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Aa. 16A. 3. 19F

AMERICAN SMELTING AND REFINING COMPANY
Tucson Arizona

September 24, 1970

W.E.S.
OCT 5 1970

TO: W. E. Saegart

FROM: R. H. Luning

SUBJECT: Santa Rosa South Project
Stanfield, Pinal County, Arizona

Summary

Five holes were drilled in the exploration drilling of the Santa Rosa South Project beginning June 8, 1970 and ending August 1, 1970. Except for SRS-4 where, due to difficult drilling conditions and limited capabilities of the Failing 1500 drill, bedrock was not reached, all the holes drilled encountered fresh and unmineralized Precambrian granite.

Total costs for 5667 feet of drilling (direct and indirect drilling costs) was $51,228.21 or $9.03 per foot. Drilling and other cost data are itemized later in this report.

Introduction

As a result of additional geologic reconnaissance and geochemical sampling in the vicinity of the North Vaiva Hills, two target areas of potential porphyry copper mineralization and possible sources of anomalous molybdenum were delineated a few miles south of the 1967 Santa Rosa Project (File Aa.16A.3.19F - B. E. French, May 27, 1970).

Drilling

The contractor on the Santa Rosa South Project was Shelton Drilling Co. of Phoenix, Arizona, who used a truck-mounted Failing 1500 drill. The initial hole, designated SRS-1, located in the southeastern corner of section 32, T7S, R4E, was started on June 8, 1970 and completed on June 19, 1970. Coarse grained, fresh and unmineralized Precambrian granite was encountered at 1500'. The hole was bottomed at 1530'.

SRS-2, originally located in the southwestern corner of section 34, T7S, R4E, was relocated one and one-half miles due East and was completed on July 2, 1970 at a depth of 1214'. Premineral bedrock was placed at 1160'. Core runs indicated similarly fresh and unmineralized Precambrian granite.

One other hole had been planned one and a half miles due North of the original SRS-2 location, but on the basis of the information obtained from SRS-1 and SRS-2, it was decided to re-locate SRS-3 to the northeastern corner of Section 24, T7S, R3E. This hole was bottomed at a depth of 401 on July 6, 1970 within fresh and unmineralized Precambrian granite. On the basis of vial examination, bedrock was placed at 220'.

Also see: Santa Rosa South Project, Pinal Co., Az., by BE French. May 27, 1970 (7 pages) File Aa-16A.3.19F

SRS-4 was never drilled to completion. It is located just north of the newly completed Interstate 8 in the southwestern corner of section 7, T7S, R3E. The hole was abandoned at 1950' still in post mineral conglomerate. At a depth of 1685' the drillrods stuck in the hole and after about 48 hours were freed by pouring diesel fuel down the hole. Large amounts of clay within the conglomerate presumably caused swelling of the holewall. Progress was further hampered by loss of the cones of the bit and the replacement of the steel cable on the draw-works. At 1950' tight hole conditions again caused the rods to get stuck and on July 28, 1970 it was decided that, as funds for the project were rapidly being depleted, we should abandon the hole and move to SRS-5.

The last hole, SRS-5, was moved from the originally proposed location in the southeastern corner of section 11, T7S, R3E, about three-quarters of a mile northerly. This hole was completed on August 1, 1970 at a depth of 572' within fresh and unmineralized Precambrian granite. Vial examination placed premineral bedrock at 500'.

The additionally proposed holes by Mr. B. E. French, namely one in the southeastern corner of section 36, T7S, R3E and one in the south central section 14, T7S, R3E, were not drilled.

Attachment A shows the hole locations of the Santa Rosa South Project (colored green) and the earlier (Spring 1967) Santa Rosa Project (colored purple). Mr. Farley provided the geophysical data for the two inferred faults as shown on the map.

Attachment B tabulates the assay results (Mo values ppm) for a number of widely spaced intervals of bulk samples of SRS-3, 4 and 5. These values range from a low of -1 (less than) to a high of 9 ppm Mo.

Geologic logs for SRS-1 through SRS-5 have also been included.

Drilling Data

The following tabulation summarizes the footage drilled, both rotary drilling and diamond coring and depths to premineral rock:

Hole No.	Rotary (Ft.)	Diamond (Ft.)	Depth to Bedrock (Ft.)
SRS-1	1510	20	1500
SRS-2	1201	13	1160
SRS-3	393.5	7.5	220
SRS-4	1928	22	Not Encountered
SRS-5	564	8	500*
Totals:	5596.5	70.5	

Total Footage Drilled: 5667'
Average Depth: 1133'
Range in Depth: 401 - 1950'

* Revised from 540'

A. Direct drilling costs:

1. Contractor's billing

Hole No.	Depth	Cost	Cost/Ft.
SRS-1	1530	$ 8,214.00	$5.36
SRS-2	1214	6,521.00	5.37
SRS-3	401	1,965.00	4.90
SRS-4	1950	17,274.60	8.80
SRS-5	572	2,592.00	4.53
	Total:	$36,566.60	$6.45

The above figures reflect cost per foot as specified in the drilling contract and include hourly rates for coring ($34.00); 12 hour standby time @ $22.00 per hour with crew for SRS-2; rig time for SRS-4 @ $34.00 per hour and the use of 10 drill bits @ $56.60 each beyond 1500'; almost 3000 gallons of diesel fuel @ $0.18 per gallon to free stuck rods on SRS-4 and 50' of 6" casing @ $2.25 per foot.

Seventy and one-half feet of coring was done with the rotary drill at an average cost of $54.00 per foot.

2. Mud Costs (including tax)

Hole No.	Cost	Cost/Ft.
SRS-1	$ 759.26	$0.49
SRS-2	294.97	0.24
SRS-3	248.27	0.61
SRS-4	1,029.01	0.52
SRS-5	241.67	0.42
Total:	$2,573.18	$0.45

Grand total charges for mud and additives were $3,511.08 (tax included) leaving $937.90 unused. Of this amount, ASARCO is to be credited $425.77 for mud and additives salvageable (less $99.00 for transportation charges). The remaining portion was unusable due to careless handling and exposure to weather.

3. Mud losses - $512.13

4. Diamond bit costs - $785.19

5. Mud pits and site preparation - $919.68
(9 sites were prepared but only 5 used)

6. Mud handling and delivery costs - $404.25

Total cost: $41,761.03 $7.36/Ft.

B. Indirect Costs

1.	Salaries	$2,036.00
2.	Travel Expense	1,151.51
3.	Wages	2,735.68
4.	Per Diem Allowance	1,188.00
5.	Transportation	891.26
6.	Supplies and Miscellaneous	1,019.68
	Indirect Costs:	$9,022.13

7. Indirect cost, August '70 (not itemized) 445.05

Total Indirect Costs: $9,467.18 $1.67/Ft.

Total Direct and Indirect Drilling Costs: $51,228.21 $9.03/Ft.

C. Property Costs

1.	Staking claims	$6,440.42
2.	Mineral property, rental payments	3,432.48

Grand Total Project: $61,101.11

R. H. Luning

R. H. Luning

RHL:mw
Att.

ATTACHMENT B

Hole No. and Interval		Mo ppm
SRS-3	80-100	3
	140-160	2
	200-220	1
SRS-4	220-240	2
	400-420	-1
	530-540	2
	630-640	2
	730-740	1
	830-840	2
	930-940	1
	1030-1040	2
	1130-1140	3
	1230-1240	2
	1330-1340	-1
	1440-1450	2
	1520-1530	7
	1620-1630	5
	1720-1730	3
	1820-1830	3
	1940-1950	6
SRS-5	125-155	3
	255-285	9
	405-435	7
	540-550	6

Sept. 24, 1970

Final Depth 1530'
Collar Elevation
Coordinates
Inclination 90°

ASARCO

GEOLOGIC – ASSAY LOG

Property SANTA ROSA SOUTH

HOLE NO. SRS-1
Sheet No. 1 of 1
Date Completed 6/19/7
Logged By RHL 1976

Depth	Interval	Core Size	Sp Grav	Core Rec %	Core Assay – % Cu Total	Non-S	Average	Mineralization Oxides	Pyrite	Cpy	Cc	Other	Alteration		Rock Type	Remarks
60'	160'	5" RoBit														Alluvium & conglomerate. No samples collected.
70	110	4-3/4" RoBit													cgl	Predominantly rounded to subangular qtz, feldspar chips w/occ. granitic fragments. Volcanic (andesite and/or basalt?) grains become more abundant w/depth. Mod. amts of clay.
90	120	"													Cgl basalt	Mostly volcanic chips ranging from dk grey to reddish-grown in color. Some qtz-feldspar chips.
90	100	"													Cgl	Increase in qtz-feldspar fraction w/ subordinate volcanic chips. Occ. granite fragments.
70	80	"													Basalt	Abrupt change to bluish-grey volcanic chips. Clay portion virtually absent. Samples carry little or no concentrate.
40	70	"													-do-	Mixed reddish-brown to grey volcanic (andesite-basalt) chips.
50	10	NX	spot-100 core												Andesite Basalt flow	- An alternating interval of dk grey to reddish-brown volcanic rock w/scat'd vugs some of which are lined by a sott x'talline white min (calcite?). Segments of the core appear almost porous. Numerous reddish specks within the f.gr'd groundmass. Suggests series of flows.
500	850	4-3/4" RoBit													-do-	In essence no change throughout this interval. Varying proportions of reddish-brown to reddish-grey volcanic chips. Clay: wk-moderate.

Page 1 of 2 SRS-1

Final Depth 1530'
Collar Elevation
Coordinates
Inclination 90°

ASARCO

GEOLOGIC – ASSAY LOG

Property SANTA ROSA SOUTH

HOLE NO. SRS-1
Sheet No. 2 of 2
Date Completed 6/19/
Logged By RHL

Depth	Interval	Core Size	Sp Grav	Core Rec %	Core Assay – % Cu Total	Non-S	Average	Mineralization Oxides	Pyrite	Cpy	Cc	Other	Alteration		Rock Type	Remarks
1520	20	4-3/4" Robit													Gr.	Increase of granitic chips. Bedrock placed @ 1500'.
1530	10	NX		100											Gr.	Coarse grained Pre Є granite. No alt. or mineralization observed.
END OF HOLE																

page 2 of 2 SRS-1

nal Depth 1214.0'
ollar Elevation
oordinates
clination 90°

ASARCO

GEOLOGIC – ASSAY LOG

Property SANTA ROSA SOUTH

HOLE NO. SRS-2
Sheet No. 1 of 1
Date Completed 7/2/70
Logged By RHL

h	Interval	Core Size	Sp Grav	Core Rec %	Core Assay – % Cu Total	Non-S	Average	Mineralization Oxides	Pyrite	Cpy	Cc	Other	Alteration		Rock Type	Remarks
0	890	5-1/8",5", 4-3/4" RoBit														Alluvium and conglomerate. St clay between 140 & 320'.
0	190	4-3/4" RoBit													Basalt	Dark reddish-brown fine gr'd volc.
85	115	4-3/4" RoBit													Cgl	Contains varying proportions of volcanic chips. Bedrock placed @ 1160'.
89	4'	NX		37											Gr	Precambrian granite; fresh & unmineralized.
05	16	4-3/4" RoBit													-do-	
14	9	NX		100											-do-	
D OF HOLE																

SRS-2

Final Depth 401.0'
Collar Elevation
Coordinates
Inclination 90°

ASARCO

GEOLOGIC – ASSAY LOG

Property SANTA ROSA SOUTH

HOLE NO. SRS-3
Sheet No. 1 of 1
Date Completed 7/6/70
Logged By RHL

Depth	Interval	Core Size	Sp Grav	Core Rec. %	Core Assay – % Cu Total	Non-S	Average	Mineralization Oxides	Pyrite	Cpy	Cc	Other	Alteration		Rock Type	Remarks
60	60	5-1/8" Ro	Bit													No samples collected
220	60	do														Alluvium and conglomerate. Bedrock placed at 220'.
393.5																
393.5	173.5	5"	RoBit												Granite	Predominantly granitic chips within vials.
401.0																
401.0	7.5	NX		100											-do-	Precambrian granite. No evidence of alteration or mineralization.
END OF HOLE																

SRS-3

Final Depth 1950.0
Collar Elevation
Coordinates
Inclination 90°

ASARCO

GEOLOGIC – ASSAY LOG

Property SANTA ROSA SOUTH

HOLE NO SRS-4
Sheet No. 1 of 1
Date Completed 7/28/70
Logged By RHL 1970

Depth	Interval	Core Size	Sp Grav	Core Rec %	Core Assay - % Cu Total	Non-S	Average	Mineralization Oxides	Pyrite	Cpy	Cc	Other	Alteration		Rock Type	Remarks
60	60	5-1/8" RoBit														No samples collected.
240	1180	5" RoBit														Alluvium and conglomerate. Varying proportions of clay.
246	6	NX		50											Cgl	-
532	286	5" RoBit													Cgl	Strong clay fraction.
538	6	NX													Cgl	-
875	337	4-3/4" RoBit													Cgl	Large amounts of clay.
885	10	NX		100											Cgl	-
950	65	4-3/4" RoBit													Cgl	Drill cuttings suggest no substantial change.
END OF HOLE (Hole abandoned)																

SRS-4

Final Depth 572.0
Collar Elevation
Coordinates
Inclination 90°

ASARCO

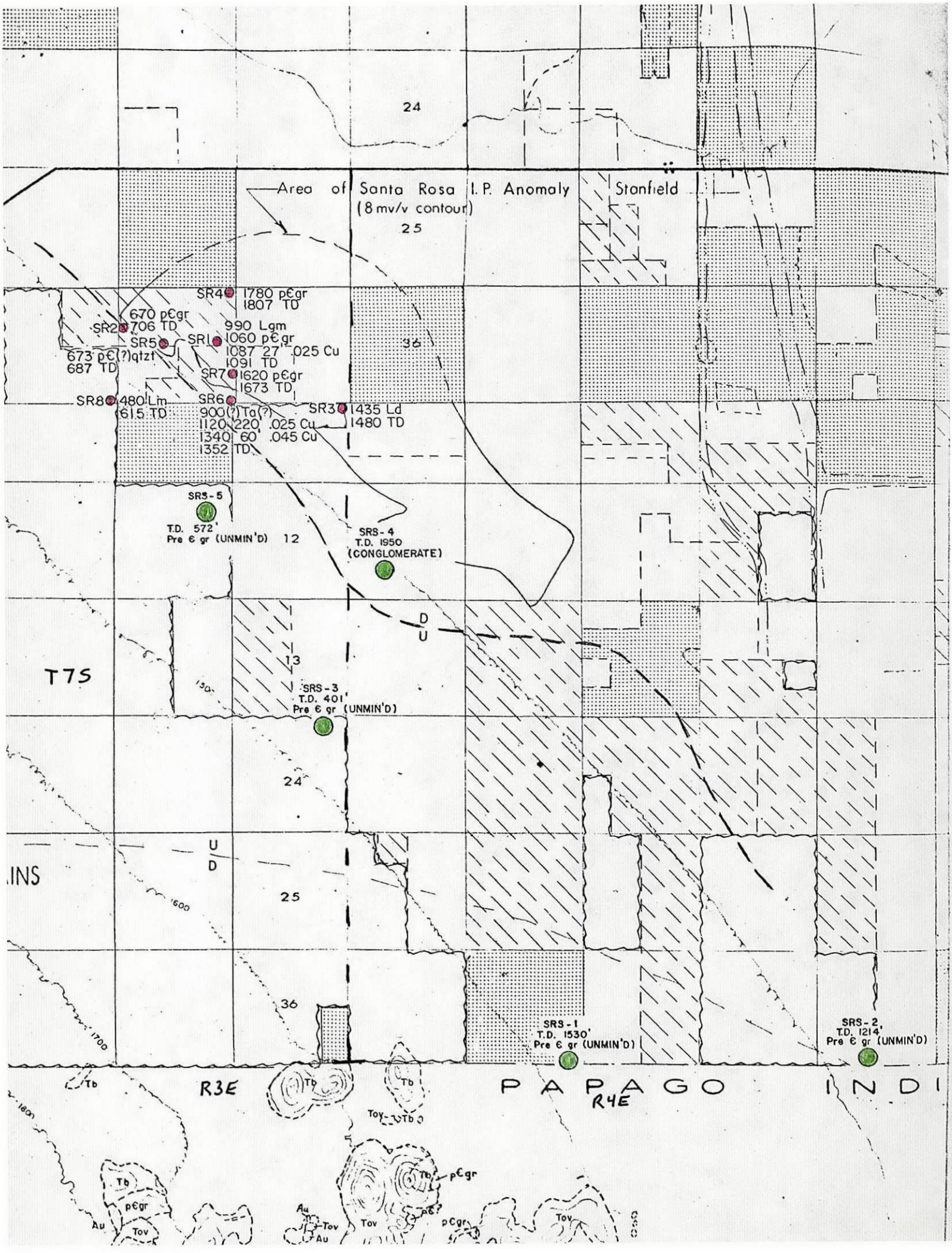
GEOLOGIC – ASSAY LOG

Property SANTA ROSA SOUTH

HOLE NO. SRS-5
Sheet No. 1 of 1
Date Completed 8/1/70
Logged By RHL

Depth	Interval	Core Size	Sp Grav	Core Rec %	Core Assay – % Cu			Mineralization					Alteration		Rock Type	Remarks
					Total	Non-S	Average	Oxides	Pyrite	Cpy	Cc	Other				
65	65	5-1/8" RoBit														No samples collected.
375	310	5" RoBit													Cgl	Variable mixture of schist, andesite-basalt, quartz, feldspar and granitic chips.
500	125	do													Cgl	Increase in granite chips. Bedrock placed @ 500'.
564	64	do													Granite	Predominantly fresh and unmineralized granite.
572	8	NX		100											Granite	Coarse grained (Pre Є) granite; unaltered and unmineralized.
END OF HOLE																

SRS-5


24
Area of Santa Rosa I.P. Anomaly
(8 mv/v contour)
Stanfield
25
SR4 1780 p€gr
1807 TD
670 p€gr
SR2 706 TD
990 Lgm
SR5
SR1 1060 p€gr
1087 27' .025 Cu
1091 TD
673 p€(?)qtzt
687 TD
SR7 1620 p€gr
1673 TD
36
SR8 480 Lm
615 TD
SR6
900(?) Ta(?)
1120 220' .025 Cu
1340 60' .045 Cu
1352 TD
SR3 1435 Ld
1480 TD
SRS-5
T.D. 572'
Pre € gr (UNMIN'D)
12
SRS-4
T.D. 1950
(CONGLOMERATE)
D
U
13
T7S
SRS-3
T.D. 401'
Pre € gr (UNMIN'D)
24
U
D
25
36
SRS-1
T.D. 1530'
Pre € gr (UNMIN'D)
SRS-2
T.D. 1214'
Pre € gr (UNMIN'D)
R3E
PAPAGO
R4E
Tb
Toy
p€gr
Au
Tov

JDS 6/14/76

Santa Rosa South Core & Cutting interpretation

SRS-1 Rotary 0-1500 Spot Core 640-650 Skeleton 641, 646, 1525 & 1529
Core 1520-1530 T.D. Tov pegr

0-160 Qal

160-490 Cgl. variable feldspar, with granite, & volc. chips.

490-1500 Tov. Series of andesitic basalt flow ranging from bluish-grey to red-brown to purplish. Cored portion reddish to purple, vuggy with zeolite filling. Similar to Antelope Peak-I-10 pass volcanics.

TS-1529 1500-1530 T.D. pЄ granite. coarse grained, recrystallized w/crackled qtz, mag-hem biotite sites, orange enhanced feldspar

SRS-2 Rotary 0-1205 Spot Core 1185-1189 Skeleton 1210 pegr
Core 1205-1214 T.D. 1211

0-890 Qal & cgl

890-1080 Tov. dark reddish-brown, purplish volcanics

TS 1210 1080-1214 T.D. pЄ granite. coarse grained weak clay-chlorite, minor mag-hem in biotite sites. Overall light salmon, relatively unenhanced. Some wk hem on shears.

SRS-3 Rotary 0-393½ Skeleton 394 pegr
Core 393½-401 T.D.

0-220 Qal & cgl.

TS 394 220-401 T.D. pЄ granite. coarse grained, mag-hem w/clay-chlorite in biotite sites. Enhanced, weakly chalky feldspar with hard pink feldspar.

SRS Continued

SRS-4 Rotary 0-1950 T.D. Spot Core 1240-1246; 1532-1538; 1875-1885

skeleton 1245, 1533, & 1877

0-1950 T.D. Qal & cgl

1240-1246. Cgl. general fine clast <1/4" few large, rare vole clast; mainly alt (argillic) mz, fine grained with FeOx-clay spotting, some magnetite. Few Fe, reddish, structure at 45°.

1532-1538. Cgl. slightly more gritty, some alt gr but mostly alt mz. more yellow-orange FeOx-clay spotting. Some 45° structure.

1875-1885. Cgl. much more gritty with 1/4"-1/2" clast, less altered fine grained mz, abundant p€gr, some aplite.

SRS-5 rotary 0-564
core 564-572 T.D.

skeleton 567 & 572 p€gr

0-500 Qal & cgl.

TS-567 500-572 p€granite, wk clay-chlorite-mag-hem in biotite site, very weak enhancement of feldspar. partially oxidized Cut by several 45° shears which streak out ferromags.

	Hole	T.D	Rotary	Spot Core	Units
16A.3.19 E F	SRS-1	1530	0-1510	1510-1530 ✓(640-650) ✓(1520-1530)	(vol. agglomerate w/ zeolite Fov.) 0-1500 Qal 1500-1530 pC gr. unalt. (wk mag & chl in hist, very pink.)
	SRS-2	1214	0-1205	✓1205-1214 ✓(1185-1189)	0-1160 Qal 1160-1214 pC gr. unalt. (mag - some chl. in hist) as in SRS-3) ↓ wk hem on shears.
	SRS-3	401	0-393½	✓393½-401	0-220 Qal 220-401 pC gr. unalt. (magnetite in hist., wk alt feld.)
to be recovered?	SRS-4	1950?	0-1928	1928-1950 ✓(1240-1246 1532-1538 1875-1885)	0-1950 Qal, cgl. cgl may be from mg terrane, argillic
	SRS-5	572	0-564	✓564-572	0-540 Qal 540-572 pC gr. unalt. (slight pinking & silicification)

J. H. C.
JUN 10 1970

AMERICAN SMELTING AND REFINING COMPANY
Tucson Arizona

June 2, 1970

Mr. J.J. Collins
Assistant Vice President
New York Office

Santa Rosa South Project
Pinal County, Arizona

Dear Sir:

This will transmit Mr. Barry E. French's Memorandum on the Santa Rosa South exploration proposal of May 27, together with Mining Authorization Forms 302-M and 302-MA which outline proposed exploration costs.

Mr. French has done an excellent job of detailed mapping and sampling in the northern Vaiva Hills where several small zones of altered pre-Cambrian granite have been defined. He has also compiled the results of all the geophysical and geochemical work conducted in the district over the past several years. The objective of our proposed exploration in the Santa Rosa South Area has been completely outlined by Mr. French and is in my opinion supported by the evidence which has been accumulated through his compilation. I am in complete agreement with his recommendations to acquire mineral rights on State and Federal ground and to drill eight rotary scout holes to obtain spot core samples of bedrock beneath post-mineral cover. The proposed drill holes will locally test the covered projection of alteration exposed in the North Vaiva Hills and will explore the possible source areas of anomalous quantities of molybdenum in ground water. These leads provide localized drilling targets within an area which we consider highly favorable in a regional sense. This is the intersection of two porphyry copper lineaments; the Northeast Miami, Superior, Blackwater, Sacaton-Santa Cruz zone and the Northwest Patagonia, Twin Buttes-Mission, Silver Bell zone.

My request for a mining authorization in the amount of $60,000 to cover the cost of land acquisition and drilling was made to you verbally prior to the completion of Mr. French's report. The earlier submission of this Mining Authorization Request was made to enable us to validate three State prospecting lease permits which were due on May 27. These were validated following advisory committee approval of the project on May 20. We are now in the process of locating Federal claims through a contractor in the area defined on Attachment 1 of Mr. French's Memorandum. These claims together with our State prospect permit leases cover all the Federal and State mineral lands within the area of interest. The remaining acreage within the target areas is fee mineral. We do not propose acquiring options on any of the fee land prior to completion of the drilling program as outlined unless important alteration-mineralization is intersected in the course of drilling.

Continuing work by Mr. French includes the following activities.

1. Additional mapping and sampling of outcrops along the northeast margins of the Table Top Mountains in T7S, R3E.

2. Mesquite twig sampling in the pediment areas adjacent to the Vaiva Hills and the Table Top Mountains with analyses for Cu, Mo, Pb, and Zn of the plant ash.

3. Structural photo geologic interpretation of the strong northeast fault zone (and its covered projection) cutting the block of Pinal schist in the Table Top Mountains. This fault zone is the assumed southwest extension of the Sacaton-Santa Cruz structural trend.

A rotary drilling contract has been awarded to Shelton Drilling Company of Phoenix and drilling is scheduled to be initiated on June 8.

Mr. French has done an excellent job in preparing his first report on a major exploration project since joining ASARCO in September, 1969. It is a good example of incorporating numerous and diverse earth science exploration methods to develop the subtle targets which remain in the Southwest. We plan to encourage more comprehensive project studies utilizing the same techniques.

Very truly yours,

W. E. Saegart

W. E. Saegart

Enclosure
WES:lab

cc: JHCourtright, route file copy of Report
RJLacy, w/encl
BEFrench, w/encl
KvdSteinen, w/o encl.
WLKurtz, Route file copy of Report