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James Doyle Sell Mining Collection

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CHS-2W

Final Depth
Collar Elevation
Coordinates
Inclination

ASARCO
GEOLOGIC-ASSAY LOG

Property____________

HOLE NO.___
Sheet No.
Date Completed
Logged By

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
4075-4163	'	BX			patches of lgt green garnet				<0.1				silif.		Lms, cht	Lms, white to lt grey, very fine grained, completely silicified w/ dark gray to blk chert lense & bands 4070-20. Bedding @ 15°. minor hi angled fractures.
4163-4266															Lms, chert	As above, chert ± 15-20%. alt porous zones 2"-3' & rextl'd marble w/ variable lt green garnet. fine vein sulfide hi angled fract w/ calcite & gypsum (15% alt). 5" py-galena @ 4176' (massive). Split core sampled 4205-4215, w/ garnet & 1"-2" py-w/galena, cp.
4266-4323															lms	Lt grey to white very fine xln, nearly completely silicified, minor light gray chert. spotty garnet (10%), few gyp seams, hairline w/ bornite(?) & small fold seams
4323-4400															Lms.	Lt grey to white, vf xln & silif. 50-70% rextal'd w/ leached cavities, spotty lt grn garnet throughout. fine hair calcite w/ sulfides. Weak frac.
4400-4449					4401½-4405		+80° calc. ¼" veinlet w/ garnet-epidote & blk min'l.								Lms	As above, no leaching, but continued spotty garnet (80+% alt, 20% garnet). Sparse, <0.1-.2, very fine diss sulf (bornite?)
4449-4490															Lms	Zebra texture, fine silica red w/ spotty garnet & fine pyrite 2-10% w/ diss sulf. some bornite? slight pinkish cast
4490-4728					4593-4599 Vert fract vn w/ epidote, py-bor?, sphal, galena. (⅛") 4628-4633 Vert fr-vn w/ epidote. (rare min'l) JRK 4714 sampled 1' mn-epid zone.										Lms	Nearly complete silicate conversion of calcite. spotty garnet, leached zones. rare diss sulf. enargite, bornite scarce py. [illegible] leaching, but alt. [illegible] 4433-4690, increasing below w/ leaching of the lms & garnet
4728-4827															Lms (marble)	Recryst lms marble w/ some lt grey [illegible] lms lenses. w/ 25% spotty garnet etc, leached in part. 80° [illegible] structure w/ Mn @ 4796-98. Some epi.
4827-4960									relic? bedding @ 15°						Lms (marble)	Recrystallized lms (marble), sugar textured coarse calcite gyp, horiz plates. w/ [illegible] lt-med grey orig. lms. 2-3% spotty garnet. rare py diss. Broken clear plates appear to be gypsum also. From 4935 down, decrease in grain size, increase in irreg. spotty garnet, up to 30% below 4951 with diss py-sulf (dark), few ½" massive zones, becomes dark grey, fine xln last 2 feet.
4960-4985															Silic lms	Very fine xln grey lms, silicified w/ 2-4% very fine diss pyrite. Highly fractured, some fine py veinlets high angle.

PETROGRAPHIC ANALYSIS

Section No. CHS-2W-4980'

Rock Name
strongly k-feldspathized porphyry.

Megascopic description

Massive - fractured grayish but cut by cream-colored bleached zones along fractures. Estimate 5% 1/8" white specks, occas vaguely tabular; 1% diss dark colored specks - chlorite; 2% dissem pyrite Rock is extremely siliceous? - possibly 95% qtz. with whitish zones clay-sericite? Possible MoS_2 along a fracture

Microscopic description

Minerals

quartz - 10%; fine-gr, discreet, anhedral grains, dissem uniformly throughout

orthoclase - 70%; in med.gr, subhedral phenocryst-like masses and uniform, fine gr, disseminated throughout the rock; sometimes lath-like but mostly shreddy - highly irregular and extremely crud-nch grains; suggestive of hydrothermal k-feldspar

sericite - 5%; fine gr., in small aggregates and dissem in k-feldspar

calcite - 10%; med-f.gr; in narrow veins and disseminated

tremolite - tr; in calcite veins.

chlorite - tr; fine-gr, always closely assoc. w or in contact with pyrite

apatite - 1%; dissem

pyrite-opaque - 2%; dissem and minor in calcite-tremolite veins

Textures

Tabular grains of probable hydrothermal k-feldspar are probably pseudomorphous after original feldspar phenocrysts. Remainder of k-feldspar is very fine-grained; only coarser-grains are clearly biaxial but appear similar to matrix. Abundance of k-feldspar is unusual although crud-nch aspect is often typical of hydrothermal k-feldspar. In places k-feldspar appears to replace quartz grains - also consistent with hydrothermal k-feldspar. A feldspar stain would prove k-spar. Original rock almost certainly a porphyry of some type w 10% phenocrysts. Qtz too fine-grained for fluid inclusions.

F.T.G. - Apr. 11, 1975.

J.H.C.

AMERICAN SMELTING AND REFINING COMPANY
TUCSON ARIZONA

J. H. C.
APR 2 1975

March 27, 1975

Sec. 30, T20S, R22E
Sec 36, T20S, R21E

TO: W. L. Kurtz

FROM: J. R. King

Charleston Project
Cochise Co., Arizona
Monthly Report, March 1975

Drill hole Chs-2W was at 4642 feet as of the 25th of March. Drill progress is averaging slightly over 110 feet per week (two 8-hour shifts, six days).

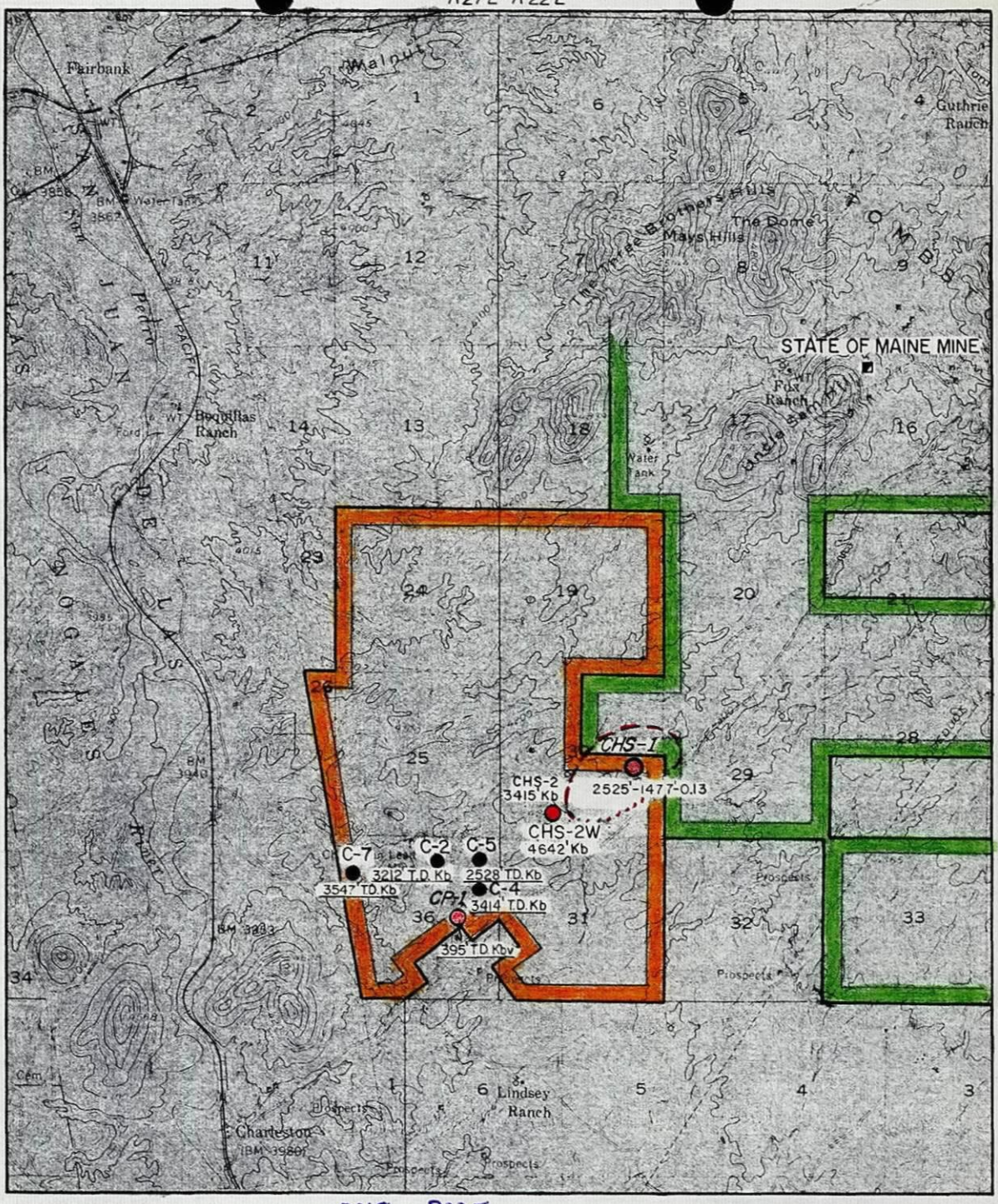
Cretaceous Bisbee sediments are still being encountered; however, since 4100' the drilled section represents almost entirely a former limestone-silty limestone sequence. Alteration is totally pervasive and intense in this section of rocks. Silicification, garnetization, and silication are the predominant alteration processes exhibited. Mineralization (chalcopyrite, sphalerite, and galena) has significantly increased below 4175'.

Estimated balance of authorization is $79,500.

John R. King

John R. King

JRK:lb
Att.



EXPLANATION

- ASARCO property boundary
- Sierra Minerals managment property
- ASARCO drill hole
- Previous drill hole
- Area of pervasive surface hydrothermal alteration & associated brecciation

ROCK TYPES

Lgd — LARAMIDE GRANODIORITE
Kbv — CRETACEOUS BRONCO VOLCANICS
Kb — CRETACEOUS BISBEE GROUP

ASSAY DATA KEY

Depth – Length – % Cu

TO ACCOMPANY Monthly Drilling Report
DATED March 27, 1975
BY J.R. King

DRILLING PROGRESS MAP
for the month of JAN-MAR. 1975

CHARLESTON PROJECT
COCHISE CO., ARIZONA

scale 1 inch = 1 mile
J.R.K.

AMERICAN SMELTING AND REFINING COMPANY
TUCSON ARIZONA

J. H. C.
FEB 21 1975

February 20, 1975

Mr. T. C. Osborne
Assistant Director of Exploration
New York Office

Supplemental Exploration
Authorization Request
Charleston Project
Cochise County, Arizona

Dear Sir:

Drill hole Chs-1 was bottomed at 4002 feet after penetrating about 1500 feet that averaged 0.13% copper in Laramide intrusive rocks. Drill hole Chs-2 is currently drilling at 3818 feet in altered and weakly mineralized Cretaceous Bisbee formation. This hole will be continued to test for ore grade copper mineralization in the lower, limy section of the Bisbee Formation and in the Paleozoic limestones which should underlie the Bisbee.

Regardless of the final results of Chs-2, another drill hole is justified to test for ore grade primary copper mineralization at the margins of the Laramide stock and located south or southwest of Chs-1. Results of this hole will determine whether or not additional drilling on the Charleston Project is justified.

The Stewart Mines Limited Partnership Agreement required a second year drilling commitment of 15,000 feet. We have renegotiated this commitment into two six-month periods, each requiring 3750 feet of drilling. Entering the first six-month period does not commit us to the second.

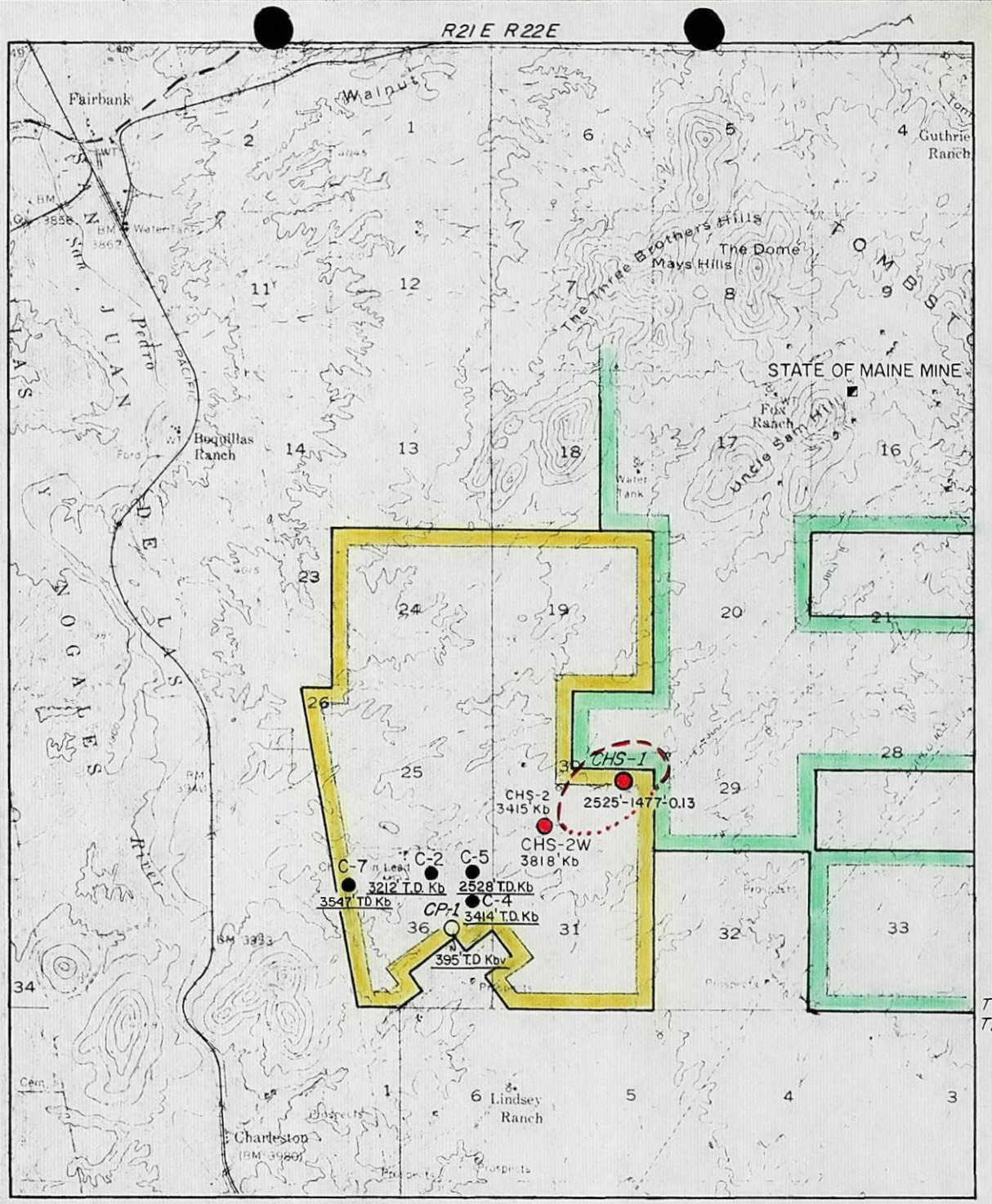
I recommend Asarco sign the amended agreement and enter into the first six-month commitment of 3750 feet of drilling. I estimate total project charges for this drilling plus commitments on State Prospecting Permits at $80,000. If you approve, please request a Supplemental Exploration Authorization in this amount. Forms 302-EA and 302-EB are attached.

Respectfully submitted,

W. L. Kurtz

WLK:lb
Atts: Map; Forms 302-EA & EB

cc: JHCourtright
RBCrist
JRKing
NPWhaley
WGKellogg



EXPLANATION

ASARCO property boundary

Sierra Minerals managment property

ASARCO drill hole

Previous drill hole

Area of pervasive surface hydrothermal alteration & associated brecciation

ASSAY DATA KEY

Depth – Length – % Cu

ROCK TYPES

Lgd — LARAMIDE GRANODIORITE

Kbv — CRETACEOUS BRONCO VOLCANICS

Kb — CRETACEOUS BISBEE GROUP

TO ACCOMPANY Supplemental Exploration Authorization Request

DATED Feb. 20, 1975

BY W.L. Kurtz

DRILLING PROGRESS MAP
for the month of _____

CHARLESTON PROJECT

COCHISE CO., ARIZONA

scale 1 inch = 1 mile

J.R.K.

mp 2725 dpm

PRINTED IN USA 9/68

FORM 302-EB

New York No. .....

APPLICATION FOR SUPPLEMENTAL EXPLORATION AUTHORIZATION

...February 20,.....19.75..

Originating Office ...Tucson - SWED.....

Application is hereby made for supplemental Authorization to cover cost, in excess of original estimate, of work authorized by New York.

No. 0060-00 Charleston Project Cochise County, Arizona

Present total Estimated Cost (Form 302-EA attached)	$.255,000..
Amount previously authorized (date..Nov..21,.1973.)	$.175,000..
Balance for which Authorization is now requested	$..80,000..

ADDITIONAL WORK CONTEMPLATED:

Diamond drill 3750 feet in one hole and complete work requirements on State Prospecting Permits.

EXPLANATION OF INCREASED COST:

Primary copper mineralization within a Laramide stock averaged 0.13% copper between the depths of 2500 feet to 4000 feet in drill hole Chs-1. The proposed hole would test for ore grade primary copper mineralization near the margins of the Laramide stock.

Reviewed by ..... Approved by .....
Acct. Mgr. or Chief Acct. Vice President

Recommended by W. L. Katz..... Approved by .....
Supervisor Comptroller

Account Chargeable to .....
To be designated by Comptroller

Approved by Advisory Committee

.....19.....

Approved by Board of Directors

.....,19.....

.....
Secretary

PROSPECT Charleston Project

LOCATION Cochise County, Arizona

COST ESTIMATE, MINERAL EXPLORATION

OFFICE Tucson - SWED

W. L. Kurtz

No.	Type of Work	Salaries/Wages Days	Salaries/Wages Amount	Material	Fees, Rent, Services	Traveling	Taxes	Other	Total Estimate Cost
501	Outright Purchase								
502	Option Payments								
503	Bonus Payments								
504	Minimum Royalties-								
	Deductible from								
	Future Production								
505	Minimum Royalties-Not								
	Deductible from								
	Future Production								
506	Rental Payments				15,000				15,000
507	Staking Claims								
511	Surface Excavating								
512	Underground "								
521	Surface Drilling				210,000				210,000
522	Underground "								
530	Geologic								
540	Sampling, Assaying, Lab.				7,000				7,000
550	Geophysics								
560	Geochem								
570	Engineering								
580	Construction (temp.)								
590	Construction (perm.)								
610	Administration, Field		15,000			5,000			20,000
	Offices and Camps								
620	Administration, General		3,000						3,000
641	Autos and Vehicles								
642	Aircraft and Boats								
650	Partner's Share								
	ASARCO'S SHARE		18,000		232,000	5,000			255,000
661	Commission or Fees								
663	Exchange								
	TOTAL		18,000		232,000	5,000			255,000

J.H.C.

AMERICAN SMELTING AND REFINING COMPANY
TUCSON ARIZONA

January 30, 1975

J. H. C.
FEB 6 1975

TO: W. L. Kurtz

FROM: J. R. King

Charleston Project
Cochise County, Arizona
Monthly Report -- Jan. 1975

As of the 23rd of January, drill hole Chs-2W was at 3425 feet. The drill hole was cased at 3202 feet and BX core drilling progressed from there. Progress for the reporting period is 481 feet (223' BX, 258' NX). Total footage drilled on the Charleston Project is 8707 feet.

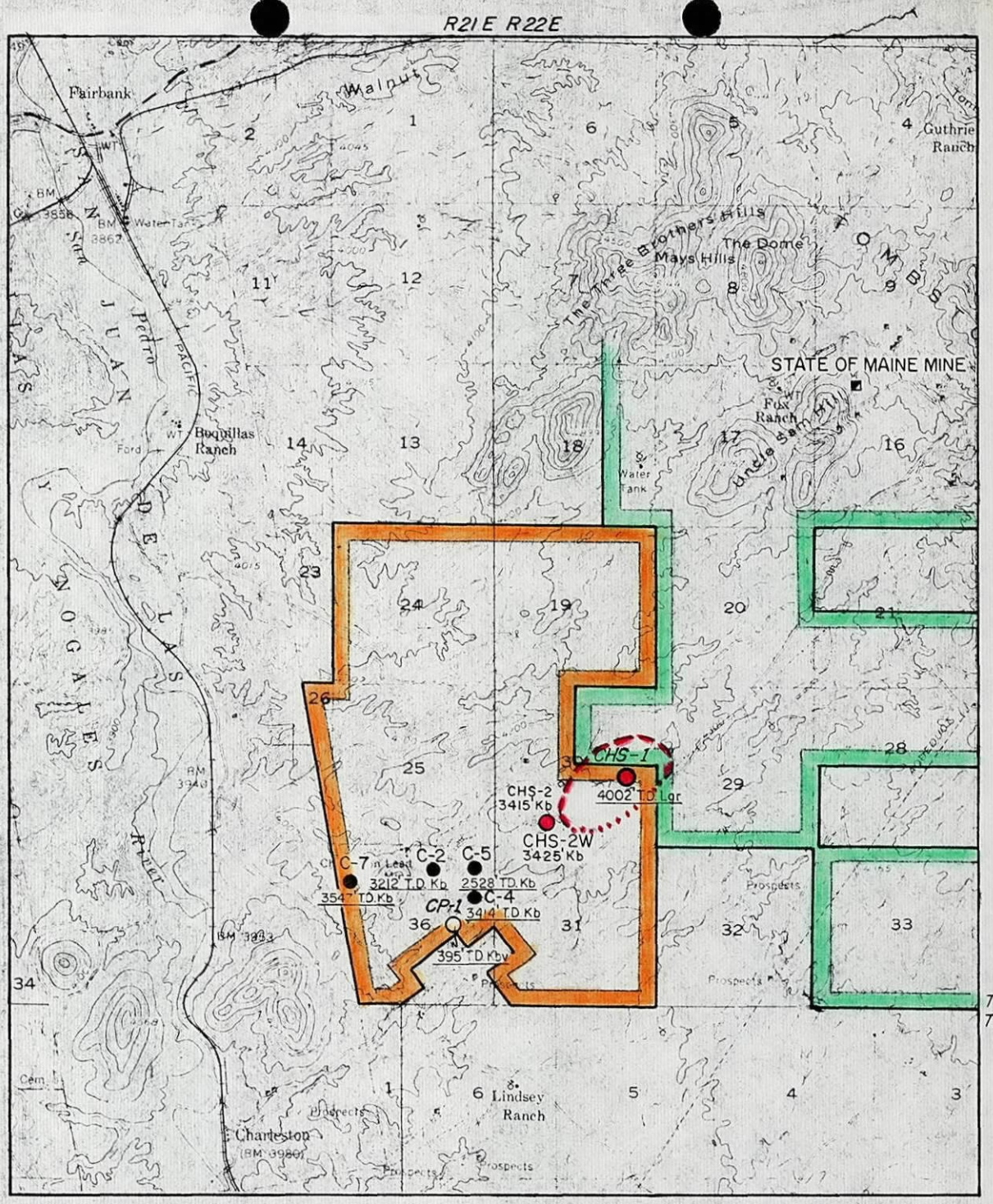
The 10,000-foot drill commitment will not be met by March 1st at present drill rates. Either an extra drill rig needs to be brought in for a 500 to 700-foot hole, or a 30-working-day extension of the contract will be necessary to satisfy the agreement. A third shift on the rig is not possible according to Joy.

The drill hole has not shown any interpretable change in alteration or mineralization since the previous report. In comparing drill hole Chs-2 and Chs-2W, the most noticeable and impressive feature logged is the control stratigraphy (rock type, composition, porosity, and permeability) has on the intensity and pervasiveness of alteration and mineralization. A +40-foot thick limestone, totally replaced by silica and garnet, was encountered at 3350 feet.

Estimated balance of authorization is $23,000.

J. R. King

JRK:lb
Attach.



EXPLANATION

ASARCO property boundary

Sierra Minerals monagment property

ASARCO drill hole

Previous drill hole

Area of pervasive hydrothermal alteration & associated brecciation

ASSAY DATA KEY

Depth – Length – % Cu

ROCK TYPES

Lgd — LARAMIDE GRANODIORITE

Kbv — CRETACEOUS BRONCO VOLCANICS

Kb — CRETACEOUS BISBEE GROUP

TO ACCOMPANY Report (Monthly Drilling)

DATED Jan. 30, 1975

BY J.R. King

DRILLING PROGRESS MAP
for the month of January 1975

CHARLESTON PROJECT

COCHISE CO., ARIZONA

scale 1 inch = 1 mile

J.R.K.

JHC

AMERICAN SMELTING AND REFINING COMPANY
TUCSON ARIZONA

December 20, 1974

TO: W. L. Kurtz

FROM: J. R. King

Charleston Project
Cochise County, Arizona
Monthly Progress Report
December 1974

As of the 19th of December, drill hole Chs-2Wedge was at 2944 feet and progress for the month is 393' of NX core. Total footage drilled on the Charleston project is 8266 feet.

Comparing Chs-2W to the old hole Chs-2, the following differences have been noted:

1. The limy siltstones and limy sandstones contain the better base metal mineralization (galena, chalcopyrite, and sphalerite) and thicker and more frequent sulfide veins.

2. The mineralization of the limy mudstones is predominantly disseminated pyrite and replacement pyrite of the calc-silicated carbonate nodules and limestone laminia.

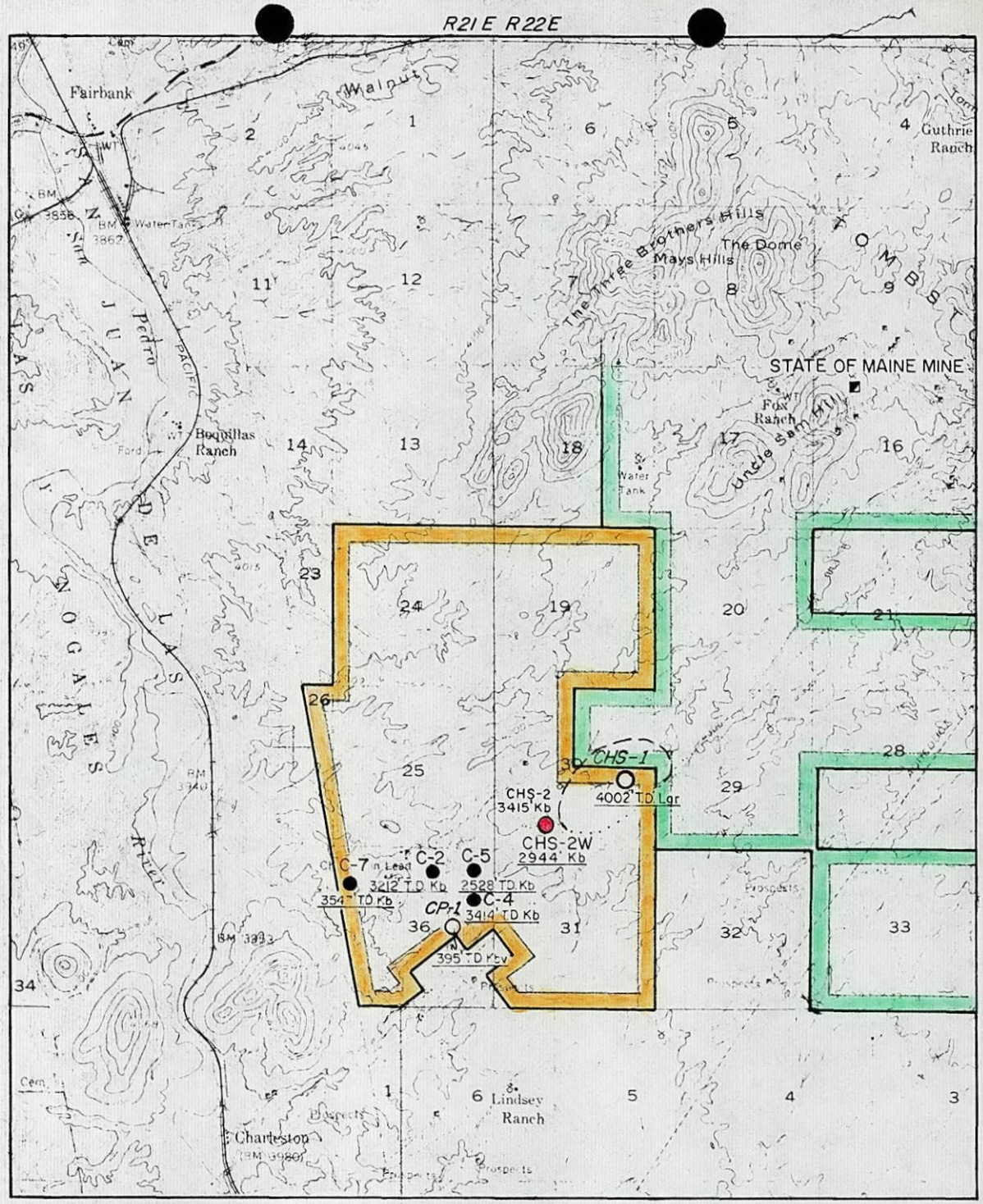
3. Alteration is pervasive and of the same relative type regardless of stratigraphy; however, the limier mudstones display a greater volume of the alteration minerals.

Rechecking drill hole Chs-1, a post-mineral fault occurs from 3605'-3656', which is tentatively believed to be the same structure as encountered in Chs-2 from 3033'-3093'. In Chs-1, this structure bottoms the best intercept, 240 feet of .233% Cu.

Estimated balance of the authorization is $32,000.

John R. King

JRK:lb
Attach.



EXPLANATION

ASARCO property boundary

Sierra Minerals manogment property

ASARCO drill hole

Previous drill hole

Area of pervasive hydrothermal alteration & associated brecciation

ASSAY DATA KEY

Depth – Length – % Cu

ROCK TYPES

Lgd — LARAMIDE GRANODIORITE

Kbv — CRETACEOUS BRONCO VOLCANICS

Kb — CRETACEOUS BISBEE GROUP

TO ACCOMPANY Monthly Drilling Report

DATED Dec. 20, 1974

BY J.R. King

DRILLING PROGRESS MAP
for the month of Dec. 74

CHARLESTON PROJECT
COCHISE CO., ARIZONA

scale 1 inch = 1 mile

J.R.K.

mp 2725 dam

AMERICAN SMELTING AND REFINING COMPANY
TUCSON ARIZONA

J. H. C.
DEC 20 1974

December 10, 1974

Mr. T. C. Osborne
ASARCO
New York Office

file

Enclosed is Mr. Graybeal's report on fluid inclusion studies of surface rocks and drill core from the Charleston Project area. Mr. Graybeal verbally presented the significant findings of his study during your recent trip to Tucson.

Fluid inclusion case histories, such as 3R-Thunder Mountain, are supporting theoretical studies, and it now appears that these studies may help in guiding our exploration. It should have applicability in the San Juan Colorado type environment.

W. L. Kurtz

W. L. Kurtz

WLK:lb
Enc.

cc: JHCourtright - w/enc.
FTGraybeal - w/o enc.

AMERICAN SMELTING AND REFINING COMPANY
TUCSON ARIZONA

December 2, 1974

TO: W. L. Kurtz

FROM: F. T. Graybeal

Alteration and fluid inclusion studies, Charleston project, Cochise County, Arizona

SUMMARY

Lateral and vertical zoning of advanced argillic, phyllic, and potassic alteration as well as gas-rich and saline fluid inclusions appears well-developed adjacent to CHS-1. Propylitic alteration and dilute fluid inclusions dominate in CHS-2 and all other deep drill holes. Hole CHS-1 appears to have drilled through the porphyry copper system into relatively fresh granodiorite porphyry.

The transition from the central to peripheral zones is fairly sharp and appears to confine the zone of pervasive alteration to a small area. Thus, the potential for disseminated mineralization in porphyry appears limited. The potential for copper-bearing skarn deep under CHS-2 appears reasonable and this hole should be continued.

INTRODUCTION

A brief investigation was made of 96 thin sections available from various surface locations and drill holes in the Charleston mining district. This work was limited to a study of alteration mineralogy and fluid inclusions. My exposure to the area is limited to this work, review of the file data, a brief review of selected core from CHS-1 and 2, one day in the field, and several discussions with J. R. King. A number of interesting features were observed, some with favorable exploration implications, indicating the need for further work.

THE DATA

The majority of the rock types sampled are granodiorite porphyry, andesite porphyry, and Uncle Sam porphyry — a quartz latite ash flow tuff. These rocks tend to alter in similar ways and do not noticeably influence alteration patterns. Clastic and limy rocks in the Bisbee group respond in an irregular fashion and their distribution is noted where important.

Surface samples.

Eleven surface samples were examined, mostly from within the altered zone as shown on Figure 1. All samples of the breccias contained strong advanced argillic alteration as quartz-kaolinite-diaspore, quartz-alunite-diaspore (sericite), and quartz-alunite. Samples of the unbrecciated rocks contained only phyllic alteration, regardless of their proximity to the breccias. Breccias, other than those sampled, were examined in the field and all exhibited the typical resistant, gray, somewhat porous and siliceous nature common to the samples thin sectioned. It is not clear whether the breccias controlled the advanced argillic alteration or whether the alteration formed the breccias. Fragments in the breccias are both angular and rounded. The breccias are not particularly vuggy and vug-filling quartz is generally absent.

Samples collected outside the breccias contain varying amounts of sericite. Information in CHS-1 and 2 suggests that the majority of the sericite is hypogene.

The distribution of gas-rich fluid inclusions is shown on Figure 1. Although a rather limited number of samples were collected, the abundance of gas-rich inclusions (as a percentage of total inclusion types present and independent of the total abundance of all fluid inclusions) decreases uniformly outward from an area centered near CHS-1. A second smaller area of abundant gas-rich inclusions is present at the northeast edge of the zone of "90 percent pervasive alteration" (see J.R. King, Geologic Report, Charleston Area, Sept. 1973, Att. B). Within the larger area, gas-rich inclusions are abundant in both the breccias and the wallrocks.

Hole CHS-1.

Forty-eight thin sections were studied and are summarized on Figure 2. Sericite is variably present in Uncle Sam porphyry, andesite, and granodiorite porphyry to about 2700 ft. and decreases in abundance to the bottom of the hole. Hydrothermal biotite and orthoclase with traces of apatite are present from 900-1600 ft. with sericite and from 2400-4002 ft. mostly exclusive of sericite. A well-defined zone of anhydrite (present in excess of 1 percent) is present from 1100-3000 ft. Below about 3000 ft. the hole is entirely within a granodiorite porphyry stock of unknown size in which both hydrothermal biotite and orthoclase decrease in abundance to 4002 ft. The granodiorite porphyry appears to be the source of the mineralization.

Pink orthoclase, which forms about 25 percent of the rock, persists to the bottom of the hole. It strongly resembles hydrothermal feldspar and has led to the interpretation that this rock has undergone strong potassic alteration. However, the presence of granophyric intergrowths of this feldspar and quartz suggest it is of igneous origin. In addition, the presence of several unrecrystallized, coarse-grained biotite grains and

plagioclase compositions of An_{43} (one determination on a Carlsbad-Albite twin at 3964 ft.) suggest that the majority of the minerals in the granodiorite porphyry are magmatic.

Clear evidence that sericite cuts hydrothermal biotite, orthoclase, and anhydrite suggests the phyllic alteration below 1500 ft. may overprint preexisting potassic alteration. This is also suggested by the isolated nature of the upper potassic zone and the high level position of the anhydrite zone — normally a potassic-zone mineral — and permits the interpretation of thermal collapse of the alteration zones in this area, possibly along vein systems.

Of particular significance is the nature of the fluid inclusions. Gas-rich inclusions are abundant throughout the hole. Saline inclusions become abundant below 1400 ft. with hematite and halite as the most common daughter minerals. The presence of the saline inclusions is a clear indication of the underlying higher grade copper mineralization. I am somewhat surprised the grade was not higher, although the relatively small size of the system may be the culprit.

Hole CHS-2.

Eighteen thin sections to a depth of 3384 ft. were studied. All samples of igneous rocks contain propylitic alteration in which the Fe/Fe+Mg ratios of chlorite decrease noticeably with increasing depth. Anhydrite is present below 2200 ft. in both the igneous and sedimentary rocks. Fluid inclusions were generally the low-salinity type which are characteristic of peripheral environments, in agreement with the alteration assemblage. Only sedimentary rocks were sampled below 3150 ft. and they were not suitable for fluid inclusion studies. Alteration in them varied extensively and garnet was irregularly abundant.

Hole TMR-1.

A single sample at 600 ft. contained well-developed advanced argillic alteration and gas-rich fluid inclusions. This hole is located about 500 ft. NE of CHS-1.

Hole TM.

Three thin sections were weakly altered. They contained iron-rich chlorite and low-salinity fluid inclusions. This hole is located 7500 ft. NE of CHS-1 and is incorrectly labeled as TMR-1 on Attachment 1 of J.R. King's report (correction brought to my attention by Mr. King).

C-series drill holes.

Twelve thin sections mostly below 2000 ft. were examined from holes C-3, 5, and 7 in a variety of rock types. Only propylitic alteration was observed along with low-salinity fluid inclusions. Garnet was present in C-7:3287. The mineralogy of all three holes was similar.

Tenneco holes.

Three thin sections were examined from Tenneco holes H-1 and T71-3. These samples were of fresh Schieffelin granodiorite which is indistinguishable from the Patagonia granodiorite. Of more specific interest is the presence of saline fluid inclusions in matrix quartz from hole T71-3, which are very similar to fluid inclusions observed in the Patagonia granodiorite along the north side of Soldier Basin adjacent to the Sunnyside alteration zone.

DISCUSSION

Alteration zoning is clearly defined on a district-wide basis regardless of the irregular distribution of the sample points. The lateral zoning pattern is mixed advanced argillic and phyllic alteration outward into propylitic alteration as shown on Figure 1. The vertical zoning pattern in CHS-1 is mixed advanced argillic and phyllic to phyllic to potassic with increasing depth as shown on Figure 2. The shape of the vertical zones is uncertain, although the potassic alteration probably does not extend much beyond the limits of the zone of gas-rich inclusions as seen on the surface. The broad-crested domal shape of the anhydrite zone is crudely paralleled by variations in the Fe/Fe+Mg ratio in chlorite, and together may indicate that the deep potassic zone is more widespread than is indicated on Figure 2.

Fluid inclusion zoning is also well defined. Gas-rich inclusions occur only in association with advanced argillic, phyllic, and potassic alteration. Gas-poor, low-salinity inclusions are dominant in the propylitically altered rocks. Saline inclusions appear restricted to areas within and immediately above potassic alteration in CHS-1. It is interesting that experience gained from fluid inclusion studies in the Sunnyside area would have led to the prediction, based on any single thin section at the top of CHS-1, that potassic alteration with a significant (+200 ft.) interval of +0.20% Cu as chalcopyrite would be intersected at depth. Although I could not predict the depth, thickness, or grade of the mineralization, the mere ability to predict its presence is of significant exploration importance and attests to the potential practical value of simple fluid inclusion studies.

The remaining potential appears to lie beneath the altered zone mapped by J. R. King. This zone is small as compared to other porphyry copper deposits, but the strength, type, and zoning of hydrothermal alteration and fluid inclusions are impressive. The somewhat variable alteration zoning

in the intermediate portion of CHS-1 is worrisome and may reflect an incompletely equilibrated porphyry copper system or late thermal collapse. I am satisfied from a brief review of the core and thin sections that the base of the system has been penetrated in CHS-1 and that there is no potential for deeper economic mineralization in the granodiorite porphyry.

Interpretation of data gathered to date in CHS-2 is also troublesome. The absence of well-defined alteration or fluid inclusion zoning and the peripheral nature of the alteration mineralogy and fluid inclusion types contrast sharply with features observed in CHS-1 and are initially unfavorable. In addition, the fine-grained, disseminated garnet in the limy sections below 3000 ft., initially considered to be skarn proximal to an intrusion, is similar to the garnet in C-7. This latter hole is peripheral in all other respects and may indicate that the presence of this type of garnet is not diagnostic. However, the presence of copper-bearing skarn in underlying Paleozoic limestones may exhibit vertical zoning patterns quite different from those known to occur in igneous rocks, and thus, speculations based on hydrothermal alteration or fluid inclusion zoning are difficult to make. The broad-crested domal shape of the anhydrite zone shown on Figure 2 may indicate that the potassic-phyllic interface could be more flat-lying and, if parallel to the anhydrite zone, would intersect CHS-2 at about 4500 ft. As Paleozoic limestones may be present at about this depth, it would appear desirable to extend CHS-2 to that depth regardless of the overlying alteration patterns.

Of a more general nature, I am impressed with several aspects of the Schieffelin granodiorite near Charleston. The outcrops of granodiorite near Bronco Hill may be worthy of additional study, particularly in regard to mineralization in the numerous pits in the Bronco volcanics to the northeast and to adjacent areas of post-mineral cover. I believe John King has suggested some geologic drilling in this area.

Another comment concerns the Laramide andesite porphyry mapped by King in the area of the current drilling. The dark color and variable epidote alteration of this rock is similar to the dike rocks adjacent to San Manuel, to the Copper Bell quartz monzonite porphyry at Courtland-Gleeson, to some of the andesite at the San Juan mine at Safford, and perhaps to some of the dikes at Silver Bell. Further reconnaissance and study in the greater Charleston district appears warranted.

F. T. Graybeal

FTG:lb
Attachs.

cc: JRKing

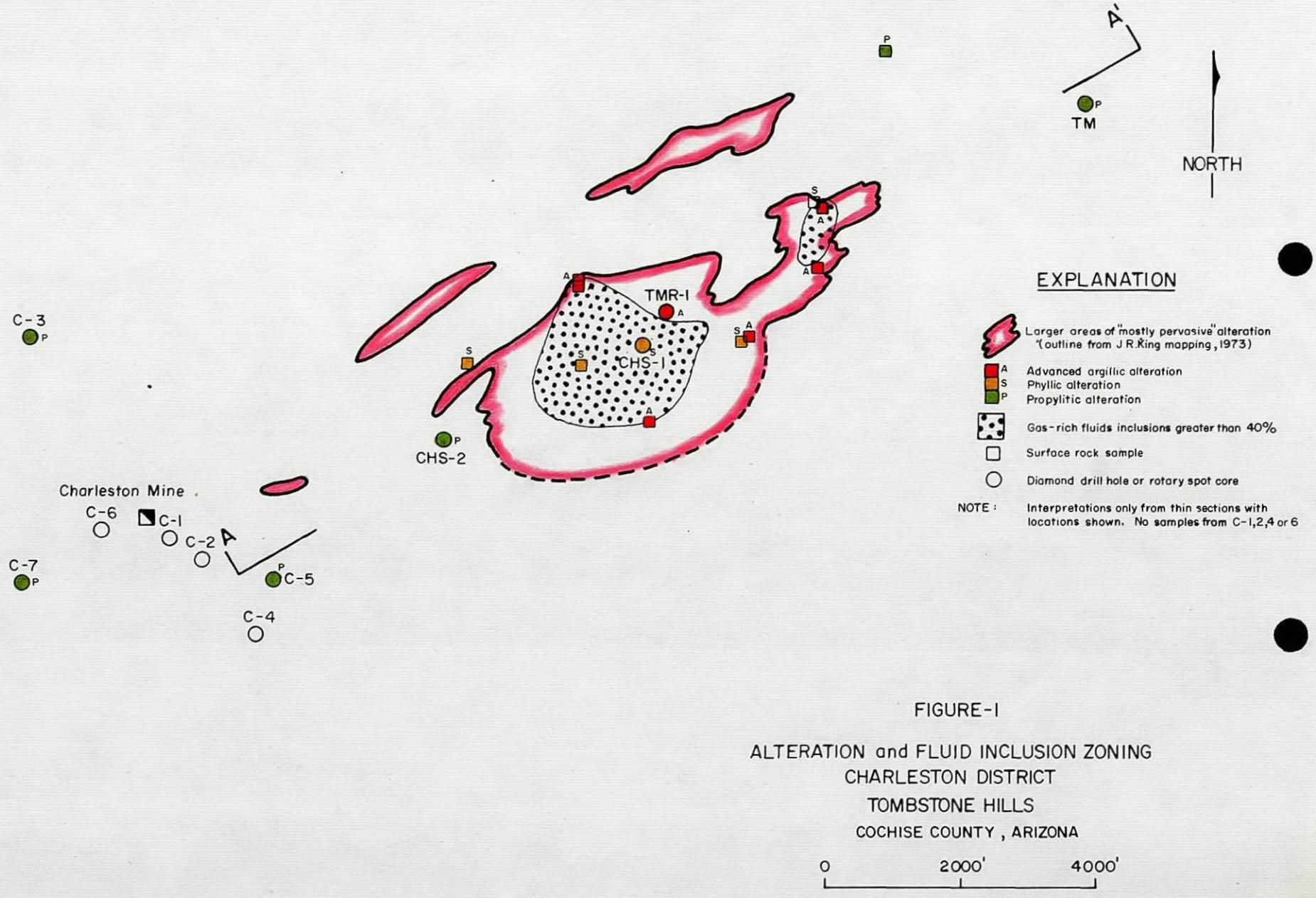


FIGURE-1

ALTERATION and FLUID INCLUSION ZONING
CHARLESTON DISTRICT
TOMBSTONE HILLS
COCHISE COUNTY, ARIZONA

0 2000' 4000'

mn 2790a dam - ftg

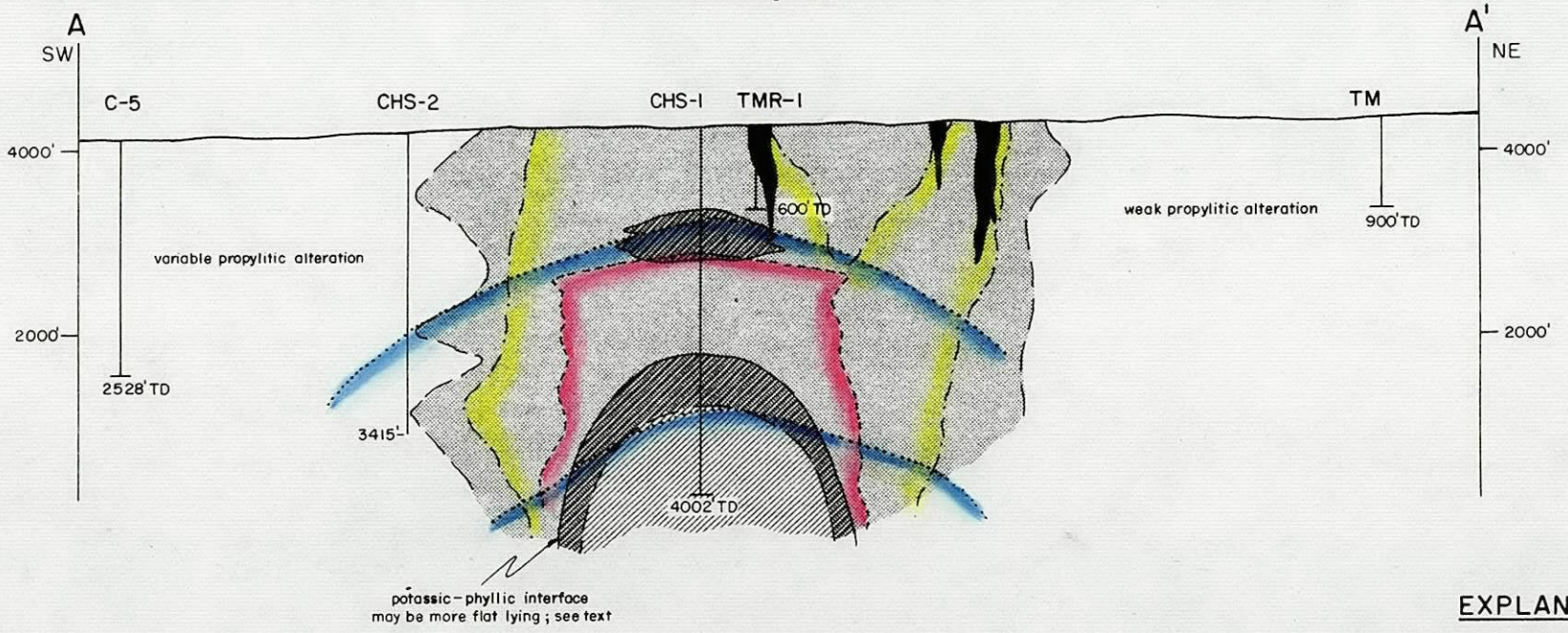


FIGURE-2

ALTERATION and FLUID INCLUSION ZONING
CHARLESTON DISTRICT
TOMBSTONE HILLS
COCHISE COUNTY, ARIZONA

0 2000' 4000'

mn 2790b dam-ftg

J.H.C.

AMERICAN SMELTING AND REFINING COMPANY
TUCSON ARIZONA

J H C.

OCT 30 1974

October 29, 1974

TO: W. L. Kurtz

FROM: J. R. King

Charleston Project
Cochise County, Arizona
Monthly Progress Report
October 1974

As of the 28th of October, drill hole Chs-2 was at a depth of 3415 feet. The hole was cased and reduced to BX at 3002 feet. Severe caving has stopped progress and an attempt will be made to ream the hole and reset casing below the cave area.

A high angle (≈70°) fault was encountered from 3033 feet to 3093 feet and it is believed that this structure is responsible for the cave problems. The fault does not appear to be significant in terms of geologic offset as similar (lithology, attitude, alteration, and mineralization) sedimentary rocks exist above and below the fault.

Three encouraging features are interpreted from the logging of the core from this month's drilling.

1. The Bisbee sediments are becoming increasingly limey in lithology with depth. In the Tombstone district this is indicative of being within 1000 feet of Paleozoic limestones (Gilluly, USGS PP 281, pp 78-79). In Chs-2, 2088 feet of Bisbee sediments and porphyry dikes have been drilled since first encountering sedimentary rocks at 1327 feet.

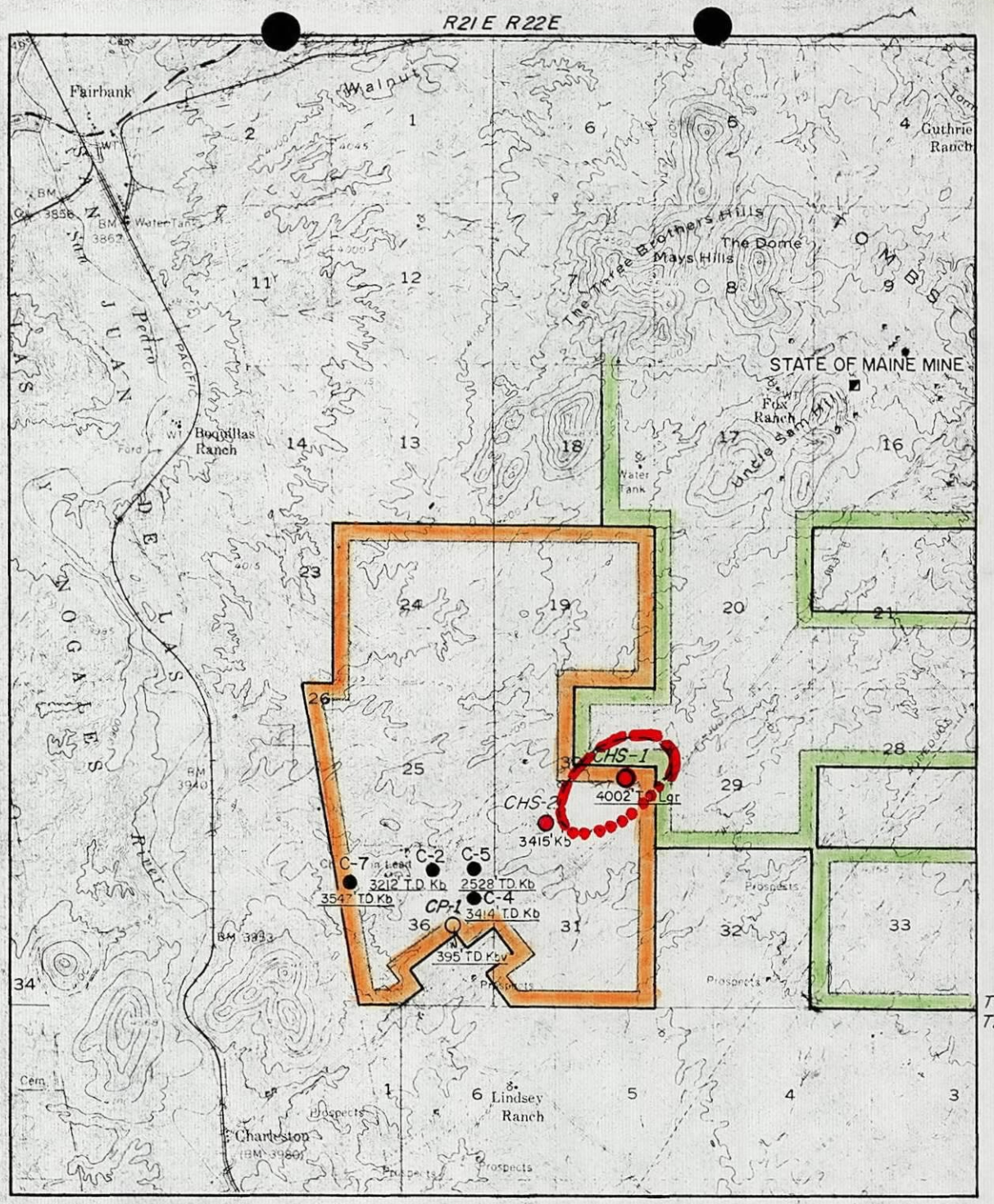
2. Alteration is totally pervasive below 2100 feet and is increasing in intensity with depth. The limestones and silty limestone are intensely altered to a variable assemblage of calc-silicates, silica and clay. Sulfides (pyrite, galena and chalcopyrite) are occurring as small replacements.

3. Base metal mineralization (Pb, Zn, Cu) is increasing with depth.

Estimated balance of authorization is $49,000.

John R. King
J. R. King

JRK:lb
Attach.



EXPLANATION

ASARCO property boundary

Sierra Minerals managment property

ASARCO drill hole

Previous drill hole

Area of pervasive hydrothermal alteration & associated brecciation

ASSAY DATA KEY

Depth – Length – % Cu

ROCK TYPES

Lgd — LARAMIDE GRANODIORITE

Kbv — CRETACEOUS BRONCO VOLCANICS

Kb — CRETACEOUS BISBEE GROUP

TO ACCOMPANY MONTHLY DRILLING REPORT

DATED 10-29-74

BY J.R. KING

DRILLING PROGRESS MAP

for the month of OCT - 74

CHARLESTON PROJECT

COCHISE CO., ARIZONA

scale 1 inch = 1 mile

J.R.K.

mp 2725 dam

J.H.C.

AMERICAN SMELTING AND REFINING COMPANY
TUCSON ARIZONA

J. H. C.
AUG 29 1974

August 27, 1974

TO: W. L. Kurtz

FROM: S. R. Davis

Charleston Project
Cochise Co., Arizona
Monthly Progress Report
August 1974

Diamond drill hole CHS-2, started July 15th, had penetrated to 2,270 feet as of August 24th. Progress for the month consisted of 612 feet of NC core and 1,258 feet of NX core.

The rock types penetrated include Laramide Uncle Sam porphyry (0-1575') and Cretaceous Bisbee group sediments (1575'-2270'). Numerous small dike and sill-like masses of andesite, andesite porphyry, and latite were also encountered. The Uncle Sam is generally a quartz latite porphyry to a quartz monzonite porphyry(?) and most often has undergone moderate to intense clay-sericite alteration. The Bisbee group sediments exhibit variable recrystallization and metamorphism with locally abundant epidote and chlorite.

Pyrite is present throughout and varies from less than 1/2% to greater than 5% by volume. Rare chalcopyrite, sphalerite and galena(?) were observed.

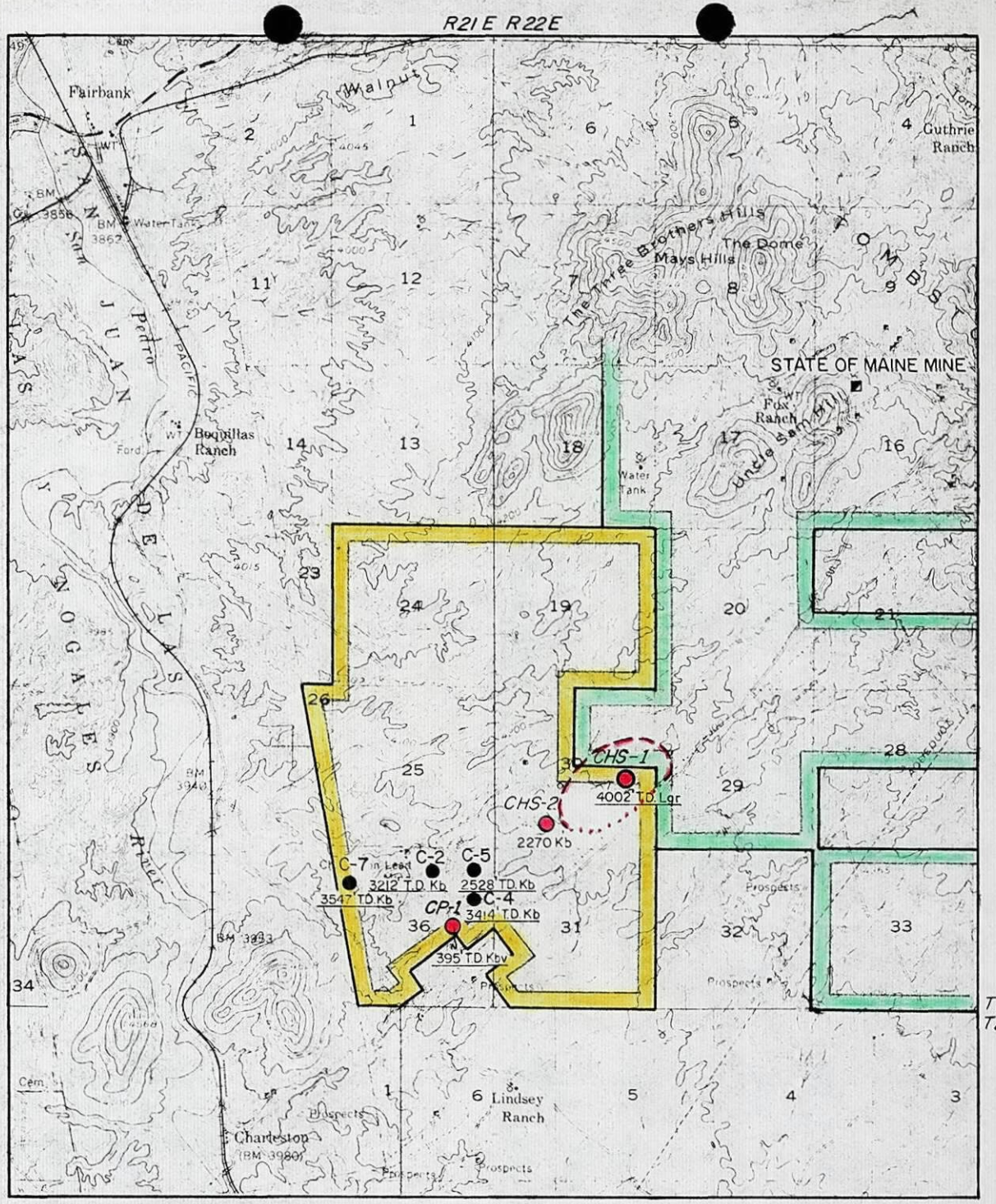
Splitting of the core from CHS-1 below 2525 feet is continuing and complete assay data should be available by late September. No assays are yet available for CHS-2.

Estimated balance of authorization is $68,000.

S. R. Davis

S. R. Davis

SRD:lb
Attach.



EXPLANATION

ASARCO property boundary

Sierra Minerals managment property

ASARCO drill hole

Previous drill hole

Area of pervasive hydrothermal alteration & associated brecciation

ASSAY DATA KEY

Depth – Length – % Cu

ROCK TYPES

Lgd — LARAMIDE GRANODIORITE

Kbv — CRETACEOUS BRONCO VOLCANICS

Kb — CRETACEOUS BISBEE GROUP

TO ACCOMPANY Monthly Drilling Report

DATED Aug. 29, 1974

BY S.R. Davis

DRILLING PROGRESS MAP
for the month of August, 1974

CHARLESTON PROJECT

COCHISE CO., ARIZONA

scale 1 inch = 1 mile

J.R.K.

J.H.C.

AMERICAN SMELTING AND REFINING COMPANY
TUCSON ARIZONA

J. H. C.
AUG 6 1974

July 26, 1974

TO: W. L. Kurtz

FROM: J. R. King

Charleston Project
Cochise Co., Arizona
Monthly Progress Report
July 1974

Drill hole Chs-1 was bottomed at 4002 feet. Progress since the last monthly report was 706 feet of BX core. The rock encountered is a granodiorite(?) porphyry pluton(?) cut by andesite porphyry dikes. Potassic alteration is pervasive; however, the intensity of alteration is questionable. My interpretation is that the granodiorite porphyry is intensely flooded with groundmass hydrothermal potassium-feldspar. Intense biotitization of the groundmass exists throughout the andesite porphyry. Mineralization varies between 1 and 3% (total volume sulfide) and is predominantly controlled along thin seams and fractures. The pyrite to chalcopyrite ratio varies between 3 to 1 and 30 to 1. At depth the chalcopyrite has increased in grain size. Attached are the Ca, Mo, Pb, Zn assays for the hole.

Drill hole Chs-2 was collared this month and was at a depth of 400 feet on the 24th of July. Uncle Sam porphyry and dikes of andesite porphyry have been encountered so far this month. The Uncle Sam porphyry is pervasively altered and mineralized. Strong fine-grained sericitization and argillization are prevalent. Mineralization is strictly disseminated pyrite and total sulfide content varies from 3 to 8%.

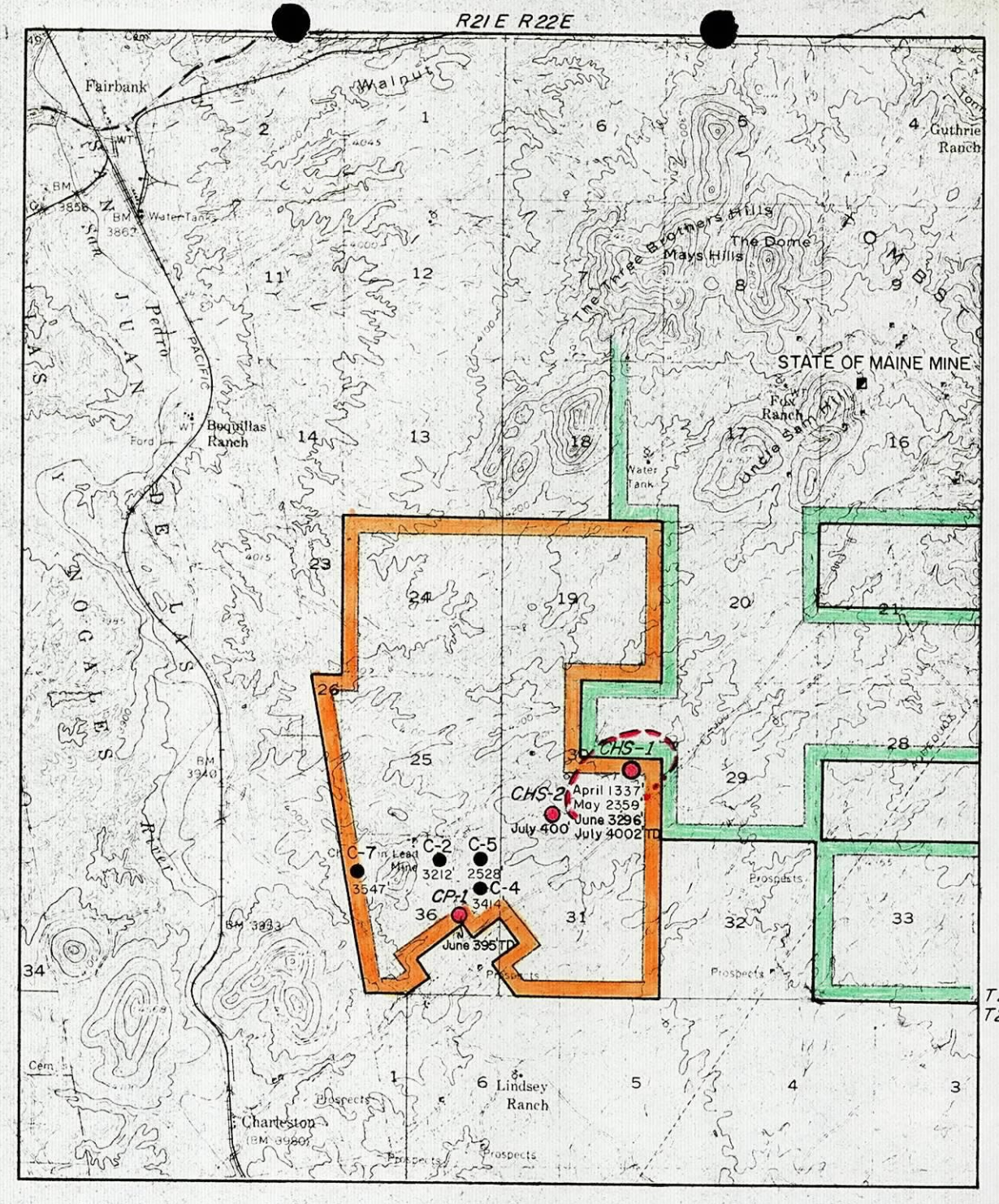
Estimated balance of authorization is $90,000.

John R. King

JRK:lb
Attachs.

CHARLESTON PROJECT
Hole Chs-1

Depth	Cu	Mo	Pb	Zn
68-75	25	10	30	20
143-152	40	8	30	25
164-169	310	4	25	30
194-199	105	4	75	125
321-326	255	6	120	100
398-403	255	16	110	185
520-528	300	8	45	70
591-599	280	10	40	130
692-700	180	4	105	200
792-800	450	8	25	95
923-933	330	14	60	80
983-993	400	30	60	50
1087-1097	600	14	25	20
1257-1267	850	36	45	60
1347-1357	750	40	45	60
1442-1452	950	22	50	55
1552-1562	900	18	40	35
1632-1642	1350	14	35	20
1745-1754	20	22	30	5
1857-1867	235	2	15	10
1948-1958	610	6	35	40
1996-2006	475	4	20	5
2041-2051	135	30	20	5
2124-2134	1200	12	20	5
2207-2217	60	<2	10	5
2280-2290	630	2	10	10
2380-2390	620	10	10	5
2455-2465	1150	20	10	10
2525-2535	0.19%	12	1000	85
2612-2622	0.19%	18	20	20
2684-2694	0.19%	22	20	20
2787-2797	0.13%	16	15	15
2844-2854	0.41%	16	15	20
2919-2929	950	10	25	15
3011-3021	425	<2	15	15
3102-3112	495	2	10	15
3231-3241	1300	<2	10	30
3305-3315	0.20%	6	15	40
3401-3411	0.25%	10	15	15
3459-3469	0.21%	<2	10	35
3545-3554	0.23%	14	10	85
3626-3636	500	6	85	110
3710-3719	430	6	220	240
3849-3858	0.23%	18	15	35
3905-3914	0.26%	4	45	160
3979-3988	0.20	4	25	65
3992-4002	0.16	4	20	230



EXPLANATION

- ASARCO property boundary
- Sierra Mineral Management property
- ASARCO drill hole showing current depth
- Previous drill hole showing depth
- Area of pervasive hydrothermal alteration & associated brecciation

TO ACCOMPANY Drilling Report
DATED July 26, 1974
by J.R. King

DRILLING PROGRESS MAP
for the month of July, 1974

CHARLESTON PROJECT

COCHISE CO., ARIZONA

scale 1 inch = 1 mile

J.R.K.

J.H.C.

AMERICAN SMELTING AND REFINING COMPANY
TUCSON ARIZONA

June 28, 1974

J. H. C.

AUG 9 1974

TO: W. L. Kurtz

FROM: J. R. King

Charleston Project
Cochise County, Arizona
Monthly Progress Report
June 1974

As of the 24th of May, drill hole Chs-1 was at a depth of 3296 feet. Progress for the month was 588 feet of NX core and 349 feet of BX core.

Strong pervasive alteration and mineralization continued to around 3000 feet. Below this depth, mineralization and especially alteration have decreased in total intensity and pervasiveness. By 3150 feet the core contains at best 1% total sulfides (py/cp, 10/1), and megascopic alteration is pervasive to only 20% of the core. The rock type appears to be a granodiorite porphyry with a potassium-feldspar flooded groundmass.

Attached are the geochemical analyses for the hole. The good news is apparent -- well over 600 feet of core that would average greater than .1% copper.

Drill hole CP-1 was collared in State Sec. 36 and bottomed at a depth of 395 feet. Approximately $3,200 was spent on this hole, which will cover the necessary expenditure required to keep the state lease valid.

Estimated balance of the authorization is $120,000.

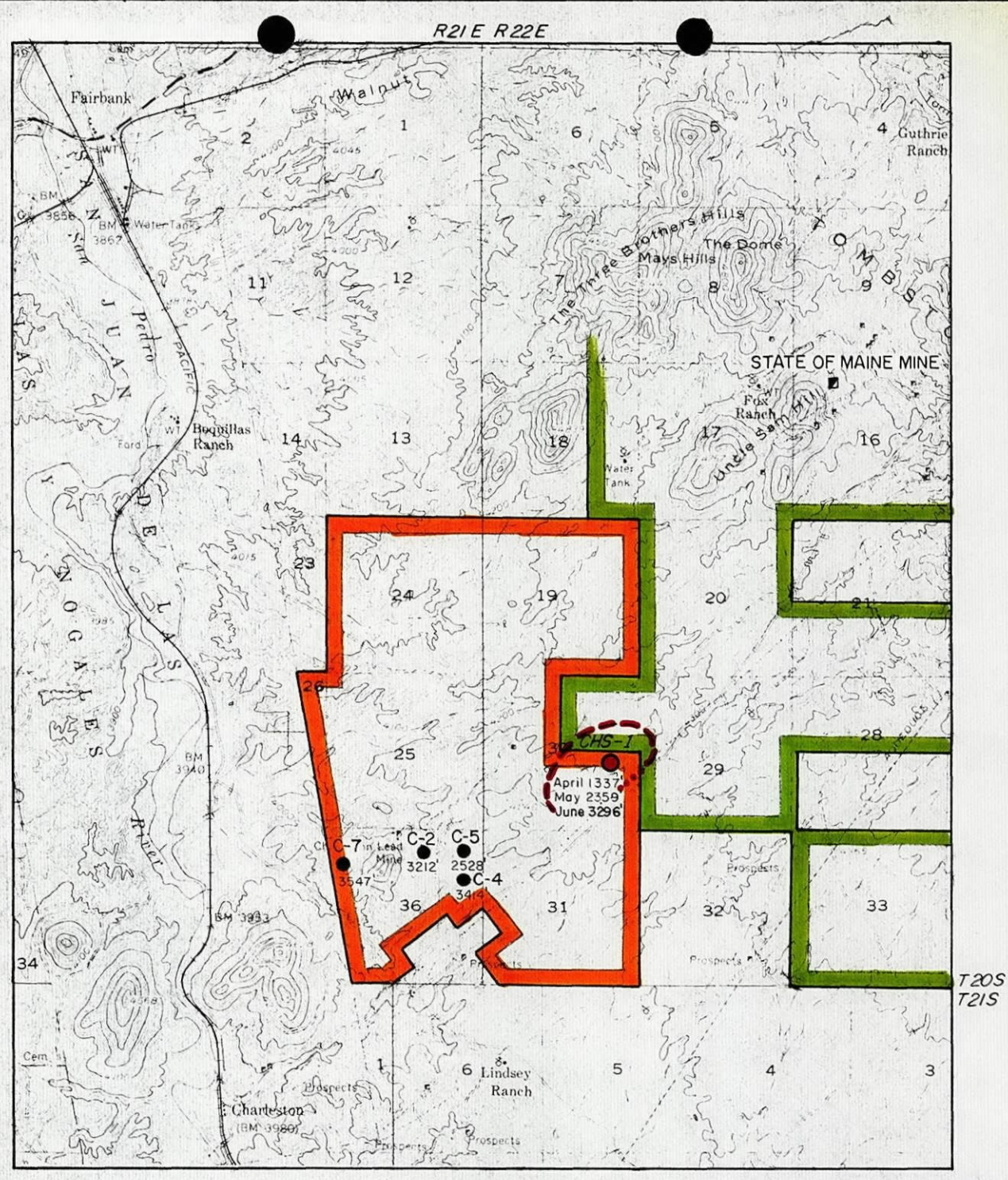
John R. King

John R. King

JRK:lb
Attachs.

CHARLESTON PROJECT
Hole Chs-1

Depth	Cu	Mo	Pb	Zn
68-75	25	10	30	20
143-152	40	8	30	25
164-169	310	4	25	30
194-199	105	4	75	125
321-326	255	6	120	100
398-403	255	16	110	185
520-528	300	8	45	70
591-599	280	10	40	130
692-700	180	4	105	200
792-800	450	8	25	95
923-933	330	14	60	80
983-993	400	30	60	50
1087-1097	600	14	25	20
1257-1267	850	36	45	60
1347-1357	750	40	45	60
1442-1452	950	22	50	55
1552-1562	900	18	40	35
1632-1642	1350	14	35	20
1745-1754	20	22	30	5
1857-1867	235	2	15	10
1948-1958	610	6	35	40
1996-2006	475	4	20	5
2041-2051	135	30	20	5
2124-2134	1200	12	20	5
2207-2217	60	<2	10	5
2280-2290	630	2	10	10
2380-2390	620	10	10	5
2455-2465	1150	20	10	10
2525-2535	.19%	12	1000	85
2612-2622	.19%	18	20	20
2684-2694	.19%	22	20	20
2787-2797	.13%	16	15	15
2844-2854	.41%	16	15	20
2919-2929	950	10	25	15



TO ACCOMPANY
MONTHLY REPORT
DATED
BY J.R. KING

EXPLANATION

- ASARCO property boundary
- Sierra Mineral Management property
- ASARCO drill hole showing current depth
- Previous drill hole showing depth
- Area of pervasive hydrothermal alteration & associated brecciation

DRILLING PROGRESS MAP
for the month of JUNE 74

CHARLESTON PROJECT

COCHISE CO., ARIZONA

scale 1 inch = 1 mile

J.R.K.

JHC

AMERICAN SMELTING AND REFINING COMPANY
TUCSON ARIZONA

May 31, 1974

J. H. C.
MAY 31 1974

TO: W. L. Kurtz

FROM: J. R. King

Charleston Project
Cochise County, Arizona
Monthly Progress Report
May 1974

As of May 25th, drill hole Chs-1 was at a depth of 2359 feet. Progress for the month was 1022 feet of NX core.

Pervasive alteration and sulfide mineralization continue and have increased in intensity since last reported at 1300 feet. Variations in alteration minerals and in total intensity of alteration assemblages are persisting with depth and are occurring in association with variable sulfide mineralization. By 2135 feet, the sulfide content is approximately 5% by volume, predominantly pyritic in nature, and associated with quartz-sericite alteration.

The good news for this month is that copper content (1200 ppm at 2124') is increasing in association with phyllic alteration, whereas higher in the hole the copper content (1350 ppm at 1632') is associated with an alteration assemblage of magnetite, chlorite, and anhydrite.

Attached are the geochemical analyses for the hole. Copper appears to be increasing with depth.

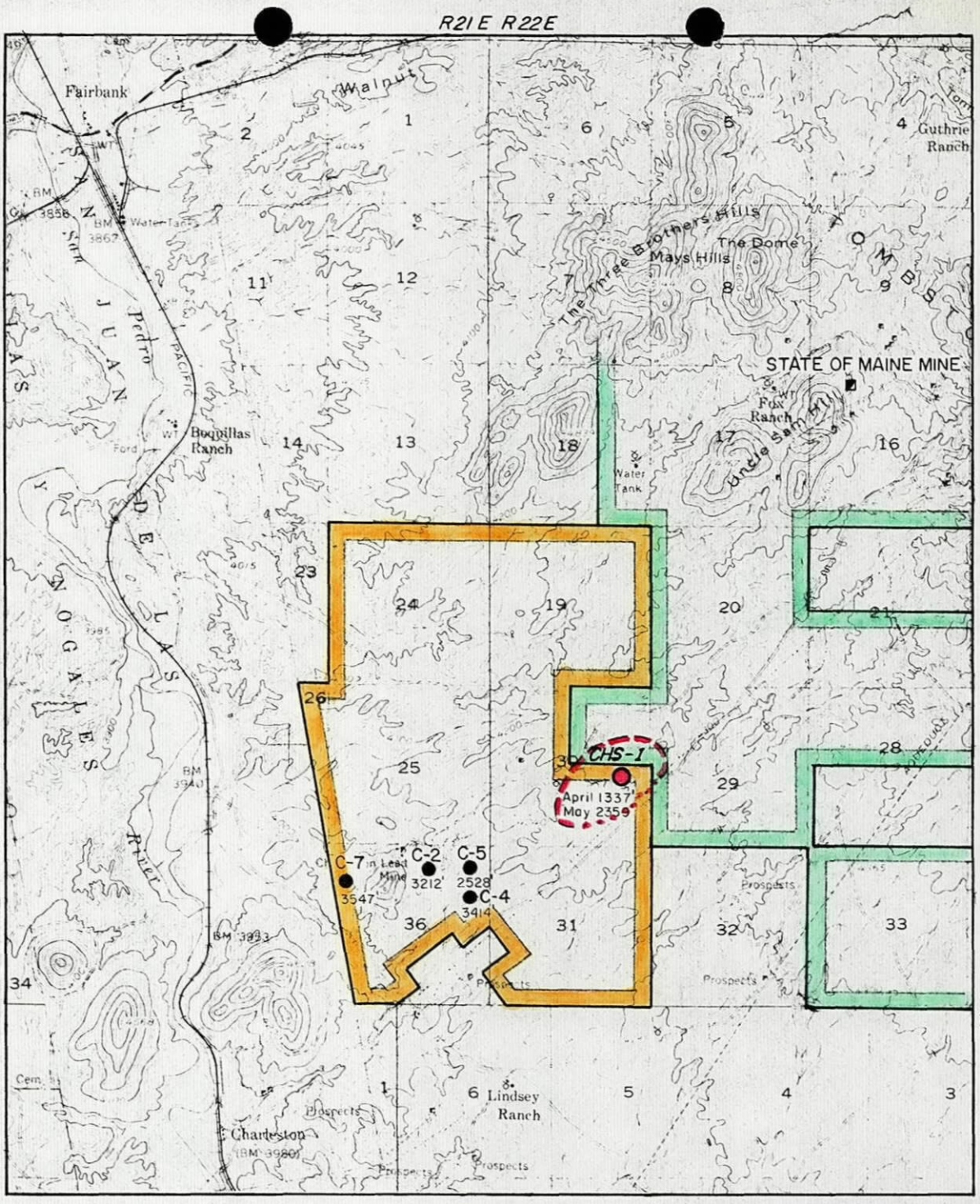
Estimated balance of authorization is $128,000.

J. R. King

JRK:lb
Attachs.

CHARLESTON PROJECT
Hole Chs-1

Depth	Cu	Mo	Pb	Zn
68-75	25	10	30	20
143-152	40	8	30	25
164-169	310	4	25	30
194-199	105	4	75	125
321-326	255	6	120	100
398-403	255	16	110	185
520-528	300	8	45	70
591-599	280	10	40	130
692-700	180	4	105	200
792-800	450	8	25	95
923-933	330	14	60	80
983-993	400	30	60	50
1087-1097	600	14	25	20
1257-1267	850	36	45	60
1347-1357	750	40	45	60
1442-1452	950	22	50	55
1552-1562	900	18	40	35
1632-1642	1350	14	35	20
1745-1754	20	22	30	5
1857-1867	235	2	15	10
1948-1958	610	6	35	40
1996-2006	475	4	20	5
2041-2051	135	30	20	5
2124-2134	1200	12	20	5



TO ACCOMPANY REPORT
DATED MAY 31, 1974
BY J. R. KING

EXPLANATION

- ASARCO property boundary
- Sierra Mineral Management property
- ASARCO drill hole showing current depth
- Previous drill hole showing depth
- Area of pervasive hydrothermal alteration & associated brecciation

DRILLING PROGRESS MAP
for the month of MAY 1974

CHARLESTON PROJECT

COCHISE CO., ARIZONA

scale 1 inch = 1 mile

J.R.K.

J.H.C.

AMERICAN SMELTING AND REFINING COMPANY
TUCSON ARIZONA

J. H. C.
MAY 2 1974

May 1, 1974

TO: W. L. Kurtz

FROM: J. R. King

Charleston Project
Cochise County, Arizona
Monthly Progress Report
April 1974

As of April 25th, drill hole Chs-1 was at a depth of 1337 feet. NC drilling was terminated at 1000 feet and NX drilling continues.

Pervasively altered and mineralized rock exist throughout the hole. The most intense alteration and mineralization (sulfide content) is associated with the hydrothermal breccia zones (5-10% by volume). Wall rocks to the breccias are andesite and granodiorite porphyries. The last breccia zone was encountered at a depth of 700 feet.

Total sulfide mineralization sporadically decreases in volume below 700 feet and by 1300 feet sulfide content is between one and two percent. The good news is that the chalcopyrite to pyrite ratio has increased from 1 to 100 at 200 feet to about 1 to 5 at 1300 feet. Also, molybdenite is present only below 900 feet. Geochemical analysis of part of the core is attached.

Estimated balance of the authorization is $153,700.

John R. King

J. R. King

JRK:lb
Attachs.

SKYLINE LABS, INC.
Hawley & Hawley, Assayers and Chemists Division
1700 W. Grant Rd., P.O. Box 50106, Tucson, Arizona 85703
(602) 622-4836

Charles E. Thompson
Arizona Registered Assayer No. 9427

William L. Lehmbeck
Arizona Registered Assayer No. 9425

CERTIFICATE OF ANALYSIS

ITEM NO.	SAMPLE IDENTIFICATION	Ag ppm	Cu ppm	Pb ppm	Zn ppm	Mo ppm	As ppm			
1	Chs-1 68-75	<0.2	25	30	20	10				
2	143-152	<0.2	40	30	25	8				
3	164-169 tr Cc ??	<0.2	310	25	30	4				
4	194-199		105	75	125	4				
5	321-326		255	120	100	6	5			
6	Chs-1 398-403	<0.2	255	110	185	16				

J. R. K.
APR 2 [illegible] 1974

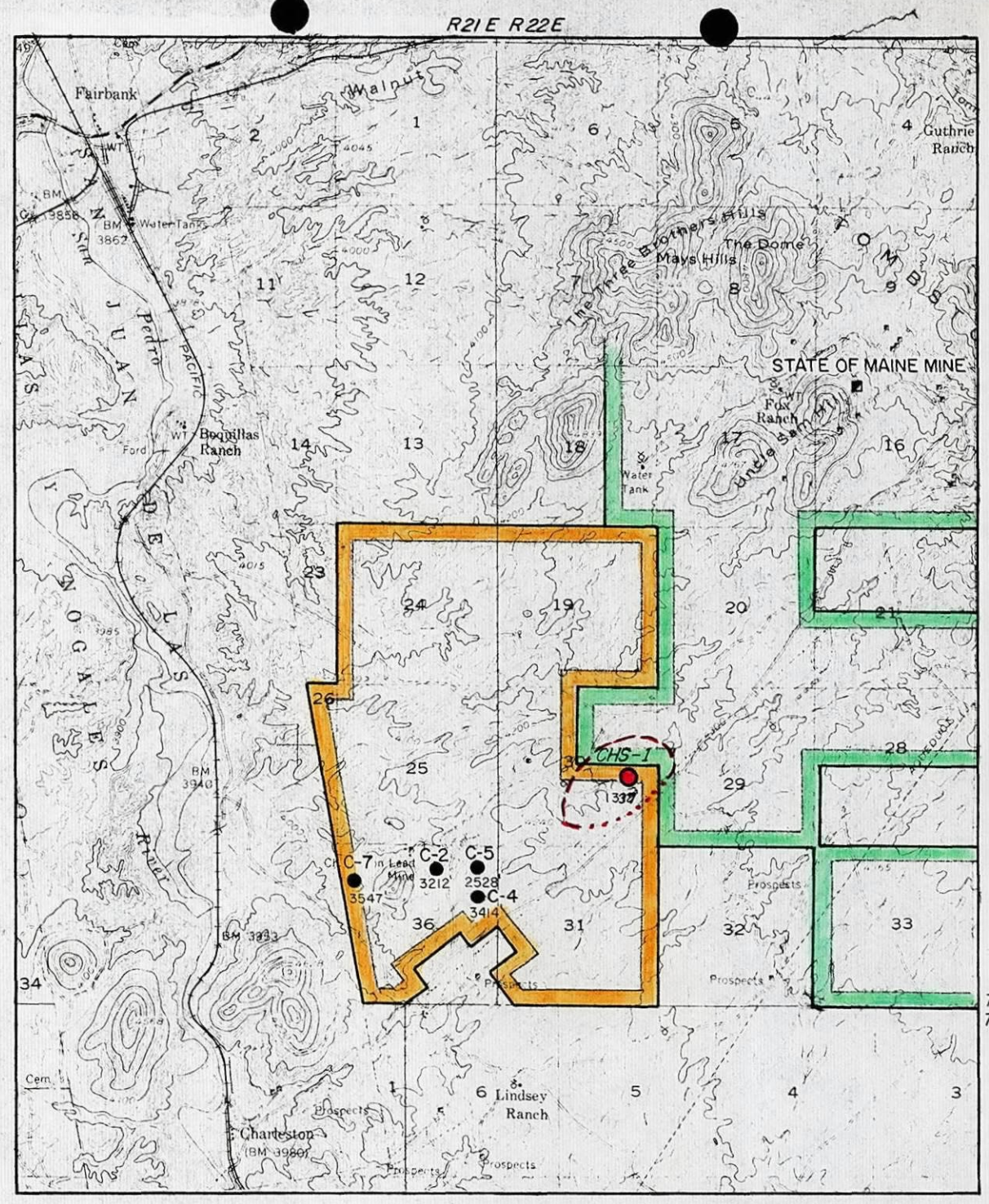
TO:
American Smelting & Refining Company
Southwestern Exploration Division
P.O. Box 5747
Tucson, Arizona 85703

REMARKS:
Trace analysis

CERTIFIED BY: William L. Lehmbeck

REGISTERED ASSAYER CERTIFICATE NO. 9425 WILLIAM L. LEHMBECK DATE SIGNED 4/24/74 Arizona U.S.A.

DATE REC'D: | DATE COMPL.: | JOB NUMBER:



TO ACCOMPANY Mema...
DATED May 1, 1974.....
BY J.R. King.....

EXPLANATION

- ASARCO property boundary
- Sierra Mineral Management property
- ASARCO drill hole showing current depth
- Previous drill hole showing depth
- Area of pervasive hydrothermal alteration & associated brecciation

DRILLING PROGRESS MAP
for the month of April, 1974

CHARLESTON PROJECT
COCHISE CO., ARIZONA

scale 1 inch = 1 mile

J.R.K.

J.H.C.

AMERICAN SMELTING AND REFINING COMPANY
TUCSON ARIZONA

J. H. C.

November 7, 1973

NOV 8 1973

Mr. T. C. Osborne
Asst. Director of Exploration
New York Office

Exploration Authorization Request
Charleston Project
Cochise County, Arizona

Dear Sir:

You have reviewed Mr. King's report on the subject project, visited the area in the field, and are in agreement that this copper prospect warrants two 3500-5000 foot diamond drill holes as a minimum test.

We are currently drafting an option agreement with the James Stewart Company calling for the following terms:

Year	Committment
1	10,000' drilling; $15,000 rental payment
2	15,000' drilling
3	$50,000 rental payment
4	$100,000 rental payment
5	$150,000 rental payment
6	$200,000 rental payment
7	$250,000 per year until start of production

Upon start of production, $500,000 per year for 5 years or until payback -- whichever comes first;

then

4.5% NSR on Federal land; 2% NSR on State land until a total of $25 million has been paid (rental plus NSR), then perpetual 1% NSR.

The adjoining property is held by Sierra Minerals Management who have stated that they are willing to joint venture their ground, but only after Asarco consummates an agreement with the James Stewart Company.

I estimate funds to complete the first year's committment as follows:

$15,000	rental payment
150,000	10,000 feet of drilling
10,000	Legal, contingencies
$175,000	

Please request an authorization, conditional on signing an agreement with the James Stewart Company, in the amount of $175,000. Forms 302-E and 302-EA are attached.

Respectfully submitted,

W. L. Kurtz

WLK:lb
Attachs: Forms & Map

cc: JHCourtright - w/encs.
RBCrist - w/o encs.
JRKing - w/o encs.
JDSell - w/o encs.
ADCoumides -w/forms only

PRINTED IN USA. 9/69

New York No. .....

FORM 302-E

APPLICATION FOR EXPLORATION AUTHORIZATION

November 7, 19.73 Originating Office ..Tucson - SWED.....

DESCRIPTION:

LOCATION OF PROSPECT/PROJECT: Charleston Project
Sections 24, 25, 36, T20S, R21E; sections 19, 30, 31, T20S, R22E
Cochise County, Arizona, approximately six miles southwest of
PARTNERS: Tombstone, Arizona.

Partner's Per Cent .....

COMPANY: [X] ASARCO

[ ] Subsidiary. Specify .....

WORK CONTEMPLATED:

Diamond drill two 3500-5000 foot holes to test for porphyry copper mineralization.

Total estimated cost (FORM 302-EA ATTACHED) $.175,000.....

Reviewed by .....
Acct. Mgr. or Chief Acct.

Approved by .....
Vice President

Recommended by .....
Supervisor

Approved by .....
Comptroller

Account Chargeable to .....
To be designated by Comptroller

Approved by Advisory Committee

.....19 ...

Approved by Board of Directors

.....19 .....

.....
Secretary

Form 302—EA

Printed in U.S.A

PROSPECT Charleston

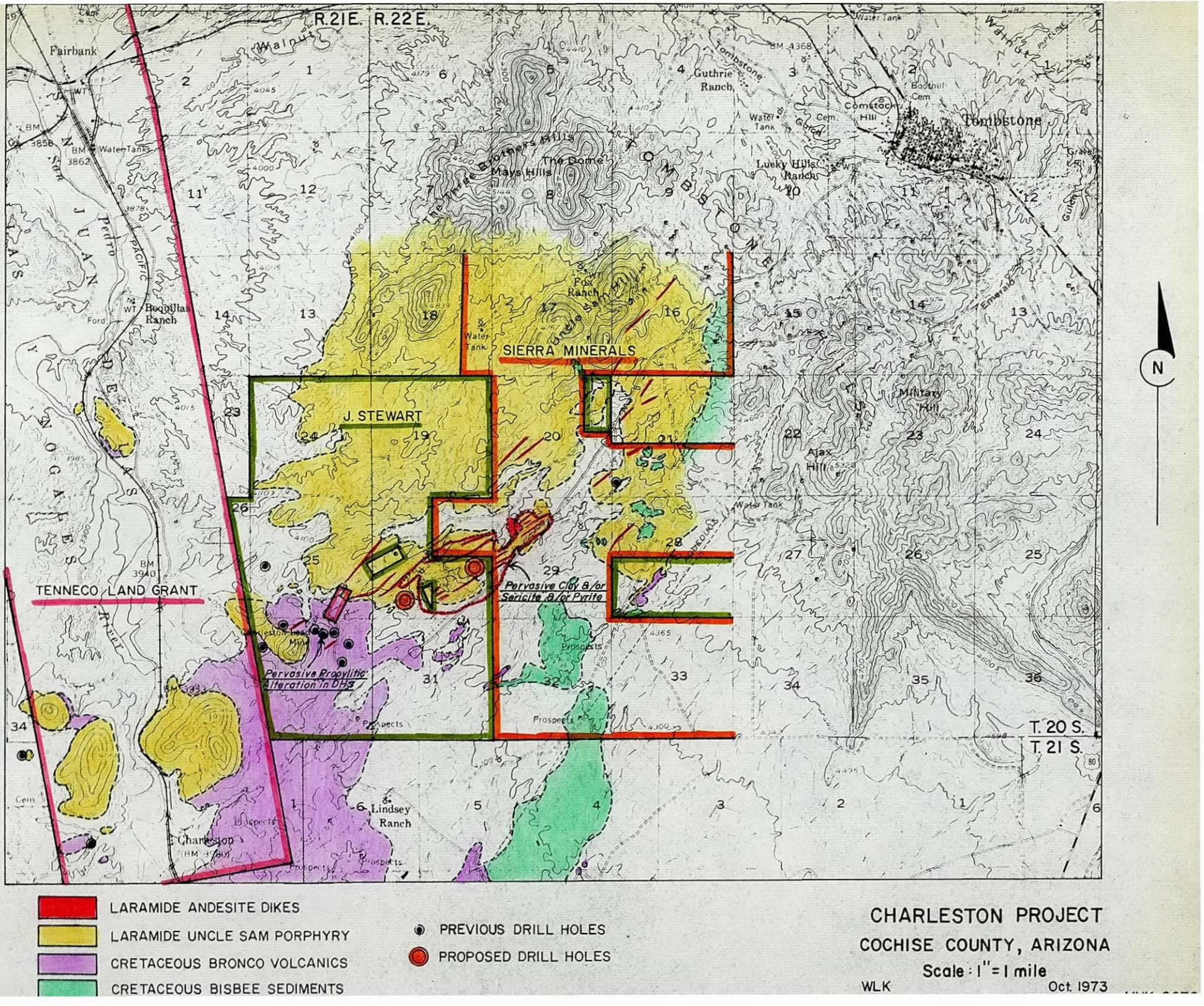
LOCATION Cochise Co., Arizona

COST ESTIMATE, MINERAL EXPLORATION

OFFICE Tucson - SWED

BY W. L. Kurtz

No.	Type of Work	Salaries/Wages Days	Salaries/Wages Amount	Material	Fees, Rent, Services	Traveling	Taxes	Other	Total Estimate Cost
501	Outright Purchase								
502	Option Payments								
503	Bonus Payments								
504	Minimum Royalties-								
	Deductible from								
	Future Production								
505	Minimum Royalties-Not								
	Deductible from								
	Future Production								
506	Rental Payments				15,000				15,000
507	Staking Claims								
511	Surface Excavating								
512	Underground "								
521	Surface Drilling				150,000				150,000
522	Underground "								
530	Geologic								
540	Sampling, Assaying, Lab.				2,000				2,000
550	Geophysics								
560	Geochem								
570	Engineering								
580	Construction (temp.)								
590	Construction (perm.)								
610	Administration, Field		5,000			3,000			8,000
	Offices and Camps								
620	Administration, General								
641	Autos and Vehicles								
642	Aircraft and Boats								
650	Partner's Share								
	ASARCO'S SHARE		5,000		167,000	3,000			175,000
661	Commission or Fees								
663	Exchange								
	TOTAL		5,000		167,000	3,000			175.000



CHARLESTON PROJECT

COCHISE COUNTY, ARIZONA

Scale: 1" = 1 mile

WLK Oct. 1973

J. H. C.

SEP 13 1973

AMERICAN SMELTING AND REFINING COMPANY
Tucson Arizona

September 12, 1973

Mr. T. C. Osborne
Asst. Director of Exploration
New York Office

Charleston Area
Cochise County, Arizona

Dear Sir:

You requested to be informed during the early stages of negotiations for mineral properties in the Southwest.

We have obtained information on seven drill holes up to 3300 feet in depth located in the Charleston Mine area (approximately seven miles southwest of Tombstone, Arizona). Several of these holes contain in excess of 2,000 feet of altered and pyritized, with minor copper, zinc and lead, Cretaceous sediments and volcanics. Mapping by Asarco has demonstrated a permissive zone sufficientiy large to house an important copper deposit.

The property, consisting of about six sections, is held by the James Stewart Company and, through their president, Mr. Seth Horne, 3033 N. Central Ave., Phoenix, Arizona 85012, are asking the following terms:

Year	
1	10,000' drilling plus reimbursement of $15-20,000 of Stewart Company's drilling expenses
2	24,000' drilling
3	$50,000 Advance Royalty
4	$75,000 " "
5	$100,000 " "
6	$150,000 " "
7	$200,000 " "
8	$250,000 " " continues until production.

Upon production 6% NSR on Federal Land and 3% on State Land (in addition to Royalty due State). After $25 million has been paid in royalties, the NSR drops to 1% on both Federal and State Land.

Mr. Courtright and I rate the area a longshot exploration gamble, but worthy of a couple deep, 3-5,000 foot drill holes if terms can be changed along following lines:

> Year 2 10-15,000 feet of drilling
> After 8, continue minimum advance royalty until after payback then 5% NSR Federal:3% State until $25 million paid, then 1% NSR

This would make costs for a four or five hole test of the property in the range of $170,000 the first year and $150,000-$225,000 the second year.

If you approve, I should like to present the above alternative terms, or any others you might suggest, to Mr. Horne next week. A report on this property by Mr. King should be completed next week, and will be submitted with an Exploration Authorization Request if satisfactory business terms can be negotiated.

Very truly yours,

W. L. Kurtz

WLK:lb

cc: JHCourtright
JRKing
JDSell
RBCrist