the Deep and Morrison shafts of the Chief mine, that area should also be covered by the examination, and particularly the so-called Chief fault zone.

Because of the type of the Flux deposits there may be, within the mine area, additional ore bodies, or substantial extensions of those now being mined, assuming the presence of limestone. It is important, therefore, that the examination be completed as soon as possible so that any exploration that seems warranted may be done currently with mining. Mr. Courtright will make the examination and should devote his entire time to it.

Very truly yours,

ORIGINAL SIGNED BY
W. R. LANDWEHR

W. R. Landwehr

WRL:si
cc:W.H.Loerpabel
D.J.Pope
L.K.Wilson
J.H.Courtright

Vitroclastic rocks – micro criteria

1. Flow structure in glass (or devit glass) common

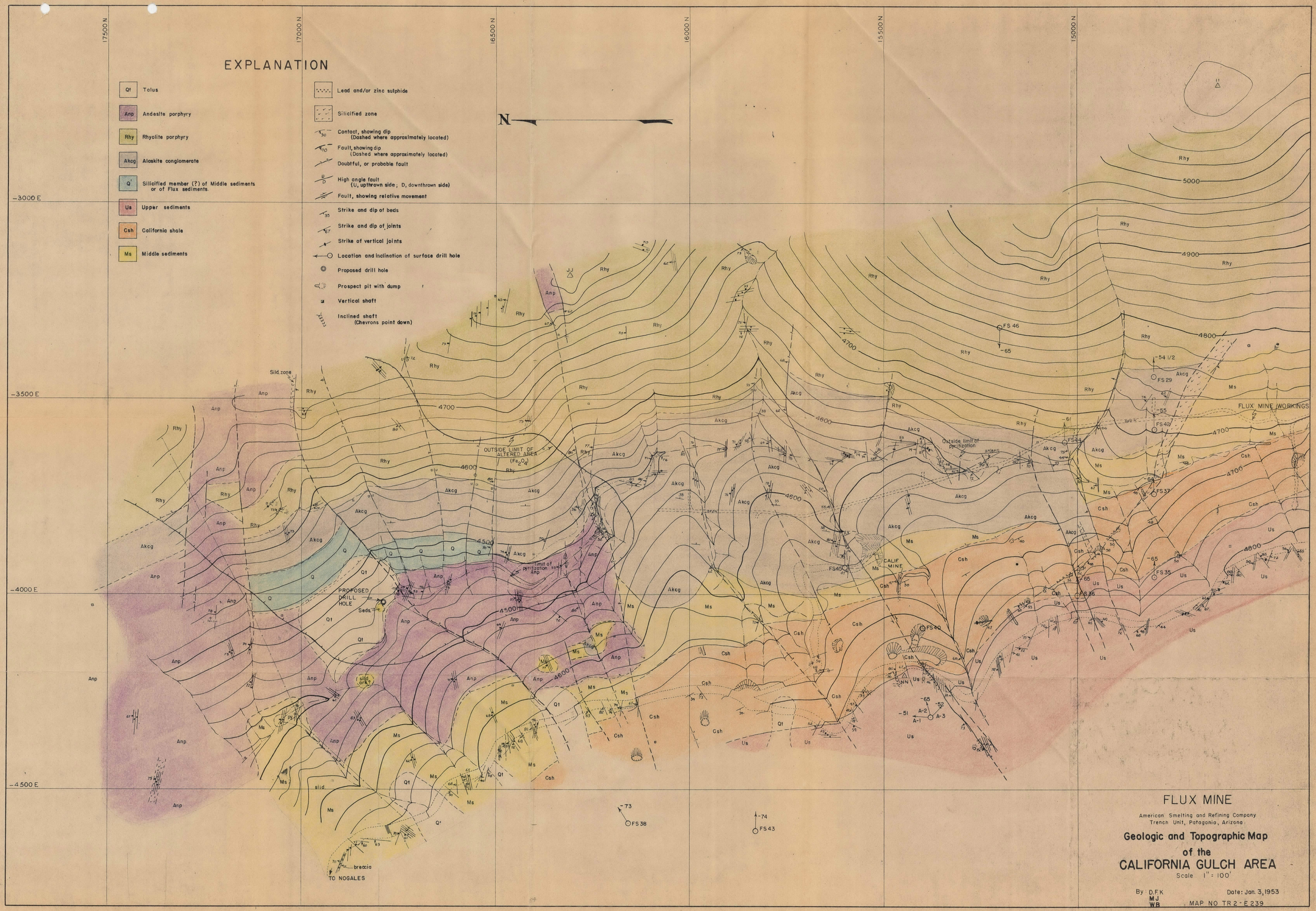
2. Angular rounded + euh feldspars common – also angular + rounded qtz – also rounded zircon flow bands pass around frags.

3. magnetite ubiquitous – often grains produce dk + light bands in glass. Ptygmatic folding of bands common on both large and small scale.

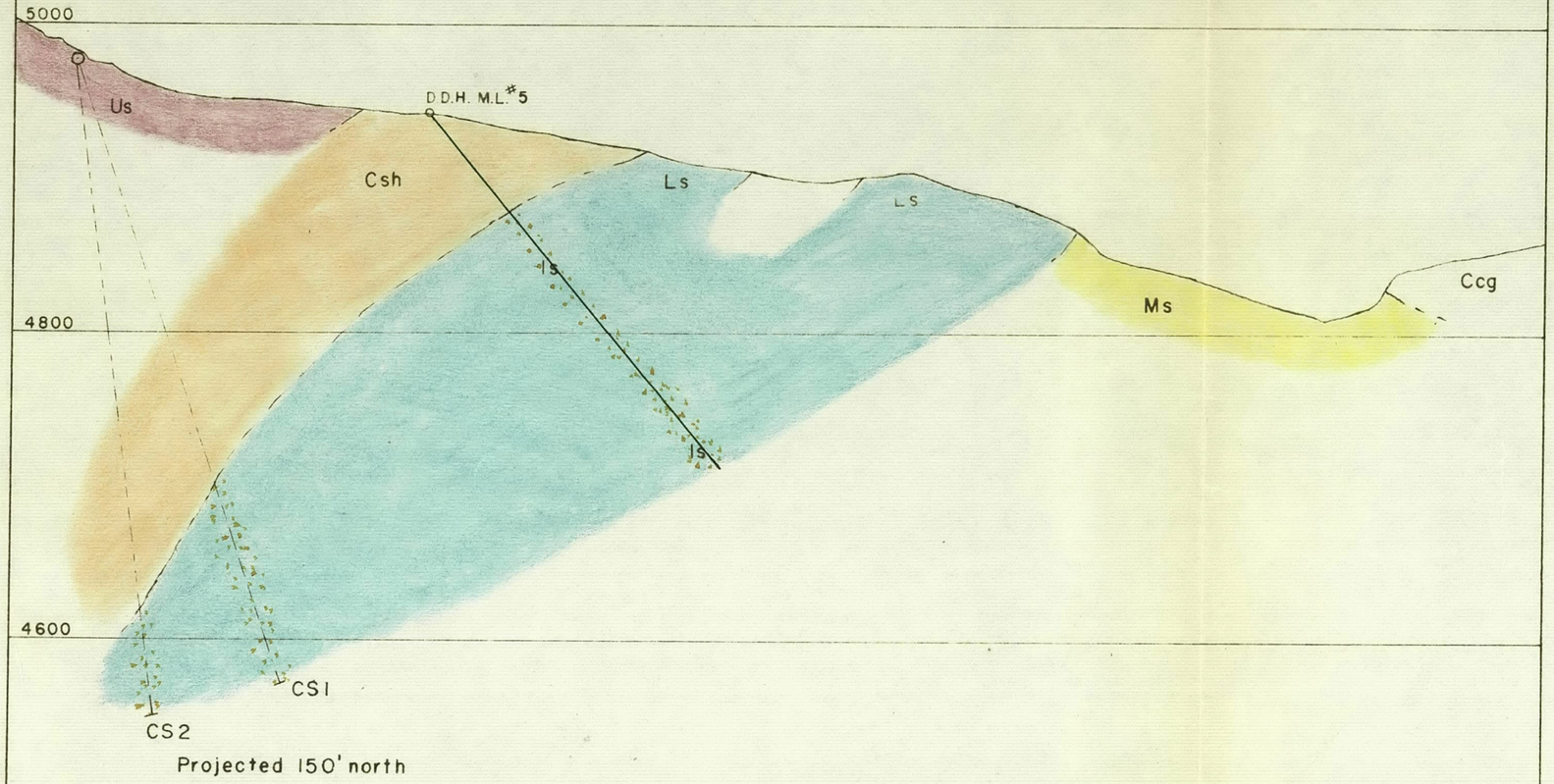
4. Epidote grains are earlier than flow structure

5. Feldspar + qtz frags often occur in a matrix of fine aggregate texture – similar to that of grits – portions of this fine agg with ang grains occur as patches ~~may form grain~~ surrounded by flow-like bands.

Origin – produced by metamorphism – recrystallization of grit or cg matrix – ?


EXPLANATION
Qt Talus
Anp Andesite porphyry
Rhy Rhyolite porphyry
Akcg Alaskite conglomerate
Q' Silicified member (?) of Middle sediments or of Flux sediments.
Us Upper sediments
Csh California shale
Ms Middle sediments
Lead and/or zinc sulphide
Silicified zone
Contact, showing dip (Dashed where approximately located)
Fault, showing dip (Dashed where approximately located)
Doubtful, or probable fault
High angle fault (U, upthrown side; D, downthrown side)
Fault, showing relative movement
Strike and dip of beds
Strike and dip of joints
Strike of vertical joints
Location and inclination of surface drill hole
Proposed drill hole
Prospect pit with dump
Vertical shaft
Inclined shaft (Chevrons point down)
N
17500 N
17000 N
16500 N
16000 N
15500 N
15000 N
-3000 E
-3500 E
-4000 E
-4500 E
OUTSIDE LIMIT OF ALTERED AREA (Fe_2O_4)
Outside limit of pyritization
Limit of pyritization
PROPOSED DRILL HOLE
Seds.
CALIF MINE
FLUX MINE WORKINGS
Sild. zone
breccia
TO NOGALES
FS 46
FS 29
FS 42
FS 44
FS 37
FS 35
FS 36
FS 40
FS 45
FS 38
FS 43
A-1
A-2
A-3
FLUX MINE
American Smelting and Refining Company
Trench Unit, Patagonia, Arizona
Geologic and Topographic Map
of the
CALIFORNIA GULCH AREA
Scale 1" = 100'
By: D.F.K
MJ
WB
Date: Jan. 3, 1953
MAP NO TR 2-E 239

Section drawn in plane of h[illegible], or N65°E
Hole coordinates are 8536.0N, -956.9 E



EXPLANATION

Progress this period	Limestone
Upper Sediments	Middle Sediments
California Shale	Pyrite (disseminated)

ASSAY DATA

C = CORE SAMPLE
S = SLUDGE SAMPLE

SAMPLE NO	TYPE	AG	PB	CU	ZN	FE	

American Smelting and Refining Company
SUNNYSIDE AREA SANTA CRUZ CO., ARIZ.

MARY LOU PROPERTY

CROSS SECTION OF
MARY LOU DDH. NO. 5

Scale : 1 inch = 100 feet

By: P. Eimon 1953

MAP NO. TR-153-C-51

9000 N
8500 N
8000 N
7500 N
N
Silicification
Ccg
Talus slope from silicified rib
Talus slope from silicified rib
arkose ?
alteration
5000
cg 8 ft in drift unsilicified
impure fragmental limestone
DEEP
alteration
Ms
ss
MORRISON
ore on dump
uncertain contact
Ms
cgcg
Ms
4900
DDH ML 2
4899.3
Lower Conglomerate?
-500 E
0
cgcg
Possible fault zone
alteration
Ms
Ls
Ls
Grab Sample 7.20 oz Ag 0.90 Pb 2.45 Zn high Mn
Ls
Ls
Ls
cgcg
cgcg
60°
KEMP
66°
Csh
alt
Us
DDH ML 1
4934.8
DDH ML 3
4941.6
Csh
mudstones, siltstones and shales
-50° N 65° E
450'±
Proposed ML #5
Csh
Area of soil cover
and Upper Sediment float
ss
-1000 E
Us
CS 1 (-71)
CS 2 (-83)
5000
DDH ML 4
5051.2
5100
5200
Ls 65°
FS 10
FS 11
Csh
Us
Us
Us (arkosic)
FS 10, 11, 12 (V)
Bx pipe
Us
Ccg
Mz
Mz
EXPLANATION
Monzonite – plutonic
Chief Conglomerate
Upper Sediments
California Shale (mudstones included)
Middle Sediments
Limestone
Vein or Fissure (leached sulphides)
Fault
Contact
American Smelting and Refining Company
Trench Unit
Patagonia, Arizona
Geologic and Topographic Map
of the
MARY LOU AREA
SCALE 1" = 100'
January, 1953
By: P.I.E.
M.B.J.
MAP NO. TR

13500 N
13000 N
12500 N
-2500 E
-3000 E
-3500 E
GLORY HOLE
No. 2 Orebody
No. 2-N
No. 5 Orebody
NO. 5 SHAFT
70 LEVEL
130 LEVEL
430 LEVEL
260 PORTAL
2-5 RS.
Covered
Powder House
Matrix
Poor outcrop
Prob. ate
No outcrop
NOTE: Mine workings, claims and drainage pattern surveyed by transit and stadia. Geology by tape and compass, Wilson & Bogue, Oct. 1949. Topography available on 40 scale.
Horizontal projection of orebody
Triangulation station
Thin section by R.G.B. - L.K.W.
Thin section by H. Schmitt
29.50
29.00
28.50
28.00
27.50
26.75
26.00
24.50
23.50
22.00
20.00
19.00
18.25
18.00
17.75
17.00
40 SCALE MINE SECTIONS
OUTCROP MAP
Above No. 2 to No. 5 Orebodies
FLUX MINE
Scale 1" = 100'
Embodied in 500 Scale map of Flux area geology, report on ore controls by L. Kenneth Wilson, December, 1949