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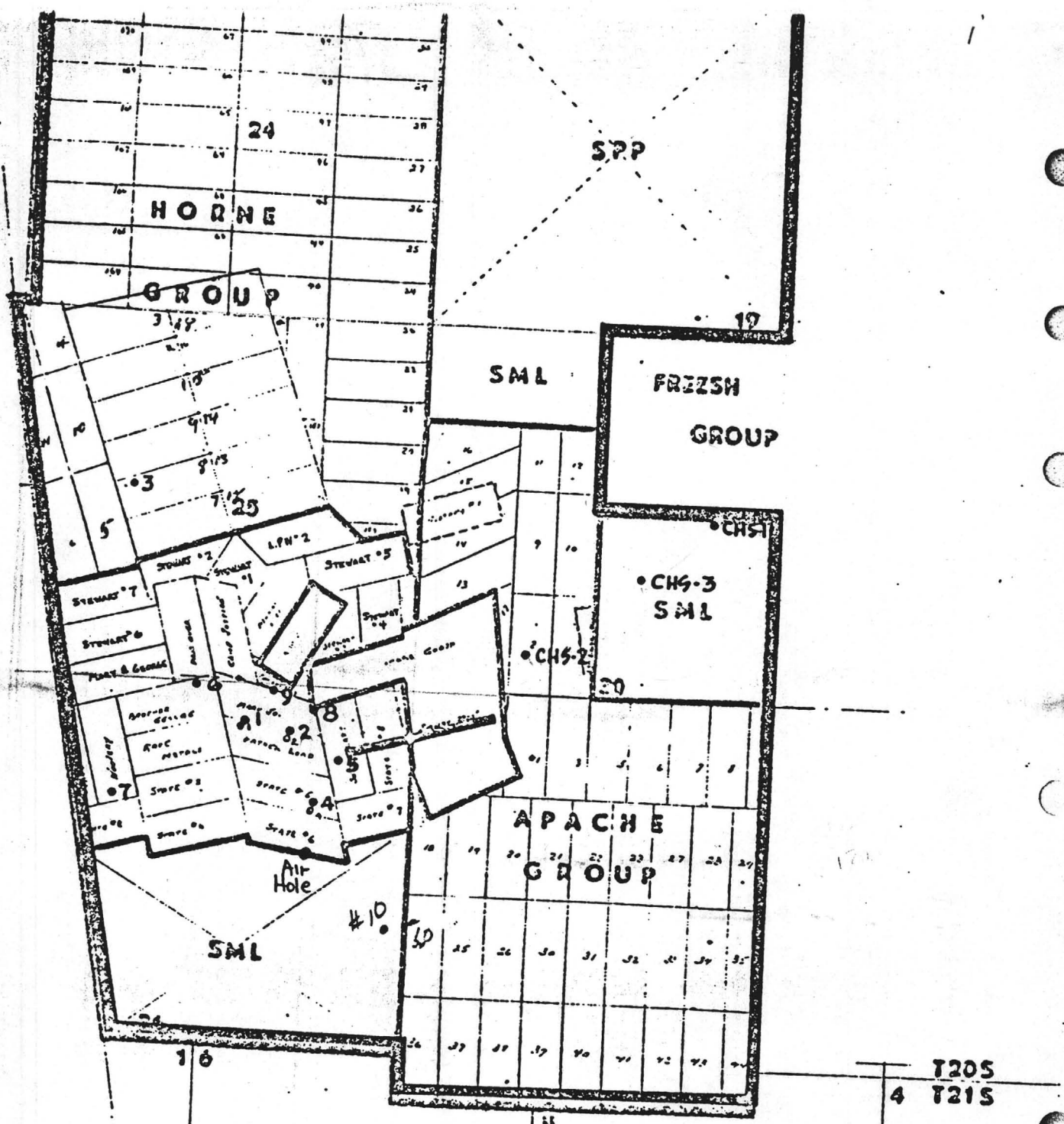
TOMBSTONE MINING DISTRICT
COCHISE COUNTY, ARIZONA

GEOLOGY & LAND RESEARCH

VOLUME III
DRILLING LOGS, REPORTS, & ASSAYS
BOOK 1
CHARLESTON MINE AREA
PAGE 1 to 238

JAMES STEWART COMPANY
AUGUST, 1984

PREPARED BY:
JAMES A. BRISCOE & ASSOC., INC
TUCSON, AZ



DEPTH OF DIAMOND DRILL HOLES

• 1	2107'	• CHS-1	4002'
• 2	3212'	• CHS-2	5020'
• 3	2617'	• CHS-3	3005'
• 4	3310'	Air Hole	14~~05~~81' (10/78)
• 5	2928'	• #10	~~2260~~ 8-32-83
• 6	237' = 1407?		
• 7	3595'		
• 8	872'		
• 9	940'		

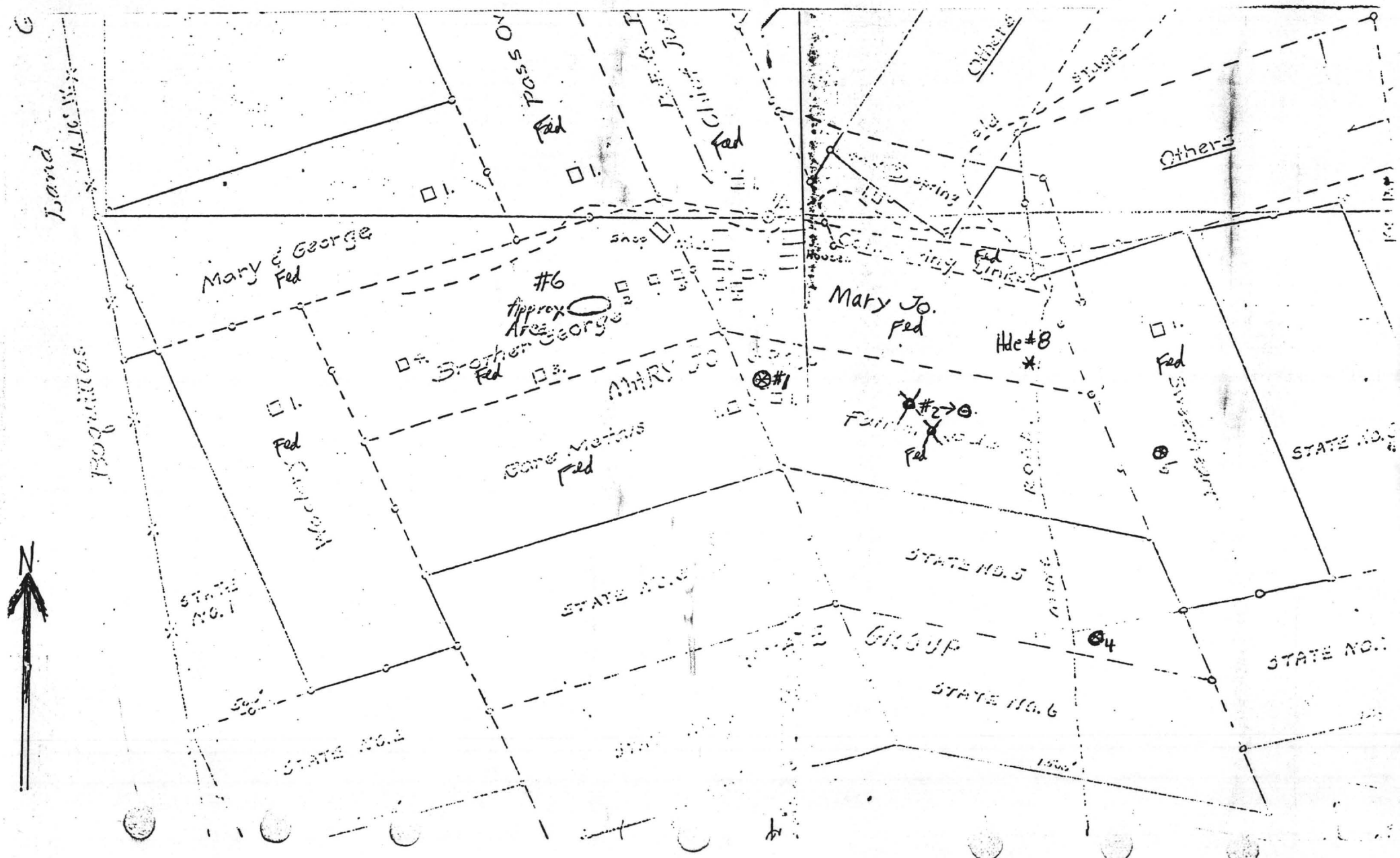
DRILL SITE OVER-LAY

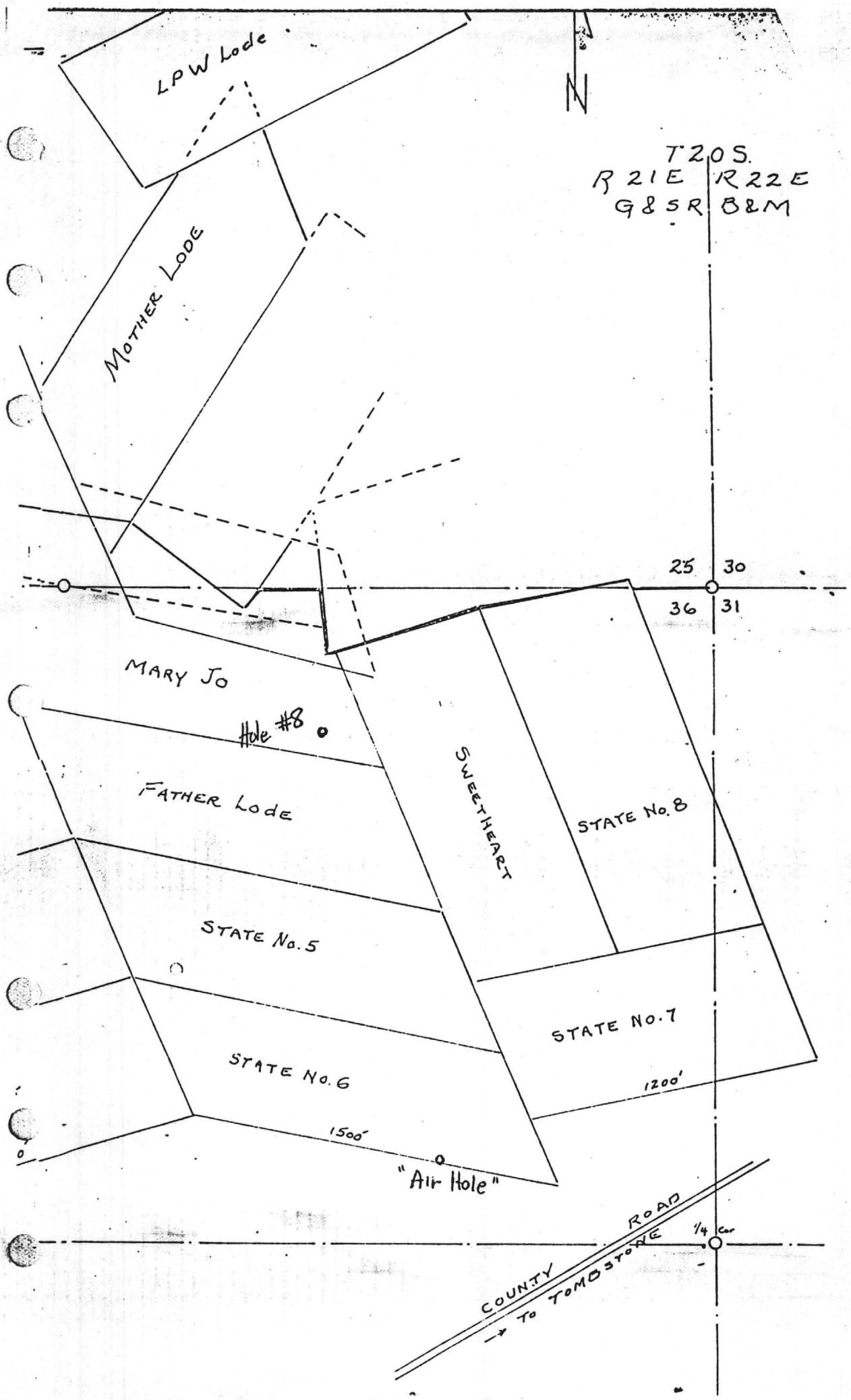
CHARLESTON MINE

18 AUG 73

DRILL HOLES OF THE CHARLESTON MINE AREA

1	Mary Jo	2107 ft.	O-14	core size
2	Father Lode	3212	O-10	core size
[illegible]	Horne #8	2617		
4	State #5	2528		
5	Sweetheart	2518	O-12	core size
A-5	State #6, S½	1481	NXF	core
6	Brother Geo.	237		
7	Wooley	3595		
8	Mary Jo	872		
9	Mary Jo	940		
10	Apache 24	2260	NX	
CHS 1		3922	NC	
CHS 2		5028	NC,NX,BX,AX	
CHS 3		3003	NC,NX	


Land
Mary & George
Fed
Poss O
Fed
Fed
Shop
#6
Approx
Area
Brother George
Fed
MARY JO
#1
Mary Jo.
Fed
Hde #8
Fed
#2
Fed
Fed
Gone Metals
Fed
Others
Others
Stage
Fed
STATE NO.1
STATE NO.2
STATE NO.3
STATE NO.5
STATE NO.6
STATE NO.7
STATE NO.4
GROUP
N


LPW Lode
N
T20S.
R21E R22E
G&SR B&M
MOTHER LODE
25 30
36 31
MARY JO
Hole #8
FATHER LODE
SWEETHEART
STATE No. 8
STATE No. 5
STATE No. 7
STATE No. 6
1200'
1500'
0
"Air Hole"
COUNTY ROAD
→ TO TOMBSTONE
1/4 Cor

D.D. #1 L065

ASARCO

DEC 8 1978

JAMES STEWART COMPANY
PHOENIX, ARIZONA

Exploration Department
Southwestern United States Division
R. B. Crist
Property Manager

December 6, 1978

J. Stewart Company
3033 North Central Avenue
Phoenix, Arizona 85012

Attention: Mr. Roger Horne

Charleston Mine
Cochise County, Arizona

Dear Roger:

Sorry to be so late with this. Burt Devere, the Asarco geologist who handles the Tombstone area, gave me the enclosed log regarding your Charleston property.

In October, he logged the core from Drill Holes 1 and 2.

The alteration was weak and the mineralization decreased with depth. None of the core was assayed due to the lack of mineralization.

We always appreciate the opportunity to look at rocks. In this instance the core was not split for assay work, however, I did promise assays and if you ask again, I will get some for you.

Very sincerely,

R. B. Crist

R. B. Crist.

RBC:jlh
encls BJD log

ASARCO Incorporated P. O. Box 5747 Tucson, Az 85703
1150 North 7th Avenue (602) 792-3010

1/78
B.J.Devere

Charleston Pb Mine
Cochise County, Arizona

Hole #1

From	To	
0	2103	Drilled previously.
2103	2252	Cretaceous Bisbee Group, <½% py, rare Tr sph mineral.
2252	2514	Cretaceous Bisbee Group, barren to rare Tr py mineral.
2514	2640	Cretaceous Bisbee Group, weak py <1% mineral.
2640	2764	Cretaceous Bisbee Group, barren, no mineral.

Bottom 2764 feet.

Hole #5-A

0	631	Drilled previously.
631	733	Tertiary-Cretaceous Bronco Volcanics, ±2% diss py mineral.
733	785	Tertiary-Cretaceous Bronco Volcanics, barren, no mineral.
785	824	Tertiary-Cretaceous Bronco Volcanics, ±1% diss py mineral.
824	984	Tertiary-Cretaceous Bronco Volcanics, barren, no mineral.
984	1184	Cretaceous Bisbee Group, barren, no mineral.
1184	1405	Cretaceous Bisbee Group, rare trace diss py, mineral.

Bottom 1405 feet.

BJD:jlh

py = pyrite
Tr = trace
sph = sphalerite
diss = disseminated

P.D. WALK ER?

3

GENERALIZED DESCRIPTIVE LOG

Charleston Lead Mine

James Stewart Construction Company

HORNE #1 DRILL HOLE

0-14 No core

14-148 Fragmental meta-andesite tuff. Hematite (earthy) clay, chlorite. Coarsely fragmental to 63, then tuff to 74, then coarsely fragmental to 148.

148-152 Fault zone, gouge and breccia

152-153 Fragmental tuff

153-155 Fault zone, gouge and breccia

155-180 Weathered, bleached, clay-altered tuff.

180-223 Bleached white arg. alt. medium, fragmental tuff, heavily sericitized.

223-227 Gouge - fault zone

227-243 White arg. alt. tuff - sericitized.

243-244 Gouge - fault zone

244-254 Whitearg.. alt. tuff - sericitized

254-257 Gouge - fault zone

257-303^6 Graywacke, silicified, mosaic appearance, reddish. (Might be a silicified tu: Scattered pyrite cubes. Grades to fine gray siltstone. Pyrite on seams <1%.

303^6-328^5 Gouge and breccia, heavily sericitized (313).

328^5-340 Fine siltstone, thoroughly bleached, pyritized (2-3% py), sericitized, to 340.

340-342-1/2 Gouge

342-1/2-400 Fine light grey to white siltstone, considerable fine qtz., sericitized. At 366, 1/4" sphalerite - chalcopyrite veinlet. Pyrite 1-3%, locally up to 10%. Rock thoroughly sericitized adjacent to veinlet. Locally abundant (up to 5%) chalcopyrite. (See specimen at 371. (Nx core to 400)

400-474 Fine granular siltstone, grey, 2-6% pyrite, very little cpy (<0.2%) At 430, 1/4" vein calcite, siderite, galena, chalcopyrite. At 440, 1" vein same.

474-476 Fault,gouge

476-525 Fine granular siltstone, pyritized (2-6% py), fragmental from 477-1/2-479, then finer grained, light grey. Two or three 1/8" vlts 482-485, sphalerite, galena, cpy. Pyrite up to 10% locally. 6" epidote zone with fine galena, sphalerite, pyrite, tetrahedrite?, 518. Several small (1/16"-1/8") vlts sphalerite. Galena with epidote to 525. Pyrite 2-6%, other sulfides <0.1% in interval.

525-573 Conglomerate, 531-1/2-536, py - 2-6%, then fine light gray siltstone, 2-6% py calcite streaks 570-1/2-573. Sericitized.

573-574 Fault, gouge

574-582 Fine gray siltstone, 2-6% pyrite. Sericitized.

582-584 Fault, gouge

584-586 Greenish gray fine siltstone, 1-2% py, becomes fine quartzite at 586.

586-649 Fine quartzite, grades to 1mm qtz locally, vuggy after 630, some py in vugs and on seams, (< 2% py.)

649-665 Quartzite, 1mm, vuggy in part.

665-671 Fine grained impure qtz, locally with a streak or two of sphalerite, 1-2% py., <0.1% sph)

671-676[4] No core

676[4]-705 Fine grained impure qtz, grades to 1mm at 679[5], vuggy, continues to 705

705-724 Qtz, 1 mm, but with pyrite on seams, bulk 5-8% py, to 724.

724-769 Bedding at 724, 75° to axis. Fine grained siltstone, light grey, 1-2% py. Becomes gray banded after 750, somewhat softer.

769-818 Fragmental (conglomerate) for about 2 feet, then splotchy, local development lime silicates. Gray siltstone with local fragmental horizon, emphasized by epidote splotches, locally fine quartzite for 5-6' intervals to 818.

818-824 At 818, bedding at 50° to axis. Fine banded greenish-grey siltstone (epidote and calcite)

824-824-1/2 Several 1/8" vlts sphalerite and galena.

824-1/2-860 Fine green-grey siltstone, splotchy with epidote, becoming drably uniform after 842-855, then splotchy.

860-886[4] Porphyry, first 18" qtz free. Altered, probably qtz monz.? Pyritized, argillic - sericite to fault at 886[4].

886[4]-934 Brecciated (healed) siltstone to 892, then fine gray siltstone, becoming darker grey with depth. Some dark epidote?

934-971-1/2 Dark grey siltstone, mottled (fine mottling) to 955[5], then fine dark gray siltstone to 971-1/2.

971-1/2-974 24" carbonate vein (not calcite), ankerite or siderite)

974-1004.3 Dark grey massive siltstone grades into fine-grained arkose.

1004.3-1106 At 1056, bedding 55° to axis. Becomes somewhat darker after 1080.

1106-1162.3 Fine grained, nearly quartzite, grey, gradually becomes coarser (about 1mm) at 1117. Stays coarse to 1141, then grades into finer at 1153. Fine arkosic qtz. - medium gray.

1162.3-1178 Arkose, fine grained. Sericitized. Becomes fine grained at 1178.

1178-1248 Grades back into fine grained arkose after 1186. Two or three calcite bands 1207-1208. Mottled locally. 6" healed breccia at 1247-1/2, then porphyry.

1248-1261 Meta-andesite porphyry -

1261-1262 8" fault gouge.

1262-1320.5 Fine massive grey granular siltstone, mottled with epidote; locally impure quartzite (hard). Becomes darker grey after 1286 to purple, 1290-1291, then 16" lime silicates to 1289[5], then purplish siltstone to 1299, then light grey grading back to purple at 1316, then grey, quartzite.

1320[5]-1350-1/2 Fine grained light grey siltstone, 1% py, some mottling, becoming medium grey with considerable mottling 1330-1336, then lighter grey with epidote patches and blobs, becoming less splotchy after 1337. Splotches end at 1350-1/2.

1350-1/2-1367 Fine granular impure quartzite. Grades from medium light to medium grey at 1367.

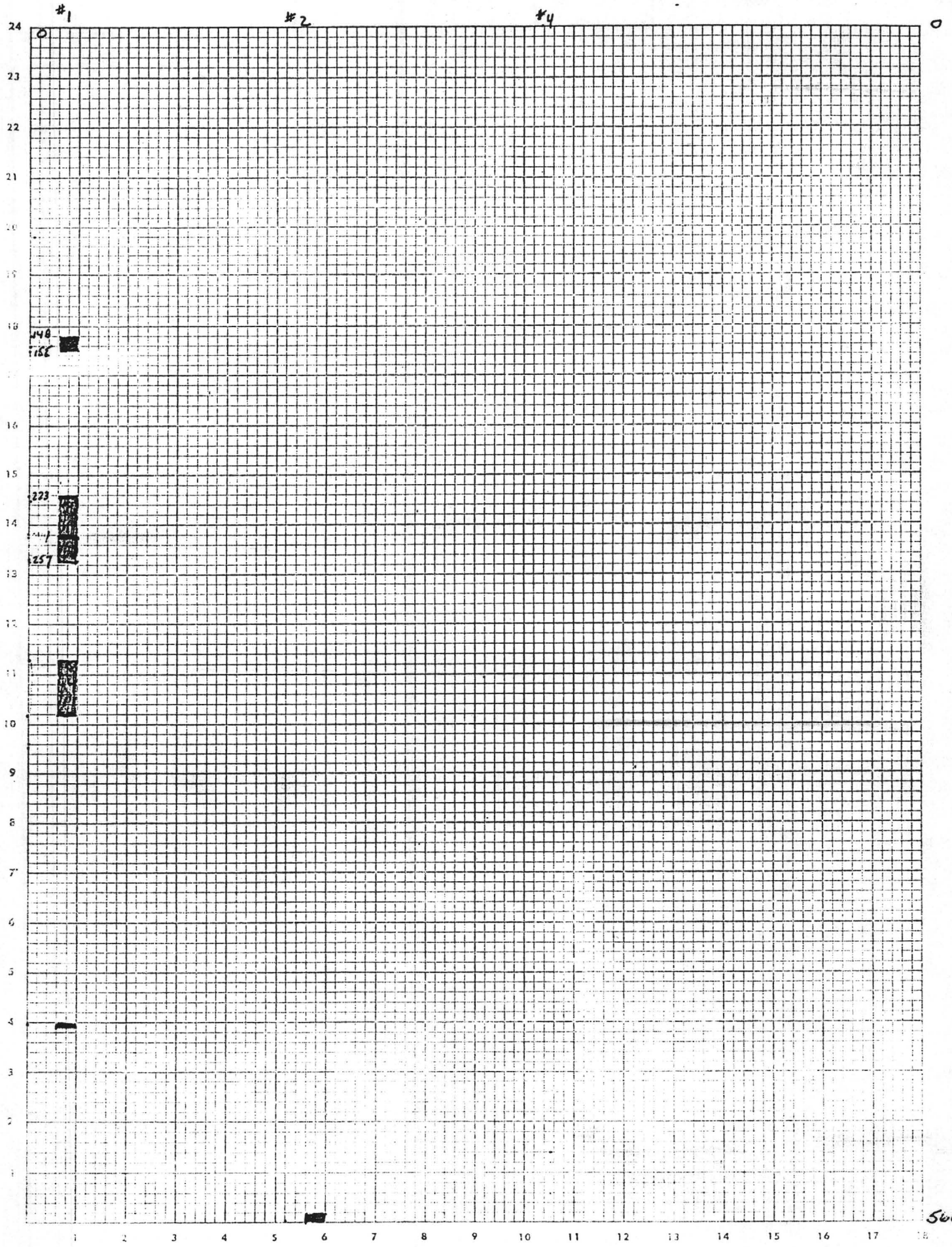
1367-1482[5] Banded siltstone, some epidote banding, purplish at 1367, becomes gray and mottled, then finely mottled 1378 to 1385. Fine grained grey quartzite (impure).

1482[5]-1585 Fine grained light gray qtz (impure). Some epidote veinlets, sphalerite (1/4" vein) at 1490. Grey to 1496, then mottled, fragmental looking to 1503. Fine grained grainy-looking to 1511. Fragmental to 1514, then fine grained, meta-arkose, fragmental 1524-1525. Fine grained light colored quartzite 1525-1566. 12" breccia 1566-1567 (healed). Fragmental light colored impure fine grained qtz to 1574.5.

1585-1606	Meta-andesite-silicified.
1606-1616	Mixed-meta-andesite.
1616-1630	Mixed-meta-andesite, quartzite (impure)
1630-1650	Mottled meta-arkose-fine
1650-1678	Siltstone, splotchy, grey, grades to light grey at 1657. Fragmental 1662-1664. Purplish 1666-1676-1/2, bedding 60° to axis, contact 1678.
1678-1698	Meta-andesite porphyry, several mixed zones.
1698-1746	Siltstone, purplish, to 1722, 18" fine qtz., then purplish siltstone, gradually grading to more qtz. material.
1746-1757	Siltstone, fragmental (conglomerate)
1757-1810	Siltstone, becomes quartzitic at 1763. Fine grained impure light grey qtz.
1810-1818	Fragmental siltstone (conglomerate)
1818-1951	Light gray impure siltstone (fine qtz.), fragmental intervals, grades to 1mm qtz. at 1905, 2' basal arkose 1949-51.
1951-1954	Light colored grey siltstone.
1954-1981	Quartz latite?
1981-1998	Meta-arkose-conglomerate.
1998-2050	Fine grained siltstone to 2007, then 1mm qtz. to 2012, 6" cong., then arkosic qtz. (medium grained, grey), gradually becoming darker grey, more silty to 2050.
2050-2103	Purplish siltstone, fragmental 2061-2068, then grey qtz. siltstone, medium grained, splotchy, to bottom. 2103

WJW:jc
December 13, 1967

FAULTS Charleston



Peter Dunn

AREA CHARLESTON T. 20S R. 21E S. 36 TOTAL DEPTH 2103 COLLAR ELEV. _____ HOLE NO. 1

Kennicott Bear Creek

Footage From	Footage To	Description	Footage From	Footage To	% Cu.	% Zn.	% Pb.	Oz. Ag.	Oz. Au.
5	102	Latite porphyry - fine-grained-gray 15-20% phenocrysts of feldspar < ¼' - contains abundant large fragments of green volcanic tuff - contains abundant clay - dark red (hematite) clay along fractures 45° ∧ core - epidote locally common - locally green tuff in matrix with large fragments of porphyry.							
102	162	Tuff - green with abundant large fragment of other volcanic rocks and of green siltstone - abundant clay & chlorite - weak goethitic staining locally on fractures - Fault? 149-152							
162	180	Volcanic - altered - strong goethitic staining - strong clay-sericite alteration - some Mn staining - poor core recovery.							
180	254	Volcanic, white, altered - strong clay-sericite alteration - no significant iron staining 1% limonite after pyrite as fine disseminated grains - rare thin quartz veinlets - probably an alteration feature - original pyrite content increases to 2-3% below 220'.							
254	258	Volcanic, pink - altered - consists almost entirely of clay (sericite) - weak goethitic staining along fractures.							
258	303	Volcanic - gray fine-grained, altered - quartz-sericite alteration not as intensive as above strong goethitic staining along fractures - hematitic limonite locally present. Fresh pyrite appears @ 262' - finely disseminated euhedral crystals up to 3% - goethite stringers still present - becomes common and mostly on fractures below 272' - chlorite becomes common ≈ 265'. Pyrite content increases with depth up to 5-8% below 280' - thin calcite stringers (up to ¼") locally present.							
303	325	Volcanic - highly altered - white < 1' of small chips 303'-311'8" - possibly a fault. 1-2% fresh euhedral pyrite disseminated -≈1% limonite casts after pyrite.							
325	411	Volcanic - fine-grained, gray - strong quartz-sericite alteration - strong silicification - strong goethitic staining on fractures - 1% disseminated fresh pyrite > 2% limonite after pyrite. Pyrite content increases below 330' up to 3-5% limonite rare-finely disseminated - weak chlorite and rare epidote on fractures - rare calcite stringers - highly altered 340'-342' as above - rare epidote stringers and clots.							
411	589	Andesite, fine-grained, green, porphyritic - probably less altered rock as above - change is gradual - shows weak chlorite alteration.- epidote common along very narrow stringers - disseminated euhedral- pyrite up to 5% - rare visible chalcopyrite - some calcite associated with epidote - some narrow calcite veinlets - rock weakly silicified ?							
		½" sphalerite-galena vein with rare chalcopyrite @ 440' - 32° ∧ core							

AREA CHARLESTON T. 20S R. 21E S. 36 TOTAL DEPTH 2103 COLLAR ELEV. HOLE NO. 1

Footage From	Footage To	Description	Footage From	Footage To	% Cu.	% Zn.	% Pb.	Oz. Ag.	Oz. Au.
		some pyrite occurs with epidote along narrow stringers ¼" Sphalerite-calcite-epidote veinlet @442' nearly parallel to core-with rare chalcopyrite ½" sphalerite-galena vein @485' 10°∧ core - with epidote and calcite ¼" sphalerite vein with chalcopyrite @521' ≈ 15°∧core with epidote 1/8" sphalerite vein with chalcopyrite @503' - 40° ∧ core ¼" sphalerite vein with abundant epidote @525' 20° ∧ core 1/8" sphalerite vein with abundant epidote @528' 20° ∧ core Pyrite content decreases to ≈ 2% below 530' - rare other narrow sphalerite epidote veinlets occur - most of rock barren. Abundant random calcite veinlets 550' - 556' sericite becomes common below 560' - epidote and chlorite rare - pyrite < 1% - no other sulfides.							
589	750	Quartzite - arkosic, fine-grained, white clay-sericite matrix < ½% disseminated pyrite sericite locally quite abundant - a few ½"-1" quartz veins ≈40°∧ core with 3-10% pyrite - no other sulfides - down to 700' - thin sphalerite veinlets 700'-702' - rare overall. 705-725' contains disseminated and random veins of pyrite up to 10% - 3-4% overall. Bedding to core angle 50° @710' - some pyrite occurs as open fracture fillings with quartz and unidentified white rhombehedral mineral - with very very rare galena crystals - only rare visible sulfides below 725'.							
750	859	Tuff - light green, aphanitic - chlorite abundant throughout and as narrow veinlets. Disseminated euhedral pyrite up to 2% - thin calcite veinlets and some irregular calcite clots - this rock grades into a very fine-grained quartzite 787'-783' - pyrite < 1% below. Epidote becomes common from 793' as irregular clots and irregular stringers - some very rare very narrow sphalerite veins occur with epidote - some pyrite very thin stringers - < .5 mm - bedding to core angle < 70° @806' sericite locally common.							
859	886	Dacite porphyry - green, fine-grained - 5% feldspar phenocrysts ¼" and 2-3% biotite phenocrysts smaller in a green groundmass. 2% pyrite as disseminated euhedral crystals - thin calcite stringers - clay alteration increases with depth til 868' where it is a white rock with clay phenocrysts in a clay matrix - < 1% pyrite.							
886	892	Brecciated tuff - poor core recovery - probable fault							
892	934	Tuff - light green - 1-2% disseminated pyrite. Manganese oxide - goethite-calcite stringers common 892' -911' - pyrite content < ½% below 900' - no limonite below 911' - thin calcite stringers - pyrite absent below 920'.							

AREA CHARLESTON T. 20S R. 21E S. 36 TOTAL DEPTH 2103 COLLAR ELEV. HOLE NO. 1

Footage From	Footage To	Description	Footage From	Footage To	% Cu.	% Zn.	% Pb.	Oz. Ag.	Oz. Au.
934	956	Tuff, red fine-grained with small altered phenocrysts - chlorite common in groundmass & alteration of phenocrysts - probably a tuff-marked bedding locally - bedding to core angle 40° @ 946' - pyrite very rare.							
956	1027	Tuff, green fine-grained - rare calcite stringers - rare very fine-grained pyrite. Goethite along calcite stronger @968'. Coarse calcite vein makes up most of the core 972'-974' - no sulfides. < ½% pyrite below 974' - disseminated euhedral crystals - rare epidote - becomes more abundant as clots from 1020'.							
1027	1105	Quartzite, fine grained, white with clay matrix - rare thin epidote stringers - no sulfides - Bedding to core angle 50° @ 1030'. Chlorite matrix and epidote increase from 1031' - locally an aphanitic siltstone - mostly fine quartzite - calcite stringer occur locally with manganese dendrites - very rare sphalerite along a narrow epidote veinlet @1085' - nearly parallel to core.							
1105	1108	Tuff (tuffaceous siltstone) white to light green 1% very fine-grained pyrite.							
1108	1140	White to green quartzite as above - top 8" bright brick red - ≈1% pyrite disseminated - rare calcite veinlets - no pyrite below 1120'.							
1140	1241	Tuff - pale green - chlorite becomes more abundant with depth - epidote common - pyrite only locally present and thin as disseminated small euhedral crystals < ½%- calcite veinlets common - quartzite 1165' - 1175' - no sulfides - 1/8" sphalerite -epidote-calcite stringers @1193' 32°∧ core - pyrite ≈ ½% 1190'-1200' - barren below 1200'-1208' - pyrite content increases to 1% - local goethitic staining along fractures.							
1241	1262	Dacite porphyry, green - 10-15% feldspar phenocrysts in dark green, chloritic groundmass only some crystals altered to epidote < ½ - < 1% pyrite as disseminated grains.							
1262	1264	Brecciated white tuff - almost entirely clay or sericite - no sulfides - probably a fault.							
1264	1440	Tuff - fine-grained, green ≈1% very fine-grained pyrite disseminated decreasing with depth. Bedding to core angle 42° @1270' - rare epidote clots - increasing with depth. 3' red tuff beds occur between 1280 and 1320' - core out of order - very narrow pyrite-sphalerite vein @1331' - white quartzite 1320' - 1326'; 1350' - 1357' - no sulfides - pyrite generally absent sometimes disseminated up to ½% and very rarely in this veinlet up to 1/8" thick. Pyrite content about 1% below 1400'.							

AREA CHARLESTON T. 20S R. 21E S. 36 TOTAL DEPTH 2103 COLLAR ELEV. HOLE NO. 1 4

Footage From	Footage To	Description	Footage From	Footage To	% Cu.	% Zn.	% Pb.	Oz. Ag.	Oz. Au.
1440	1578	Tuff, light green, very fine-grained with rare clay after feldspar phenocrysts? < 1/16" - 1-2% fine-grained disseminated pyrite-weak chlorite and epidote alteration with some narrow calcite veins - locally fragmental - fragments same rock as matrix. Few small galena crystals in an ¼" epidote vein with rare chalcopyrite and sphalerite @1488'. Phenocryst locally very abundant - 1500'-1503'. Volcanic breccia 1521'-1525' - includes angular fragments of tuffs - some volcanic matrix < ½% pyrite - similar breccias 1550'-1578'.							
1578	1597	Dacite porphyry with abundant 10-15% feldspar phenocrysts - probably same rock as above only more porphyritic - fine-grained groundmass - 1-2% quartz - phenocrysts - 2-4% fine epidote phenocrysts - no pyrite-locally fragmental.							
1597	1666	Tuff, fine-grained, light green- very little chlorite in matrix - up to 15% feldspar small phenocrysts - same rock as 1440'-1578'. 1-2% pyrite disseminated or associated with epidote - rare calcite stringers.@1635' 2" sphalerite vein with rare galena - no pyrite- no chalcopyrite roughly parallel to core - cut off by an identical ¼" vein - that is 45° to core - mineralization extends for about 6" along core.							
1666	1679	Tuff, fine-grained, red - no pyrite - rare epidote, chlorite and sericite clots - very thin calcite stringers.							
1679	1704	Tuff, fine-grained, light green as 1597-1666' - locally with angular fragments of red tuff and rarely of white quartzite. No pyrite rare epidote.							
1704	1734	Tuff-fine-grained - mostly red but some bands of green. Bedding to core angle 68° @1730'. Rare chlorite and epidote clots - no pyrite - 2" dikes? of white altered quartz-latite @1716' contains 2-3% pyrite grains.							
1734	1765	Tuff, light green, fine-grained - weak chloritic and epidote alteration - pyrite very rare.							
1765	1806	Quartzite, arkosic, fine-grained, white - weakly chloritic matrix - pyrite very rare - 1" calcite-epidote vein @1786 10° to core - no sulfides. Bedding to core angle 50° @1806' - some bands of fragmental fine-grained green tuff.							
1806	1875	Tuff, fine-grained, green - rare phenocrysts - chlorite very abundant - epidote locally abundant - locally fragmental - pyrite ½% - very fine-grained - 1" band @1818 consists of 60% epidote and 40% alunite? (specimen) - pyrite very rare below 1830'.							
1875	1900	Tuff, fine-grained, white to green - weak chloritic groundmass - fine-grained phenocrysts of feldspar - pyrite content < ½% - irregular large lenses of fine-grained white material							

AREA CHARLESTON T. 20S R. 21E S. 36 TOTAL DEPTH 2103 COLLAR ELEV. _____ LOGGED BY Peter Dunn HOLE NO. 1

Footage From	Footage To	Description	Footage From	Footage To	% Cu.	% Zn.	% Pb.	Oz. Ag.	Oz. Au.
1875	1900 (con't)	probably feldspar - thin calcite veinlets.							
1900	1950	Quartzite, arkosic, fine-grained in sericitic matrix - with chlorite alteration - epidote rare as clots and narrow stringers. Pyrite absent - small crystals and narrow stringers occur very rarely.							
1950	1962	Tuff, fine-grained, green - weak chlorite and epidote - narrow calcite stringers - no pyrite 1955'-1956' - green dacite porphyry - 15% ¼" feldspar phenocrysts - chlorite abundant - no pyrite.							
1962	1973	Quartzite - arkose, white to gray conglomerate 1965'-1972' - fragments up to 2" - epidote common - pyrite < ½%.							
1973	1980	Dacite porphyry, fine-grained - 5-15% feldspar phenocrysts, 2-5% quartz phenocrysts in a green aphanitic groundmass - epidote locally common - thin calcite stringers common often with sericite or talc- pyrite < ½%.							
1980	2055	Conglomerate, arkosic, red-grades to a fine-grained arkosic quartzite at 1998' - epidote very common in conglomerate - some calcite on fracture faces - chlorite abundant in quartzite. Bedding to core angle 76° @2011' - pyrite very rare - large irregular clots of calcite up to 1" become common below 2020'.							
2055	2067	Tuff, red - calcite clots up to 1" also common. Bedding to core angle 75 @ 2059' - no sulfides -							
2067	2096	Quartzite, arkosic - calcite clots rare - thin stringers - no sulfides.							
2096	2103	Quartzite, arkosic, red, fine-grained rare chlorite - rare calcite clots. No sulfides							
		END OF HOLE							

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Charleston Project
Cochise County Arizona

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Page 1
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Alteration	Chalcopyrite	Sphalerite	Galena	Ag	Pyrite	Rock Type

Alteration

	Sericite		Garnet
	Kaolin		Serpentine
	Silica		Biotite
	Chlorite		K Feldspar

0-14 No Core
14-148 Fragmental meta-andesite tuff. Hematite (earthy) clay, chlorite. Coarsely fragmental to 63, then tuff to 74, then coarsely fragmental to 148
148-152 Fault zone, gouge and breccia
152-153 Fragmental tuff
153-155 Fault zone, gouge and breccia
155-180 Weathered, bleached, clay-altered tuff.
180-223 Bleached white arg. alt. medium, fragmental tuff, heavily sericitized.

50
100
150
200
250

223-227 Gouge - fault zone
227-243 White arg. alt. tuff - sericitized
243-244 Gouge - fault zone
244-254 White arg. alt. tuff - sericitized

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Alteration	Chalcopyrite	Sphalerite	Galena	Ag	Pyrite	Rock Type

Alteration

	Sericite		Garnet
	Kaolin		Serpentine
	Silica		Biotite
	Chlorite		K Feldspar

254-257 Gouge - fault zone

257-303.6 Graywacke, silicified, mosaic appearance, reddish. (Might be a silicified tuff) Scattered pyrite cubes. Grades to fine gray siltstone. Pyrite on seams <1%.

303.6-328.5 Gouge and breccia, heavily sericitized (313)

328.5-340 Fine siltstone, thoroughly bleached, pyritized (2-3% py), sericitized, to 340.

300

340-342.5 Gouge

342.5-400 Fine light grey to white siltstone, considerable fine qtz., sericitized. At 366, ¼" sphalerite - chalcopyrite veinlet. Pyrite 1-3%, locally up to 10%. Rock thoroughly sericitized adjacent to veinlet. Locally abundant (up to 5%) chalcopyrite. (See specimen at 371. Nx core to 400)

350

400-474 Fine granular siltstone, grey, 2-6% pyrite, very little cpy (< 0.2%) At 430, ¼" vein calcite, siderite, galena, chalcopyrite. At 440, 1" vein same.

400

474-476 Fault, gouge

450 476-525 Fine granular siltstone, pyritized (2-6% py), fragmental from 477-1/2-479, then finer grained, light grey. Two or three 1/8" vlts 482-485, sphalerite, galena, cpy. Pyrite up to 10% locally. 6" epidote zone with fine galena, sphalerite, pyrite, tetrahedrite?, 518. Several small (1/16"-1/8") vlts sphalerite. Galena with epidote to 525. Pyrite 2-6%, other

500

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Alteration	Chalcopyrite	Sphalerite	Galena	Ag	Pyrite	Rock Type

Alteration

	Sericite		Garnet
	Kaolin		Serpentine
	Silica		Biotite
	Chlorite		K Feldspar

sulfides <0.1% in interval.

525-573 Conglomerate, 531-1/2-536, py - 2-6%, then fine light gray siltstone, 2-6% py calcite streaks 570-1/2-573. Sericitized.

573-574 Fault, Gouge

550

574-582 Fine gray siltstone, 2-6% pyrite. Sericitized.

582-584 Fault, gouge

584-586 Greenish gray fine siltstone, 1-2% py, becomes fine quartzite at 586.

586-649 Fine quartzite, grades to 1mm qtz locally, vuggy after 630, some py in vugs and on seams, (< 2% py)

600

649-665 Quartzite, 1mm, vuggy in part.

665-671 Fine grained impure qtz, locally with a streak or two of sphalerite, 1-2% py, <0.1% sph.

650

671-676.4 No core

676.4-705 Fine grained impure qtz, grades to 1mm at 679.5, vuggy, continues to 705

700 705-724 Qtz, 1mm, but with pyrite on seams, bulk 5-8% py, to 724

724-769 Bedding at 724, 75° to axis. Fine grained siltstone, light grey, 1-2% py. Becomes gray banded after 750, some what softer.

750

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Alteration	Chalcopyrite	Sphalerite	Galena	Ag	Pyrite	Rock Type

Alteration

	Sericite		Garnet
	Kaolin		Serpentine
	Silica		Biotite
	Chlorite		K Feldspar

769-818 Fragmental (conglomerate) for about 2 feet, then splotchy, local development lime silicates. Gray siltstone with local fragmental horizon, emphasized by epidote splotches, locally fine quartzite for 5-6' intervals to 818.

800 818-824 At 818, bedding at 50° to axis. Fine banded greenish-grey siltstone (epidote and calcite)

824-824.5 Several 1/8" vlts sphalerite and galena

824.5-860 Fine green-grey siltstone, splotchy with epidote, becoming drably uniform after 842-855, then aplotchy.

850

860-886.4 Porphyry, first 1'8" qtz free. Altered, probably qtz monz.? Pyritized, argillic - sericite to fault at 886.4.

886.4-934 Brecciated (healed) siltstone to 892, then fine gray siltstone, becoming darker grey with depth. Some dark epidote?

900

934-971.5 Dark grey siltstone, mottled (fine mottling) to 955.5, then fine dark gray siltstone to 971.5

950

971.5-974 24" carbonate vein (not calcite), ankerite or siderite

974-1004.3 Dark grey massive siltstone grades into fine-grained arkose.

1000

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Alteration	Chalcopyrite	Sphalerite	Galena	Ag	Pyrite	Rock Type

Alteration

	Sericite		Garnet
	Kaolin		Serpentine
	Silica		Biotite
	Chlorite		K Feldspar

1004.3-1106 At 1056, bedding 55° to axis. Becomes somewhat darker after 1080.

1050

1100 1106-1162.3 Fine grained, nearly quartzite, grey, gradually becomes coarser (about 1mm) at 1117. Stays coarse to 1141, then grades into finer at 1153. Fine arkosic qtz. - medium gray.

1150

1162.3-1178 Arkose, fine grained. Sericitized. Becomes fine grained at 1178.

1178-1248 Grades back into fine grained arkose after 1186. Two or three calcite bands 1207-1208. Mottled locally. 6" healed breccia at 1247.5, then porphyry.

1200

1248-1261 Meta-andesite porphyry

1250

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Alteration	Chalcopyrite	Sphalerite	Galena	Ag	Pyrite	Rock Type

Alteration

	Sericite		Garnet
	Kaolin		Serpentine
	Silica		Biotite
	Chlorite		K Feldspar

1261-1262 8" fault gouge

1262-1320.5 Fine massive grey granular siltstone, mottled with epidote; locally impure quartzite (hard). Becomes darker grey after 1286 to purple, 1290-1291, then 16" lime silicates to 1289.5, then purplish siltstone to 1299, then light grey grading back to purple at 1316, then grey, quartzite.

1300

1320.5-1350.5 Fine grained light grey siltstone, 1% py, some mottling, becoming medium grey with considerable mottling 1330-1336, then lighter grey with epidote patches and blobs, becoming less splotchy after 1337. Splotches end at 1350.5

1350 1350.5-1367 Fine granular impure quartzite. Grades from medium light to medium grey at 1367

1367-1482.5 Banded siltstone, some epidote banding, purplish at 1367, becomes gray and mottled, then finely mottled 1378 to 1385. Fine grained grey quartzite (impure).

1400

1482.5-1585 Fine grained light gray qtz (impure). Some epidote veinlets, sphalerite (¼" vein) at 1490. Grey to 1496, then mottled, fragmental looking to 1503. Fine grained grainy-looking to 1511. Fragmental to 1514, then fine grained, meta-arkose, fragmental 1524-1525. Fine grained light colored quartzite 1525-1566. 12" breccia 1566-1567 (healed). Fragmental light colored impure fine grained qtz to 1574.5

1450

1500

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Alteration	Chalcopyrite	Sphalerite	Galena	Ag	Pyrite	Rock Type

Alteration

	Sericite		Garnet
	Kaolin		Serpentine
	Silica		Biotite
	Chlorite		K Feldspar

1550

1585-1606 Meta-andesite-silicified.

1600

1606-1616 Mixed-meta-andesite.
1616-1630 Mixed-meta-andesite, quartzite (impure)
1630-1650 Mottled meta-arkose-fine

1650 1650-1678 Siltstone, splotchy, grey, grades to light grey at 1657. Fragmental 1662-1664. Purplish 1666-1676.5, bedding 60° to axis, contact 1678
1678-1698 Meta-andesite porphyry, several mixed zones.
1698-1746 Siltstone, purplish, to 1722, 18" fine qtz., then purplish siltstone, gradually grading to more qtz. material.

1700

1746-1757 Siltstone, fragmental (conglomerate)

1750

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Alteration	Chalcopyrite	Sphalerite	Galena	Ag	Pyrite	Rock Type

Alteration

	Sericite		Garnet
	Kaolin		Serpentine
	Silica		Biotite
	Chlorite		K Feldspar

1757-1810 Siltstone, becomes quartzitic at 1763. Fine grained impure light grey qtz.

1800

1810-1818 Fragmental siltstone (conglomerate)

1818-1951 Light gray impure siltstone (fine qtz.), fragmental intervals, grades to 1mm qtz. at 1905, 2' basal arkose 1949-51.

1850

1900

1950

1951-1954 Light colored grey siltstone
1954- 1981 Quartz latite?
1981-1998 Meta-arkose-conglomerate

2000

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Collar Elevation
Coordinates
Bearing
Depth
Inclination 90°

Charleston Project
Cochise County Arizona

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Alteration	Chalcopyrite	Sphalerite	Galena	Ag	Pyrite	Rock Type	
							1998-2050 Fine grained siltstone to 2007, then 1mm qtz. to 201.., 6" cong., then arkosix qtz. (medium grained, grey) gradually becoming darker grey, more silty to 2050.
							2050 2050-2103 Purplish siltstone, fragmental 2061-2068, then grey qtz. siltstone, medium grained, splotchy, to bottom. 2103
							2100
							2150
							2200
							2250

Alteration

	Sericite		Garnet
	Kaolin		Serpentine
	Silica		Biotite
	Chlorite		K Feldspar

FORM 223-A
11-66

F3-13

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PROPERTY Charleston Mine

SHEET NO. 1

HOLE NO. #1 DEPTH _____ ANGLE V STRIKE _____ ELEVATION _____

CO-ORDINATES _____ _____

DEPTH FEET	FORMATION	SAMPLE NO.	LENGTH FT.	ANALYSIS COPPER %	ANALYSIS NICKEL %	ANALYSIS CU. & NI. %	LENGTH FEET	PROGRESSIVE TOTALS FEET X PER CENT COPPER	NICKEL	CU. & N
201.3	White porphyry feldspar									
	kaolinized									
254	Progressively more alt'd									
	porphyry 243-245 rock al-									
	most completely clay									
264	Contact zone between									
	porphyry and tuff 254-259									
	yellow gouge? slickensides									
	minor limonite 259-264									
	broken alt'd brown tuff									
310	Tuff 264-284 brown 264-									
	284 to green tuff with									
	abund frags up to 2" vein									
	ed with qtz stringers and									
	chlorite abund fine pyrite									
	284-310 grab-yellow tuff									
	few frags, veins chlorite?									
	Lumanite? speckled from									
	pyrite qtz stringers									
311	310-311 missing									
330	Highly sericitized 311-									
	322 completely alt to									
	sercite 322 highly mixed									
	seriticized rock and									
	frsh gray tuff									
341	gray tuff abund fine									
	pyrite									
343	Completely sericitized									
	soft white rock pre-									
	dominantly mottled gray									
	meta-tuff veined with qtz									
	chlorite, v fine in string-									
	ers and disseminated									
503	372-373 bxiated 387-390									
	bx or agglomerates 503									
	stringers 302 to axis of									

FORM 225-A
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PROPERTY Charleston Mine

SHEET NO. 2

HOLE NO. #1 DEPTH _____ ANGLE V STRIKE _____ ELEVATION _____ CO-ORDINATES _____

DEPTH FEET	FORMATION	SAMPLE NO.	LENGTH FT.	ANALYSIS COPPER %	NICKEL %	CU. & NI. %	LENGTH FEET	PROGRESSIVE TOTALS FEET X PER CENT COPPER	NICKEL	CU. & N
	core ¼" epidote w/1/8"									
	core sulphide py Zn Pb									
588	518-519 sample for assay									
	Cu Zn Gray tuff with fine									
	pyrite and fine chalco and									
	582-583 zone									
	wericitized									
724	Gray siltstone to qtzite									
	703-713 coarse pyrite									
	((0.8-0.1 -Cu-Ni))									
749	v fine gray siltstone									
	minor fine py									
779	Siltstone grades into									
	varigated tuff green gray									
	and brown Veins chlorite and									
	small inclusions 767-771 tuff									
	grades into brown silt									
	stone and grades gack into									
	tuff									
832	Tuff siltstone pale grn									
	fg inclusions chert-patches									
	epidote up to 1" diam									
	fine black veins									
860	Grades to more varigated									
	tuff darker green and gray									
	more chert inclusions no									
	epidote patches									
886.4	Dark gray porphyry Felspar									
	phenocyrsts qtz eyes 866 886.4									
	bleached much sericite									
	slic ensides									
893	Gray siltstone bx 6" from									
	contact with porphyry									
920	Fine grades into variagated									
	siltstone tuff gray brown									
	green									

FORM 223-A
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PROPERTY Charleston Mine

SHEET NO. 3

HOLE NO. #1 DEPTH _____ ANGLE V STRIKE _____ ELEVATION _____

CO-ORDINATES _____ _____

DEPTH FEET	FORMATION	SAMPLE NO.	LENGTH FT.	ANALYSIS COPPER %	ANALYSIS NICKEL %	ANALYSIS CU. & NI. %	LENGTH FEET	PROGRESSIVE TOTALS FEET X PER CENT COPPER	PROGRESSIVE TOTALS NICKEL	PROGRESSIVE TOTALS CU. & NI.
934	Fine grained green tuff?									
957	Purple and grn andesitic tuff									
971	Grading to grn siltz tuff									
974	White qtz vein									
976.6	6" core broken sheard clayey rock with limonite									
1002	Fg greenish tuff occasional frags									
1055	Siltstone, gry-grn tuffaceous occasional patches and stringers epidote 1038-1040 pure gry siltstone bed 40° to axis of core									
1080	1080 - gry siltstone bed 40° to axis									
1102	Tuffaceous sitlstone gry to green patches epidote and veins epidote									
1128	Gry siltstone									
1136	Gry qtzite									
1165	Varigated tuff gry minor inclusions 1143-1152 broken core limonite on fractures									
1179	Fg gray qtzite									
1187	Gry shale tuffaceous?									
1249	Gray siltstone 1219-1237 tuffaceous, 1240-1249									
1262	Porphyry (dike?) gray-green feldspar phenocrysts abund patches epidote									
1263	White gouge, sericite?									
1290	Pale green tuff siltstone									
1299	Purple tuff									
1369	Green tuff 1311-1326 gray siltstone									

FORM 225-A
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PROPERTY Charleston Mine

SHEET NO. 4

HOLE NO. #1 DEPTH _____ ANGLE V STRIKE _____ ELEVATION _____ CO-ORDINATES _____

DEPTH FEET	FORMATION	SAMPLE NO.	LENGTH FT.	ANALYSIS COPPER %	ANALYSIS NICKEL %	ANALYSIS CU. & NI. %	LENGTH FEET	PROGRESSIVE TOTALS FEET X PER CENT COPPER	PROGRESSIVE TOTALS NICKEL	PROGRESSIVE TOTALS CU. & NI
1697	1736 - Purple tuff									
	1716 2" brown completely									
	weathered porphyry									
	1730-1736 grading into									
	gray tuff									
1763	Gray-grn tuff 1738 - many									
	inclusions of fragments									
	agglomerate									
	1742 - 1746 siltz									
	1750 - 1763 mostly agglomerate									
1799	Gray siltstone qtzite									
1871	Green tuff siltz abund									
	fragments up to 1" minor									
	qtz and epidote veins of (up?)									
	to ¼" no sulphide									
	1864 - 1870 prple tuff									
1900	Pale green to gray fragmental									
	tuff silty minor pyrite									
	in less silty sections cubes									
	up to 1/8 "									
1951	conglomerate									
	mostly small fragments up to									
	½ incl poorly sorted volcanic									
	frags rounded pebbles									
	qtzite abund qtz grains									
	and feldspar									
1961	Pearl gray silicified									
	shale bedding 45° to core									
	axis									
	1955-1956 gray porphyry									
	dike or flow? scattered									
	fledspar phenocrysts in									
	fg gray goound mass									
	1958 1" dike as above									
1966	Gray qtzite									
	fg minor dissem pyrite									

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FORM 225-A
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PROPERTY Charleston Mine

SHEET NO. 5

HOLE NO. #1 DEPTH _____ ANGLE V STRIKE _____ ELEVATION _____

CO-ORDINATES _____ _____

DEPTH FEET	FORMATION	SAMPLE NO.	LENGTH FT.	ANALYSIS COPPER %	ANALYSIS NICKEL %	ANALYSIS CU. & NI. %	LENGTH FEET	PROGRESSIVE TOTALS FEET X PER CENT COPPER	PROGRESSIVE TOTALS NICKEL	PROGRESSIVE TOTALS CU. & NI.
1974	Arkosic conglom pebbles									
	up to 2" volcanic and									
	qtziteetc. Inclusions of									
	porphyry at 1973									
1981	Gray porphyry flow or dike									
	feldspar phenocrysts up to									
	¼" Patches of epidote up to									
	3/4" qtz. minor scattered									
	py in gray-green ground mass									
1998	Arkosic conglom as at									
	1974									
	1992 - 1998 shearing									
	sericite and some calcite									
	in fract flares small									
	fault zone									
2009	Gray shale with arkose beds									
	up to 2"									
2015	Dark green gray qtzite									
	2014 4" conglomerate									
2103	Arkose									
	2015-2053 gray -green									
	with irregular inclusions									
	of limestone ground mass									
	silty with calcite cement									
	2054 - 2070 similar to									
	above but purple									
	2063-2064 with frags andesite?									
	2096-2103 prple arkose									
	similar to 2154									

14') breccia of andesite: dacite fragments (& component xls) in dense glassy matrix (→ Fe_2O_3). feldspars → clay, mafites → chlorite

63') quartz latite (kaolinized plagioclase, β quartz, & biotite → FeOx in intensely sericitized matrix) - rock is cut by dikelets similar to the matrix at 14'

180') quartz latite. (plagioclase phenocrysts heavily sericitized) rock veined with quartz & tr. of pyrite — [rock resembles Bronco qtz latite to the south

244') quartz latite like at 180'; strongly sheared and laced with quartz (and a few calcite) veins

257½') latite bx; plagioclase → clay & serici; mafites → chlorite, then FeOx; cut by chloritic shears

263') latite bx like at 257½' but cemented by cognate latite; alteration of both latites is like at 257½'; also tr. altered pyrite

286') andesite bx; plagioclase wholly altered to sericite; veined with chlorite + pyrite, then calc

371') andesite; shearing + alteration converted matrix to folioded chlorite + sericite; plagioclase xls → sericite & then drawn out by shearing; several % diss. pyrite

427') andesite like above but less shearing & slightly more intense epizonal meta. has produc epidote; several % diss. pyrite; late calcite veins

464') meta-andesite; plagioclase partly → sericite; mafites → chlorite + epidote - cut by epidote veins w/ pyrite (FeS_2 also disseminated) & tr. PbS

DDH-1 (cont.)

518') piece shows contact between andesite like at 464' & a calcareous shale, epizonally metm to produce epidote. meta-sediment is veined wit & carries diss. specks of CuFeS2, PbS, ZnS & pyrite - only pyrite occurs in the andesite; FeS mol% in ZnS almost 0%.

630') quartzite - fracturing & recrystallization have produced vuggy qtz veins w/ tr. late calcite; tr. disseminated pyrite

740') arkose, uniform-sized, fine-grained quar & slightly sericitized feldspars; tr. diss. pyrite (≤1

786') andesite; shearing has promoted extensive chloritization of matrix; plagioclase → sericite, trace of pyrite

829') calc-shale; epizonal metm has produced new epidote (especially in and around pebble veins of quartz & chlorite

860') dacite porphyry (plagioclase phenocrysts quite fresh; β quartz; hornblende → chlorite) ~1% Fe late calcite veins

866') andesite (plagioclase → sericite, biotite → chlorite) very minor pyrite

1004') argillite (fragments of plagioclase & parent andesite, dacite etc in dirty chloritic matrix)

1025') argillite - shows better sorting than above; cut by veins of epidote, calcite etc

DDH-#1 (cont.)

1159') argillite much like at 1025'. – more quartz.

1248') meta-dacite (plagioclase → calcite + epidote β qtz; mafites & xenoliths → epidote; minor pyrite

1255') just like above but longer, more spectac. epidotized xenoliths & plagioclase; uniformly diss. pyrite

1319') argillite (matrix rich in calcite, qtz, chlorite fragments selectively replaced by epidote–chlorite–calcite etc.

1350') calc-sandstone w/ chlorite in matrix

1450') like above but more calcareous; fractured & veined w/ epidote, chlorite, calcite etc; some diss. pyrite

1580') andesite bx; matrix chloritic; plagioc. → sericite + chlorite; pyrite very rare

1590') dacite (plagioclase phenocrysts quite fresh matrix of qtz & chloritized glass & mafites)

1648') banded argillite / greywacke w/ heavily chloritized mafites, plagioclase → sericite

1686') andesite (plagioclase → sericite, mafites → chlorite) veined w/ calcite, epidote & chlorite

1704') mudstone - loaded w/ amygular fragments; mild chloritization of mafites

1776') dirty ss w/ abundant chlorite in matrix epidote replaces calcareous bands; local veins of pyrite

DDH-11 (cont.)

1912') quartzite (dirty chloritic matrix) some chert pebbles; tr. euhedral pyrite

1976') dacite porph (fresh plag; β quartz; mafics → epidote + chlorite; minor coarse pyrite (rock strongly resembles 860')

1979') dacite like 1976 but much more epidote (repl. mafics & matrix) tr. pyrite

2103') dirty ss w/ ferruginous cement; veined by chlorite w/ reduced Fe_2O_3 wall

D.D. #1 ASSAYS

30 So. Main St.
P. O. Box 1889

Jacobs Assay Office

Registered Assayers

PHONE MA 2-0813

85702 Tucson, Arizona, Sept 23rd, 1967

Sample Submitted by Mr. James Stewart Co. By H. Clyde Davis

Sample Marked	GOLD Ozs. per ton ore	GOLD Value per ton ore * $	SILVER Ozs. per ton ore	COPPER Per cent Wet Assay	LEAD Per cent Wet Assay	NICKEL Ni Per Cent Wet Assay	Per Cent Wet Assay	Per Cent Wet Assay
703-713	—	—	—	.08	—	TRACE	—	—

(Check to pay 1/10/67)

* Gold Figured $35.00 per oz. Troy

Charges $ 7.00

Very respectfully,

Ben D. Jacobs

30

HAWLEY & HAWLEY
ASSAYERS AND CHEMISTS, INC.
1700 W. GRANT RD. • BOX 5934 • 622-4836
TUCSON, ARIZONA 85703

BRANCHES
DOUGLAS, ARIZONA
HAYDEN, ARIZONA
EL PASO, TEXAS
AMARILLO, TEXAS

IDENTIFICATION	GOLD OZS	SILVER OZS	LEAD %	COPPER %	ZINC %	MO. %	IRON %		
Sample	None	0.02		0.02					

RECEIVED
JAMES ST

CC: James Stewart Company
ADD: 3033 North Central
CITY: Phoenix, Arizona
DD:
CITY:
ACC: JAMES STEWART COMPANY

REMARKS:

ANALYSIS CERT. BY Pleckard

PREPARATION $ 1.00
ANALYSIS $ 8.00

DATE SPL. RECEIVED 9/8/67 | DATE COMPL 9/11/67 | PNX 336897 | $ 9.00PAID

HAWLEY & HAWLEY
ASSAYERS AND CHEMISTS, INC.
1700 W. GRANT RD. • BOX 5934 • 622-4836
TUCSON, ARIZONA 85703

BRANCHES
DOUGLAS, ARIZONA
HAYDEN, ARIZONA
EL PASO, TEXAS
AMARILLO, TEXAS

IDENTIFICATION	GOLD OZS	SILVER OZS	LEAD %	COPPER %	ZINC %	MO. %	IRON %	Ni %
280	None	None		0.05				< 0.03
1632	None	None		0.01				< 0.03
1636	None	0.50	5.60	0.08	8.05			< 0.03

CC: James Stewart Company
ADD: 3033 N. Central
CITY: Phoenix, Arizona
DD:
CITY: Attn: Mr. Cosgrove
ACC: JAMES STEWART CO. - Phoenix

OK

REMARKS: Charge Charles Top

ANALYSIS CERT. BY D. Creighton

PREPARATION $ 2.55
ANALYSIS $ 34.25

DATE SPL. RECEIVED 9/21/67 | DATE COMPL 9/26/67 | PNX 336987 | $ 36.80

6 33

BRIGHAM YOUNG UNIVERSITY
PROVO, UTAH
84601

ERNEST L. WILKINSON, PRESIDENT

OFFICE OF UNIVERSITY DEVELOPMENT

September 8, 1967

Mr. Seth Horne
144 East Country Club Drive
Phoenix, Arizona

Dear Seth:

Enclosed are the spectographic analysis reports of the four samples submitted to Rogers Research & Analysis Company.

I am also enclosing a Certificate of Assay received from Black & Deason.

Sincerely,

H. Clyde Davis

H. Clyde Davis, Director
Mineral Development

by cc

HCD:cc

Enclosures

34

P. O. BOX 1888
165 SOUTH WEST TEMPLE ST.

CERTIFICATE OF ASSAY

TELEPHONE EM 3-2563

BLACK & DEASON

ASSAYERS AND CHEMISTS

H. C. Davis

SALT LAKE CITY, UTAH 84110 September 6, 1957

Hole #1

ASSAY PER TON OF 2000 POUNDS

NAME	NO.	GOLD OUNCES	VALUE GOLD PER TON	SILVER OUNCES	WET LEAD %	COPPER %	INSOLUBLE %	ZINC %	%	IRON %	%
Horne #1		Trace		Trace		0.05	1102'-1107'				
Horne #2		Trace		0.4		0.05	1108'				
Horne #3		Trace		0.4		0.05	1106'-1108'				
Horne #4		Trace		Trace		0.10	1130'-1135'				

CHARGE $ 27.75 total

V E Worsley

35

ROGERS RESEARCH & ANALYSIS CO.

X-ray Spectographic & Diffraction Specialists

1009 WEST 5TH SOUTH WEST BOUNTIFUL PHONE 295-4402
P. O. BOX 6, WOODS CROSS, UTAH 84087

Customer's Name Clyde Davis Date Sept 5, 1967

Address 859 E. 2730 North, Provo, Utah 84601 Phone 374-5389

REPORT OF X-RAY SPECTOGRAPHIC (FLUORESCENCE) ANALYSIS — COMPLETE

Type:** Qualitative ☐ Semi-Quantitative ☐ Semi-Quantitative ☒ Quantitative ☐

R.R.A No. 9567-3 Customer's Identification of Sample Number 1

1102-1107

Elements in Sample:

	Antimony		Germanium		Osmium*		Thallium
.1%	Arsenic	Tr	Gold*		Palladium*		Thulium
.6%	Barium		Hafnium		Platinum*		Thorium
Tr	Bismuth		Holmium		Praseodymium	Tr	Tin
	Cadmium		Indium		Rhenium	1.5%	Titanium
	Cerium		Iodine		Rhodium	.1%	Tungsten*
	Cesium		Iridium	Tr	Rubidium		Uranium
.2%	Chromium	9.8%	Iron		Ruthenium*	.2%	Vanadium
Tr	Cobalt		Lanthanum		Samarium		Ytterbium
	Columbium (Niobium)	Tr	Lead		Scandium*		Yttrium
.5%	Copper		Lutecium*		Selenium	.1%	Zinc
	Dysprosium	.3%	Manganese	1 oz/Ton	Silver*	.3%	Zirconium
	Erbium		Mercury	.7%	Strontium		
	Europium	Tr	Molybdenum		Tantalum		
	Gadolinium		Neodymium		Tellerium		
	Gallium	.2%	Nickel		Terbium		

* Limited detection

COMPLETE ANALYSIS: An identification of all the detectable elements present in the sample with an atomic number of 22 or higher.

By R. J. Rogers
ROGERS RESEARCH & ANALYSIS CO.

** REPORT SYMBOLS:

☐ Qualitative — P = Present, Blank = Non-Present
☐ Semi-Quantitative Qualitative — T = Below .03%, W = .03% to .3%, S = .3% to 3.0%, L = 3.0% to 30.0%, Q = Above 30.0%
☒ Semi-Quantitative — Given in % within ± 10% to 25% of the Element's Concentration
☐ Quantitative — Given in %

TOTAL SERVICE CHARGE $17.00

36

ROGERS RESEARCH & ANALYSIS CO.

X-ray Spectographic & Diffraction Specialists

1009 WEST 5TH SOUTH WEST BOUNTIFUL PHONE 295-4402
P. O. BOX 6, WOODS CROSS, UTAH 84087

Customer's Name Clyde Davis Date Sept 5, 1967

Address 859 E. 2730 North. Provo, Utah Phone 374-5389

REPORT OF X-RAY SPECTOGRAPHIC (FLUORESCENCE) ANALYSIS — COMPLETE

Type:** Qualitative ☐ Semi-Quantitative ☐ Semi-Quantitative ☒ Quantitative ☐

R.R.A No. 9567-4 Customer's Identification of Sample Number 2

1108'

Elements in Sample:

	Antimony		Germanium		Osmium*		Thallium
Tr	Arsenic	.1 oz/ Ton	Gold*		Palladium*		Thulium
.5%	Barium		Hafnium		Platinum*	Tr	Thorium
Tr	Bismuth		Holmium		Praseodymium		Tin
	Cadmium		Indium		Rhenium	.8%	Titanium
	Cerium		Iodine		Rhodium	Tr	Tungsten*
	Cesium		Iridium	Tr	Rubidium		Uranium
.1%	Chromium	4.7%	Iron		Ruthenium*	Tr	Vanadium
	Cobalt		Lanthanum		Samarium		Ytterbium
	Columbium (Niobium)	.1%	Lead		Scandium*	.1%	Yttrium
.3%	Copper		Lutecium*		Selenium	.2%	Zinc
	Dysprosium	.4%	Manganese	Tr	Silver*	.3%	Zirconium
	Erbium		Mercury	~~.3~~ .2%	Strontium		
	Europium	Tr	Molybdenum		Tantalum		
	Gadolinium		Neodymium		Tellerium		
	Gallium	.2%	Nickel		Terbium		

Limited detection

COMPLETE ANALYSIS: An identification of all the detectable elements present in the sample with an atomic number of 22 or higher.

By [signature]
ROGERS RESEARCH & ANALYSIS CO.

*** REPORT SYMBOLS:**

- ☐ Qualitative — P = Present, Blank = Non-Present
- ☐ Semi-Quantitative Qualitative — T = Below .03%, W = .03% to .3%, S = .3% to 3.0%, L = 3.0% to 30.0%, Q = Above 30.0%
- ☒ Semi-Quantitative — Given in % within ± 10% to 25% of the Element's Concentration
- ☐ Quantitative — Given in %

TOTAL SERVICE CHARGE $ 17.00

37

ROGERS RESEARCH & ANALYSIS CO.

X-ray Spectographic & Diffraction Specialists

1009 WEST 5TH SOUTH WEST BOUNTIFUL PHONE 295-4402
P. O. BOX 6, WOODS CROSS, UTAH 84087

Customer's Name Clyde Davis Date Sept 5, 1967

Address 859 E. 2730 N. Provo, Utah Phone 374-5389

REPORT OF X-RAY SPECTOGRAPHIC (FLUORESCENCE) ANALYSIS — COMPLETE

Type:** Qualitative ☐ Semi-Quantitative ☐ Semi-Quantitative ☒ Quantitative ☐

R.R.A No. 9567-5 Customer's Identification of Sample Number 3 1106-1108

Elements in Sample:

	Antimony		Germanium		Osmium*		Thallium
.2%	Arsenic	Tr	Gold*		Palladium*		Thulium
.1%	Barium		Hafnium		Platinum*		Thorium
	Bismuth		Holmium		Praseodymium	.1%	Tin
	Cadmium		Indium		Rhenium	.8%	Titanium
	Cerium		Iodine		Rhodium		Tungsten*
	Cesium		Iridium	.3%	Rubidium	Tr	Uranium
.1%	Chromium	14.9%	Iron		Ruthenium*	Tr	Vanadium
Tr	Cobalt		Lanthanum		Samarium		Ytterbium
	Columbium (Niobium)	.6%	Lead		Scandium*		Yttrium
.1%	Copper		Lutecium*		Selenium	1.2%	Zinc
	Dysprosium	.2%	Manganese	3 oz/Ton	Silver*	.4%	Zirconium
	Erbium		Mercury	.8%	Strontium		
	Europium		Molybdenum		Tantalum		
	Gadolinium		Neodymium		Tellerium		
	Gallium	Tr	Nickel		Terbium		

* Limited detection

COMPLETE ANALYSIS: An identification of all the detectable elements present in the sample with an atomic number of 22 or higher.

By [signature]
ROGERS RESEARCH & ANALYSIS CO.

** REPORT SYMBOLS:

- ☐ Qualitative — P = Present, Blank = Non-Present
- ☐ Semi-Quantitative Qualitative — T = Below .03%, W = .03% to .3%, S = .3% to 3.0%, L = 3.0% to 30.0%, Q = Above 30.0%
- ☒ Semi-Quantitative — Given in % within ± 10% to 25% of the Element's Concentration
- ☐ Quantitative — Given in %

TOTAL SERVICE CHARGE $ 17.00

38

ROGERS RESEARCH & ANALYSIS CO.

X-ray Spectographic & Diffraction Specialists

1009 WEST 5TH SOUTH WEST BOUNTIFUL PHONE 295-4402
P. O. BOX 6, WOODS CROSS, UTAH 84087

Customer's Name Clyde Davis Date Sept 5, 1967

Address 859 E. 2730 North, Provo, Utah Phone 374-5389

REPORT OF X-RAY SPECTOGRAPHIC (FLUORESCENCE) ANALYSIS — COMPLETE

Type:** Qualitative ☐ Semi-Quantitative ☐ Semi-Quantitative ☒ Quantitative ☐

R.R.A No. 9567-6 Customer's Identification of Sample Number 4 1130-1135

Elements in Sample:

	Antimony		Germanium		Osmium*		Thallium
.3%	Arsenic	Tr	Gold*		Palladium*		Thulium
.5%	Barium		Hafnium		Platinum*		Thorium
	Bismuth		Holmium		Praseodymium	Tr	Tin
	Cadmium		Indium		Rhenium	1.6%	Titanium
	Cerium		Iodine		Rhodium	.1%	Tungsten*
	Cesium		Iridium	.2%	Rubidium		Uranium
.1%	Chromium	2.6%	Iron		Ruthenium*		Vanadium
	Cobalt		Lanthanum		Samarium		Ytterbium
	Columbium (Niobium)	.1%	Lead		Scandium*		Yttrium
.3%	Copper		Lutecium*		Selenium	.2%	Zinc
	Dysprosium	.4%	Manganese	2 oz/Ton	Silver*	.4%	Zirconium
	Erbium		Mercury	.3%	Strontium		
	Europium	Tr	Molybdenum		Tantalum		
	Gadolinium		Neodymium		Tellerium		
	Gallium	Tr	Nickel		Terbium		

* Limited detection

COMPLETE ANALYSIS: An identification of all the detectable elements present in the sample with an atomic number of 22 or higher.

By E W Rogers
ROGERS RESEARCH & ANALYSIS CO.

** REPORT SYMBOLS:

- ☐ Qualitative — P = Present, Blank = Non-Present
- ☐ Semi-Quantitative Qualitative — T = Below .03%, W = .03% to .3%, S = .3% to 3.0%, L = 3.0% to 30.0%, Q = Above 30.0%
- ☒ Semi-Quantitative — Given in % within ± 10% to 25% of the Element's Concentration
- ☐ Quantitative — Given in %

TOTAL SERVICE CHARGE $ 17.00

VALLEY ASSAY OFFICE

AND ORE TESTING LABORATORY

MEMORANDUM OF ASSAY

Made for James Stuart Co. Tempe, Arizona, Sept. 8, 1967

SAMPLE NO.	PER TON OF 2000 POUNDS AVOIRDUPOIS								COPPER, OR			LEAD, OR			TOTAL	
	GOLD				SILVER											
	AT 35.00 PER OUNCE				AT 1.60 PER OUNCE				AT 0.38 PER LB.			AT PER LB.				
	OZS.	100's	$	CTS.	OZS.	100's	$	CTS.	%	$	CTS.	%	$	CTS.	$	CTS.
1098'					0.	30		48	0.05		38					86
Clyde- 1102	0.	02		70	0.	80	1	28	.10		76				2	74
" 1130	0.	01		35	0.	40		64								
" 1260					0.	60		96	.05		38				1	30
" 1290					0.	40		64								64

REMARKS:

REGISTERED ASSAYER
CERTIFICATE EXPIRES
L LEE
BOYER
DEC 31, 1967
ARIZONA, U.S.A.

NO.

BY L. Lee Boyer
Registered Assayer.

CHARGE $ 21.00

VALLEY ASSAY OFFICE
AND ORE TESTING LABORATORY
MEMORANDUM OF ASSAY

Made for James Stuart Co. Tempe, Arizona, Sept. 8, 19 67

SAMPLE NO.	PER TON OF 2000 POUNDS AVOIRDUPOIS								COPPER, OR			~~[illegible]~~ OR Nickel			TOTAL	
	GOLD				SILVER											
	AT		PER OUNCE		AT		PER OUNCE		AT		PER LB.	AT		PER LB.		
	OZS.	100's	$	CTS.	OZS.	100's	$	CTS.	%	$	CTS.	%	$	CTS.	$	CTS.
860' to 887'												0.15				

REGISTERED ASSAYER
CERTIFICATE EXPIRES
L. LEE
BOYER
DEC. 31, 1967
ARIZONA, U.S.A.

REMARKS:

NO.

BY L. Lee Boyer
Registered Assayer.

CHARGE $ 7.50 Rt.
L.L.B.

VALLEY ASSAY OFFICE
AND ORE TESTING LABORATORY
MEMORANDUM OF ASSAY

Made for James Stuart Co. Tempe, Arizona, Sept. 11, 19 67

SAMPLE NO.	PER TON OF 2000 POUNDS AVOIRDUPOIS															
	GOLD				SILVER				COPPER, OR			LEAD, OR			TOTAL	
	AT		PER OUNCE		AT 1.60 PER OUNCE				AT 0.38 PER LB.			AT		PER LB.		
	OZS.	100's	$	CTS.	OZS.	100's	$	CTS.	%	$	CTS.	%	$	CTS.	$	CTS.
860 to 864'					0.	60		96	.10		76				1	72
893 to 904'					0.	40		64	.05		38				1	02

REMARKS:

REGISTERED ASSAYER CERTIFICATE EXPIRES L. LEE BOYER DEC. 31, 1967 ARIZONA, U.S.A.

NO.

BY L. L. Boyer
Registered Assayer.

CHARGE $ 8.00 - Pd. 9/14/67

6

VALLEY ASSAY OFFICE
AND ORE TESTING LABORATORY
MEMORANDUM OF ASSAY

Made for James Stuart Co. Tempe, Arizona, Sept. 7, 19 67

SAMPLE NO.	PER TON OF 2000 POUNDS AVOIRDUPOIS								COPPER, OR			~~[illegible]~~, OR Nickel			TOTAL	
	GOLD				SILVER											
	AT		PER OUNCE		AT		PER OUNCE		AT		PER LB.	AT		PER LB.		
D.D.Core	OZS.	100's	$	CTS.	OZS.	100's	$	CTS.	%	$	CTS.	%	$	CTS.	$	CTS.
860'to887'												Present				
887'to930'												Present				

REMARKS: The Core from the 860' to 887'is high in Copper in places.

NO.

CHARGE $ 4.00

BY L. Lee Boyer
Registered Assayer.

REGISTERED ASSAYER
CERTIFICATE EXPIRES
L. LEE
BOYER
DEC. 31, 1967
ARIZONA, U.S.A.

Shop No. 7456
File No. 1988 S T

Date 16 AUG 1967

VALUES
Latest Quotation

1 oz. Gold.....
1 oz. Silver.....
1 lb. Copper.....
1 lb. Lead.....
1 lb. Zinc.....

THIS CERTIFIES
Samples submitted for assay contain as follows:

Arizona Assay Office

815 NORTH FIRST STREET
Phone: 253-4001

Phoenix, Arizona 85001
P. O. BOX 1148

JAMES STEWART CO
3033 N.Central
Phoenix Arizona

Short Ton ..... 2000 Lbs.
Short Ton Unit ..... 20 Lbs.
Long Ton ..... 2240 Lbs.
Long Ton Unit ..... 22.4 Lbs.

MARKS	SILVER PER TON Ozs.	SILVER PER TON Tenths	VALUE PER TON	GOLD PER TON Ozs.	GOLD PER TON 100ths	VALUE PER TON	TOTAL VALUE PER TON of Gold & Silver	PERCENTAGE COPPER	PERCENTAGE LEAD	PERCENTAGE ZINC	REMARKS
CHARLESTON # 20	.8		$1.20		.03	$1.05		0.055	TRACE	2.00	310'

Charges $ 10.00 PAID

Assayer

REGISTERED ASSAYER
CERTIFICATE EXPIRES
JACK A. STONE
DEC. 31, 19
JACK STONE REG. NO. 5490

ANDY CHUKA, PRINT

Shop No. 7465
File No. 1989 S T

Date 21 AUG 1967

VALUES
Latest Quotation

1 oz. Gold.....
1 oz. Silver.....
1 lb. Copper.....
1 lb. Lead.....
1 lb. Zinc.....

THIS CERTIFIES
Samples submitted for assay contain as follows:

Arizona Assay Office

815 NORTH FIRST STREET
Phone: 253-4001

JAMES STEWART CO
3033 N.CENTRAL
PHOENIX ARIZONA

Phoenix, Arizona 85001
P. O. BOX 1148

Short Ton ..... 2000 Lbs.
Short Ton Unit ..... 20 Lbs.
Long Ton ..... 2240 Lbs.
Long Ton Unit ..... 22.4 Lbs.

MARKS	SILVER PER TON Ozs.	SILVER PER TON Tenths	VALUE PER TON	GOLD PER TON Ozs.	GOLD PER TON 100ths	VALUE PER TON	TOTAL VALUE PER TON of Gold & Silver	PERCENTAGE COPPER	PERCENTAGE LEAD	PERCENTAGE ZINC		REMARKS
# 21		.4	$.60		.03	$1.05		0.04	0.20			$98
# 22		.4	$.60		.02	$.70		0.045	TRACE			$10
# 23		.6	$.90		.01	$.35						Lpi surface
# 102		.4	$.60		.02	$.70		0.055	0.20	1.00		$64. $69

REGISTERED ASSAYER
CERTIFICATE EXPIRES
DEC. 31, 1967
ARIZONA, U.S.A.

Charges $ 29.00

Assayer.....
JACK STONE REG. NO. 5479

ANDY CHUKA, PRINT

Shop No. 7410S
File No. 1999 ST

Date 13 SEPT 1967

VALUES
Latest Quotation

1 oz. Gold
1 oz. Silver
1 lb. Copper
1 lb. Lead
1 lb. Zinc

THIS CERTIFIES
Samples submitted for assay contain as follows:

Arizona Assay Office

815 NORTH FIRST STREET
Phone: 253-4001

Phoenix, Arizona 85001
P. O. BOX 1148

JAMES STEWART CO
3033 N.CENTRAL
PHOENIX ARIZONA

Short Ton ..... 2000 Lbs.
Short Ton Unit ..... 20 Lbs.
Long Ton ..... 2240 Lbs.
Long Ton Unit ..... 22.4 Lbs.

MARKS	SILVER PER TON Ozs.	SILVER PER TON Tenths	VALUE PER TON	GOLD PER TON Ozs.	GOLD PER TON 100ths	VALUE PER TON	TOTAL VALUE PER TON of Gold & Silver	PERCENTAGE COPPER	REMARKS
1541'		.3	$.45					0.07	
Hole #1									

Charges $ 5.00

Assayer Jack Stone

JACK STONE REG. No. 5479

ANDY CHUKA, PRINT

Shop No. 7428
File No. 1375 CO

Date 28 SEPT 1967

Arizona Assay Office

815 NORTH FIRST STREET
Phone: 253-4001

Phoenix, Arizona 85001
P. O. BOX 1148

RECEIVED
SEP 28 1967
JAMES STEWART COMPANY
PHOENIX, ARIZONA

VALUES
Latest Quotation

1 oz. Gold.....
1 oz. Silver.....
1 lb. Copper.....
1 lb. Lead.....
1 lb. Zinc.....

THIS CERTIFIES
Samples submitted for assay contain as follows:

MR.COSGROVE
JAMES STEWART CO

Short Ton ..... 2000 Lbs.
Short Ton Unit ..... 20 Lbs.
Long Ton ..... 2240 Lbs.
Long Ton Unit ..... 22.4 Lbs.

MARKS	SILVER PER TON Ozs.	SILVER PER TON Tenths	VALUE PER TON		GOLD PER TON Ozs.	GOLD PER TON 100ths	VALUE PER TON		TOTAL VALUE PER TON of Gold & Silver		PERCENTAGE % COPPER				REMARKS
											0.025				

REGISTERED ASSAYER
CERTIFICATE EXPIRES
DEC. 31, 1967
JACK STONE
ARIZONA
JACK STONE REG. NO. 5479

Charges $ 2.50 PAID

Assayer

ANDY CHUKA, PRINT

Shop No. 7425
File No. 2003 ST

Date 22 SEPT 1967

VALUES
Latest Quotation

1 oz. Gold
1 oz. Silver $1.50
1 lb. Copper
1 lb. Lead
1 lb. Zinc

THIS CERTIFIES
Samples submitted for assay contain as follows:

Arizona Assay Office

815 NORTH FIRST STREET
Phone: 253-4001

Phoenix, Arizona 85001
P. O. BOX 1148

JAMES STEWART CO
707 MAYER CENTRAL BLDG
3033 N.Central Ave
Phoenix Arizona 85012

Short Ton ..... 2000 Lbs.
Short Ton Unit ..... 20 Lbs.
Long Ton ..... 2240 Lbs.
Long Ton Unit ..... 22.4 Lbs.

MARKS	SILVER PER TON Ozs.	SILVER PER TON Tenths	VALUE PER TON	GOLD PER TON Ozs.	GOLD PER TON 100ths	VALUE PER TON	TOTAL VALUE PER TON of Gold & Silver	PERCENTAGE Copper	PERCENTAGE LEAD	PERCENTAGE ZINC	PERCENTAGE Ni.	REMARKS
720		.8	$1.20						TRACE	11.4		
60								0.03			X	

Ni.will follow when complete

Charges $ 28.50

Assayer

JACK STONE Reg. No. 5479

REGISTERED ASSAYER
CERTIFICATE EXPIRES
JACK E. STONE
DEC. 31, 1967
ARIZONA, U.S.A.

ANDY CHUKA, PRINT

Shop No. 7425
File No. 2003 ST

Date 22 SEPT 1967

Arizona Assay Office

815 NORTH FIRST STREET
Phone: 253-4001

Phoenix, Arizona 85001
P. O. BOX 1148

VALUES
Latest Quotation

1 oz. Gold.....
1 oz. Silver.....
1 lb. Copper.....
1 lb. Lead.....
1 lb. Zinc.....

JAMES STEWART CO

Short Ton ..... 2000 Lbs.
Short Ton Unit ..... 20 Lbs.
Long Ton ..... 2240 Lbs.
Long Ton Unit ..... 22.4 Lbs.

THIS CERTIFIES
Samples submitted for assay contain as follows:

MARKS	SILVER PER TON Ozs.	SILVER PER TON Tenths	VALUE PER TON		GOLD PER TON Ozs.	GOLD PER TON 100ths	VALUE PER TON		TOTAL VALUE PER TON of Gold & Silver		PERCENTAGE Ni.				REMARKS
720											NIL				
60											NIL				

REGISTERED ASSAYER
CERTIFICATE NO. 5479
JACK E. A. STONE
DEC. 31, 19.67
ARIZONA, U.S.A.

Charges $ XXXXX

Assayer.....
JACK STONE REG. No. 5479

ANDY CHUKA, PRINT

Shop No. 7500
File No. 1986 S T

Date 15 AUG 1967

6

VALUES
Latest Quotation

1 oz. Gold.....
1 oz. Silver.....
1 lb. Copper.....
1 lb. Lead.....
1 lb. Zinc.....

THIS CERTIFIES
Samples submitted for assay contain as follows:

Arizona Assay Office

815 NORTH FIRST STREET
Phone: 253-4001

Phoenix, Arizona 85001
P. O. BOX 1148

JAMES STEWART CO
Clarence Cosgrove
3033 N.Central
Phoenix Arizona

Short Ton ..... 2000 Lbs.
Short Ton Unit ..... 20 Lbs.
Long Ton ..... 2240 Lbs.
Long Ton Unit ..... 22.4 Lbs.

MARKS	SILVER PER TON Ozs.	SILVER PER TON Tenths	VALUE PER TON	GOLD PER TON Ozs.	GOLD PER TON 100ths	VALUE PER TON	TOTAL VALUE PER TON of Gold & Silver	PERCENTAGE COPPER	PERCENTAGE LEAD	PERCENTAGE ZINC	REMARKS
54' # 10 - Liberty								0.26	TRACE	1.20	
525' #13 - High Grade Ore		.7	$1.05		.11	$3.85		0.25	TRACE	4.90	

REGISTERED ASSAYER
CERTIFICATE EXPIRES
CLARK E. STONE
DEC. 31, 1967
ARIZONA, U.S.A.
JACK LUNA, Reg. No. 5479

Charges $ 18.50

Assayer.....

ANDY CHUKA, PRINT

Shop No. 7446
File No. 1996 ST

Date 8 SEPT 1967

VALUES
Latest Quotation

1 oz. Gold.....
1 oz. Silver.....
1 lb. Copper.....
1 lb. Lead.....
1 lb. Zinc.....

THIS CERTIFIES
Samples submitted for assay contain as follows:

Arizona Assay Office

815 NORTH FIRST STREET
Phone: 253-4001

Phoenix, Arizona 85001
P. O. BOX 1148

JAMES STEWART CO
3033 N.CENTRAL
PHOENIX ARIZONA

Short Ton ..... 2000 Lbs.
Short Ton Unit ..... 20 Lbs.
Long Ton ..... 2240 Lbs.
Long Ton Unit ..... 22.4 Lbs.

MARKS	SILVER PER TON Ozs.	SILVER PER TON Tenths	VALUE PER TON		GOLD PER TON Ozs.	GOLD PER TON 100ths	VALUE PER TON		TOTAL VALUE PER TON of Gold & Silver		PERCENTAGE				REMARKS
CORE	2.	1	$3.	15											

REGISTERED ASSAYER
CERTIFICATE EXPIRES
JACK STONE
DEC 31, 19
ARIZONA U.S.A.

Charges $.....2.50.....

Assayer.....
JACK STONE Reg. No. 5479

ANDY CHUKA, PRINT

Shop No. 7434S
File No. 1993 ST

Date 31 AUG 1967

VALUES
Latest Quotation

1 oz. Gold.....
1 oz. Silver.....
1 lb. Copper.....
1 lb. Lead.....
1 lb. Zinc.....

THIS CERTIFIES
Samples submitted for assay contain as follows:

Arizona Assay Office

815 NORTH FIRST STREET
Phone: 253-4001

Phoenix, Arizona 85001
P. O. BOX 1148

JAMES STEWART CO
3033 N.CENTRAL
PHOENIX ARIZONA

Short Ton ..... 2000 Lbs.
Short Ton Unit ..... 20 Lbs.
Long Ton ..... 2240 Lbs.
Long Ton Unit ..... 22.4 Lbs.

MARKS	SILVER PER TON Ozs.	SILVER PER TON Tenths	VALUE PER TON	GOLD PER TON Ozs.	GOLD PER TON 100ths	VALUE PER TON	TOTAL VALUE PER TON of Gold & Silver	PERCENTAGE COPPER	REMARKS
# 120		.7	$1.05	TRACE				0.485	1102'-1106'
# 121		.4	$.60	NIL				0.095	1108'
#122		.4	$.60	NIL				0.035	1106-1108

REGISTERED ASSAYER
CERTIFICATE EXPIRES
JACK E. STONE
DEC. 31, 1967
ARIZONA U.S.A.

Charges $ 16.50

Assayer.....
JACK STONE REG. No. 5479

ANDY CHUKA, PRINT

HECTOR C. ROCHIN
MANAGER
REGISTERED ASSAYER
ARIZONA REG. No. 4073

ROCHIN ENGINEERING AND ASSAY OFFICE

P. O. BOX 218 PHONE 364-8092
DOUGLAS, ARIZONA - 85607

HECTOR A. ROCHIN
MINING ENGINEER AND
LAND SURVEYOR
ARIZONA REG. No. 2472

CERTIFICATE OF ASSAY

Name James Stewart Co. Address 3033 N Central Ave. Phoenix, Arizona

	GOLD OZS	SILVER OZS	COPPER %	LEAD %					
Lab 21468 # 101	Tr	Tr	0.029						
21469 # 102	Tr	0.04	0.033						

REGISTERED ASSAYER CERTIFICATE 4073 H. C. ROCHIN State of Arizona ARIZONA, U.S.A.

REMARKS:
Run in duplicate

DATE: 26 Sept 67

CHARGES: $ 13.00

53

ARIZONA TESTING LABORATORIES

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

Chemists . . . Engineers

CHEMICAL • RESEARCH • ASSAY • ORE TESTING • PHYSICAL TESTING

For: Clarence Cosgrove
1001 West Amelia
Phoenix, Arizona

Date: September 19, 1967

Lab. No.: 1708

Sample: Ore

Marked: 1508 Hole #1 Depth 1508'

Received: 9-13-67

Submitted by: Same

Report of Laboratory Tests

REPORT OF QUALITATIVE SPECTROGRAPHIC EXAMINATION

Element	Approximate Percent
Boron	0.005
Silicon	Major Constituent
Aluminum	Intermediate Constituent
Manganese	0.2
Magnesium	3.0
Gallium	0.003
Iron	3.0
Vanadium	0.005
Calcium	2.0
Copper	0.02
Sodium	1.0
Titanium	0.4
Zirconium	0.5

Respectfully submitted,

ARIZONA TESTING LABORATORIES

Claude E McLean

Claude E. McLean, Jr.

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

Chemists . . . Engineers

For: James Stewart Company
3033 North Central Avenue
Phoenix, Arizona

Date: August 8, 1967

Lab. No.: 1622

Sample:

Marked: ----

Received:

Submitted by: Same

Report of Laboratory Tests

REPORT OF QUALITATIVE SPECTROGRAPHIC EXAMINATION

Element	Approximate Percent
Boron	0.01
Silicon	Major Constituent
Aluminum	2.0
Manganese	0.02
Magnesium	0.2
Lead	5.0
Gallium	0.003
Copper	0.2
Iron	9.0
Niobium	Nil
Zinc	5.0
Titanium	0.1
Silver	0.05
Tantalum	Nil

Respectfully submitted

ARIZONA TESTING LABORATORIES

Charlotte Mills
Mgr. Tel of Pil - 15 to live for

Claude E McLean

Claude E. McLean, Jr.

RESEARCH • ASSAY • ORE TESTING • PHYSICAL TESTING

-55
6
file

ARIZONA TESTING LABORATORIES

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

Chemists . . . Engineers

For: James Stewart Company
3033 North Central
Phoenix, Arizona

Date: September 6, 1967

Lab. No.: 1687

Sample:

Marked: Crystal from limestone interface

Received: 9-1-67

Submitted by: Mr. Jones

Report of Laboratory Tests

REPORT OF QUALITATIVE SPECTROGRAPHIC ANALYSIS

Element	Approximate Percent
Manganese	0.3
Magnesium	0.3
Lead	1.0
Silicon	2.0
Copper	0.1
Iron	Major Constituent
Aluminum	1.0
Calcium	9.0
Titanium	0.01
Silver	Nil

Respectfully submitted,

ARIZONA TESTING LABORATORIES

Claude E. McLean, Jr.

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ARIZONA TESTING LABORATORIES

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

Chemists . . . Engineers . . . Geologists

For James Stewart Company
3033 North Central Avenue
Phoenix, Arizona

Date September 6, 1967

Sample of Ore

Received: 9-1-67

Submitted by: Mr. Jones

ASSAY CERTIFICATE

Gold figured at $ 35.00 per ounce

Silver figured at $ 1.80 per ounce

LAB. NO.	IDENTIFICATION	GOLD		SILVER *		PERCENTAGES	
		OZ. PER TON	VALUE	OZ. PER TON	VALUE		
1693	LWP #2, 4' from bottom	nil		nil*			

* Determined chemically.

Respectfully submitted,
ARIZONA TESTING LABORATORIES
Claude E. McLean, Jr.

ASSAY & DETERMINATION

	depth		Cu	Ag	Au	Ni	Pb	Zn
1	265		0.09	0.4			0.16	0.44
	280		0.05			.03		
	315	~~Ex~~ Intermediate nickel assay	⊕ 1.0%					
2	360		0.03				0.09	0.21
3	415		0.1				0.06	0.10
4	510	Chemical	0.03				0.16	0.21
		~~Check~~ Fire assay	0.055		.03		Tr	2.0
5	525	Chemical	0.01				.06	.10
		~~Check~~ Fire Assay	0.25	.7	.11		Tr	
6	541		.01				.01	.12
	642		.21				Tr	1.2
	703 - 713	Highest Concentration of Pyrites	.08			.01		
	720		.02			NONE		
	810		.02		.02			
	860 - 881					.15		
	869	Analyser	3.0					
	864 -		.035	.4	.02		.02	1.0
	898		.04	0.7	.03			
	1102 - 6	Fire assay	.485	0.7	Tr			
		Spec - Utah	.5	1.0	Tr	0.2	Tr	0.1
	1108	Fire assay	.095	.04				
		Spec - Utah	.30	Tr	0.1		1.0	0.2
	1106 - 08	Fire assay	.10	3.0	Tr		0.6	
		Spec - Utah	.3	Tr	.10	0.2	.10	0.2
	1140		.035	.04				
	1130 - 35	Spec Utah	0.3	2.0	Tr			0.2
	1300		.02	.02				
	1541		.01	.3				
	1508	Spec - Phase	.01				1.0	
	1432		01	Nil	Nil	.03		
	1636		.08	0.5	Nil	.03	5.6	0.05

Hawley -

#280 - Cu .05
Ni (-.03)

1632 Cu .01
Ni (-.03)

1636 PB 5.60
Cu .08
Zn 8.05
Ni (-.03)

Invoice # 7425 58

Arizona assay. 9/22/

#720 - Ag .8
Pb Trace
Zn 11.40 %
Ni

60 - Cu - .08
Ni

Jacobs Assay - 622-0813

703 - 713 - Cu .08
Ni (-.01)

		Cu	Ag oz	Au	Ni	Pb %	Zn %	
Surface Sericite	B		.05			52	55	B West Side Space 1632
	A		0.8			Tr	11.4	A Zinc Vein → Assay
1	265	.09	0.4			.16	0.44	
	280	.05			.03			
2	360	.03				.09	.21	
3	445	.01				.06	.10	
4	510	.03				1.6	.24	Chem
	check	.055		.03		Tr	2.0	Fire
5	525	.01				.06	.10	Chem
	check	.25	.7	.11		Tr		Fire
6	541	.01				.06	.12	
	636	—				—	—	
	642	.26				Tr	1.2	
	703-13	.08			.01			Jacobs Assay
	720	.08			None			Highest Concentration of Pyrites
	810	.02		.02				
	869 - Clyde	3.0						Analyser.
	864	.055	.4	.02		.02	.10	
	898	.04	0.7	.03				
	1127-6 Fire	.485	0.7	Tr				
	Clyde	.5	1.0	Tr	0.2	Tr	0.1	
	1108	.095	.04	—	—	—	—	
	Clyde	.30	Tr	0.1		1.0	0.2	
	1106-08	.10	3.0	Trace		0.6	1.2	
	1140 Fire	.035	.04	—				
	1130-35 Clyde	0.3	3.0	Tr			0.2	
	1300	.02	.02	—				
	1541	.07	.3					
	1508 Spect	.01				1.6		
	1632	.01	N.I	N.I	.03			
	1636	.08	0.5	N.I	.03	5.6	0.05	

ACCURACY PAPER NO. 5304 5 SQUARES TO THE CENTIMETER Nestab

Samples Correlated with Clyde

JSCo		Clyde	Cu	Ag	Cu	Ag
A	1074 - 1078					
B	1096					
C	1102 - 1107	#1	.05	Tr	0.5	1oz
D	1105 - 1110	#2				
E	1106 - 1108	#3	.05	0.4	0.1	3oz
F	1130 - 1135	#4	.10	Tr	0.3	2oz
G	1143 - 1146					
H	1148 - 1149					

JSCo				Cu	Ag
#120	= E	= 1106 - 1108	= #3	0.485	0.7
121	= C	= 1102 - 1107	= #1	.095	0.4
122	= H	= 1148 - 1149		.035	0.4
123 -	LWP #2 Surface				
1541' -				.07	0.3

ACCURACY PA... WESTAB NO. 8364 5 SQUARES TO THE CENTIMETER

Misc Assays.

Arizona Assay - Core - 1300' 2 oz Silver
#7446 - File 1996 Sr.
Taken in By Harlow.

Arizona Assay			Au	Cu	Ag	Pb	Zn
#7434	#120	1102-1106	Trace	.485	0.7		
	121	1108	Nil	.095	0.4		
	122	1148	Nil	.035	0.4		
#7465	#21	898'	.03	.04	.4	~~.04~~ .02	.03
	#22	818'	.02	.045	.4	~~.05~~ TR	TR
	#23		.01		.6		
	#102	864-869	.02	.055	.4	~~.05~~ .02	1.0
7456	#20	Check # A.T. Lab.	.03	.055	.8	TR	2.0
7500	#10	640'		.26		TR	1.2
	#13	525'	.11	.25	.7	TR	4.9

Arizona Testing Lab.						
1	265'	.09	0.4	0.12	.44	
2	360'	.03	—	.09	.21	
3	415'	.01	—	.06	.10	
4	510'	.03	—	0.16	.2	
5	525'	.01	—	.06	.09	
6	541'	.01	—	.06	.12	
Spec #1622				5.0	5.	

Note: Sample 102 - Clyde's Analyzer Shows 3% Cu.

Sack Samples - Split Core

Valley

			Ag	Cu
101 -	860.5 - 864.5			
101		→ Sample 1A to Lee Boyer	0.6	.10
102	864.5			
102	869.5			
103	874.0			
104	878.7			
105	882			
106	887.5			
107	893			
108	898	Sample 2A - To Lee Boyer 9/10/67	0.40	.05
109	904.2			
110	909.2			
111	913.6			

Hawley

Au	Nil	
Ag	.02 oz.	
Cu	.02 %	

Test 1300' zone

$9.00

336 897

ASSAYS.

		CU	AU	AG	N.	PB	ZN
#280 -	Hawley.	.05%			(.03)		
1632 -	"	.01			-(.03)		
1636 -	"	.08			-(.03)	.5.6%	8.05%
#720	Arizona #7425	.08			None		
60	" "			0.8	None	TR	11.40%
702-13	Jacobs 622-0813	.08			.01		

ACCURACY PAPER westab
NO. 8364 5 SQUARES TO THE CENTIMETER

#		
10		642
11		636
12	Sample Removed	541
13		525
14		510'
15		415
16		360
17		265'
18		516-520

Sample Assayed *

ACCURACY PA. westab
NO. 8564 5 SQUARES TO THE CENTIMETER

T Box Checks-

Box #	Cu		Ag		Comparative Cu	Comparative Ag	Footage
43		5½		10"	.01	—	411-419
37		12		14"	.03		356-360
53		10		15"	.055-.03		505-514
55		15		7"			523-532
56		15		9"	.01		532-542
188		11		12"	3.0		837-847
192	0	37	1 -	05			882-893
193	7'	26"	1'	19	.04	0.7	893-904
194	5'	27"	0	18			904-914
195	0	30	0	23			914-922
196	1	03	0	11			922-937
30		35		24			292-301.6
29		19		20	.05		282-292
28		27		27			272-282
27		20		14			264-274
26		15		12			254-264
25		5		3			245-254
24		5		3			235.5-245
23		10		6			227-235.5
22 B		10		5			217-227
22 A		5		5			209-217
21 L		4		5			199-209
20		6		8			189-199
19		5		6			179-189
242		12"	2'	10"			1367-77
243		18"	1'	53"			1377-1386
239		27	3'	38"			1340-1350
238		57"	2'	09"			1330-1340
233		20"	2'	06"	(Reverse Curve) .02	.02	1290-1300

Not Important

Calc Percent

Tests By

Not Valid Method

Per Del Peterson

	% Cu	oz Ag	Pb	Zn	Au	Ni
1541	.07	.3				
860 - 887						.15
* 1098	.05	.3				
1102	.10	0.8			.02	
1130		0.4			.01	
1260	.05	0.6				
1290	.04					
720		.8	Tr	11.4		
60	.08					
280	.05	—			—	Tr
1632	.01	—			—	
1636	.08	0.5	5.60	8.05		$32.76
713	.08					Tr

Assay Hole #1

	Cu	Ag	Au	Pb	Zn	Ni
60	.08					
280	.05					
510	.055					
525						
541						
642						

CHARLESTON - Hole # 1

		Cu	Ag	Pb	Zn	Au		Value
	265'	.09	0.4	0.16	.44			
	360	.03		.09	.21			
	415	.01		.06	.10			
	510	.03		.16	.21			
	525	01		06	.09			
	~~525~~							
	541	01		06	.12			
#10	689	.26	*	Tr	1.20	*	AA	5.40
#13	525	.25	.7	Tr	4.90	.11	AA	21.12
20	510	.055	.8	Tr	2.0	03	AA	8.94
	541	.07	.3				AA	
21	893'	.04	.4			03	AA	
22	810'	.045	.4			.02	AA	
~~23~~	~~[illegible]~~	--	~~.6~~			~~.01~~	~~AA~~	
102	864-869	.0 55	.4	02	1.0	.02	AA	
120	1102-1106	.485	.7			Tr	AA	5.75
121	~~[illegible]~~-1108	.095	.4				AA	
122	1106-1105	.035	.4				AA	
Core			2.1 oz				AA	5.04
	860-864	.10	0.6				VA	
	893-904	.05	0.4				VA	

Questionable

69

OUR MOTTO. — WHAT THERE IS IN IT, NO MORE NO LESS

M. E. PHILLIPS, SECRETARY

EDMUND E. PHILLIPS, VICE-PRES.—GEN. MGR.

THE COLORADO ASSAYING COMPANY

(INCORPORATED)

ASSAYERS AND CHEMISTS

2214 BROADWAY

DENVER 1, COLORADO March 25, 1967

REPORT ON DETERMINATIONS MADE FOR— Golden Cycle Corp., Colorado Springs, Colorado

SAMPLE MARKS	METALS	Amount per Ton Ozs	Amount per Ton Hds.	PER CENT	Value per Ton Dollars	Value per Ton Cents
#1	Silver	0.80				
	Copper			2.35		
#2	Silver	4.90				
	Copper			4.50		
#3	Silver	3.40				
	Copper			3.35		
#4	Silver	3.40				
	Copper			2.80		
	Molybdenum Sulphide			0.01		

THE COLORADO ASSAYING COMPANY

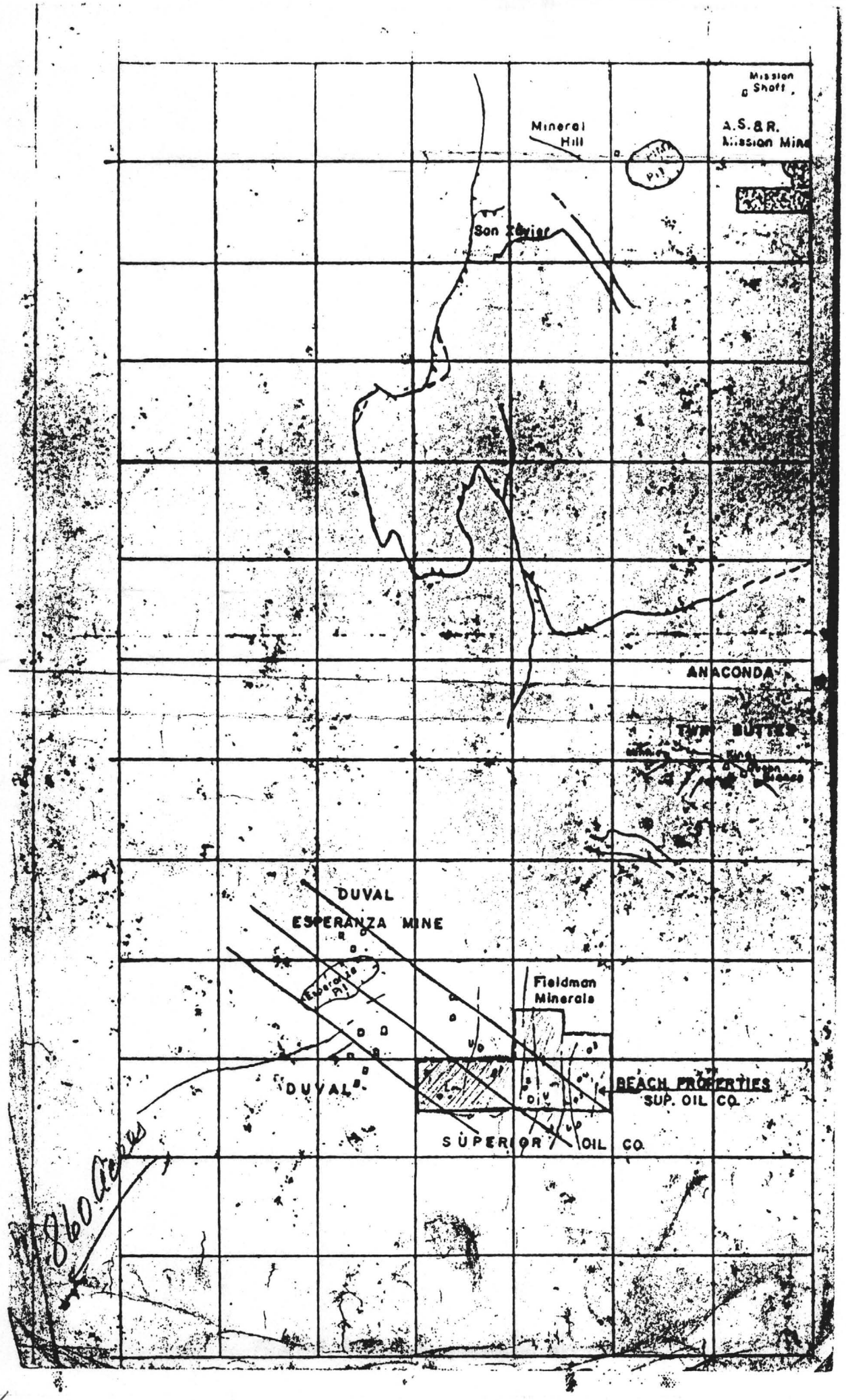
GOLD AT _____ PER OUNCE
LEAD AT _____ PER UNIT

SILVER AT _____ PER OUNCE
COPPER AT _____ PER UNIT

By Ed. Phillips

NOTE:

Average Value Silver	$ 4.03 @ 1.30 oz
Average Value Copper	24.70
Total Average Value	$28.73


Mission Shaft
Mineral Hill
A.S.&R. Mission Mine
Pit
San Xavier
ANACONDA
TWIN BUTTES
DUVAL
ESPERANZA MINE
Esperanza Pit
Fieldman Minerals
DUVAL
BEACH PROPERTIES
SUP. OIL CO.
SUPERIOR OIL CO.
860 acres

RL

JAMES STEWART COMPANY

Wed P.M.

Clyde.

Sorry to have missed you

I have samples as follows:

A- 1074 - 1078

B- 1096

#1 C - 1102 - 1107

D - 1108 - 1110

#m E - 1106 - 1108

#x F - 1130 - 1135

G - 1143 - 1148

H 1148 - 1149

Ok I have like samples.

Previously we took samples up to 1056 -

Clarence

363-2563

893
913

SETH
AU 4 2181

Reported —

*	Cu	Ag	Pb	Zn
1 (265)	.09	.40	.16	.44
2 (360)	.03	—	.09	.21
3 (415)	.01	—	06	.10
4 (510)	.03	—	.16	.21
5 (525)	.01		.06	.09
6 (541)	.01		.06	.12

Assayers Testing Lab.

FORM 140 1M 8-58 AMPCO 18740

MINE

73

JAMES STEWART COMPANY

Assey Samples -

Aug 19, 1967

Place this number on your invoices.

Order No._____

_____, 19____

JAMES STEWART COMPANY (the Contractor), agrees to purchase and _____(the Seller) agrees to deliver the following material.

Sack No.	Footage
101	860.5 – 864.5
102	864.5 – 869.5
103	869.5 – 874
104	874 – 878.7
105	878.7 – 882
106	882 – 887.5
107	887.5 – 893 (Dark Brown material)
108	893 – 898 (" " ")
109	898 – 904.2 (" " ")
110	904.2 – 909.2 (Some dark Brown)
111	909.2 – 913.6

Render copies of invoice direct to this office and two copies of shipping list to our field office.

Unless otherwise specified any and all materials furnished must be very best quality, and all material failing to meet the proper requirements or specifications is to be immediately removed from the premises by the Seller at his own expense and replaced with satisfactory material without delay to the work or buildings. The seller assumes all risk for material until delivered to the Contractor and all rejected material is held only at Seller's risk.

Unless otherwise stated above, payment shall be made on or about the 20th of the month for all material delivered the preceding month.

The Contractor reserves the right to control routing, freight rates being equal.

Kindly sign and return_____copies to Contractor, retaining the original for your files.

Accepted:_____

JAMES STEWART COMPANY

By_____

Order No._____

3226 East 46th Street

File #2-31 D.D.#1

AMERICAN ANALYTICAL and RESEARCH LABORATORIES

ASSAYERS · CHEMISTS · METALLURGISTS

TUCSON, ARIZONA 85713

SAMPLE SUBMITTED BY Hewitt Enterprises

DATE Oct. 8, 1970

SAMPLE MARKED	GOLD OZ./TON	SILVER OZ./TON	PER CENT COPPER	PERCENT LEAD	PERCENT ZINC	PERCENT MOLYBDENUM	PERCENT IRON	Percent Ni
DDH # 1 13 -1339.5								.0043

RECEIVED
OCT 19 1970
JAMES STEWART CO...
PHOENIX, ARIZONA

Invoice #5387

CHARGES $ 3.00

ASSAYER-CHEMIST

Memorandum To File

Charleston Mine

Samples - For assay on Monday 8/21/67

21 - Grab Sample - 898 ft. - Diabase rock. Dark Blue grey quartz Very fine grained & tight Crystalls of Pyrite & Calcopyrite Isolated & sparse - Veinlets of Iron Copper yellowish brown at Fractures.

22 - Grab Sample - Light grey andesite with yellow Crystal masses with contacts of green - Veins of Bluish Quartz with yellow material on contact @ 810'

23 - Redish rock from LWP Claim being assayed for silver and gold.

102 - Sample - Split Core from 864.5 to 869.5.

16

JAMES STEWART COMPANY

GENERAL CONTRACTORS

707 MAYER CENTRAL BUILDING
3033 NORTH CENTRAL AVENUE • PHOENIX, ARIZONA 85012
602-264-2181

RE: Charleston Mine
Assay Record - Hole #1

August 2, 1968

Depth	% Cu	Oz Ag	Oz Au	% Ni	% Pb	% ZN
60'	.08					
265'	.09	.04			0.16	0.44
280'	.05			.03		
315'	1.0					
360'	.03				.09	.21
415'	0.1				.06	.10
510'	.055		.03			
525'	.25	0.7	0.11		Tr	
541'	.01				.06	.12
642'	.26				Tr	1.2
703' - 713'	.08			.01		
720'	.08					
810'	.02		.02			
860' - 887'				.15		
864'	.055	.4	.02		.02	1.0
898'	.04	.7	.03			
1098'	.05	.3				
1102' - 1106'	.485	0.7	Tr			
1108'	.095					
1106'	.10	3.0	Tr		0.6	
1130'	-	0.4	.01			
1148'	.035	.04				
1130' - 1135'	0.3	2.0	Tr			0.2
1260'	.05	0.6				
1300'	.02	.02				
1541'	.07	.3				
1632'	.01	Nil	Nil	.03		
1636'	.08	0.5	Nil	.03	5.6	8.05

MASTER

Hole #1

11

HOLE #1 Assay Summary

6/18/70 - Copies to CAC and Hewitt

CHARLESTON MINE

Assay Summary

HOLE #1

Depth	% Cu	oz/Ton Ag	oz/Ton Au	% Ni	% Pb	% Zn
265	.09	0.4	--	--	.16	.44
280	.05	--	--	.03	--	--
315	1.0	--	--	--	--	--
360	.03	--	--	--	.09	.21
415	.10	--	--	--	.06	.10
510	.03	--	.03	--	.16	.21
525	.25	.7	.11	--	Tr	4.90
541	.01	--	--	--	.06	.12
642	.26	--	--	--	Tr	1.2
703 - 713	.08	--	--	.01	--	--
720	.08	--	--	--	--	11.40
810	.02	--	.02	--	--	--
860 - 887	--	--	--	.15	--	--
864	.055	.4	.02	--	.02	1.0
898	.04	0.7	.03	--	--	--
1102 - 1106	.485	0.7	Tr	--	--	--
1108	.095	.04	--	--	--	--
1106 - 1108	.10	3.0	Tr	--	0.6	--
1148	.035	.04	--	--	--	--
1300	.02	.02				
1541	.07	.3				
1632	.01	--	--	.03	--	--
1636	.08	.5	--	.03	5.6	8.05

Hole # 1 Charleston

Depth	Box #
179.3	
	19
189.3	
	20
199.3	
	21
209.3	
	22
217	
	22.8
227	
~~235.5~~	23
235.5	
	24
245	
	25
254	
	26
264	
	27
274.3	
	28
282.5	
	29
292.	

Depth	Box #
292	
	30
301.6	
	31
310	
	32
318	
	33
328	
	34
338	
	35
346.8	
	36
356.1	
	37
366	
	38
373.5	
	39
384.5	
	40
393	
	41
400	

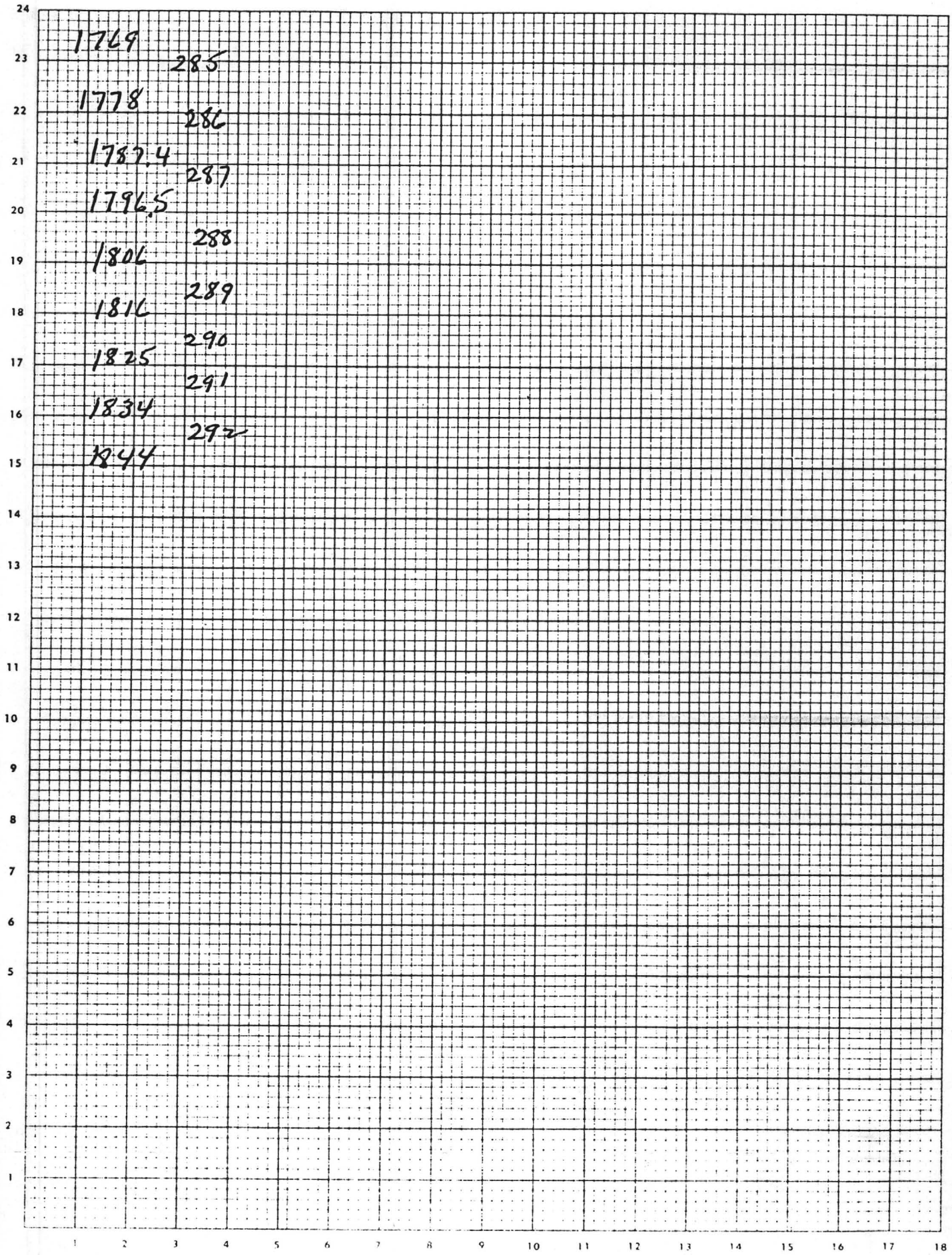
Depth	Box #
400	
	42
411	
	43
419	
	44
429	
	45
436	
	46
446	
	47
455.5	
	48
465	
	49
476.2	
	50
485.2	
	51
495.2	
	52
505	
	53
514	
	54
523	
	55
532.5	
	56
542	
	57
552	
	58
562	
	59
572	

572		731.4		893		1089.6	
	160		176		193		213
581		740.2		904.2		1098.1	
	161		177		194		214
589		749.4		914.6		1110	
	162		178 (cupric nitrate)		195		215
592		758		922		1117.5	
	163		179		196		216
602.6		768		932		1127.5	
	164		180		197		217
611		778		941		1135.5	
	165		180		198		218
618.2		788		950		1143	
	166		181		199		219
636.2		796		960.8		1152.5	
	167		182		200		220
649		804		969.3		1162.3	
	168		183		201		221
659		813		985		1171	
	169		184		202		222
667.4		822.6		995		1179.8	
	170		185		203		223
685.5		829.8		1004.3		1189	
	171		186		204		224
694		837.8		1023		1198.1	
	172		187		205		225
703		847		1028		1207.1	
	173		188		206		226
713		856		1036		1217	
	174		189		207		226 A
722		864.5		1042		1227	
	175		190		208		226 B
731.4		874		1051		1240	
			191		209		227
		882		1061		1249	
			192		210		227
		893		1070		1249	
				1080	211		
				1089.6	212		

8

1258	228
1264.5	229
1274	230
1283.5	231
1290	232
1300	233
1310	234
1311	235
1320.5	236
1330.2	237
1340.2	238
1350.2	239
1357.2	240
1367	240
1377	242
1386	243
1396	244
1406	245
1416	246
1425	247
1435	248
1445	249
1455	250
1464.5	251
1474.5	252
1484.5	253
1494.5	254
1503	255
1510	256
1521.2	257
1531.2	258
1536	259
1546	260
1556	261
1566	262
1574.5	263
1582	264
1593	265
1603	266
1613	267
1620.3	268
1630.3	269
1640.3	270
1650	271
1660	272
1668	273
1677	274
1686	275
1695.5	276
1705.5	277
1715	278
1724	279
1734	280
1744	281
1754	282
1763	283
1769	284

82


1769
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1806
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1834
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1844

D.D. #2 LOGS

ORM 223-A
11-66

Nov 17th) Inc

F 3-13

PROPERTY Charleston Mine

SHEET NO. 1

HOLE NO. #2 DEPTH ANGLE V STRIKE ELEVATION 4,170

CO-ORDINATES

DEPTH FEET	FORMATION	SAMPLE NO.	LENGTH FT.	ANALYSIS COPPER %	ANALYSIS NICKEL %	ANALYSIS CU. & NI. %	LENGTH FEET	PROGRESSIVE TOTALS FEET X PER CENT COPPER	PROGRESSIVE TOTALS NICKEL	PROGRESSIVE TOTALS CU. & N
00	Collar									
10	Casing									
39	Tuff-gray and tan,weathered									
	bleached-thick alt'd punky									
	to clay-like zones									
105	Tuff-andesitic gy to purple									
	var frag content and frag									
	size loc fg frag poor mass									
	then bxt'd with darker									
	hema fillings									
171	Tuff-purple andesitic-									
	much as pre loc sects bxt'd									
	sht zones w/rndd frags to									
	2" prob conglomerate									
311	Tuff-gy cs to fn frag loc									
	sects bxt'd zones of uni-									
	form fg sed looking-prob									
	interbedded tuff sed-gray									
	lithic wacke									
347	Tuff-gy purple cs to f,									
	frag loc bxt'd open pack-									
	ing of cs frags mx is purple									
	frag green									
424	Tuff-purple andesitic genly									
	is green frag in purple									
	mx fine grained zones									
	lithic wacke no bedding									
	may be air winnowed									
	material									
500	Tuff-interbedded gy and purple									
	andesitic-genly cs frags									
	only fairly mass occ									
	high % calcite strings									
	End of Nx Core									
520	Ditto									

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11-66

PROPERTY Charleston Mine

SHEET NO. 2

HOLE NO. #2 DEPTH _____ ANGLE V STRIKE _____ ELEVATION _____ CO-ORDINATES _____

DEPTH FEET	FORMATION	SAMPLE NO.	LENGTH FT.	ANALYSIS COPPER %	ANALYSIS NICKEL %	ANALYSIS CU. & NI. %	LENGTH FEET	PROGRESSIVE TOTALS FEET X PER CENT COPPER	PROGRESSIVE TOTALS NICKEL	PROGRESSIVE TOTALS CU. & N
591	Tuff-gy and purple much as pre but genly w/finer frags and strong zones of shring - altn sericite kaolin - w/fracts -broken and bleached core									
	531-537									
	544-546									
	558-560									
	565-567									
	577-585									
609	Felsite dike-tuff gy to pk much sh'd and alt'd w/punky core zone of felsite and alt'd bleached tuff-shr zone abundant lime diss py chip sample 591-609 assay Cu-Ag- Zn									
627	Tuff? shr zone loosely cemented broken tuff- random diss py									
683	Graywacke-lithic wacke med g greeish frags fg much alt'd to epidote irregular patches and stringers of epidotte- this is prob first good run of seds in hole so far									
772	Ditto-loc zones rich in pyrite as v small dis cubes									
785	Conglomerate-color as pr but pebls and frags now up to 2" very prob basal zone of pre wacke appears to lie conformably on									

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PROPERTY Charleston

SHEET NO. 3

HOLE NO. #2 DEPTH ANGLE V STRIKE ELEVATION CO-ORDINATES

DEPTH FEET	FORMATION	SAMPLE NO.	LENGTH FT.	ANALYSIS COPPER %	NICKEL %	CU. & NI. %	LENGTH FEET	PROGRESSIVE TOTALS FEET X PER CENT COPPER	NICKEL	CU. & N
	following enty w/only minor strings									
881	Quartzite-fairly uniform gray to buff somewhat pebbly in upper portion runs of broken core									
916	Quartzite-variable mud and fg mixed silty zones sht bxt'd xone w/narrow stringers py poss minor spiral.									
1004	Siltstone-gray to greenish gray somewhat varigated loc sects bxt'd and vuggy w/patches pale green epidote poss flow from 945-956 a lighter green more frag-mental rock genly w/diss. py									
1028	Siltstone-quartzite inter-bedded and patches of cs dk sp.hal and occ cpy chip sample 1004-1007									
1077	Siltstone-quartzite con-glomerate top of enty silty interbedded w/qtzite becomes pebbly to conglom from 1050 and a beautifully close packed basal con-glomerate from 1080 to 1094-poss repetition of conglom from 772 to 785)									
1114	Porphyry,-purple andesitic 15/20% pale phenos. of feld largely replaced by epidote contacts chilled andsome-what bxt'd									

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11-66

PROPERTY Charleston

SHEET NO. 4

HOLE NO. #2 DEPTH _____ ANGLE V STRIKE _____ ELEVATION _____ CO-ORDINATES _____

DEPTH FEET	FORMATION	SAMPLE NO.	LENGTH FT.	ANALYSIS COPPER %	NICKEL %	CU. & NI. %	LENGTH FEET	PROGRESSIVE TOTALS FEET X PER CENT COPPER	NICKEL	CU. & N
1173	Quartzite - gray to purple silty arkosic sed graywacke to occ pebbly w/impure lt gy silt stone									
1185	Conglomeratic qtzite lt gy silty-kaolinized bxt'd zone loc w/hvy py and some cpy									
1196	Silty gy quartzite									
1210	Silty gy atzite diss py ophal chip sample 14' assay Zn-Ag									
1275	Quartzite-lt gy med to fg genly more uniform than pre									
1323	Qtzite-variable upper sects loc pebbly to conglom w/purple silty bands, bxt'd lower portion of enty more uniform gy mass									
1335	Ditto bot of enty-diss sphal chip sample 1323-1335 assay Zn-Ag									
1357	Qtzite, gy to occ silty med to fg calcite vein no sulp									
1375	Ditto									
1397	Qtzite-lt gy weakly min py Pb, sphal chip sample from split core 1375-1397									
1422	Qtzite lt to dk gy-heavier sulp py, sphal, pb minor cpy chip sample 1397-1422									
1460	Quartzite-lt gry uniform									

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PROPERTY Charleston

SHEET NO. 5

HOLE NO. #2 DEPTH ANGLE V STRIKE ELEVATION

CO-ORDINATES

DEPTH FEET	FORMATION	SAMPLE NO.	LENGTH FT.	ANALYSIS COPPER %	NICKEL %	CU. & NI. %	LENGTH FEET	PROGRESSIVE TOTALS FEET X PER CENT COPPER	NICKEL	CU. & N
	very sparse sulp chip									
	1422-1460 sulp mainly									
	sphal									
1545	Quartzite-lt gry locally									
	shrd and broken w/hvy py									
	seams									
	1518 - 1520									
	1524 - 1526									
	1533 - 1535									
	Sample from 1533 to 1536									
	Assay Ag PMs hvy fault									
	gauge 1544 - 1546									
1637	Silt stone - varigated									
	purple-lt gry, buff to									
	dk gy local bleb lime									
	silicate-grades into fg									
	silty quartzite with 1/8"									
	milky qtz pebbles.									
1720	Gritty siltstone to fg									
	graywacke-dense siliceous									
	lt to drk gy var low									
	sulp sphal-Pb Py grab									
	sample from 1650 - 1720									
	Assay Zn, Pb									
1741	Siltstone qtzite v fg									
	dk gr-green gy siltstone									
	w/med g dk to lt gy qtzite									
	Heavy diss py in quartzite									
	silty zones mottled and									
	bxt'd w/pebbly bands-sulp									
	is v fn diss py									
	(grab - 1721-1741) Assay									
	Pb-Zn-Ag									
1760	Siltstone-gy green to									
	purplish bxt'd and occ									
	w/gritty zones and relic									

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PROPERTY Charleston

SHEET NO. 6

HOLE NO. #2 DEPTH _____ ANGLE V STRIKE _____ ELEVATION _____ CO-ORDINATES _____

DEPTH FEET	FORMATION	SAMPLE NO.	LENGTH FT.	ANALYSIS COPPER %	NICKEL %	CU. & NI. %	LENGTH FEET	PROGRESSIVE TOTALS FEET X PER CENT COPPER	NICKEL	CU. & NI
	vugs sulp mnly cs cubes									
	py									
1803	Siltstone ditto diss and									
	seams py - grab 1760 to									
	1803									
1893	Siltstone - ditto qtzite									
	from 1850 - 1867 w/occ									
	sphal stringers									
1905	Siltstone - gy green and									
	purple									
1922	Qtzite-gy last 10" w/Cpy									
	sphal									
1983	Lithic siltstone - gy green to									
	prple local banding(bedding?)									
	of frags at 45°suggests									
	poss flow tuff diss Py									
	thruout.									
1995	Qtzite-gy fg silty									
2023	Siltstone purple and green									
2032	Qtzite gy silty									
2045	Siltstone - val mud? gritty									
	bxt'd buff gray to purplish									
	gy									
2082	Siltstone - lithic mud									
	fg tuff not unlike pre									
	entys but more varigated									
	occ flow? banding									
2102	Qtzite - fg silty gy green									
	grades from pre enty to better									
	looking qtzite at bot									
2157	Siltstone - fg tuff bxt'd									
	occ lg incls and fine									
	frags not as muddy looking									
	as pre thin(< 1/16") high									
	veins of sphal occ present									
	the sequence from 2045									

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PROPERTY Charleston

SHEET NO. 7

HOLE NO. #2 DEPTH _____ ANGLE V STRIKE _____ ELEVATION _____ CO-ORDINATES _____

DEPTH FEET	FORMATION	SAMPLE NO.	LENGTH FT.	ANALYSIS COPPER %	ANALYSIS NICKEL %	ANALYSIS CU. & NI. %	LENGTH FEET	PROGRESSIVE TOTALS FEET X PER CENT COPPER	PROGRESSIVE TOTALS NICKEL	PROGRESSIVE TOTALS CU. & N
	seems to be more tuff-									
	acious than the previous									
	runs of siltstone-(from									
	2145 call it good tuff)									
2165	Ditto									
2210	Tuff and siltstone buff,									
	gy green, dk green and									
	purple fragmental tuff									
	and interbedded v fg									
	lithic muds 1/8" seams									
	of sphal w/diss py									
2212	Silicified contact bx									
	gy altd rock, prob tuff									
2271	Porphyry latite andesitic									
	(Uncle Sam latite por)									
	feldspar-qtz porph dk									
	greenish buff to purple									
	contacts bxt'd and altd									
	composite zone qtz latite									
	porph about 6' at 2222									
2290	Qtzite-and tuff? siltstone									
	dk gy qtzite-bxtd zone									
	w/locally heavy sphal as									
	cs diss clots and high									
	< 1/16" stringers									
2323	Qtzite-grades from fg									
	silty to med g sandy w/									
	calcite cement									
2407	Siltstone-variable gy,									
	purple buff, local sandy									
	zones numerous fn calcite									
	stringers last 10' strongly									
	alt'd, bxt'd kaolinized									
	½" wide replacement stringers									
	of cpy @ 2399 cuts core @ 150									
	to axis									

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PROPERTY Charleston Mine

SHEET NO. 8

HOLE NO. #2 DEPTH _____ ANGLE V STRIKE _____ ELEVATION _____

CO-ORDINATES _____ _____

DEPTH FEET	FORMATION	SAMPLE NO.	LENGTH FT.	ANALYSIS COPPER %	NICKEL %	CU. & NI. %	LENGTH FEET	PROGRESSIVE TOTALS FEET X PER CENT COPPER	NICKEL	CU. & N
2435	Qtzite siltstone inter-									
	bedded bxt'd diss sphal									
	2423 over 8" in a dk gy									
	bxt'd qtzite? some cpy diss									
2452	Tuff? dk gy to buff-incls									
	n fg silty mud at bot of									
	enty									
2458	Qtzite - pinkish									
2490	Siltstone-varigated pk and									
	green bleached borders									
	along epidote zones also									
	runs of dk purple mudstone									
	v fg-hemotitic packing									
	(bedding) 45° to core									
2603	Qtzite w/runs (2') of									
	purple and gy siltstone									
	qtzite is silty at top									
	becomes mass gy w/calcite									
	cement-sulp zone 2522-2530 diss									
	sphal-cpy in dk gy qtzite									
	some epidote but no signif									
	altn									
2604	Qtzite-siltstone as pre-loc									
	bxt'd contacts but 2 w/cs									
	diss sphal blebs, silt-									
	stones usually w/diss py									
2622	Siltstone									
2626	Qtzite-dk gy w/hvy diss									
	sphal and some cpy contact									
	w/ ss bxt'd vuggy epidote									
	and sphal									
2719	Qtzite-w/runs of siltstone									
	which are locally gritty									
	some bx'n w/epidote vugs									
	and stringers then genly									
	pk and gn varigated									

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PROPERTY Charleston Mine

SHEET NO. 9

HOLE NO. #2 DEPTH _____ ANGLE V STRIKE _____ ELEVATION _____ CO-ORDINATES _____

DEPTH FEET	FORMATION	SAMPLE NO.	LENGTH FT.	ANALYSIS COPPER %	ANALYSIS NICKEL %	ANALYSIS CU. & NI. %	LENGTH FEET	PROGRESSIVE TOTALS FEET X PER CENT COPPER	PROGRESSIVE TOTALS NICKEL	PROGRESSIVE TOTALS CU. & NI
2777	Qtzite-silt zone as pre sht									
	sects appear to be some-									
	what silicified calcite									
	cement in qtzite									
2878	Siltstone w/runs of gy									
	to pk qtzites buff to									
	pale green occ gritty									
	few purple bands									
2931	Siltstone as pre grades									
	into silty qtzite w/prple									
	mud bands hvy cpy over 6'									
	@ 2890									
2983	Qtzite fg, pk and green									
	occ silty loc bx'td w/									
	qtz veining some hvy diss									
	cpy in 6" zones 2945 -									
	2955 v heavy cpy diss and									
	½" stringer over 18" at									
	2959 in bxt'd recemented									
	qtzite									
2998	Qtzite - gy mass uniform									
	barren									
3031	Siltstone dk gy to buff									
3062	Tuff-gy green to buff-									
	varigated conspic oval									
	green vugs and frangs mainly									
	epidotezd sht runs of dk									
	purple mudstone									
3071	Porphyry-siltstone contact									
	sheard and altd to gy									
	koalin									
3136	Porphyry - green andesitic									
	fold pheno to epidote dk									
	green fg mix with dk ferro-									
	mag diss py lower contact									
	shrd and broken									

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PROPERTY Charleston Mine

SHEET NO. 10

HOLE NO. #2 DEPTH _____ ANGLE V STRIKE _____ ELEVATION _____ CO-ORDINATES _____

DEPTH FEET	FORMATION	SAMPLE NO.	LENGTH FT.	ANALYSIS COPPER %	NICKEL %	CU. & NI. %	LENGTH FEET	PROGRESSIVE TOTALS FEET X PER CENT COPPER	NICKEL	CU. & NI
3212	Qtzite and siltstone much									
	as pre enty of this type-									
	3180-3190 qtzite is altd									
	greenish w/some diss cpy									
	siltstone at bot of enty									
	buff-tan occ rounded vugs									
	(con dk glassy									
	epidote halos.									
	End of Hole									

Drill Hole No. 2
Collar Elevation
Coordinates
Bearing
Depth
Inclination 90°

Charleston Project
Cochise County Arizona

Scale
Started
Completed

Page 1
By

Alteration	Chalcopyrite	Sphalerite	Galena	Ag	Pyrite	Rock Type

Alteration

	Sericite		Garnet
	Kaolin		Serpentine
	Silica		Biotite
	Chlorite		K Feldspar

0-10 No Core

10-248 Weathered meta-andesite tuff. Fragmental to 123, then fine. At 151, 4" breccia. Fragmental interval 165-168. At 181 - bedding 30° to axis. To 189.5, fragmental to 197. Bedding at 199-65°. Fine to 209, fragmental to 248.

50

100

150

200

248-394 Fine to 262, fragmental to 270, fine and fragmental mixed to 278. Tuff to 323. Fragmental 323-327, fine to 329, fragmental to 394.

250

Drill Hole No. 2
Collar Elevation
Coordinates
Bearing
Depth
Declination 90°

Charleston Project
Cochise County Arizona

Scale
Started
Completed

By

Alteration	Chalcopyrite	Sphalerite	Galena	Ag	Pyrite	Rock Type	
							300
							350
							400
							450
							500

Alteration

	Sericite		Garnet
	Kaolin		Serpentine
	Silica		Biotite
	Chlorite		K Feldspar

394-506 Meta-andesite tuff-coarsely fragmental, bedding at 442 50° to asix to 437.5, bedded tuff to 453, then fragmental to 506.

l Hole No. 2
ar Elevation
dinates
ing
h
ination 90°

Charleston Project
Cochise County Arizona

Scale
Started
Completed

Page 3
By

Alteration	Chalcopyrite	Sphalerite	Galena	Ag	Pyrite	Rock Type

Alteration

	Sericite		Garnet
	Kaolin		Serpentine
	Silica		Biotite
	Chlorite		K Feldspar

506-534 Meta-andesite tuff - fragmental in part to 527, strongly fragmental to 534.
534-537 Meta-andesite, bleached, some sericite, fault zone at 536.
537-566 Meta-andesite tuff to 566.
550
566-567.5 Gouge and breccia - fault zone.
567.5-577.5 Fine grained meta-andesite tuff.
577.5-578.5 Gouge and breccia - fault zone.
578.5-582 Fine grained meta-andesite tuff.
582-591 Fragmental meta-andesite tuff.
591-598 Bleached meta-andesite sericite, specks of galena, some silicification, argillic alt. FeOx stain.
600
598-603 Crushed zone, clay, sericite.
603-604 Bleached meta-andesite.
604-605 Fault Zone.
605-623 Crushed and broken zone, bleached meta-andesite tuff. 40° dip to axis (fault).
650
623-628 Bleached meta-andesite.
628-675.5 Sericitized meta-andesite tuff, grading downward to chloritic meta-andesite tuff.
675.5-699.5 Andesite tuff (?).
699.5-737.5 Meta-andesite tuff (see specimen at 706.5) dark gray, fine grained, feldspars altered, ferromags altered to chlorite, could also be a meta-volcanic tuff. Splotches of epidote. Epidote bands may reflect bedding? (40° to core) On the whole, prefer to consider this a tuff. Some fine pyrite with epidote. Small fault, 4" gouge and breccia at 724.
700
750
737.5-761 12" gouge fault at 30° to axis of core. Meta-andesite tuff, intercalated bands fine grained medium gray siltstone

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Charleston Project
Cochise County Arizona

Scale
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Alteration	Chalcopyrite	Sphalerite	Galena	Ag	Pyrite	Rock Type		

Alteration

	Sericite		Garnet
	Kaolin		Serpentine
	Silica		Biotite
	Chlorite		K Feldspar

after 741. Crushed zone, 760-761, thereafter gray siltstone.

761-770 Arkose, granular nondescript, specked with fine pyrite cubes. Sercite

770-781 Coarse conglomeratic arkose to 779.5, fine grained light gray siltstone to fault at 781. Bedding at 85° to axis.

800

781-783 Gouge and breccia, some fine pyrite.

783-912 Quartzite, light grey, medium grained, sericite. Becomes fine grained after 869 to 877.5, then medium again to 912. At 911, bedding 56° to axis.

850

900

912-1005 Fine grained gray siltstone

1005-1007 Fine grained quartzite with sphalerite, galena, and pyrite, about 5% total sulfide.

1007-1015 Quartzite, medium grained, light grey

1015-1052 Siltstone, some fine qtz (1/16" veins sphalerite 1019-1020) to pyrite veinlets to 1028, then two or three 1/8" sphalerite veinlets. Siltstone to 1031.5. Quartzite with two or three 1/16" sphalerite veinlets to 1034, then darker gray fine grained siltstone, becoming lighter to 1039, medium grained arkosic qtz. after 1039 to fault zone 1052-1056.

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By

Alteration	Chalcopyrite	Sphalerite	Galena	Ag	Pyrite	Rock Type

Alteration

	Sericite		Garnet
	Kaolin		Serpentine
	Silica		Biotite
	Chlorite		K Feldspar

1052-1056 Fault zone

1050

1056-1094 Arkose, in part conglomeratic with pebbles up to 3/8" to 1070, then pebbles become larger to base at 1094.

1094-1102 Fine grained gray arkosic siltstone, locally medium grained quartzitic. 1/8" band pyrite and sphalerite at 1099. Fine grained to 1102.

1100 1102-1118 Meta-andesite (?) dike. Thoroughly altered prophyritic dike. Chilled border about 18" 1102-1104, then stony groundmass, epidote alt. of feldspars, chlorite. At contact at 1118, 2' mixed rock, contact irregular, welded at 30° to axis.

1118-1173 Fine grained gray arkosic rock grades into gray quarzite. An occasional 1/16 vlt of sphalerite and pyrite. Total sulfide per any 10' int. < 0.1%

1150

1173-1187 Changes from grey to light grey at 1173-1175, then conglomeratic and somewhat mineralized from 1175-1187. Vuggy, some calcite, sphalerite, galena. Perhaps 2-4% total sulfide.

1200 1187-1196.5 Fine grained silicitized arkose

1196.5-1202 Sericitized arkose (?) speckled with galena, pyrite, and sphalerite, total sulfides about 4-6% to 1200.

1202-1249 Quartzite, fine grained, light gray, grades to medium grained.

1250

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Alteration	Chalcopyrite	Sphalerite	Galena	Ag	Pyrite	Rock Type

Alteration

	Sericite		Garnet
	Kaolin		Serpentine
	Silica		Biotite
	Chlorite		K Feldspar

1249-1280 Fine grained light gray arkose-has stony look, not much quartz. Beddings locally present, one at 1262.5 40° to axis. Rock becomes mottled 1270.5-1275, then gray granular (about 1mm), grading into quartzite at 1280.

1280-1330 Quartzite to 1281, then back to granular gray arkose, as above, rock gradually becoming more quartzitic, fair qtz. after 1301.

1300

1330-1363 Arkose, dense granular to 1332, then fine grained siltstone with minor sulfide on bedding (less than 1$ sulfide), to 1334. Quartzitic arkose to 1347.5, then gray granular arkose to 1349.5, then quartz-ark. to 1363.

1350

1363-1368.6 Fine grained gray siltstone.

1368.6-1395 Quartzite with sericite, occasional grain of galena or pyrite. At 1397, 10" altered (bleached) shale and qtz. bedding 45° to axis.

1400

1395-1410 Disseminated sulfides in qtz. after 1397. ½" py ve at 1401, 25° to asix, 1% total sulfides to 1405, then 5% > to 1406.5 then 1% again. Sulfides are galena, sphalerite, minor cpy and pyrite. Sulfide content drops to much less than 1% with rock change (1410).

1410-1416 Dense greenish massive lime silicate rock (diopside?) specimen at 1409-Possible fault at 1416-no gouge but badly broken core.

1450

1416-1457.5 Dense light gray fine grained quartzite. Minor py on seams 1% sulfide. Quartzite gradually becomes coarser, about 1mm at 1454, sulfide content picks up to 2-3%, mostly galena and sphalerite for interval 1454-1457.5

1457.5-1477 Dense light gray fine grained quartzite (sericitized) At 1477, bedding plane 50° to core. Sulfide < 1%.

1500

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Alteration	Chalcopyrite	Sphalerite	Galena	Ag	Pyrite	Rock Type

Alteration

	Sericite		Garnet
	Kaolin		Serpentine
	Silica		Biotite
	Chlorite		K Feldspar

1477-1512 Quartzite-medium grained (less than 1lm but granular) Sulfide < 1%.
1512-1518.5 Fault zone, minor gouge, poor core
1518.5-1532 Quartzite, somewhat silicified.
1532-1533.6 12" heavy pyrite
1550 1533.6-1543 Quartzite, about 1mm, broken
1543-1546 Gouge and breccia - barren
1546-1594 Purplish siltstone to 1549, then bleaching to gray with lime silicate spots, grading to quartzite at 1552. (Fine grained-gray)
1594-1625 Gray siltstone, scattered blebs of py, changing color
1600 to lt gy and from siltstone to fine qtz with lime silicate streaks at 1601
1625-1727 Dense gy silicified siltstone, blobs of lime silicate minerals, some scattered py, still much less than 1% sulfide This silicified siltstone has a porphyritic look with the quartz grains separate in a dense stony groundmass. Silt-
1650 stone persists to 1725, then changes to medium grained quartzite, to
1700
1727-1733.5 1-2mm quartzite-sericite, from 1-5% total sulfides, sphalerite, cpy, py, minor galena.
1733.5 6" fault gouge
1733.5-1820 Quartzite, dense, fine grained, py cubes, less than
1750 1% sulfide. Changes from gray to reddish, becoming purplish

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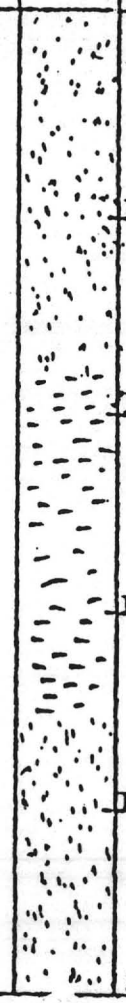
Alteration	Chalcopyrite	Sphalerite	Galena	Ag	Pyrite	Rock Type

Alteration

	Sericite		Garnet
	Kaolin		Serpentine
	Silica		Biotite
	Chlorite		K Feldspar



siltstone at 1748. Purplish siltstone to 1759, then back to dense, fine to coarse cubic pyrite. Minor lime silicate veining. Gray to 1803 then purplish to 1811, then gray as above. Somewhat coarser 1813-1818, denser 1818-1820

1800

1820-1852 Siltstone, dark gray 1820-1831, then light gray 1831-1837, 1mm quartzite 1837-1839, then purple siltstone followed by dull stony quartzite(?) at 1843 - granular. (probably lime silicates) to 1850, then fine grained siltstone to 1852

1850

1852-1853 Arkose? with sphalerite and cpy < 15% sulfides

1853-1923 Quartzite, 1-2mm, becoming finer grained, more stony looking. Minor sphalerite-galena, up to 5% for 4" interval, otherwise negligible (less than 1%). Fine grained gray q to 1865, then purplish siltstone to 1875. Lighter colored to 1878.5, then purplish again to 1892. Dense light gray 1892-1897.5, purplish to 1901. Lime silicates vlt at 1901 (½", 5% sulfide, mostly sphalerite). Fine grained light gy to 1905.5, becomes granular (fine) more quartzitic to 1923.

1900

1923-1924 Arkose, heavy sphalerite, galena. About 10% Z, 3% lead 15-20% total sulfide.

1924-1935 Quartzite with less than 1% sulfide to 1925, then purplish siltstone, becoming dark gray at 1927, then light greenish gray lime silicates with minor py (2% sulfides) to 1928.5. Dark gray siltstone grading to purple siltstone, then to greenish dense lime silicates to 1935.

1950

1935-2002.3 Dense, fine gray siltstone to 1939, greenish gray lime silicates to 1939.5, purplish dense siltstone to 1943.5,

2000

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Alteration	Chalcopyrite	Sphalerite	Galena	Ag	Pyrite	Rock Type

Alteration

	Sericite		Garnet
	Kaolin		Serpentine
	Silica		Biotite
	Chlorite		K Feldspar

then gray to light greenish gray lime silicates to 1969, then gray to light gray (some lime silicates) to 1996, then purplish siltstone to 2002. At 2002 3" light gray core. Minor py veining in gray and green gray lime silicate rock < 1% sulfide.

2050 2002.3-2027 Dense fine grey siltstone, grades to purplish siltston at 2014, then to fine grey siltstone at 2027.

2032 Qtzite gy silty

2045 Siltstone - val mud? gritty bxt'd buff gray to purplish gy

2082 Siltstone - lithic mud fg tuff not unlike pre entys but more varigated occ flow? banding

2100

2102 Qtzite - fg silty gy green grades from pre enty to better looking qtzite at bot

2157 Siltstone - fg tuff bxt'd occ lg incls and fine frags not as muddy looking as pre thin (1/16") high veins of sphal occ present the sequence from 2045 seems to be more tuffacious than the previous runs of siltstone (from 2145 call it good tuff)

2150

2165 Ditto

2200

2212 Silicified contact bx gy altd rock, prob tuff

2250

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By

Alteration	Chalcopyrite	Sphalerite	Galena	Ag	Pyrite	Rock Type

Alteration

	Sericite		Garnet
	Kaolin		Serpentine
	Silica		Biotite
	Chlorite		K Feldspar

2271 Porphyry latite andesitic (Uncle Sam latite por) feldspar qtz fprph dk greenish buff to purple contacts bxt'd and altd composite zone qtz latite porph about 6' at 2222

2290 Qtzite-and tuff? siltstone dk gy qtzite-bxt'd zone w/locally heavy sphal as cs diss clots and high < 1/16" stringers

2300

2323 Qtzite-grades from fg silty to med g sandy 2/calcite cement

2350

2407 Siltstone-variable gy, purple buff, local sandy zones numerous fn calcite stringers last 10' strongly alt'd, bxt'd kaolinized ½" wide replacement stringers of cpy at 2399 cuts core at 15° to axis.

2400

2435 Qtzite siltstone interbedded bxt'd diss sphal 2423 over 8" in a dk gy bxt'd qtzite? some cpy diss

2450

2452 Tuff? dk gy to buff-incls n fg silty mud at bot of enty

2458 Qtzite - pinkish

2490 Siltstone-varigated pk and green bleached borders along epidote zones also runs of dk purple mudstone v fg-hemotitic packing (bedding) 45° to core

2500

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Alteration	Chalcopyrite	Sphalerite	Galena	Ag	Pyrite	Rock Type

Alteration

	Sericite		Garnet
	Kaolin		Serpentine
	Silica		Biotite
	Chlorite		K Feldspar

2553-2572 Siltstone, purplish red, grades into tactite at 2555, f grained, gy, epidote splotches. This in turn grades into qtz at 2560, med gy qtz to 2572

2572-2574.5 Qtz, med gy, grades into banded f gy tactite at 2573. Tactite to 2574.5

2550 2574.5-2626.5 Tactite, metamorphosed calcareous arkose, qtz lenses, mudstones, siltstones, strong epidotized. Diss py at intervals in certain intervals, minor sphal and cpy loc in small veins.

2626.5-2657 Qtz, with chlorite and iron rich cement, epidote & calcite blebs at intervals, minor sphal and cpy 2247-2248.6

2600

2657-2669 Meta-arkose, qtz, epidote and calcite blebs, to 2669

2650 2669-2672 Mudstone, reddish, with epidote spots to 2672

2672-2694 Shale, siltstone to 3688, then qtz to 2694

2694-2704 Shale, dk purplish shale, grading downward to siltstone epidotized in part

2700

2704-2727 Qtz, lt gy in color, f grained grades to med grained

2727-2754 Shale & qtz. F gy shale, loc purple in color to 2731, then f qtz to 2739, then lt gy med f to med grained. Arkosic locally. 2752-2754

2750

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Alteration	Chalcopyrite	Sphalerite	Galena	Ag	Pyrite	Rock Type

Alteration

	Sericite		Garnet
	Kaolin		Serpentine
	Silica		Biotite
	Chlorite		K Feldspar

2754-2791 Tactite, qtzt. Lime-silicate (tactite), locally serpentinized, followed by qtzt to 2759. Two feet of shale, then gy mottled qtzt to 2770, thereafter increasing lime silicate (epidote), f grained, dense, hard to 2791

2791-2839 Qtzt, tactite. Fine to med grained qtzt to 2808, lime silicate to 2818, f grained qtzt to 2839

2800

2839-2845 Shale and lime-silicate.

2845-2882 Qtzt, f, gy, dk shale to 2850 grading through siltstone to f qtzt to 2868. Med qtzt for 2', then purple shale, locally epidotized, to 2882.

2850

2882-2902 Qtzt, f gy, grading into med grained epidotized qtz, to 2890. At 2890, 6" interval with cpy. (10% cpy) Below cpy zone, mottled f grained siltstone to 2893, then dk gy f siltstone, becomes lighter with depth and grades into epidotized lime-silicate at 2902

2900

2902-2915 Dark purplish shale, lime-silicate 2905-2908, then shale and qtzt

2915-2973.5 Qtzt, lt gy, f grained, banded with epidote, bedding 60° to axis of core, becoming med grained at 2926. 6" med grained qtzt with cpy at 2929, estimate 5% cpy. Barren shale and lime-silicate below to 2953, then 6" med qtz w/cpy, 7% cpy estimated. Underlain by barren shale and qtz, 30° angle to axis of core. Estimate 25% cpy in this interval, then 6" barren qtz, then 1" solid cpy vein at 30° to axis of core, then barren med grained qtz to 2973.5

2950

2973.5-2997 Qtzt, med to coarse, arkosic, 1/8" cpy vein at 2989, otherwise barren.

3000

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Alteration	Chalcopyrite	Sphalerite	Galena	Ag	Pyrite	Rock Type

Alteration

	Sericite		Garnet
	Kaolin		Serpentine
	Silica		Biotite
	Chlorite		K Feldspar

2997-3045 Shale, ls-silicate, minor serpentine, epidote bunches, 2' of dk shale 3043-3045

3045-3062 Lime-silicate, shale, (some serpentine), to 3049. 2' dense siltstone, 3049-3051, then lime-silicate. 1" cpy 3051.4. Chert 3054-3054.5, qtz 3057-3061. Fault zone 3061-3062

3050

3062-3072.5 Sericite, argillite, some gouge at 3062, spotted at 3065, py clots and dk angular patches, probably originally a calc-arenaceous rock, sp. 3065.5% py+. Grades downward into quartzitic-looking rock with dark patches, then to 24" dk gy-gr dense hornstone with reddish and greenish patches plus py, to contact with epidotized and pyritized andesite(?) porphyry. Spec. 3074

3100

3072.5-3128.5 Andesite(?) porphyry. Feldspars are epidotized, rock is pyritized. upper contact not cored. Lower contact at 25° to axis of core. Probably a dike.

3128.5-3154 Qtz, very f grained, or tactite, grades into granu. ls-sil w/splotches, very f grained, lt to med ty to 3139.5 (at 3141, bedding at 80° to axis) then darker gy to 3142.5, epidotized zone to 3146, then massive very dk gy siltstone w/qtz. frags (less than 0.5 mm) to 3148. Py & epidote on seams at 3148. Med gy siltstone, minor py on seams. Grades to lt gy tactite with splotches at 3150, then to f lt gy qtz at 3154.

3150

3200

3154-3177 Qtz, massive to 3163, then banded, alternate f to med. Bands (bedding) at 75° to axis. Banded to 3167, then massive med grained, to 3175.5, then coarse grained, arkosic, w/py (2%) to 3177. Gradational contact with tactite.

Bot.

3177-3181.5 Tactite, med gy, v f grained, w/epidote splotches

3250

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Alteration	Chalcopyrite	Sphalerite	Galena	Ag	Pyrite	Rock Type	Depth	Description
								3181.5-3187 Arkosic qtz. Epidotized. Spots of cpy at 3185, 8" fairly good cpy 3186.5-3187+. Interval not yet split, will run about 10% cpy - 4%± copper.
								3187-3193 Tactite, epidote splotches, variable in color, dk gy to lt gy. Spot of cpy 3192.5 in bleached & epidotized spot, grades to very f gy qtz at 3193.
							3300	3193-3207 Qtz, f grained, lt gr, impure, locally splotchy w/dk gy spots grades downward into sitlstone. Impure siltstone w/epidote clots after 3201, grading back into more quartzitic material after 3207
								3207-3212 Qartzite, light gray, impure, medium grained.
							3350	Bottom - Complete
							3400	
							3450	
							3500	

Alteration

	Sericite		Garnet
	Kaolin		Serpentine
	Silica		Biotite
	Chlorite		K Feldspar

5:54
Kathy Madden
Called.

Assay - & Log. Field Use.

Free 107

GENERALIZED DESCRIPTIVE LOG

Charleston Lead Mine — James Stewart Construction Company

HORNE #2 DRILL HOLE

0-10	No core
10-248	Weathered meta-andesite tuff. Fragmental to 123, then fine. At 151, 4" breccia. Fragmental interval 165-168. At 181 - bedding 30° to axis. To 189-1/2, Fragmental to 197. Bedding at 199-65°. Fine to 209, fragmental to 248.
248-394	Fine to 262, fragmental to 270, fine and fragmental mixed to 278. Tuff to 323. Fragmental 323-327, fine to 329, fragmental to 394.
394-506	Meta-andesite tuff-coarsely fragmental, Bedding at 442 - 50° to axis to 437-1/2, bedded tuff to 453, then fragmental to 506.
506-534	Meta-andesite tuff - fragmental in part to 527, strongly fragmental to 534.
534-537	Meta-andesite, bleached, some sericite, fault zone at 536.
537-566	Meta-andesite tuff to 566.
566-567.5	Gouge and breccia - fault zone.
567.5-577.5	Fine grained meta-andesite tuff.
577.5-578.5	Gouge and breccia - fault zone.
578.5-582	Fine grained meta-andesite tuff.
582-591	Fragmental meta-andesite tuff.
591-598	Bleached meta-andesite sericite, specks of galena, some silicification, argillic alt. FeOx stain.
598-603	Crushed zone, clay, sericite.
603-604	Bleached meta-andesite.
604-605	Fault zone.
605-623	Crushed and broken zone, bleached meta-andesite tuff 40° dip to axis(fault).
623-628	Bleached meta-andesite.
628-675.5	Sericitized meta-andesite tuff, grading downward to chloritic meta-andesite tuff.
675.5-699.5	Andesite tuff (?)
699.5-737.5	Meta-andesite tuff (see specimen at 706.5) dark gray, fine grained, feldspars altered, ferromags altered to chlorite, could also be a meta-volcanic tuff. Splotches of epidote. Epidote bands may reflect bedding? (40° to core). On the whole, I would prefer to consider this a tuff. Some fine pyrite with epidote. Small fault, 4" gouge and breccia at 724.
737.5	12" gouge, fault at 30° to axis of core.
737.5-761	Meta-andesite tuff, intercalated bands fine grained medium gray siltstone after 741. Crushed zone, 760-761, thereafter gray siltstone.
761-770	Arkose, granular nondescript, specked with fine pyrite cubes. Sericite
770-781	Coarse conglomeratic arkose to 779-1/2, fine grained light gray siltstone to fault at 781. Bedding at 85° to axis.
781-783	Gouge and breccia, some fine pyrite.
783-912	Quartzite, light grey, medium grained, sericitic. Becomes fine grained after 869 to 877-1/2, then medium again to 912. At 911, bedding 56° to axis.

912-1005	Fine grained gray siltstone
1005-1007	Fine grained quartzite with sphalerite, galena, and pyrite, about 5% total sulfide.
1007-1015	Quartzite, medium grained, light grey.
1015-1052	Siltstone, some fine qtz (1/16" veins sphalerite 1019-1020) to pyrite veinlets to 1028, then two or three 1/8" sphalerite veinlets. Siltstone to 1031-1/2. Quartzite with two or three 1/16" sphalerite veinlets to 1034, then darker grey fine grained siltstone, becoming lighter to 1039. medium grained arkosic qtz. after 1039 to fault zone 1052-1056.
1052-1056	Fault zone
1056-1094	Arkose, in part conglomeratic with pebbles up to 3/8" to 1070, then pebbles become larger to base at 1094.
1094-1102	Fine grained gray arkosic siltstone, locally medium grained quartzitic. 1/8" band pyrite and sphalerite at 1099. Fine grained to 1102.
1102-1118	Meta-andesite (?) dike. Thoroughly altered porphyritic dike. Chilled border about 18" 1102-1104, then stony groundmass, epidote alt. of feldspars, chlorite. At contact at 1118, 2' mixed rock, contact irregular, welded at 30° to axis.
1118-1173	Fine grained gray arkosic rock grades into gray quartzite. An occasiona 1/16 vlt of sphalerite and pyrite. Total sulfide per any 10' int. < 0.1%
1173-1187	Changes from grey to light grey at 1173-1175, then conglomeratic and somewhat mineralized from 1175-1187. Vuggy, some calcite, sphalerite galena. Perhaps 2-4% total sulfide.
1187-1196.5	Fine grained silicitized arkose.
1196.5-1202	Sericitized arkose(?) speckled with galena, pyrite and sphalerite, total sulfides about 4-6% to 1200.
1202-1249	Quartzite, fine grained, light gray, grades to medium grained.
1249-1280	Fine grained light gray arkose - has stony look, not much quartz. Beddings locally present, one at 1262.5 40° to axis. Rock becomes mottled 1270.5-1275, then gray granular (about 1mm), grading into quartzite at 1280.
1280-1330	Quartzite to 1281, then back to granular gray arkose, as above, rock gradually becoming more quartzitic, fair qtz. after 1301.
1330-1363	Arkose, dense granular to 1332, then fine grained siltstone with minor sulfide on bedding (less than 1% sulfide), to 1334. Quartzitic arkose to 1347-1/2, then gray granular arkose to 1349-1/2, then quartz-ark. to 1363.
1363-1368.6	Fine grained gray siltstone.
1368.6-1395	Quartzite with sericite, occasional grain of galena or pyrite. At 1397, 10" altered (bleached) shale and qtz. bedding 45° to axis.
1395-1410	Disseminated sulfides in qtz. after 1397. 1/2" py vein at 1401, 25° to axis, 1% total sulfides to 1405, then 5%± to 1406-1/2, then 1% again. Sulfides are galena, sphalerite, minor cpy and pyrite. Sulfide content drops to much less than 1% with rock change (1410)
1410-1416	Dense greenish massive lime silicate rock (diopside?) specimen at 1409
1416	Possible fault at 1416 - no gouge but badly broken core.

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.231

1416-1457-1/2	Dense light gray fine grained quartzite. Minor pyrite on seams 1% sulfide. Quartzite gradually becomes coarser, about 1mm at 1454, sulfide content picks up to 2-3%, mostly galena and sphalerite for interval 1454-1457-1/2.
1457-1/2-1477	Dense light gray fine grained quartzite (sericitized). At 1477, bedding plane 50° to core. Sulfide $<$1%.
1477-1512	Quartzite - medium grained (less than 1mm but granular) Sulfide $<$1%.
1512-1518.5	Fault zone, minor gouge, poor core
1518.5-1532	Quartzite, somewhat silicified.
1532-1533.6	12" heavy pyrite
1533.6-1543	Quartzite, about 1mm, broken.
1543-1546	Gouge and Breccia - barren
1546-1594	Purplish siltstone to 1549, then bleaching to gray with lime silicate spots, grading to quartzite at 1552. (Fine grained - gray)
1594-1625	Gray siltstone, scattered blebs of pyrite, changing color to light gray and from siltstone to fine quartzite with lime silicate streaks at 1601.
1625-1727	Dense gray silicified siltstone, blobs of lime silicate minerals, some scattered pyrite, still much less than 1% sulfide. This silicified siltstone has a porphyritic look with the quartz grains separate in a dense stony groundmass. Siltstone persists to 1725, then changes to medium grained quartzite, to
1727-1733-1/2	1-2mm quartzite-sericitic, from 1-5% total sulfides, sphalerite, cpy, pyrite, minor galena.
1733-1/2	6" fault gouge
1733-1/2-1820	Quartzite, dense, fine grained, pyrite cubes, less than 1% sulfide Changes from gray to reddish, becoming purplish siltstone at 1748. Purplish siltstone to 1759, then back to dense, fine to coarse cubic pyrite. Minor lime silicates veining. Gray to 1803 then purplish to 1811, then gray as above. Somewhat coarser 1813-1818, denser 1818-1820.
1820-1852	Siltstone, dark gray 1820-1831, then light gray 1831-1837, 1mm quartzite 1837-1839, then purple siltstone followed by dull stony quartzite (?) at 1843 - granular. (probably lime silicates) to 1850, then fine grained siltstone to 1852.
1852-1853	Arkose? with sphalerite and cpy - +15% sulfides
1853-1923	Quartzite, 1-2mm, becoming finer grained, more stony looking. Minor sphalerite - galena, up to 5% for 4" interval, otherwise negligible (less than 1%). Fine grained gray qtz to 1865, then purplish siltstone to 1875. Lighter colored to 1878-1/2, then purplish again to 1892. Dense light gray 1892-1897-1/2, purplish to 1901. Lime silicates vlt at 1901 (1/2", 5% sulfide, mostly sphalerite.) Fine grained light gray to 1905-1/2, becomes granular (fine) more quartzitic to 1923.
1923-1924	Arkose, heavy sphalerite, galena. About 10% Zn, 3% lead, 15-20% total sulfide.

1924-1935	Quartzite with less than 1% sulfide to 1925, then purplish siltstone, becoming dark gray at 1927, then light greenish gray lime silicates with minor pyrite (2% sulfides) to 1928-1/2. Dark gray siltstone grading to purple siltstone, then to greenish dense lime silicates to 1935 -
1935-2002.3	Dense, fine gray siltstone to 1939, greenish gray lime silicates to 1939-1/2, purplish dense siltstone to 1943-1/2, then gray to light greenish gray lime silicates to 1969, then gray to light gray (some lime silicates) to 1996, then purplish siltstone to 2002. At 2002, 3" light gray core - Bedding 47° at 1998. Minor pyrite veining in gray and green gray lime silicate rock $\angle$1% sulfide.
2002.3-2027	Dense fine grey siltstone, grades to purplish siltstone at 2014, then to fine grey siltstone at 2027.

WjW:jc
December 13, 1967

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MEMORANDUM

Kennicott? Bear Creek M.C.

To: M. S. Horne

Date: September 27, 1968

From: C. A. Cosgrove

Re: Charleston

Call from Jack Phillips regarding Charleston. He requested permission ~~xx~~ which I granted to take the non-assayed portion of Hole 2, core boxes to Tucson for his lab to process, split and assay and make their other studies. He will return the ½ of split core, the pulps and send us copy of the results.

He talked today to the geophysical section of his company.They are working on the data given. The criticism of work is that it does not cover a broad enough zone to balance the district geo magnetics against the ore zone highlights. However, they will do cross sectional work and obtain some findings. They disregard value of government magnetic map.

His subordinates have finished the ground work and filed the reports. HIs study of this brought on the above request.

My impression is he is he is generally favorable but needs more facts.

C. A. Cosgrove

CAC:jm

Peter Dunn Kennecott Pick Up

AREA CHARLESTON T. 20S R. 21E S. 30 TOTAL DEPTH 3209 COLLAR ELEV. LOGGED BY Peter Dunn HOLE NO. 2

Footage From	Footage To	Description	Footage From	Footage To	% Cu.	% Zn.	% Pb.	Oz. Ag.	Oz. Au.
10	39	Andesite, purple - weathered to gray - some fragments up to 2" - abundant chlorite & abundant goethite & manganese staining along fractures - pyrite casts < 1% overall but locally abundant - some thin quartz veins - & some calcite & ankerite? along fractures - heavily altered down to 39'.							
39	175	Andesite flow breccia - matrix is purple, but most fragments are green - appear to be sheared in a direction 40° to core. Manganese stains & dendrites common along fractures - quartz veins 40° to core - fragments becomes more purple down the hole - rocks are flooded with iron staining. Narrow fault @ 152'							
175	213	Tuff, medium-grained, green arkose? - abundant chlorite - weak manganese staining on fractures. Bedding to core angle 70° @ 201'.							
213	284	Andesite flow breccia - purple with green fragments appear to have been sheared - abundant chlorite - irregular calcite between fragments.							
284	329	Tuff, fine-grained green - bedding to core angle 50° @300' - contains abundant purple fragments - very rare quartz veins - chlorite very abundant.							
329	566	Andesite flow breccia, purple with green fragments up to 7" across - chlorite abundant in fragments - some bands up to 8' thick - straight green fine-grained tuff - rare calcite veins. Very weak disseminated pyrite weak goethite stains along some rare fractures - weakly iron-stained shear zone 534'-538' - all goethite abundant clay and/or talc in shear zone - some rock below shear - similar shear zone 542'-546', similar shear zone 560'-562'.							
566	567.5	Tuff - fine-grained, green strongly brecciated -green sed. abundant gouge - weak chlorite and/or epidote - very rare iron staining - probable fault.							
567.5	591	Tuff, fine-grained green - weakly iron stained along fractures - thin calcite & dolomite stringers - becomes more & more purple down the hole - fault 577.5' - 578'.	580		.045			0.4	
591	612	Volcanic - fine-grained white mostly sericite strong goethitic staining on fractures - 2-3% fine-grained fresh pyrite both disseminated and along fractures (veinlets).	598		.03			0.3	

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AREA CHARLESTON T. 20S R. 21E S. 36 TOTAL DEPTH 3209 COLLAR ELEV. LOGGED BY Peter Dunn HOLE NO. 2

Footage From	Footage To	Description	Footage From	Footage To	% Cu.	% Zn.	% Pb.	Oz. Ag.	Oz. Au.
612	615	Fault - strongly brecciated white volcanic as above - abundant clay & talc - fine-grained fresh pyrite 1-2%.							
615	617	Tuff - fine-grained, green - abundant clay-some chlorite < 1% pyrite.	620		.04			0.4	
617	626	Fault - strongly brecciated green sediment as above.							
626	742	Tuff, medium-grained, green - epidote veins & clots very abundant - disseminated fine-grained fresh pyrite ≈ 1% . Pyrite along epidote veins - bedding to core angle 70° @700' calcite veinlets up to ¼" thick common - often associated with epidote & pyrite - abundant talc on shears 684'-685'; 690'-691'. Pyrite content decreases below ≈ 665' - < ½% - restricted mostly to epidote veins - fault at 718' 35°angle to core; fault at 741' 30°angle to core.	660		.035			0.3	
742	762	Tuff, very fine-grained, green,epidote very abundant. Pyrite ≈ ½% as disseminated fresh grains - rarely along epidote stringers - pyrite increases up to 1% below 760'.	750		.02		Tr	1.6	
762	781	Tuff, very fine-grained - green as above but with fragments primarily of white clay - weakly calcareous - pyrite 1-1½% as discrete grains - epidote very rare - rare calcite veinlets.	781		.03	0.9		0.6	.01
781	783	Fault - strongly brecciated sediment as above - chloritic (black) gouge - < 1% pyrite.							
783	910	Quartzite, medium-grained, arkosic - rare small discrete pyrite grains - becomes increasingly fine-grained with depth - pyrite content decreases with depth - rare below 855'- locally contains abundant sericite - some bands of fine-grained tuff @867'-872'; 899' - locally brecciated @865'.							
910	1004	Tuff, extremely fine-grained, greenish-gray - bedding to core angle 35° @965- calcite veinlets common - up to 1/8" thick - veinlets possibly parallel to bedding? - contain small amount of epidote - some calcite occurs as small euhedral crystals - no visible pyrite until 946' - very rare pyrite below there. Fresh pyrite veinlets from 955' - along epidote stringers - some talc along shears - pyrite content up to 1-2% - locally brecciated @958' - weakly iron-stained - locally brecciated @963' - weakly iron-stained. These zones include sericite, talc, and calcite veinlets - very thin pyrite-sphalerite veinlet up to ½" - contains very rare chalcopyrite and galena @994'.							
1004	1007	Tuff, fine-grained as above but strongly brecciated - pyrite content up to 2% - galena & sphalerite common where brecciated - rare chalcopyrite.	1005	1008	.43	9.2	4.88		

AREA CHARLESTON T. 20S R. 21E S. 36 TOTAL DEPTH 3209 COLLAR ELEV. _____ LOGGED BY Peter Dunn HOLE NO. 2

Footage From	Footage To	Description	Footage From	Footage To	% Cu.	% Zn.	% Pb.	Oz. Ag.	Oz. Au.
1007	1015	Quartzite, fine-grained white, weakly calcareous - abundant sericite - ½-1% pyrite - very fine grained - well disseminated - bedding to core angle 50° @1010'.							
1015	1017	Tuff, aphanitic, green, abundant chlorite and calcite - no sulfides.							
1017	1039	Quartzite, very fine-grained, white - calcite veinlets common - epidote veinlets common - pyrite abundant (1-2%) both as veinlets & disseminated - very rare chalcopyrite along pyrite veinlets - galena & sphalerite occurs as narrow veinlets associated with epidote & with pyrite some beds of green aphanitic tuff; 1023'-1030' shows thin stringers of chalcopyrite, galena, and sphalerite; 1034'-1039' pyrite with rare chalcopyrite, galena, and sphalerite usually with epidote - not as common here as in clean quartzites.	1028	1032	.07	5.0	.6		
1039	1077	Quartzite, medium-grained, white calcite veinlets common - pyrite < ½% - along calcite or epidote stringers. Fault 1051'-1058' - rare galena and sphalerite in fault zone - epidote common as veinlets and as clots - no sulfides outside of fault.							
1077	1102	Quartzite as above as a breccia - large calcite & epidote clots in the breccia matrix - pyrite content 1-2% - rare galena.							
1102	1115	Tuff, very fine-grained, weakly porphyritic - abundant epidote phenocrysts (after feldspar?) dark aphanitic groundmass < 1% pyrite no other sulfides visible.							
1115	1207	Tuff, fine-grained green with bands of fine white quartzite·calcite veinlets common - pyrite <½% epidote very rare - very rare galena and sphalerite from 1145' - brecciated 1176'-1187' abundant pyrite in breccia below 1180' (up to 10%) with common galena & sphalerite - white quartzite below 1187' - abundant clay - pyrite very rare - rare galena and sphalerite - becomes abundant (3-4% galena & sphalerite)- finely disseminated - pyrite euhedral cyrstals up to 3% from 1195-1198'.	1129		.029	Tr	.02		
			1134		.038	Tr	.02		
			1137		.037	Tr	.02		
			1142		.037	Tr	.44		
			1159.5		.037	Tr	.07		
			1163		.037	Tr	.02		
			1168		.058	Tr	.02		
			1185		1.0	.08	.2		.5
			1175	1185	0.16	1.48	.44		
			1196		0.08	2.17	1.25		
1207	1405	Quartzite, medium-grained, very rare pyrite calcareous - calcite stringers common -rare sphalerite, chalcopyrite & galena at 1296' - sericite locally common rare chlorite or epidote some along shears - bedding to core angle 40° @1275' - rare galena and sphalerite begin @1393' 1½" pyrite stringers @1398'.							

AREA CHARLESTON T. 20S R. 21E S. 36 TOTAL DEPTH 3209 COLLAR ELEV. LOGGED BY Peter Dunn HOLE NO. 7 4

Footage From	Footage To	Description
1405	1417	Quartzite as above with abundant sericite and rare chlorite - euhedral pyrite abundant with galena, sphalerite & rare chalcopyrite - contains fragments of fine-grained tuff which contain no sulfides. Sulfides occur both as veinlets & finely disseminated-chlorite becomes abundant from 1409' to 1417' - sulfides rare below 1411'.
1417	1451	Quartzite as above - weakly calcareous - sulfides very rare & finely disseminated - sericite becomes increasingly abundant - thin sphalerite veinlets ≈1442' - disseminated galena 1456'-1457'.
1451	1461	Tuff, fine-grained, green disseminated euhedral pyrite up to 1/16" - some narrow veinlets.
1461	1541	Quartzite locally with abundant chlorite - weakly calcareous - galena and sphalerite as narrow stringers near 1464' - most core contains no visible sulfides - contain some narrow (< 1') tuff lenses - bedding to core angle 75° @1500'.
1541	1546	Tuff, green, fine-grained - highly brecciated - very rare pyrite - probable fault.
1546	1550	Tuff, dark red, fine-grained - thin <1/32" calcite veinlets common - thin epidote veinlets rare very rare fine disseminated pyrite.
1550	1624	Quartzite, fine-grained, white - locally calcareous - epidote abundant - occurs as irregular lenses - pyrite rare along epidote veinlets. Dark fine-grained siltstone(?) 1594'-1599' - contains common pyrite clots up to ½" across.
1624	1725	Quartzite, fine-grained, white to gray, with beds of black siltstone - abundant epidote - pyrite locally abundant. Bedding to core angle 55° @1676' usually associated with epidote - some euhedral pyrite crystals in black siltstone - epidote & pyrite occurs in both rock types - both weakly calcareous - pyrite up to 2-3% - very rare thin veinlets of sphalerite 1717'-1725'.

Footage From	Footage To	% Cu.	% Zn.	% Pb.	Oz. Ag.	Oz. Au.
1407	1411.5	0.14	2.87	1.45		
1411.5	1416	0.048	Tr	0.10		
1416	1422.5	0.029	Tr	0.07		
1422.5	1429	0.038	0.20	0.10		
1429	1434	0.047	0.25	0.12		
1434	1439	0.048	0.05	0.02		
1439	1444.5	0.049	0.32	0.30		
1444	1448.5	0.028	0.12	0.25		
1448	1453	0.038	0.20	0.13		
1453	1457	0.07	1.40	0.66		
1656.5	1661	0.038	Tr	Tr		
1661	1665	0.029	Tr	Tr		
1665	1670	0.038	Tr	Tr		
1670	1675	0.029	Tr	Tr		
1678	1680	0.030	Tr	Tr		
1680	1685	0.019	Tr	Tr		
1690	1694.5	.028	.12	.05		
1694.5	1699	.028	.10	.05		
1699	1703	.029	.12	.05		
1703	1708	.027	.12	.03		
1708	1713	.049	Tr	.06		
1721.5	1726.5	.038	.60	.36		

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AREA CHARLESTON T. 20S R. 21E S. 36 TOTAL DEPTH 3209 COLLAR ELEV. _____ LOGGED BY Peter Dunn HOLE NO. 2 5

Footage From	Footage To	Description
1725	1735	Quartzite, white-medium-grained - abundant sulfides from 1727' - including pyrite & sphalerite with rare chalcopyrite and rare galena - chlorite abundant where quartzite contains sulfides - most sulfides occurs as disseminated euhedral crystals.
1735	1746	Quartzite, very fine-grained, white to dark gray with abundant epidote - pyrite abundant - associated with epidote both as veinlets and as disseminations - calcite crystal locally common - most pyrite crystals - mostly fine-grained < 1/32" - locally up to 1/2" - galena and sphalerite rare.
1746	1761	Tuff, dark red - bedded with thin layers of fine-grained white quartzite, fine-grained disseminated pyrite - weak epidote veinlets. Chlorite abundant from 1753' - pyrite as veinlets associated with epidote.
1761	2164	Quartzite, white, fine-grained to aphanitic - fine-grained disseminated pyrite & epidote veinlets - some pyrite veinlets associated with epidote & chlorite - pyrite abundant at 1771'- dark red fine-grained tuff beds with rare sulfides occur along the following intervals: 1803-1811; 1823-1824; 1840-1841; 1864-1870; 1870-1875; 1880-1892; 1896-1898; 1940-1943; 1963-1965; 1996-2002; 2013-2020' 2103-2113; 2152-2155, chalcopyrite & sphalerite locally abundant 1853-1855' as veinlets mostly as disseminations. Sphalerite abundant veinlets @1857-1863' with rare galena - bedding to core angle 40° @1893'. Sphalerite disseminations & thin veinlets 1923-1927' - galena abundant 1925-1927' with abundant epidote.

Footage From	Footage To	% Cu.	% Zn.	% Pb.	Oz. Ag.	Oz. Au.	
1726	1732	0.10	3.70	.42			
1732	1737	0.047	3.40	.46			
1737	1741.5	0.076	0.17	.03			
1741	1745.5	0.028	0.25	.12			
1745.5	1750.5	0.020	0.30	.07			
1750.5	1755	0.037	0.25	.07			
1755	1759.5	0.028	.05	Tr			
1759.5	1763.5	0.047	.05	Tr			
1763.5	1767.5	0.036	.12	.05			
1767.5	1772	0.029	.12	.03			
1772	1776.5	0.029	Tr	.03			
1776.5	1780	0.037	Tr	.02			
1780.5	1785	0.029	Tr	.03			
1785	1789	0.048	Tr	.05			
1789	1793.5	0.029	Tr	.02			
1793.5	1798.5	0.048	.05	.03			
1798.5	1803	0.037	.07	.03			
1803	1808	0.029	.07	.03			
1808	1812	0.037	0.50	0.14			
1812	1816	0.076	0.40	0.12			
1816	1821.5	0.048	Tr	Tr			
1820		1.9	6.1	.35		.02	MO .13
1821.5	1826.5	.029	Tr	Tr			
1826.5	1831	.029	Tr	Tr			
1831	1836	.037	Tr	Tr			
1836	1841	.029	Tr	Tr			
1841	1845	0.037	Tr	Tr			
1845.5	1850.5	0.029	.02	.05			
1850.5	1854.5	0.21	1.12	0.92			
1850		0.15			0.2	.01	
1854.5	1858.5	0.087	.12	.10			
1886	1889.5	0.029	Tr	.02			
1893	1896.5	0.057	Tr	Tr			
1896.5	1901	0.029	Tr	Tr			
1901	1905	0.037	Tr	.08			

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AREA CHARLESTON T. 20S R. 21E S. 36 TOTAL DEPTH 3209 COLLAR ELEV. _____ LOGGED BY Peter Dunn HOLE NO. 2 6

Footage From	Footage To	Description	Footage From	Footage To	% Cu.	% Zn.	% Pb.	Oz. Ag.	Oz. Au.
			1905	1910	0.029	Tr	Tr		
			1910	1915.5	0.038	Tr	.02		
			1915.5	1919	0.019	Tr	Tr		
			1923		.05	14.7			
2164	2185	Tuff, fine-grained, dark green, very chloritic - epidote locally abundant - pyrite locally rare as small grains. Pyrite & sphalerite abundant 2173-2174' rare chalcopyrite - ¼" pyrite-sphalerite veinlet @2179' nearly parallel to core - contains epidote & chlorite - similar veins @2181' and 2185'.	2167.5	2172	.03	.07	Tr		
			2172	2176.5	.06	.10	Tr		
			2176.5	2181.5	.06	1.0	Tr		
			2181.5	2185.7	.05	0.9	Tr		
2185	2191	Quartzite, fine-grained - finely disseminated pyrite also veinlets of pyrite with sphalerite and very rare chalcopyrite up to ¼" thick.	2185.7	2189.7	.07	0.4	Tr		
			2189.7	2195	.03	.15	.15		
2191	2199	Quartzite, fine-grained, chloritic very thin veinlets of pyrite with rare sphalerite.	2195	2200	.03	.12	.12		
2199	2212	Quartzite, arkosic, fine-grained disseminated - sphalerite occurs locally - brecciated 2209-2212' - no sulfides in breccia zone.	2200	2205	.04	.07	.05		
			2205	2209.5	.03	.12	.12		
			2209.5	2214	.06	.25	Tr		
2212	2233	Rhyolite (tuff?), fine-grained, abundant chlorite & epidote - small phenocrysts of quartz & biotite - unrecognizable brown grains - thin calcite veinlets - fine-grained - pyrite well disseminated throughout 2-5% - narrow sphalerite-calcite vein @2218' - rare crystals of chalcopyrite @2226' - ¼" chlorite clots abundant below 2233'.	2214	2219	.07	.25	Tr		
			2219	2223	.06	.22	.14		
			2223	2229.5	.11	Tr	Tr		
			2229.5	2236	.10	Tr	Tr		
2233	2256	Dacite porphyry ? - feldspar phenocrysts up to 1/8" in an aphanitic groundmass - altered (weathered) 2233'-2245' - abundant chlorite < 1% pyrite disseminated very fine-grained.	2236	2241	.05	Tr	Tr		
			2241	2246.5	.04	.05	Tr		
			2246.5	2251.5	.05	.05	Tr		
			2251.5	2256.5	.05	Tr	Tr		
2256	2277.	Rhyolite (tuff?) chlorite very abundant - 1" chalcopyrite calcite veinlet @2263' with some pyrite - extends to 2266' - calcite very abundant - pyrite disseminated.	2256.5	2261.5	.16	Tr	Tr		
			2261.5	2266.5	3.40	.07	Tr		
			2266.5	2272	3.11	.05	Tr		
			2272	2278	0.28	Tr	Tr		

AREA CHARLESTON T. 20S R. 21E S. 36 TOTAL DEPTH 3209 COLLAR ELEV. LOGGED BY Peter Dunn HOLE NO. 2

Footage From	Footage To	Description	Footage From	Footage To	% Cu.	% Zn.	% Pb.	Oz. Ag.	Oz. Au.
2277	2280	Quartzite, weakly calcareous - barren of sulfides.	2278	2283	0.05	Tr	Tr		
2280	2295	Tuff, fine-grained, green - abundant chlorite and epidote - sphalerite vein 1" thick @2285 with rare chalcopyrite - thinner veinlets up to 2287' - dark red tuff with epidote 2289'-2291' - barren of sulfides.	2283	2288	0.05	1.25	Tr		
2295	2325	Quartzite - calcareous - contains some chlorite-thin calcite veinlets - no visible sulfides - except abundant sphalerite with some chalcopyrite @2324' - associated with calcite veinlet.							
2325	2397	Tuff, fine-grained, green - locally calcareous - locally with abundant epidote - sulfides < 1% - barren in most places - fine-grained disseminated. Dark red tuff 2365-2367'	2332.5 2337 2394	2337 2342 2406	.04 .06 .04	Tr .07 Tr	Tr Tr Tr		
2397	2401	Tuff as above - brecciated and cemented with abundant calcite - 1" chalcopyrite veinlet @2399 with some pyrite and calcite.							
2401	2492	Tuff, fine-grained, green - abundant epidote with some calcite crystals - no visible sulfides - some large epidote bands contain large 1-2' clots of chlorite. Bedding to core angle 62° @2446' - beds of dark aphanitic tuff occur: 2462-2464'; 2470-2482'; 2484-2485'; contains no visible sulfides - contains very rare very narrow (1/32") calcite veinlets - rare irregular small epidote clots.							
2492	2507	Quartzite, white, fine-grained - locally contains enough chlorite to give it a green cast - small euhedral pyrite disseminated << ½%- weakly calcareous.							
2507	2511	Tuff, fine-grained, red - rare chlorite & epidote clots but no visible sulfides.							
2511	2531	Tuff, fine-grained, green, very chloritic - contains up to ½% pyrite as fine disseminated euhedral crystals - becomes more medium-grained and more arkosic - from 2514'-2530'. Weakly calcareous with rare calcite veinlets - chlorite becomes more abundant from 2522'-also epidote. Sphalerite and galena as fine disseminated grains become abundant suddenly @2522' - none above - with rare chalcopyrite but no visible pyrite. Specimen 2526 typical of this stretch. Specimen 2528 not typical - contains more sulfides and more epidote than most - sulfides & epidote locally more abundant 2527' 28'. Sulfides rare except for some pyrite below 2530'							
2531	2533	Tuff, fine-grained red - no visible sulfides - occasional epidote clots - bedding to core angle 50° @2533'.							

AREA CHARLESTON T. 20 S R. 21E S. 36 TOTAL DEPTH 3204 COLLAR ELEV. LOGGED BY Peter Dunn HOLE NO. 2

Footage From	Footage To	Description	Footage From	Footage To	% Cu.	% Zn.	% Pb.	Oz. Ag.	Oz. Au.
2533	2538	Quartzite, fine-grained, white with abundant chlorite & epidote - no visible sulfides except for a narrow 1" band with very abundant chlorite and 3-5% pyrite disseminated crystals up to 1/8" across.							
2538	2555	Quartzite, fine-grained, white contains narrow calcite veinlets and narrow epidote veinlets chlorite common in matrix - no visible sulfides - red tuff beds 2553-54'.							
2555	2563	Tuff, fine-grained, green, very chloritic with abundant epidote - bedding to core angle 68° @2556' - 1" sphalerite-chalcopyrite-calcite veinlet @2557' apparently parallel to bedding - no other visible sulfides - red tuff bed 2558-2560' - disseminated pyrite crystals in chlorite tuff at 2560'.							
2563	2573	Quartzite - medium-grained, white - chlorite increases with depth - very rare fine-grained sulfides in chloritic part below 2569' - no sulfides in white qtz. - grades into underlying tuff.							
2573	2628	Tuff, green, aphanitic - contains abundant epidote as narrow veinlets & 2-3% disseminated euhedral pyrite crystals 2573-2574' - red tuff beds 2574-76'; 87-88'- ½" quartz veinlet @2579! 15° core - rare disseminated pyrite in red tuff. Chlorite locally very abundant - in these patches of high chlorite usually contain abundant sphalerite and chalcopyrite - no pyrite. Sulfides present only where indicated - otherwise barren -- epidote clots abundant in very chloritic tuff 2603-2625'. Abundant sphalerite associated with 2-3% chalcopyrite 2623-2625' and rare galena associated with abundant chlorite and epidote - no visible sulfides above 2623' and only 1% pyrite disseminated below 2625'.							
2628	2656	Quartzite, white, arkosic - sulfides very rare - restricted to euhedral - pyrite in chloritic bands - chloritic bands common up to ¼" thick - 21° to core locally contains epidote or epidote/chlorite clots - bedding to core angle 78° @2656'.							
2656	2704	Tuff, fine-grained, chloritic - locally contains epidote & talc? 1% euhedral pyrite @2656' grades to white fine tuff or fine quartzite @2659' with abundant epidote-but no sulfides. Red tuff siltstone 2669-2672'; 2682-83'; 85-86'; narrow quartz veins @2684to core angle 80°. Fault 2680-82' brecciated white tuffaceous quartzite with abundant talc - talc abundant on shear surfaces down to 2696'.	2640		1.0	26.2	Tr	1.6	
2704	2727	Quartzite, white, arkosic - thin calcite stringers - rare pyrite crystals occur locally - mostly barren.							

AREA CHARLESTON T. 20S R. 21E S. 36 TOTAL DEPTH 3209 COLLAR ELEV. _____ LOGGED BY Peter Dunn HOLE NO. 2

Footage From	Footage To	Description	Footage From	Footage To	% Cu.	% Zn.	% Pb.	Oz. Ag.	Oz. Au.
2727	2737	Tuff, light green, chloritic-bedding to core angle 82° @2728' - disseminated euhedral pyrite < ½%. Red tuff 2728-2730'.							
2737	2759	Quartzite, white - abundant clay matrix - locally contains chlorite and talc but no visible sulfides.							
2759	2789	Tuff, fine-grained, green,chloritic - epidote clots common - chlorite very common on fracture faces - no visible sulfides - bedding to core angle 72° @2785'.							
2789	2791	Tuff as above, brecciated, probable fault - abundant white clay or talc -							
2791	2804	Quartzite, white - locally rich in chlorite - no sulfides.							
2804	2852	Tuff, fine-grained, green - commonly epidote rich - thin calcite veinlets - locally dark and rich in chlorite - brecciated 2825-2831' - crystalline calcite between some of the breccia fragments. Sulfides very rare - restricted to local rare disseminations of pyrite. Bedding to core angle 75° @2834'.							
2852	2871	Quartzite, white - very fine-grained - chlorite common and some epidote - thin calcite veinlets no sulfides.							
2871	2931	Tuff, fine-grained, green - chlorite and epidote both abundant. Red tuff 2575-2578'; 2902-04'; 13'-15'; & 28-31'. Small bleb of black sphalerite @2881' with rare pyrite first visible sulfides - associated with chlorite rich clot - pyrite up to 3% and rare chalcopyrite associated with epidote 2882-83'. Strong irregular chalcopyrite-chlorite vein @2899' - vein to core angle 24° - about 4" of core here contains ≈ 12% copper as chalcopyrite - no other sulfides. open fractures filled with euhedral calcite crystals @2894'. No other visible sulfides.							
2931	2998	Quartzite,white - bedding to core angle 80° @2933' - very rare fine-grained pyrite occurs locally mostly barren - chlorite becomes more abundant from 2945'-locally with bands of fine-grained tuff - abundant epidote - ≈ 10% chalcopyrite and sphalerite occurs for 4" in a fine-grained quartzite @2949' - rest of rock contains ≈ 1½%. Pyrite as disseminations - Chalcopyrite associated with abundant chlorite and epidote - apparently parallel to bedding. Bedding to core angle 80°. Similar chalcopyrite occurrence with sphalerite 2953-2953'6". Chalcopyrite occurrence 2958' - as chalcopyrite - chlorite-calcite vein nearly parallel to core - extends for a foot - up to 1" thick in another brief 1" chalcopyrite vein @2960'. No other sulfides present.	2962		8.71			2.8	

120

AREA CHARLESTON T. 20S R. 21E S. 36 TOTAL DEPTH 3209 COLLAR ELEV. _____ LOGGED BY Peter Dunn HOLE NO. 2

Footage From	Footage To	Description	Footage From	Footage To	% Cu.	% Zn.	% Pb.	Oz. Ag.	Oz. Au.
2998	3056	Tuff, fine-grained, chloritic, dark gray to green locally with abundant epidote - clay fairly common - no sulfides - red tuff 3042-44'.							
3056	3072	Quartzite, fine-grained, chloritic - probably tuffaceous - very fine pyrite disseminated - < 1% overall - but locally up to 5%. Sericite very abundant below 3061'. Pyrite content ≈ 2% - fine grained. 3066' - 3068' - contains abundant chlorite crystals up to ¼" - fine-grained green matrix with abundant sericite - pyrite content ≈ 2%.							
3072	3073	Dacite, porphyry, very fine-grained - phenocrysts of red altered feldspars ? in a green aphanitic groundmass - 3% pyrite.							
3073	3121	Dacite, porphyry - phenocrysts of plagioclase (1-2%); potash feldspar (3-5%); chlorite and/or biotite (5%); and epidote (15-20%) - pyrite (1-3%) disseminated in green chloritic groundmass rare thin calcite veinlets - pyrite content decreases with depth < 1% below 3115' - no other sulfides.							
3121	3128	Tuff, fine-grained, green, with abundant chlorite - pyrite 1-3% - pyrite-chalcopyrite vein ½" thick nearly parallel to core - 3122' - abundant sericite - some small epidote phenocrysts.							
3128	3152	Tuff, fine-grained, green chlorite & epidote abundant - sericite common - thin calcite veinlets common - pyrite generally absent - locally present ½% as fine euhedral crystals. Red tuff 3141-3148' - no sulfides - bedding to core angle 90° @3148'.							
3152	3178	Quartzite, very fine-grained and white - pyrite very rare - few thin chlorite rock lenses - bedding to core angle @70° @3173'.							
3178	3199	Tuff, very fine-grained, very chloritic - epidote common - disseminated euhedral - pyrite crystals up to 3% - becomes a fine-grained chloritic quartzite - 3181-3187' - contains abundant epidote - no visible sulfides down to 3185' - 3185'-3187', disseminated chalcopyrite and possibly rare primary chalcocite - see specimen @3186' - some rare sphalerite tuff below 3187' - no sulfides.							
3199	3209	Tuff, fine-grained, gray - rare epidote - no visible sulfides.							

END OF HOLE

PHELPS DODGE CORPORATION

WESTERN EXPLORATION OFFICE
DRAWER 1217
DOUGLAS, ARIZONA 85607

TEL. 602-364-8414

March 2, 1968

RECEIVED
MAR 4 1968
JAMES STEWART COMPANY
PHOENIX, ARIZONA

Mr. Clarence Cosgrove
James Stewart Construction Co.
3033 North Central Avenue
Phoenix, Arizona 85012

Dear Mr. Cosgrove:

Attached is a portion of the geologic log for Hole No. 2 of your Charleston drilling. Also attached are the more recent assay results from Holes 2 and 3.

Very truly yours,

R. W. Ludden

R. W. Ludden, Jr.
Chief Geologist

RWL:g

Encls

Hole Horne "C

123

2553-2572	Siltstone, purplish red, grades into tactite at 2555, fine grained, grey, epidote splotches. This in turn grades into quartzite at 2560, medium grey quartzite to 2572.
2572-2574½	Quartzite, medium gray, grades into banded fine grey tactite at 2573. Tactite to 2574½.
2574½-2626½	Tactite, metamorphosed calcareous arkose, quartzitic lenses, mudstones, siltstones, strong epidotized. Disseminated pyrite at intervals in certain intervals, minor sphalerite and chalcopyrite locally in small veins.
2626½-2657	Quartzite, with chlorite and iron rich cement, epidote and calcite blebs at intervals, minor sphalerite and chalcopyrite 2247-2248.6.
2657-2669	Metaarkose, quartzitic, epidote and calcite blebs, to 2669.
2669-2672	Mudstone, reddish, with epidote spots to 2672.
2672-2694	Shale, siltstone to 2688, then quartzite to 2694.
2694-2704	Shale. Dark purplish shale, grading downward to siltstone, epidotized in part.
2704-2727	Quarzite, Light grey in color, fine grained grades to medium grained.
2727-2754	Shale and quartzite. Fine grey shale, locally purple in color to 2731, then fine quartzite to 2739, then light grey medium fine to medium grained. Arkosic locally. 2752-2754.
2754-2791	Tactite, quartzite. Lime-silicate (tactite), locally serpentinized, followed by quartzite, to 2759. Two feet of shale, then grey mottled quartzite to 2770, thereafter increasing lime silicate (epidote), fine grained, dense, hard to 2791.
2791-2839	Quartzite, tactite. Fine to medium grained quartzite to 2808, lime silicate to 2818, fine grained quartzite to 2839.
2839-2845	Shale and lime-silicate.
2845-2882	Quartzite, fine, grey, dark shale to 2850 grading through siltstone to fine quartzite to 2868. Medium quartzite for two feet, then purple shale, locally epidotized, to 2882.
2882-2902	Quartzite, fine grey, grading into medium grained epidotized quartzite, to 2890. At 2890, 6" interval with chalcopyrite. (10% cpy) Below chalcopyrite zone, mottled fine grained siltstone to 2893, then dark grey fine siltstone, becomes lighter with depth and grades into epidotized lime-silicate at 2902.
2902-2915	Dark purplish shale, lime-silicate 2905-2908, then shale and quartzite.
2915-2973½	Quartzite, light grey, fine grained, banded with epidote, bedding 60° to axis of core, becoming medium grained at 2926. 6" medium grained quartzite with chalcopyrite at 2929, estimate 5% cpy. Barren shale and lime-silicate below to 2953, then 6" medium quartzite with chalcopyrite, 7% cpy estimated. Underlain by barren shale and quartzite to 2958, then 12" good chalcopyrite in healed breccia zone in quartzite, 30° angle to axis of core. Estimate 25% cpy in this interval, then 6" barren quartzite, then 1" solid chalcopyrite vein at 30° to axis of core, then barren medium grained quartzite to 2973½.

2973½-2997	Quartzite, medium to coarse, arkosic, 1/8" chalcopyrite vein at 2989, otherwise barren.
2997-3045	Shale, ls-silicate, minor serpentine, epidote bunches. Two feet of dark shale 3043-3045.
3045-3062	Lime-silicate, shale, (some serpentine), to 3049. Two feet dense siltstone, 3049-3051, then lime-silicate. 1" cpy 3051½. Chert 3054-3054½, quartzitic 3057-3061. Fault zone 3061-3062. Bottom 2/17/68.

D.D. #2 ASSAYS

Shop No. 109
File No. 2031 ST

Date 26 FEB 1968

Hole #c

VALUES
Latest Quotation

1 oz. Gold.....
1 oz. Silver.....
1 lb. Copper.....
1 lb. Lead.....
1 lb. Zinc.....

THIS CERTIFIES
Samples submitted for assay contain as follows:

Arizona Assay Office

815 NORTH FIRST STREET
Phone: 253-4001

Phoenix, Arizona 85001
P. O. BOX 1148

JAMES STEWART CO
PHOENIX ARIZONA

Short Ton ..... 2000 Lbs.
Short Ton Unit ..... 20 Lbs.
Long Ton ..... 2240 Lbs.
Long Ton Unit ..... 22.4 Lbs.

MARKS	SILVER PER TON Ozs.	SILVER PER TON Tenths	VALUE PER TON	GOLD PER TON Ozs.	GOLD PER TON 100ths	VALUE PER TON	TOTAL VALUE PER TON of Gold & Silver	PERCENTAGE COPPER	REMARKS
2962 CHARLESTON # 2	2	.8	$ 4.20	TRACE				8.71	
29X CHARLESTON # 2		.8	$1.20	TRACE				1.50	
2920 CHARLESTON # 2		.8	$1.20	TRACE				0.035	
1375 CHARLESTON # 3		.4	$.60	TRACE				0.035	
1460 CHARLESTON # 3		.4	$.60	TRACE				0.035	
1470 CHARLESTON # 3		.4	$.60	TRACE				0.035	
1480 CHARLESTON # 3		.4	$.60	.01	$.35			0.03	

REGISTERED ASSAYER
CERTIFICATE EXPIRES
JACK E.A. STONE
DEC. 31, 19
ARIZONA, U.S.A.

Charges * 45.50

Assayer.....

JACK STONE REG. No. 5439

ANDY CHUKA, PRINT

25

1/10 S2 126

will follow when complete

RECEIVED

SEP 4 1979

JAMES STEWART COMPANY
PHOENIX, ARIZONA

Send Copy to Clyde + Lloyd

ANDY CHUKA – PHONE: 258-6508
PRINTING - LITHOGRAPHING - ENGRAVING - PICTURE FRAMING

Shop No. 1172 ST
File No.

Date 3 SEPT 1969

Assays on Hole #2 Charleston

Arizona Assay Office

815 NORTH FIRST STREET
Phone: 253-4001

Phoenix, Arizona 85001
P.O. BOX 1148

RECEIVED
SEP 4 1969
JAMES STEWART COMPANY
PHOENIX, ARIZONA

VALUES
Latest Quotation
1 oz. Gold $41.10
1 oz. Silver $ 1.65
1 lb. Copper
1 lb. Lead
1 lb. Zinc

THIS CERTIFIES
Samples submitted for assay contain as follows:

JAMES STEWART CO
707 MAYER CENTRAL BUILDING
3033 N. CENTRAL AVE
PHOENIX AZ. 85012

Short Ton ..... 2000 Lbs.
Short Ton Unit ..... 20 Lbs.
Long Ton ..... 2240 Lbs.
Long Ton Unit ..... 22.4 Lbs.

MARKS	SILVER PER TON Ozs.	SILVER PER TON Tenths	VALUE PER TON	GOLD PER TON Ozs.	GOLD PER TON 100ths	VALUE PER TON	TOTAL VALUE PER TON of Gold & Silver	PERCENTAGE COPPER	PERCENTAGE ZINC	REMARKS
1323 - 1331				0.01				0.01	1.50	
1333.5 - 1337.5				0.01				0.02	1.10	
1175 - 1185				0.03						
1726.5 - 1733				0.03						
2366.5 - 2373	0.70			0.03						
2947 - 2949				0.03					0.70	
2959.8 -2961				0.03					0.90	

REGISTERED ASSAYER
CERTIFICATE EXPIRES
JACK STONE
5479
DEC. 31, 19
ARIZONA, U.S.A.

Charges $ 43.00

Copy to Delinda Davis Clyde 9/5/69

Assayer
JACK STONE Reg. No. 5479

ANDY CHUKA, PRINT

Shop No. 1172
File No.

Date 3 SEPT 1969

VALUES
Latest Quotation

1 oz. Gold
1 oz. Silver
1 lb. Copper
1 lb. Lead
1 lb. Zinc

THIS CERTIFIES
Samples submitted for assay contain as follows:

Arizona Assay Office

815 NORTH FIRST STREET
Phone: 253-4001

Phoenix, Arizona 85001
P. O. BOX 1148

RECEIVED
SEP 5 1969
JAMES STEWART COMPANY
PHOENIX, ARIZONA

JAMES STEWART CO
707 MAYER CENTRAL BLDG
3033 N. CENTRAL
PHOENIX AZ. 85012

Short Ton ..... 2000 Lbs.
Short Ton Unit ..... 20 Lbs.
Long Ton ..... 2240 Lbs.
Long Ton Unit ..... 22.4 Lbs.

MARKS	SILVER PER TON Ozs.	SILVER PER TON Tenths	VALUE PER TON	GOLD PER TON Ozs.	GOLD PER TON 100ths	VALUE PER TON	TOTAL VALUE PER TON of Gold & Silver	PERCENTAGE MOLYBDENUM	REMARKS
1323 - 1331								0.0021	
1333.5 - 1333.5								0.0023	
1175 - 1185								0.0028	
1726.5 - 1732								0.0024	
2266.5 - 2272								0.0066	
1028 - 1032								0.0021	
1850.5 - 1854								0.0025	
2512 - 2515								0.0027	
2516 - 2512 (?)			(?)					0.0029	
2947 - 2949								0.0027	
2949 - 2951								0.0022	
2953 - 2955								0.0018	
2955 - 2957								0.0031	
2959 - 2961								0.0020	
2639.5 - 2641								0.0031	

Charges $ 120.00 - Mo
163.00 - Total

Assayer

JACK STONE REG. No. 9

REGISTERED ASSAYER
CERTIFICATE EXPIRES
JACK STONE
5479
DEC. 31, 19
ARIZONA, U.S.A.

Copy to Mr. Clyde Dean 9/5/69

BY CHUKA, PR

129

February 13, 1970

Hawley & Hawley
P. O. Box 5934
Tucson, Arizona 85703

Gentlemen:

Enclosed are two samples on which we would appreciate having the following assays run:

#2-2953-2955 - Assay for Copper

#2-1028-1032 - Assay for Zinc

Please mail the results to our Phoenix office with invoices.

Thank you very much.

Very truly yours,

C. A. Cosgrove

CAC:ef
Encls.

ASSAYERS AND CHEMISTS, INC.
1700 W. GRANT RD. • BOX 5934 • 622-4836
TUCSON, ARIZONA 85703

BRANCHES EL PASO, TEXAS
AMARILLO, TEXAS

IDENTIFICATION	GOLD OZS	SILVER OZS	LEAD %	COPPER %	ZINC %	MO. %	IRON %		
# 2 - 2953 - 2955				0.33					
# 2 - 1028 - 1032					1.25				

RECEIVED
FEB 20 1970
JAMES STEWART COMPANY
PHOENIX, ARIZONA

CC: James Stewart Company
ADD: 707 Mayer Central Bldg.
CITY: 3033 N. Central Ave
DD: Phoenix, Arizona 85012
CITY:

REMARKS:
Verified determination

ANALYSIS CERT. BY

REGISTERED ASSAYER CERTIFICATE INC. 67B4 H. EDWARD RICHARDS Date Stamped Arizona U.S.A.

OK

PREPARATION $
ANALYSIS $ 7.75

ACC: JAMES STEWART COMPANY | DATE SPL. RECEIVED 2/16/70 | DATE COMPL 2/19/70 | PHO 344026 | $ 7.75

E-131

February 18, 1970

Hawley & Hawley
P. O. Box 5934
Tucson, Arizona 85703

Gentlemen:

Enclosed are two samples, both #2-1726[5] - 1732. Please assay both samples for zinc, noting the pulp and reject status.

Thank you very much.

Very truly yours,

JAMES STEWART COMPANY

C. A. Cosgrove

CAC:ef
Encl.

* Verifies V.D.
Int. Nickel Wrong

HAWLEY & HAWLEY
ASSAYERS AND CHEMISTS, INC.
1700 W. GRANT RD. • BOX 5934 • 622-4836
TUCSON, ARIZONA 85703

6 4 BRANCHES

DOUGLAS, ARIZONA
HAYDEN, ARIZONA
EL PASO, TEXAS
AMARILLO, TEXAS

IDENTIFICATION	GOLD OZS	SILVER OZS	LEAD %	COPPER %	ZINC %	MO. %	IRON %		
# 2 - 1726^5-1732					3.58				
# 2 - 1726^5-1732 Pulp sample					3.64				

RECEIVED
FEB 25 1970
JAMES STEWART COMPANY
PHOENIX, ARIZONA

There were no rejects left, but there is remaining pulp of both samples.

REGISTERED ASSAYER CERTIFICATE No. 6784 H. E. RICHARD Date Issued Arizona U. S. A.

CC: James Stewart Company
ADD: 707 Mayer Central Bldg.
CITY: 3033 N. Central Ave., Phoenix, Arizona
DO:
CITY:

REMARKS: Verified determination

ANALYSIS CERT. BY H. E. Richard

PREPARATION $ 1.00
ANALYSIS $ 9.50

ACC: JAMES STEWART COMPANY | DATE SPL. RECEIVED 2/19/70 | DATE COMPL 2/24/70 | PHO 344040 | $ 10.50

133

6

PHELPS DODGE CORPORATION

WESTERN EXPLORATION OFFICE
DRAWER 1217
DOUGLAS, ARIZONA 85607

May 14, 1968

TEL. 602-364-8414

Mr. Clarence Cosgrove
James Stewart Construction Company
3033 North Central Avenue
Phoenix, Arizona 85012

Dear Mr. Cosgrove:

Enclosed are assay slips for the intervals sampled of hole Horne #3. The logs of the holes have not been brought to date. I hope to visit Charleston sometime this week to log #3 to date. At that time I will also visit the Bertha area and log B-1.

Very truly yours,

W. J. Walker

W. J. Walker

WJW:j
cc: Mr. Horne w/encls.
Encls.

HECTOR C. ROCHIN
MANAGER
REGISTERED ASSAYER
ARIZONA REG. No. 4073

ROCHIN ENGINEERING AND ASSAY OFFICE

P. O. BOX 218 PHONE 364-8092
DOUGLAS, ARIZONA - 85607

HECTOR A. ROCHIN
MINING ENGINEER AND
LAND SURVEYOR
ARIZONA REG. No. 2472

CERTIFICATE OF ASSAY

Name Western Exploration Office Address Drawer 1217 Douglas, Arizona

Mr. W.J. Walker	GOLD OZS	SILVER OZS	COPPER %	LEAD %	MoS_2	WO_3	Hole No.	FROM	TO
					SAMPLES				
J-b 23307 B-12090			0.039		James Stewart		JSO #2	2737.5	2742
23308 B-12091			0.028		Company			2742	2747
23309 B-12092			0.026					2747	2752
23310 B-12093			0.025					2752	2757
23311 B-12094			0.057					2757	2762
23312 B-12095			0.039					2762	2767
23313 B-12096			0.048					2767	2772
23314 B-12097			0.027					2772	2777
23315 B-12098			0.048					2777	2782
23316 B-12099			0.036					2782	2787
23317 B-10535			0.027					2787	2791
23318 B-10536			0.078					2791	2796
23319 B-10537			0.037					2796	2801
23320 B-10538			0.026					2801	2806
23321 B-10539			0.018					2806	2809.5
23322 B-10540			0.018					2809.5	2814
23323 B-10541			0.016					2814	2819
23324 B-10542			0.037					2819	2824
23325 B-10543			0.055					2824	2827.5
23326 B-10544			0.010					2827.5	2832
23327 B-10545			0.016					2832	2835.5
23328 B-10546			0.018					2835	2840
23329 B-10547			0.018					2840	2845

REGISTERED ASSAYER CERTIFICATE No. 4073 H. C. ROCHIN Date Signed ARIZONA, U.S.A.

MARKS:

DATE: May 6, 1966

CHARGES: $ Prep. $ 46.00
5.75
$ 51.75

HECTOR C. ROCHIN
MANAGER
REGISTERED ASSAYER
ARIZONA REG. No. 4073

ROCHIN ENGINEERING AND ASSAY OFFICE

P. O. BOX 218 PHONE 364-8092
DOUGLAS, ARIZONA - 85607

HECTOR A. ROCHIN
MINING ENGINEER AND
LAND SURVEYOR
ARIZONA REG. No. 2472

CERTIFICATE OF ASSAY

Name ....WESTERN EXPLORATION OFFICE.... Address ....Drawer 1217.-Douglas, Arizona.....

	GOLD OZS	SILVER OZS	COPPER %	LEAD %	NAME	HOLE NO.	DEPTH FROM	DEPTH TO:
23330.-B-10548.			0.016		James Jennett	JS6#2	2845	2850
23331.-B-10549			0.027		Company		2850	2854
23332.-B-10550			0.028				2854	2857.5
23333.-B-10551			0.026				2857.5	2862
23334.-B-10552			0.017				2862	2866.5
23335.-B-10553			0.025				2866.5	2871
23336.-B-10554			0.016				2871	2876
23337.-B-10555			0.023				2876	2880.5
23338.-B-10556			0.027				2880.5	2884.5
23339.-B-10557			0.016				2884.5	2889
23340.-B-10558			0.620	✓			2889	2894
23341.-B-10559			0.027				2894	2898
23342.-B-10560			0.016				2898	2903
23343.-B-10561			0.048				2903	2907.5
23344.-B-10562			0.027				2907.5	2912
23345.-B-10563			0.016				2912	2916
23346.-B-10564			0.010				2916	2920
23347.-B-10565			0.010				2920	2926.5
23348.-B-10566			0.013				2926.5	2930
23349.-B-10567			0.018				2930	2935.5
23350.-B-10568			0.010				2935.5	2940
23351.-B-10569			0.039				2940	2945
23352.-B-10570			0.058				2945.5	2949

REGISTERED ASSAYER CERTIFICATE NO. 4073 ARIZONA

REMARKS:

DATE: 6 May 68

CHARGES: $ 46.00
5.75
$ 51.75

136

HECTOR C. ROCHIN
MANAGER
REGISTERED ASSAYER
ARIZONA REG. No. 4073

ROCHIN ENGINEERING AND ASSAY OFFICE

P. O. BOX 218 PHONE 364-8092
DOUGLAS, ARIZONA - 85607

HECTOR A. ROCHIN
MINING ENGINEER AND
LAND SURVEYOR
ARIZONA REG. No. 2472

CERTIFICATE OF ASSAY

Name Western Exploration Office Address Drawer 1217 Douglas, Arizona

	GOLD OZS	SILVER OZS	COPPER %	LEAD %	NAME	HOLE NO.	DEPTH From	DEPTH To:
Lab 23353 B-10571			0.039		James Stewart	JS-04	2988	2991
23354 B-10572			0.067		Company		2991	2996
23355 B-10573			0.049				2996	3000
23356 B-10574			0.050				3000	3005
23357 B-10575			0.048				3005	3010
23358 B-10576			0.051				3010	3015
23359 B-10577			0.049				3015	3018
23360 B-10578			0.019				3018	3022
23361 B-10579			0.029				3022	3027
23362 B-10580			0.058				3027	3032
23363 B-10581			0.018				3032	3037
23364 B-10582			0.039				3037	3042
23365 B-10583			0.040				3042	3045.5
23366 B-10584			0.16				3045.5	3050
23367 B-10585			0.15				3050	3054.5
23368 B-10586			0.019				3138.5	3143
23369 B-10587			0.028				3143	3148.5
23370 B-10588			0.020				3148.5	3153
23371 B-10589			0.029				3153	3157
23372 B-10590			0.019				3157	3162
23373 B-10591			0.020				3162	3166
23374 B-10592			0.010				3166	3171
23375 B-10593			0.021					

REGISTERED ASSAYER CERTIFICATE NO. 4073 H. C. ROCHIN Date Issued ARIZONA, U.S.A.

MARKS:

DATE: 6 May 68

CHARGES: $ 46.00
5.75
$ 51.75

137

MEMORANDUM January 8, 1968

TO: M. S. Horne

RE: Charleston Mine - Hole #2 - Phelps Dodge

Attached is a record of core split sample preparation. Items under Column marked P.D. were given to Bud Walker of Phelps Dodge on 1-5-68. They will prepare samples, assay and return excess pulps to us.

In addition, they took samples as listed:

1005' to 1008'
1028' to 1032'
1119' to 1125'
1175' to 1185'
1196' to 1202'

and a number of specific samples to spectograph.

Mr. Walker delivered to us a spectroanalysis of samples taken on Hole #1 and the upper 2000 feet of Hole #2. These were given to Clyde. He is to use and send us a xerox copy.

Generally: Phelps Dodge is out of touch for this and the following week because of company scheduled events. He feels 75,000,000 tons of ore will be their minimum interest. Their usual cut off point for ore (although each deposit varies) is 4/10% cu. They would like in excess of 1000 acres to operate in.

Samples were returned from U of A by Clyde. We now have them ± on hand. Two sets of each I will deliver to the Mine. ???

C. A. Cosgrove

CAC:ef
Attachment - U of A Sample Preparation

12-280

U of A Sample Prep - Drill Hole # 2

File Assays Hole #138 To Chandler

Bag #	Box #	Footage		To U of A	Rec'd U of A		To PO	Assay Rcvd
1	189	1726½	1732	x	x		x	x
2	189	1721½	1726	x	x		x	x
3	190	1737	1741	x	x		x	x
4	190	1732	1737	x	x		x	x
5	188	1717	1721.5	x	x			
6	188	1713	1717	x	x			
7	187	1708	1713	x	x		x	x
8	187	1703	1708	x	x		x	x
9	186	1699	1703	x	x		x	x
10	186	1694.5	1699	x	x		x	x
11	185	1690	1694.5	x	x		x	x
12	185	1685	1690	x	x			
13	124	1134	1137	x	x			
14	124	1129	1134	x	x			
15	125	1142	1147	x	x			
16	125	1137	1142	x	x			
17								
18	126	1150	1155	x	x			
19	126	1147	1153	x	x			
20	127	1154	1159		x			
21	127	1159½	1163	x	x			
22	128	1168	1173	x	x	/		
23	128	1165	1168	x	x			
24	200	1826.5	1831	x	x	/		
25	200	1821.5	1826.5	x	x	/		
26	199	1816	1821.5	x	x			
27	199	1812	1816	x	x			
28	203	1831	1858.5	x	x	/		
29	203	1850.5	1854	x	x			
30	202	1845.5	1845	x	x			
31	202	1841	1845	x	x			
32	201	1836	1841	x	x			
33	201	1831	1836	x	x			
34	198	1808	1812	x	x			
35	197	1798	1803	x	x			
36	197	1793.5	1798	x	x			
37	196	1785	1789	x	x			
38	196	1789	1793.5	x	x			
39	195	1780.5	1785	x	x			
40	195	1776.5	1778.5	x	x			
41	194	1772	1776.5	x	x			
42	194	1767	1772	x	x			
43	193	1763.5	1767	x	x			
44	193	1759.5	1763.5	x	x			
45	192	1755	1759.5	x	x			
46	192	1750.5	1755	x	x			
47	191	1745.5	1750.5	x	x			
48	—	—	—					
49	—	—	—					

Material ground & seperated by U of A Mr Roseveare

10 Squares to the Inch

12-280

Bag #	Box #	Footage		To UofA	Recd from UofA
50	191	1741	1745.5	x	
51	184	1680	1685	x	
52	184	1678	1680	x	
53	183	1620	1675	x	
54	193	1665	1670	x	
55	182	1661	1665	x	
56	182	1656	1661	x	
57	209	1905	1910	x	
58	209	1901	1905	x	✓
59	208	1896	1901	x	✓
60	208	1893	1896	x	
61	207	1889	1893	x	
62	207	1886	1893	x	
63	210	1910	1915.5	x	
64	210	1915.5	1919	x	
65	212	1931.5	1935		
66	212	1928	1931		
67	213	1935	1937.5		
68	211	1923.5	1926		
69	211	1919	1923.5		
70	225	2040.5	2045		
71	225	2036	2040		
72	224	2031.5	2036		
73	224	2027	2031.5		
74	223	2024	2027		
75	223	2021	2024		
76	222	2015	2021		
77	222	2011	2015		
78	231	2097	2102.5		
79	231	2092.5	2097		
80	230	2087	2092.5		
81	230	2082.5	2087		
82	229	2078	2082.5		
83	229	2073.5	2078		
84	238	2162.5	2167.5		
85	238	2157.5	2162.5		
86	237	2154	2157.5		
87	237	2149	2154		
88	236	2144	2149		
89	236	2139.5	2144		
90	235	2135.5	2139.5		
91	235	2130.5	2135.5		
92	234	2125.5	2130.5		
93	234	2121	2125.5		
94	233	2116.5	2121		

12-280

Bag #	Box #	Footage		PO	
95	233	2113.5	2116.5		
96	232	2107	2113.5		
97	232	2	2107		
98	228	2068.5	2073.5		
99	228	2063.5	2068.5		
100	254	2318.5	2323.5		
101	254	2314.5	2318.5		
102	253	2309.5	2314.5		
103	253	2306	2309.5		
104	252	2301	2306		
105	252	2295.7	2301		
106	251	2291.5	2295.7		
107	251	2288	2291.5		
108	250	2283	2288	+	✓
109	250	2278	2283	+	✓
110	258	2356.5	2361.5		
111	258	2351.5	2356.5		
112	257	2347	2351.5		
113	257	2342	2347		
114	256	2337	2342	+	✓
115	256	2332.5	2337	+	✓
116	255	2328	2332.5		
117	255	2323.5	2328		
118	249	2272	2278	+	✓
119	249	2266.5	2272	+	✓
120	248	2261	2266.5	+	✓
121	248	2256.5	2261.5	+	✓
122	247	2251.5	2256.5	+	✓
123	247	2246.5	2251.5	+	✓
124	246	2241	2246.5	+	✓
125	246	2236	2241	+	✓
126	245	2229.5	2236	+	✓
127	245	2223	2229.5	+	✓
128	244	2219	2223	+	✓
129	244	2214	2219	+	✓
130	243	2209.5	2214	+	✓
131	243	2205	2209.5	+	✓
132	242	2200	2205	+	✓
133	242	2195	2200	+	✓
134	241	2189.7	2195	+	✓
135	241	2185.7	2189.7	+	✓
136	240	2181.1	2185.7	+	✓
137	240	2176.5	2181.1	+	✓
138	237	2172	2176.5	+	✓
139	239	2167.5	2172	+	✓
140	227	2058.5	2063.5		
141	227	2054.5	2058.5		

Samples - To Walker 1/25/68

10 Squares to the Inch

12-280

Bag #	Box #	Footage		T.	PD		
142	153	1377 -	1382.5				x
143	153	1382.5	1387.5				x
144	154	1387.5	1391.5				x
145	154	1391.5	1396				x
146	155	1396	1401.5	x		✓	
147	155	1401.5	1407	x		✓	
148	156	1407	1411.5	x		✓	
149	156	1411.5	1416.				x
150	157	1416	1422.5				x
151	157	1422.5	1429				x
153	158	1434	1439				x
~~154~~							
152	158	1429	1434				x
154	159	1439	1444				x
155	159	1444	1448.5				x
156	160	1448.5	1453				x
157	160	1453	1457	x		✓	
158	161	1457	1462				x
159	161	1462	1467				x

(May Sample Next)

MANAGER
REGISTERED ASSAYER
ARIZONA REG. No. 4073

ROCHIN ENGINEERING AND ASSAY OFFICE

P. O. BOX 218
PHONE EMpire 4[illegible]2
DOUGLAS, ARIZONA

HECTOR A. ROCHIN
MINING ENGINEER AND
LAND SURVEYOR
ARIZONA REG. No. 2472

CERTIFICATE OF ASSAY

Name Western Exploration Office Address Drawer 1217 Douglas, Arizona

Att: Mr.W.J.Walker	GOLD OZS. NAME	SILVER OZS.	COPPER %	LEAD %	Zn %		HOLE NO.	DEPTH From	DEPTH To:
Lab 22738 B-9706	James	Stewart	0.090	Tr	0.55	Core	JSC#2	2578.5	2583
22739 B-9707	Co.		0.028	Tr	0.07			2585	2588.1
22740 B-9708			0.042	Tr	1.20			2588.1	2593.3
22741 B-9709			0.031	Tr	0.12			2593.3	2598
22742 B-9710			0.029	Tr	Tr			2598	2603.7
22743 B-9711			0.037	Tr	0.07			2603.7	2607
22744 B-9712			0.040	Tr	0.05			2607	2610
22745 B-9713			0.028	Tr	Tr			2610	2615
22746 B-9714			0.031	Tr	0.08			2615	2620
22747 B-9715			0.088	Tr	0.30			2620	2624
22748 B-9716			0.12	Tr	1.12			2624	2628.5
22749 B-9717			0.029	Tr	Tr		JSC#3	996	1003
22750 B-9718			0.031	Tr	0.07			1003	1011
22751 B-9719			0.030	Tr	0.05			1011	1019
22752 B-9720			0.022	Tr	0.04			1019	1028.9
22753 B-9721			0.028	Tr	0.06			1028.9	1036
22754 B-9722			0.020	Tr	0.03			1036	1045
22755 B-9723			0.032	Tr	0.05			1045	1053
22756 B-9724			0.029	Tr	0.04			1053	1062
22757 B-9725			0.042	Tr	0.05			1062	1071
22758 B-9726			0.031	Tr	0.03			1071	1080
22759 B-9727			0.041	Tr	0.07			1080	1088.6
22760 B-9728			0.022	Tr	0.06			1088.6	1098

REMARKS:

ANALYSIS CERT. BY:

DATE: 29 Feb 1968

CHARGES: $ 184.00
5.75
$ 189.75

HECTOR A. ROCHIN
MANAGER
REGISTERED ASSAYER
ARIZONA REG. No. 4073

ROCHIN ENGINEERING AND ASSAY OFFICE

P. O. BOX 218
PHONE EMpire 4 J2
DOUGLAS, ARIZONA

HECTOR A. ROCHIN
MINING ENGINEER AND
LAND SURVEYOR
ARIZONA REG. No. 2472

CERTIFICATE OF ASSAY

Name Western Exploration office Address Drawer 1217 Douglas, Arizona

Att: Mr.W.J.Walker	GOLD OZS.	SILVER OZS.	COPPER %	LEAD %	Zn %		HOLE NO.	DEPTH From:	DEPTH To:
	NAME								
Lab 22761 B-9729	James	Stewart	0.030	Tr	0.08	Core	JSC#3	1098	1107
22762 B-9730	Co.		0.041	Tr	0.12			1107	1116
22763 B-9932			0.019	0.12	0.25		JSC#2	1377	1382
22764 B-9933			0.030	0.07	0.27			1382.5	1387
22765 B-9934			0.032	0.07	0.15			1387.5	1391
22766 B-9935			0.048	0.24	0.70			1391.25	1396
22767 B-9936			0.16	0.65	1.75			1457	1462
22768 B-9937			0.030	0.05	0.25			1462	1467
22769 B-9938			0.048	0.34	0.70			1858.5	1862
22770 B-9939			0.040	Tr	Tr			1862	1867
22771 B-9940			0.052	Tr	Tr			1867.5	1872
22772 B-9941			0.028	Tr	Tr			1872	1876
22773 B-9942			0.042	Tr	0.05			1876.5	1881
22774 B-9943			0.028	0.03	0.03			1881	1886
22775 B-9944			0.030	Tr	0.05			1937.5	1941
22776 B-9945			0.049	Tr	0.03			1941	1946
22777 B-9946			0.032	Tr	Tr			1946.5	1951
22778 B-9947			0.049	Tr	Tr			1951	1956
22779 B-9948			0.031	Tr	Tr			1956	1961
22780 B-9949			0.042	Tr	0.07			1961	1965
22781 B-9950			0.040	Tr	Tr			1965.5	1969
22782 B-9851			0.029	Tr	0.05			1969	1974
22783 B-9852			0.041	Tr	Tr			1974	1978

REGISTERED ASSAYER CERTIFICATE NO. 4073 HECTOR A. ROCHIN Date Signed ARIZONA

REMARKS:

ANALYSIS CERT. BY:

DATE: 29 Feb 1968

CHARGES: $ 184.00
5.75
189.75

144

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file PD

PHELPS DODGE CORPORATION

WESTERN EXPLORATION OFFICE
DRAWER 1217
DOUGLAS, ARIZONA 85607

TEL. 602-364-8414

March 12, 1968

Mr. Clarence Cosgrove
James Stewart Construction Co.
3033 North Central Avenue
Phoenix, Arizona 85012

RECEIVED
MAR 1[illegible] 1968
JAME[illegible] COMPANY

Dear Mr. Cosgrove:

Attached are the final page from the geologic log for Hole No. 2, the geologic log for Hole No. 3, and the most recent assay results for Hole No. 2 dated March 8, 1968.

Very truly yours,

R. W. Ludden

R. W. Ludden, Jr.
Chief Geologist

RWL:g
Encls

HECTOR C. ROCHIN
MANAGER
REGISTERED ASSAYER
ARIZONA REG. No. 4073

ROCHIN ENGINEERING AND ASSAY OFFICE

P. O. BOX 218 PHONE 364-8092
DOUGLAS, ARIZONA - 85607

HECTOR A. ROCHIN
MINING ENGINEER AND
LAND SURVEYOR
ARIZONA REG. No. 2472

CERTIFICATE OF ASSAY

Name Western Exploration Office Address Drawer 1217 Douglas, Arizona

		GOLD OZS	SILVER OZS	COPPER %	LEAD %	Zn %		FILE NO.	FROM	TO
		NAME								
L 22784	B-9853	James Stuart		0.030	Tr	0.04	Core	[illegible]	1978	1982
22785	B-9854	No.		0.028	Tr	Tr			1982	1986
22786	B-9855			0.032	Tr	Tr			1986	1992
22787	B-9856			0.052	Tr	Tr			1992	1996
22788	B-9857			0.041	1.80	2.20				1922
22789	B-9858			0.028	Tr	Tr			1922	1926
22790	B-9859			0.037	Tr	0.07			1926	1931
22791	B-9860			0.039	Tr	0.05			1931	1935
22792	B-9861			0.038	Tr	0.06			1935	1937
22793	B-9862			0.030	Tr	Tr			1998	2002
22794	B-9863			0.028	Tr	0.20			2002	2007
22795	B-9864			0.032	Tr	0.07			2007	2011
22796	B-9865			0.040	Tr	0.06			2011	2015
22797	B-9866			0.042	Tr	0.12			2015	2021
22798	B-9867			0.032	Tr	Tr			2021	2024
22799	B-9868			0.021	Tr	Tr			2024	2027
22800	B-9869			0.019	Tr	Tr			2027	2031
22801	B-9870			0.030	Tr	Tr			2031	2036
22802	B-9871			0.042	Tr	Tr				2040
22803	B-9872			0.061	Tr	Tr			2040	2045
22804	B-9873			0.040	Tr	Tr			2045	2050
22805	B-9874			0.049	Tr	Tr				2054
22806	B-9875			0.027	Tr	Tr			2054	2058

REGISTERED ASSAYER CERTIFICATE NO. 4073 H. C. ROCHIN Date Signed ARIZONA, U.S.A.

REMARKS:

DATE: 8 Mar 68

CHARGES: $ Prep. 5.75
184.00
189.75

HECTOR C. ROCHIN
MANAGER
REGISTERED ASSAYER
ARIZONA REG. No. 4073

ROCHIN ENGINEERING AND ASSAY OFFICE

P. O. BOX 218 PHONE 364-8092
DOUGLAS, ARIZONA - 85607

HECTOR A. ROCHIN
MINING ENGINEER AND
LAND SURVEYOR
ARIZONA REG. No. 2472

146

CERTIFICATE OF ASSAY

Name Western Exploration Office Address Drawer 1217 Douglas, Arizona

	GOLD OZS	SILVER OZS	COPPER %	LEAD %	Zn %		FILE NO.	DEPTH From	DEPTH To
	NAME								
22807 B-9876	James	Stuart	0.041	Tr	Tr	Core	[illegible]	2051.5	2062.5
22808 B-9877	Co.		0.039	Tr	Tr			2062.5	2064.5
22809 B-9878			0.030	Tr	Tr			2064.5	2072.5
22810 B-9879			0.032	Tr	0.05			2072.5	2078
22811 B-9880			0.040	Tr	0.03			2078	2082.5
22812 B-9881 - A			0.059	Tr	0.05			2087	2092.5
22813 B-9882 - B			0.050	Tr	0.05			2087	2092.5
22814 B-9883			0.042	Tr	0.45			2092.5	2097
22815 B-9884			0.060	Tr	Tr			2097	2102.5
22816 B-9885			0.072	Tr	Tr			2102.5	2107
22817 B-9886			0.039	Tr	Tr			2107	2112.5
22818 B-9887			0.040	Tr	Tr			2112.5	2116.5
22819 B-9888			0.062	Tr	Tr			2116.5	2121
22820 B-9889			0.030	Tr	0.12			2121	2125.5
22821 B-9890			0.042	Tr	Tr			2125.5	2130.5
22822 B-9891			0.049	Tr	0.25			2130.5	2135.5
22823 B-9892			0.041	Tr	0.07			2135.5	2139.5
22824 B-9893			0.030	Tr	0.07			2137.5	2144
22825 B-9894			0.039	Tr	Tr				2147
22826 B-9895			0.038	Tr	0.05			2149	2154
22827 B-9896			0.040	Tr	0.03			2154	2157.5
22828 B-9897			0.031	Tr	0.05			2157.5	2162.5
22829 B-9898			0.052	Tr	0.04			2162.5	2167.5

REGISTERED ASSAYER CERTIFICATE NO. 4073 H. C. ROCHIN Date Signed..... ARIZONA, U.S.A.

MARKS:

DATE:

CHARGES: $ Prep. 5.25
184.00
189.75

HECTOR C. ROCHIN
MANAGER
REGISTERED ASSAYER
ARIZONA REG. No. 4073

ROCHIN ENGINEERING AND ASSAY OFFICE

P. O. BOX 218 PHONE 364-8092
DOUGLAS, ARIZONA - 85607

HECTOR A. ROCHIN
MINING ENGINEER AND
LAND SURVEYOR
ARIZONA REG. No. 2472

147

CERTIFICATE OF ASSAY

Name Western Exploration Office Address Drawer 1217 Douglas, Arizona

	GOLD OZS	SILVER OZS	COPPER %	LEAD %	Zn %		HOLE NO.	DEPTH From:	DEPTH To:
	NAME								
Lab 22830 B-9899	James	Stewart	0.037	Tr	0.12	Core	JSH2	2288	2291.5
22831 B-9900	Co.		0.049	Tr	0.05			2291.5	2293.7
22832 B-9651			0.021	Tr	0.03			2306	2309.5
22833 B-9652			0.019	Tr	0.05			2309.5	2314.5
22834 B-9653			0.020	Tr	Tr			2314.5	2318.5
22835 B-9654			0.022	Tr	Tr			2318.5	2323.5
22836 B-9655			0.039	Tr	0.40			2323.5	2328
22837 B-9656			0.018	Tr	0.07			2328	2332.5
22838 B-9657			0.040	Tr	Tr			2342	2347
22839 B-9658			0.031	Tr	Tr			2351.5	2356.5
22840 B-9659			0.029	Tr	Tr			2356.5	2361.5
22841 B-9660			0.027	Tr	Tr			2361.5	2366
22842 B-9661			0.042	Tr	0.03			2366	2371
22843 B-9662			0.031	Tr	0.05			2371	2375
22844 B-9663			0.032	Tr	0.07			2375	2380
22845 B-9664			0.029	Tr	Tr			2380	2384
22846 B-9665			0.030	Tr	Tr			2384	2388
22847 B-9666			0.042	Tr	Tr			2388	2393
22848 B-9667			0.029	Tr	Tr			2393	2397.5
22849 B-9668			0.070	Tr	Tr			2397.5	2402
22850 B-9669			0.97	Tr	0.03			2402	2407
22851 B-9670			0.049	Tr	0.02			2407	2412
22852 B-9671			0.030	Tr	0.02			2412	2417

REGISTERED ASSAYER CERTIFICATE NO. 4073 H. C. ROCHIN Date Signed ARIZONA, U.S.A.

REMARKS:

DATE: 11 Mar 68

CHARGES: $ Prep 5.75
184.00
m189.75

HECTOR C. ROCHIN
MANAGER
REGISTERED ASSAYER
ARIZONA REG. No. 4073

ROCHIN ENGINEERING AND ASSAY OFFICE

P. O. BOX 218 PHONE 364-8092
DOUGLAS, ARIZONA · 85607

HECTOR A. ROCHIN
MINING ENGINEER AND
LAND SURVEYOR
ARIZONA REG. No. 2472

CERTIFICATE OF ASSAY

N ... WESTERN EXPLORATION OFFICE ..... Address . Drawer. 1217.-Douglas,. Arizona.....

	GOLD OZS	SILVER OZS	COPPER %	LEAD %	Zn. %		HOLE NO.	DEPTH From	DEPTH To
	NAME								
22853.-B-9672	James	Stewart	0.041	Tr.	Tr.	Core	JSC#2	2417	2421
22854.-B-9673	Do.		0.032	Tr.	Tr.			2421	2426
22855.-B-9674			0.029	Tr.	Tr.			2426 5	2430
22856.-B-9675			0.019	Tr.	Tr.			2430 5	2435
22857.-B-9676			0.042	Tr.	Tr.			2435 7	2440
22858.-B-9677			0.027	Tr.	0.07			2440	2445
22859.-B-9678			0.038	Tr.	0.05			2445 7	2450
22860.-B-9679			0.040	Tr.	0.04			2450	2456
22861.-B-9680			0.042	Tr.	Tr.			2456 4	2461 5
22862.-B-9681			0.027	Tr.	0.06			2461 5	2464
22863.-B-9682			0.019	Tr.	Tr.			2464	2470 5
22864.-B-9683			0.041	Tr.	0.05			2470 5	2474
22865.-B-9684			0.020	Tr.	Tr.			2474	2479
22866.-B-9685			0.032	Tr.	Tr.			2479	2483 1
22867.-B-9686			0.029	Tr.	0.07			2483 1	2488
22868.-B-9687			0.031	Tr.	Tr.			2488	2492 5
22869.-B-9688			0.019	Tr.	Tr.			2492 5	2497
22870.-B-9689			0.041	Tr.	Tr.			2293 7	2301
22871.-B-9690			0.027	Tr.	Tr.				2351 5
22872.-B-9691			0.029	Tr.	Tr.	2497			2502
22873.-B-9692			0.020	Tr.	0.03			2512	2515
22874.-B-9693			0.022	Tr.	0.05				2517 6
22875.-B-9694			0.100	Tr.	2.40			2517 6	2521

REGISTERED ASSAYER CERTIFICATE NO. 4073 H. C. ROCHIN DATE SIGNED ARIZONA, U.S.A.

RE. .RKS:

3/12/68
DATE:

CHARGES: $ 184.00
5.75 Prep.
$189.75

HECTOR C. ROCHIN
MANAGER
REGISTERED ASSAYER
ARIZONA REG. No. 4073

ROCHIN ENGINEERING AND ASSAY OFFICE

P. O. BOX 218 PHONE 364-8092
DOUGLAS, ARIZONA - 85607

HECTOR A. ROCHIN
MINING ENGINEER AND
LAND SURVEYOR
ARIZONA REG. No. 2472

CERTIFICATE OF ASSAY

ie ...WESTERN EXPLORATION OFFICE..... Address ..Drawer 1217 - Douglas, Arizona.....

	GOLD OZS	SILVER OZS	COPPER %	LEAD %	NAME		HOLE No.	DEPTH From	DEPTH To
23025 - B - 10519			0.160						
23026 - B - 10520			0.120						
23027 - B - 9739			0.019	James Stewart			JSC#3	1197	1206
23028 - B - 9740			0.028	Co.				1206	1215
23029 - B - 9741			0.046					1215	1223
23030 - B - 9742			0.048				JSC#2	2945	2947
23031 - B - 9743			0.830					2947	2949
23032 - B - 9744			0.076					2949	2951
23033 - B - 9745			0.670					2951	2953
23034 - B - 9746			0.360					2953	2955
23035 - B - 9748			0.048					2955	2957
23036 - B - 9748			5.52					2957	2959
23037 - B - 9749			6.76					2959	2961
23038 - B - 9750			0.067					2961	2963
23039 - B - 12051			0.028					2963	2964.5
23040 - B - 12052			0.036					2964.5	2966.5
23041 - B - 12053			0.048					2966.5	2968.5
23042 - B - 12054			0.027					2968.5	2969.5
23043 - B - 12055			0.088					2969.5	2971
23044 - B - 12056			0.190					2971.5	2973.5
23045 - B - 12057			0.076					2973.5	2975.5
23046 - B - 12058			0.140					2975.5	2977.5
23047 - B - 12059			0.110					2977.5	2979.5

REGISTERED ASSAYER CERTIFICATE NO. 4073 H. C. ROCHIN Date Signed ..... ARIZONA, U.S.A.

MARKS: Diamond Drill Core.

DATE: 3/12/68

CHARGES: $ 46.00
" 5.75
$ 51.75

HECTOR C. ROCHIN
MANAGER
REGISTERED ASSAYER
ARIZONA REG. No. 4073

ROCHIN ENGINEERING AND ASSAY OFFICE

P. O. BOX 218 PHONE 364-8092
DOUGLAS, ARIZONA - 85607

HECTOR A. ROCHIN
MINING ENGINEER AND
LAND SURVEYOR
ARIZONA REG. No. 2472

150

CERTIFICATE OF ASSAY

Name ....WESTERN EXPLORATION OFFICE..... Address ...Drawer 1217,-Douglas, Arizona.....

	GOLD OZS	SILVER OZS	COPPER %	LEAD %	NAME		HOLE NO.	DEPTH From	DEPTH To.
23048.-B-12060			0.028	James	Stewart	Co.	JSCH2	2979.5	2981.5
23049.-B-12061			0.028					2981.5	2983.5
23050.-B-12062			0.036					3054.5	3058.5
23051.-B-12063			0.068					3058.5	3062
23052.-B-12064			0.058					3062	3067
23053.-B-12065			0.058					3067	3071.5
23054.-B-12066			0.056					3071.5	3076
23055.-B-12067			0.068					3076	3080.5
23056.-B-12068			0.068					3080.5	3084.5
23057.-B-12069			0.066					3084.5	3089.5
23058.-B-12070			0.066					3089.5	3094.5
23059.-B-12071			0.056					3094.5	3103
23060.-B-12072			0.038					3103	3104
23061.-B-12073			0.066					3104	3105
23062.-B-12074			0.066					3105	3107
23063.-B-12075			0.048					3107	3109
23064.-B-12076			0.066					3109	3111
23065.-B-12077			0.066					3111	3113
23066.-B-12078			0.058					3113	3115
23067.-B-12079			0.047					3115	3117
23068.-B-12080			0.036					3117	3119
23069.-B-12081			0.048					3119	3120.5
23070.-B-12082			0.088					3120.5	3127

REGISTERED ASSAYER CERTIFICATE NO. 4073 H. C. ROCHIN Signed ARIZONA, U.S.A.

EMARKS:

DATE: 3/13/68

CHARGES: $ $ 46.00
5.75 Prep.
$ 51.75

HECTOR C. ROCHIN
MANAGER
REGISTERED ASSAYER
ARIZONA REG. No. 4073

ROCHIN ENGINEERING AND ASSAY OFFICE

P. O. BOX 216 PHONE 364-8092
DOUGLAS, ARIZONA - 85607

HECTOR A. ROCHIN
MINING ENGINEER AND
LAND SURVEYOR
ARIZONA REG. No. 2472

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CERTIFICATE OF ASSAY

Name WESTERN EXPLORATION OFFICE..... Address Drawer 1217.-Douglas,..Arizona.....

	GOLD OZS	SILVER OZS	COPPER %	LEAD %	NAME		HOLE NO.	DEPTH From	DEPTH To:
23071.-B- 12083			0.076	James Stewart Co.			JSC#2	3127	3129.5
23072.-B-10521			0.088						
23073.-B-10522			0.150						
23074.-B-10523			0.210						
23075.-B-10524			0.200						
23076.-B-10525			0.130						
23077.-B-10526			0.120						
23078.-B-10527			0.130						
23079.-B-10528			0.160						
23080.-B-10529			0.200						
23081.-B-10530			0.170						
23082.-B-10531			0.190						
23083.-B-10532			0.210						
23084.-B-10533			0.270						
23085.-B-12084			0.020	James Stewart Co.			JSC#2	2301	2306
23086.-B-12085			0.028					2512.1	2516
23087.-B-12086			0.056					2516	2520
23088.-B-12087			0.028					1150.5	1155
23089.-B-12088b			0.028					1147	1155
23090.-B-12089			0.028					1154	1159.5

REGISTERED ASSAYER CERTIFICATE NO. 4073 H. C. ROCHIN Date Signed ARIZONA, U.S.A.

REMARKS

DATE: 3/13/68

CHARGES: $ $ 40.00
" 5.00 Prep.
$ 45.00

PHELPS DODGE CORPORATION

WESTERN EXPLORATION OFFICE
DRAWER 1217
DOUGLAS, ARIZONA 85607

TEL. 602-364-8414

May 31, 1968

Mr. Clarence Cosgrove
James Stewart Construction Co.
3033 North Central Avenue
Phoenix, Arizona 85012

Dear Clarence:

Enclosed are the results obtained from assaying the core from Horne #2 drill hole.

Very truly yours,

W. J. Walker

WJW:g
Encls
cc: J. Horne w/encls

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HECTOR C. ROCHIN
MANAGER
REGISTERED ASSAYER
ARIZONA REG. No. 4073

ROCHIN ENGINEERING AND ASSAY OFFICE

P. O. BOX 216 PHONE 364-8092
DOUGLAS, ARIZONA - 85607

HECTOR A. ROCHIN
MINING ENGINEER AND
LAND SURVEYOR
ARIZONA REG. No. 2472

CERTIFICATE OF ASSAY

Name WESTERN EXPLORATION OFFICE Address Drawer 1217.-Douglas, Arizona.

	GOLD OZS	SILVER OZS	COPPER %	LEAD	NAME	HOLE NO.	DEPTH From	DEPTH To:
23453.-B-11320			0.029	James	Stewart	JSC#2	3129.5	3134
23454.-B-11321			0.029	0.0.			3134	3138.5
23455.-B-11322			0.018				3175	3178
23456.-B-11323			0.036				3178	3181
23457.-B-11324			0.048				3181	3183
23458.-B-11325			0.078				3183	3185
23459.-B-11326			0.057				3185	3187
23460.-B-11327			0.220				3187	3189
23461.-B-11328			0.150				3189	3190
23462.-B-11329			0.048				3190	3195
23463.-B-11330			0.027				3195	3199.5

REGISTERED ASSAYER CERTIFICATE No 4073 H. C. ROCHIN Date Signed ARIZONA, U.S.A.

REMARKS:

DATE: 5/28/68

CHARGES $24.75

HECTOR C. ROCHIN
MANAGER
REGISTERED ASSAYER
ARIZONA REG. No. 4073

ROCHIN ENGINEERING AND ASSAY OFFICE

P. O. BOX 216 PHONE 364-6092
DOUGLAS, ARIZONA - 85607

HECTOR A. ROCHIN
MINING ENGINEER AND
LAND SURVEYOR
ARIZONA REG. No. 2472

CERTIFICATE OF ASSAY

Name WESTERN EXPLORATION OFFICE. Address Drawer 1217.-Douglas, Arizona.

	GOLD OZS	SILVER OZS	COPPER %	LEAD %	NAME	HOLE NO.	DEPTH From	DEPTH To
23430.- B-10597			0.010	James	Stewart	JSC-2	2628.5	2633.5
23431.- B-10598			0.010	Co.			2633.5	2639.5
23432.- B-10599			0.028				2639.5	2644
23433.- B-10600			0.048				2644	2648.6
23434.- B-11301			0.010				2648.6	2652
23435.- B-11302			0.026				2652	2657.4
23436.- B-11303			0.036				2657.4	2662
23437.- B-11304			0.026				2662	2666.7
23438.- B-11305			0.018				2666.7	2672
23439.- B-11306			0.018				2672	2677
23440.- B-11307			0.027				2677	2682
23441.- B-11308			0.018				2682	2687
23442.- B-11309			0.016				2687	2692
23443.- B-11310			0.016				2692	2695.5
23444.- B-11311			0.010				2695.5	2701
23445.- B-11312			0.028				2701	2705
23446.- B-11313			0.016				2705	2709
23447.- B-11314			0.010				2709	2714
23448.- B-11315			0.028				2714	2719
23449.- B-11316			0.010				2719	2724.5
23450.- B-11317			0.029				2724.5	2728
23451.- B-11318			0.016				2728	2733
23452.- B-11319			0.018				2723	2727.5

REGISTERED ASSAYER CERTIFICATE NO. 4073 H. C. ROCHIN ARIZONA, U.S.A.

REMARKS:

DATE: May 28, 1968

CHARGES: $ 51.75

DEPTH	ASSAY #	CU %	AG OZ	AU OZ	PB	ZN	NI	MO	VA
580'	A 7356	.045	.4						
598'	✓	.03	.3						
620	✓	.04	.4						
660	✓	.035	.3						
781	A 7372	.03	.6	.01	TR	.9			
750	TL 1774	.02	1.6		0.1		.001		.005
?	V ? 11/4/67	1.85	1.1	.02	0.15	0.35		0	
970	A 1185	0.50	0.8	.01					TR
1197	✓								TR
1185	✓								
1109	V 11/15		0.2						
1156	✓	.05	0.4	TR.					
1185	V						NIL		

Hole # 2 Assay Results

File

	Assay #	date	Ag	Au	Cu	Pb	Zn	Mo	Ni	Co	Sel
1 - 598	7366	10/18	0.3	–	.03						
2 620	✓	✓	0.4	–	.04						
3 660	✓	✓	0.3	–	.035						
9 580	✓	✓	0.4	–	.045						
10 - 781		10/23	0.6 ~~0.9~~	.01	.03	Tr	0.9 Sericite with Metal Black Blue Harlow				
11 - 950	Spectograph	10/24	1.6	–	.02	.01	Pyrites - Calcite - in Andesite Harlow				
1185			0.75		1.0	.2		0.08	Nil	Tr	Tr
1820	✓	12/7	0.6	.02	1.9	.35		6.1	.13	.09	
1850		12/7	.02	.01	.15						
1690 - 94.5	PD B8431	12			.028	.05		.12	Nil		
94.5 99	B8432				0.028	.05		.10	Nil		
99 1703	B8433				0.029	.05		.12	Nil		
1703 1708					.027	.03		.12	Nil		
1708 1713					0.049	.06		Tr	Nil		
1721.5 1726.5					.038	.36		0.60	Nil		
1726.5 1732					0.10	0.42		3.70	Nil		
1732 1737					0.049	0.46		3.40	Nil		
1737 1741					0.076	0.03		0.17	Nil		
1923	Bryan	12/14			.05			14.7%			
1852	✓	12/15								(Tel .06)	0.32
1850		12/7			0.15						
1820		12/7	0.6	.02	1.9	.35		6.1	.13	.09	

OFFICE CORRESPONDENCE

JAMES STEWART COMPANY

December 11, 1967

MEMORANDUM TO FILE

Assays From International Nickel

On a sample of Hole #2 taken at depth 1185 feet, their assay reports show results as follows:

Zinc	.08 %
Lead	.2 %
Silver	3/4 oz/
Copper	1.0 %
Nickel	Trace
Cobalt	Heavier than nickel
Vanadium	Nil
Molly	Nil

Remarks by A. R. Smith:

~~This is~~ Good commercial ore BUT must carry at least a 10 foot width for the depth involved to be commercial. Will give us a balance of their reports within a week of the current materials, and will give results of materials we are sending by January 1, and we will have International Nickel Company talking to us about the property at that time.

Harlow Jones

Harlow Jones

HJ:jm

(Revised 9/17/69

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CHARLESTON MINE

Assay Summary

HOLE #2

Depth	% Cu	Oz. AG	% ZN	% Pb	Oz. Au	% MoS_2
580	.045	0.4				
598	.03	0.3				
620	.04	0.4				
660	.035	0.3				
750	.02	1.6		Tr		
781	.03	0.6	0.9		.01	
1005 - 1008	.43		9.2	4.88		
1028 - 1032	.07 .084	0.14	5.0 1.22	.6 0.65	.003	DUMP 0.0021
1129	.029		Tr	.02		
1134	.038		Tr	.02		
1137	.037		Tr	.02		
1142	.037		Tr	.44		
1159 5	.037		Tr	.07		
1163	.037		Tr	.02		
1168	.058		Tr	.02		
1185	1.0		.08	.2	.75	
1175 - 1185	0.16 .113	.11	1.48 1.35	.44 .66	.02	RESECT 0.0028
1196	0.08		2.17	1.25		
1407 5 - 1411 5	0.14		2.87	1.45		
1411 5 - 1416	0.048		Tr	0.10		
1416 5 - 1422 5	0.029		Tr	0.07		
422 5 - 1429	0.038		0.20	0.10		
1429 - 1434	0.047		0.25	0.12		
1434 - 1439	0.048		0.05	0.02		
1439 - 1444 5	0.049		0.32	0.30		
1444 - 1448 5	0.028		0.12	0.25		
1448 - 1453	0.038		0.20	0.13		
1453 5 - 1457	0.07		1.40	0.66		
1656 5 - 1661	0.038		Tr	Tr		
1661 - 1665	0.029		Tr	Tr		
1665 - 1670	0.038		Tr	Tr		
1670 - 1675	0.029		Tr	Tr		
1678 - 1680	0.030		Tr	Tr		
1680 - 1685 5	0.019		Tr	Tr		
1690 5 - 1694	.028		.12	.05		
1694 5 - 1699	.028		.10	.05		
1699 - 1703	.029		.12	.05		
1703 - 1708	.027		.12	.03		
1708 5 - 1713 5	.049		Tr	.06		
1721 5 - 1726 5	.038		.60	.36		
1726 - 1732	0.10 .101	0.7 .04	3.70 0.64	.42 0.44	.02	RESECT 0.0024
1732 - 1737	0.047		3.40	.46		
1737 - 1741 5	0.076		0.17	.03		
1741 5 - 1745 5	0.028		0.25	.12		
1745 5 - 1750	0.020		0.30	.07		
1750 - 1755 5	0.037		0.25	.07		
1755 5 - 1759 5	0.028		.05	Tr		
1759 5 - 1763 5	0.047		.05	Tr		
1323 5 - 1331 5	.01 .038	.11	1.50 .56	? .40	.01	RESECT 0.0021
1333 5 - 1337 5	.02 .086	.04	1.10 .10	? < .05	.01	RESECT 0.0023

Charleston Mine - Assay Summary - Hole #2

2/26/68
Sheet 2

Depth	% Cu	Oz. AG	% ZN	% Pb	Oz. Au	% Mo
1763 5 - 1767 5	0.036		.12	.05		
1767 5 - 1772 5	0.029		.12	.03		
1772 5 - 1776 5	0.029		Tr	.03		
1776 5 - 1780	0.037		Tr	.02		
1780 - 1785	0.029		Tr	.03		
1785 - 1789 5	0.048		Tr	.05		
1789 5 - 1793 5	0.029		Tr	.02		
1793 5 - 1798 5	0.048		.05	.03		
1798 5 - 1803	0.037		.07	.03		
1803 - 1808	0.029		.07	.03		
1808 - 1812	0.037		0.50	0.14		
1812 - 1816 5	0.076		0.40	0.12		
1816 - 1821 5	0.048		Tr	Tr		
1820 5	1.9		6.1	.35	.02	.1
1821 5 - 1826 5	.029		Tr	Tr		
1826 5 - 1831	.029		Tr	Tr		
1831 - 1836	.037		Tr	Tr		
1836 - 1841	.029		Tr	Tr		
1841 - 1845 5	0.037		Tr	Tr		
1845 5 - 1850 5	0.029		.02	.05		
1850 5 - 1854	0.21 0.239	0.27	1.12 1.64	0.92 0.78	RESEAT	0.0
1850 5	0.15	0.2			.01	
1854 5 - 1858 5	0.087		.12	.10		
1886 - 1889 5	0.029		Tr	.02		
1893 - 1896 5	0.057		Tr	Tr		
1896 5 - 1901	0.029		Tr	Tr		
1901 - 1905	0.037		Tr	.08		
1905 - 1910 5	0.029		Tr	Tr		
1910 5 - 1915 5	0.038		Tr	.02		
1915 5 - 1919	0.019		Tr	Tr		
1923	.05		14.7			
1858 5 - 1862	.048		.7	.34		
1862 5 - 1867 5	.04		Tr	Tr		
1867 5 - 1872 5	.052		Tr	Tr		
1872 - 1876	.028		Tr	Tr		
1876 5 - 1881	.042		.05	Tr		
1881 - 1886	.028		.03	.03		
1937 5 - 1941	.030		.05	Tr		
1941 - 1946 5	.049		.03	Tr		
1946 5 - 1951	.032		Tr	Tr		
1951 - 1956	.049		Tr	Tr		
1956 - 1961	.031		Tr	Tr		
1961 5 - 1965 5	.042		.07	Tr		
1965 5 - 1969	.04		Tr	Tr		
1969 - 1974	.029		.05	Tr		
1974 - 1978 6	.041		Tr	Tr		
1978 6 - 1983 6	.03		.04	Tr		
1983 6 - 1988	.028		Tr	Tr		
1988 - 1993	.032		Tr	Tr		
1993 - 1998 5	.052		Tr	Tr		
- 1923 5	.041		2.20	1.80		

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Charleston Mine - Assay Summary - Hole #2

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Sheet 1-A

Depth	% Cu	Oz. AG	% ZN	% Pb	Oz. Au	% Mo
1116.6 - 1128	.029		Tr	Tr		
1128 - 1138	.030		Tr	Tr		
1138 - 1148	.042		.05	Tr		
1148 - 1158	.021		Tr	Tr		
1158 - 1167	.068		.07	Tr		
1167 - 1179	.041		.05	Tr		
1179 - 1188	.022		.06	Tr		
1188 - 1197	.051		.05	Tr		
1098 - 1107.6	.030		.08	Tr		
1107 - 1116.6	.041		.12	Tr		
1377 - 1382.5	.019		0.25	.12		
1382.5 - 1387.75	.030		0.27	.07		
1387.75 - 1391	.032		0.15	.07		
1391 - 1396	.048		0.70	0.24		
1457 - 1462	.16		1.75	0.65		
1462 - 1467	.03		0.25	.05		

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Sheet 2-A

Charleston Mine - Assay Summary - Hole #2

Depth	% Cu	Oz.AG	% ZN	% Pb	Oz. Au	% Mo
1923.5 - 1928	.028		Tr	Tr		
1928 - 1931.5	.037		.07	Tr		
1931.5 - 1935	.039		.05	Tr		
1935 - 1937.5	.038		.06	Tr		
1998 - 2002	.03		Tr	Tr		
2002 - 2007	.028		.02	Tr		
2007 - 2011	.032		.07	Tr		
2011 - 2015	.04		.06	Tr		
2015 - 2021	.042		.12	Tr		
2021 - 2024	.032		Tr	Tr		
2024 - 2027.5	.021		Tr	Tr		
2027 - 2031.5	.029		Tr	Tr		
2031.5 - 2036	.030		Tr	Tr		
2036 - 2040.5	.042		Tr	Tr		
2040 - 2045	.061		Tr	Tr		
2045 - 2050	.04		Tr	Tr		
2050 - 2054	.049		Tr	Tr		
2054 - 2058	.027		Tr	Tr		
2058 - 2063	.041		Tr	Tr		
2063 - 2068	.039			Tr		
2068 - 2073	.03			Tr		
2073 - 2078	.032		.05	Tr		
2078 - 2082	.040		.03	Tr		
2082 - 2087	[illegible]		[illegible]	[illegible]		
2087 - 2092	[illegible]		[illegible]	[illegible]		
2092 - 2097	.042		.045	Tr		
2097 - 2103	.06		Tr	Tr		
2103 - 2107	.072		Tr	Tr		
2107 - 2113	.039		Tr	Tr		
2113 - 2116	.04		Tr	Tr		
2116 - 2121	.062		Tr	Tr		
2121 - 2125	.03		.12	Tr		
2125 - 2130	.042		Tr	Tr		
2130 - 2135	.049		Tr	Tr		
2135 - 2139	.041		.07	Tr		
2139 - 2144	.03		.07			
2144 - 2149	.039		Tr			
2149 - 2154	.038		.05			
2154 - 2157	.04		.03			
2157 - 2162	.031		.05			
2162 - 2167	.052		.04			

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Charleston Mine - Assay Summary - Hole #2

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Sheet 3

Depth	% Cu	Oz. AG	% ZN	% Pb	Oz. Au	% MoS₂
2167 5 - 2172 5	.03		.07	Tr		
2172 5 - 2176 5	.06		.10	Tr		
2176 5 - 2181 7	.06		1.0	Tr		
2181 7 - 2185 7	.05		0.9	Tr		
2185 7 - 2189	.07		0.4	Tr		
2189 - 2195	.03		.15	.15		
2195 - 2200	.03		.12	.12		
2200 - 2205 5	.04		.07	.05		
2205 5 - 2209 5	.03		.12	.12		
2209 - 2214	.06		.25	Tr		
2214 - 2219	.07		.25	Tr		
2219 - 2223 5	.06		.22	.14		
2223 5 - 2229 5	.11		Tr	Tr		
2229 - 2236	.10		Tr	Tr		
2236 - 2241 5	.05		Tr	Tr		
2241 5 - 2246 5	.04		.05	Tr		
2246 5 - 2251 5	.05		.05	Tr		
2251 5 - 2256 5	.05		Tr	Tr		
2256 5 - 2261 5	.16		Tr	Tr		
2261 5 - 2266	3.40 3.36	0.86	.07 0.10	Tr <.05		REJECT
2266 - 2272	3.11 3.38	.70 .82	.05 0.08	Tr <.05	.02	.002 PULP 0.006
2272 - 2278	0.28		Tr	Tr		
2278 - 2283	0.05		Tr	Tr		
2283 - 2288 5	0.05		1.25	Tr		
2288 5 - 2291 5	.037		.12	Tr		
2291 5 - 2293 7	.049		.05	Tr		
2293 7 - 2301	.041		Tr	Tr		
2306 5 - 2309 5	.021		.03	Tr		
2309 5 - 2314 5	.019		.05	Tr		
2314 5 - 2318 5	.020		Tr	Tr		
2318 5 - 2323 5	.022		Tr	Tr		
2323 5 - 2328 5	.039		.40	Tr		
2328 5 - 2332 5	.018		.07	Tr		
2332 5 - 2337	.04		Tr	Tr		
2337 - 2342	.06		.07	Tr		
2342 - 2347 5	.04		Tr	Tr		
2347 5 - 2351 5	.027		Tr	Tr		
2351 5 - 2356 5	.031		Tr	Tr		
2356 5 - 2361 5	.029		Tr	Tr		
2361 5 - 2366	.027		Tr	Tr		
2366 - 2371	.042		.03	Tr		
2371 - 2375	.031		.05	Tr		
2375 - 2380	.032		.07	Tr		
2380 - 2384	.029		Tr	Tr		
2384 - 2388	.030		Tr	Tr		
2388 - 2393 5	.042		Tr	Tr		
2393 5 - 2397 5	.029		Tr	Tr		
2397 5 - 2402	.07		Tr	Tr		
2402 - 2407	.07		.03	Tr		
2407 - 2412	.049		.02	Tr		
2412 - 2417	.03		.02	Tr		
2417 - 2421 5	.041		Tr	Tr		
2421 - 2426	.032		Tr	Tr		

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Sheet 4

Charleston Mine - Assay Summary - Hole #2

Depth	% Cu		Oz.AG	% ZN	% Pb	Oz. Au	% Mo
2426 5/5 - 2430 5/7	.029			Tr	Tr		
2430 5/7 - 2435	.019			Tr	Tr		
2435 - 2440 9/9	.042			Tr	Tr		
2440 9/9 - 2445	.027			.07	Tr		
2445 - 2450	.038			.05	Tr		
2450 - 2456	.04			.04	Tr		
2456 - 2461	.042			Tr	Tr		
2461 - 2464	.027			.06	Tr		
2464 - 2470	.019			Tr	Tr		
2470 - 2474	.041			.05	Tr		
2474 - 2479	.02			Tr	Tr		
2479 - 2483	.032			Tr	Tr		
2483 - 2488	.029			.07	Tr		
2488 - 2492	.031			Tr	Tr		
2492 - 2497	.019			Tr	Tr		
2497 - 2502	.029			Tr	Tr		
2512 - 2515	.020			.03	Tr		0.00
2515 - 2526	.10			2.40	Tr		
2512 - 2516	.028						
2516 - 2520	.056	.053	.02	<.05	<.05	REJECT	0.00
Lab #23025	.16						
Lab #23026	.12						
2578 25/ - 2583	.09			.30	Tr		
2583 - 2588	.028			.07	Tr		
2588 - 2593	.042			1.20	Tr		
2593 - 2598	.031			.12	Tr		
2598 - 2603	.029			Tr	Tr		
2603 - 2607	.037			.07	Tr		
2607 - 2610	.04			.05	Tr		
2610 - 2615	.028			Tr	Tr		
2615 - 2620	.031			.08	Tr		
2620 - 2624 5/5	.088			.03	Tr		
2624 - 2628	.12			1.12	Tr		
2640 5/5	1.0		1.6	26.2	Tr		
2628 - 2633 5/5	.010						
2633 5/5 - 2639 5/5	.010						
2639 - 2644	.028						0.00
2644 - 2648 6/6	.048						
2648 6/6 - 2652	.010						
2652 - 2657 4/4	.026						
2657 4/4 - 2662 7/7	.036						
2662 7/7 - 2666 7/7	.026						
2666 7/7 - 2672	.018						
2672 - 2677	.018						
2677 - 2682	.027						
2682 - 2687	.018						
2687 - 2692	.016						

Charleston Mine - Assay Summary - Hole #2

Sheet 5

Depth	% Cu		Oz.AG	% ZN		% Pb	Oz. Au		% I
2692 - 2695.5	.016								
2695.5 - 2701	.010								
2701 - 2705	.028								
2705 - 2709	.016								
2709 - 2714	.010								
2714 - 2719	.028								
2719 - 2724.5	.010								
2724.5 - 2728	.029								
2728 - 2733	.016								
2733 - 2737.5	.018								
2845 -	.016								
2850 -	.027								
2854 -	.028								
2857.5 -	.026								
2862.5 -	.017								
2866 -	.025								
2871 -	.016								
2876 -	.028								
2880.5 -	.027								
2884.5 -	.016								
2889 -	.620								
2894 -	.027								
2898 -	.016								
2903 -	.048								
2907.5 -	.027								
2912 -	.016								
2916 -	.010								
2920.5 -	.010								
2926 -	.018								
2930.5 -	.018								
2935.5 -	.010								
2940 -	.039								
2945 - 2947	.048	.057	Nil	<.05		<.05			
2947 - 2949	.83	1.03	0.15	0.70	<.05	<.05	0.02	.002 REJECT PULP	0.0
2949 - 2951	.076								0.0
2951 - 2953	.67								
2953 - 2955	.36	3.40 ?	.08	0.22		<.05		REJECT	0.0
2955 - 2957	.048								0.0
2957 - 2959	5.52								
2959 - 2961	6.76	5.66	1.09	0.90	No PULP	REMAINING	0.03	PULP	0.0
2961 - 2963.5	.067								
2963 - 2964.5	.028	0.48	0.46	<.05		<.05		REJECT	
2964.5 - 2966.5	.036								
2966.5 - 2968.5	.048								
2968.5 - 2969.5	.027								
2969.5 - 2971.5	.088								
2971.5 - 2973.5	.19								
2973.5 - 2975.5	.076								
2975.5 - 2977.5	.14								
2977 - 2979.5	.11								

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Charleston Mine - Assay Summary - Hole #2 Sheet 6

Depth	% Cu.	Oz.AG	% ZN	% Pb	Oz. Au	% MoS
3129.5 - 3134.5	.029					
3134 - 3138	.029					
3175 - 3178	.018					
3178 - 3181	.036					
3181 - 3183	.048					
3183 - 3185	.078					
3185 - 3187	.057					
3187 - 3189	.220					
3189 - 3190	.150					
3190 - 3195	.048					
3195 - 3199.5	.027					

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HOLE #2 Assay Summary

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CHARLESTON MINE

Assay Summary

HOLE #2

Depth	% Cu	Oz. AG	% ZN	% Pb	Oz. Au	% MoS_2
580	.045	0.4				
598	.03	0.3				
620	.04	0.4				
660	.035	0.3				
750	.02	1.6		Tr		
781	.03	0.6	0.9		.01	
1005 - 1008	.43	2.20	9.2	4.88		
1028 - 1032	.07		1.25	.6		0.0021
1129	.029		Tr	.02		
1134	.038		Tr	.02		
1137	.037		Tr	.02		
1142	.037		Tr	.44		
1159	.037		Tr	.07		
1163	.037		Tr	.02		
1168	.058		Tr	.02		
1185	1.0		.08	.2	.75	
1175 - 1185	0.16		1.48	.44	.02	0.0028
1196	0.08		2.17	1.25		
1407 - 1411	0.14	0.48	2.87	1.45		
1411 - 1416	0.048		Tr	0.10		
1416 - 1422	0.029		Tr	0.07		
1422 - 1429	0.038		0.20	0.10		
1429 - 1434	0.047		0.25	0.12		
1434 - 1439	0.048		0.05	0.02		
1439 - 1444	0.049		0.32	0.30		
1444 - 1448	0.028		0.12	0.25		
1448 - 1453	0.038		0.20	0.13		
1453 - 1457	0.07		1.40	0.66		
1656 - 1661	0.038		Tr	Tr		
1661 - 1665	0.029		Tr	Tr		
1665 - 1670	0.038		Tr	Tr		
1670 - 1675	0.029		Tr	Tr		
1678 - 1680	0.030		Tr	Tr		
1680 - 1685	0.019		Tr	Tr		
1690 - 1694	.028		.12	.05		
1694 - 1699	.028		.10	.05		
1699 - 1703	.029		.12	.05		
1703 - 1708	.027		.12	.03		
1708 - 1713	.049		Tr	.06		
1721 - 1726	.038		.60	.36		
1726 - 1732	0.10	0.7	3.70	.42	.02	0.0024
1732 - 1737	0.047		3.40	.46		
1737 - 1741	0.076		0.17	.03		
1741 - 1745	0.028		0.25	.12		
1745 - 1750	0.020		0.30	.07		
1750 - 1755	0.037		0.25	.07		
1755 - 1759	0.028		.05	Tr		
1759 - 1763	0.047		.05	Tr		
1323 - 1331	.01		1.50	?	.01	0.0021
1333 - 1337	.02		1.10	?	.01	0.0023
1401 - 1407		0.80				

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Charleston Mine - Assay Summary - Hole #2

Sheet 1-A

Depth	% Cu	Oz. AG	% ZN	% Pb	Oz. Au	% Mo
1116^{6} - 1128	.029		Tr	Tr		
1128 - 1138	.030		Tr	Tr		
1138 - 1148	.042		.05	Tr		
1148 - 1158	.021		Tr	Tr		
1158 - 1167	.068		.07	Tr		
1167 - 1179	.041		.05	Tr		
1179 - 1188	.022		.06	Tr		
1188 - 1197	.051		.05	Tr		
1098 - 1107	.030		.08	Tr		
1107 - 1116^{6}	.041		.12	Tr		
1377 - 1382^{5}_{5}	.019		0.25	.12		
1382_{5} - 1387^{75}	.030		0.27	.07		
1387^{5}_{75} - 1391	.032		0.15	.07		
1391 - 1396	.048		0.70	0.24		
1457 - 1462	.16		1.75	0.65		
1462 - 1467	.03		0.25	.05		

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Sheet 2

Charleston Mine - Assay Summary - Hole #2

Depth	% Cu	Oz. AG	% ZN	% Pb	Oz. Au	% MoS_2
1763.5 - 1767.5	0.036		.12	.05		
1767.5 - 1772.5	0.029		.12	.03		
1772.5 - 1776.5	0.029		Tr	.03		
1776.5 - 1780	0.037		Tr	.02		
1780 - 1785	0.029		Tr	.03		
1785 - 1789.5	0.048		Tr	.05		
1789.5 - 1793.5	0.029		Tr	.02		
1793.5 - 1798.5	0.048		.05	.03		
1798.5 - 1803	0.037		.07	.03		
1803 - 1808	0.029		.07	.03		
1808 - 1812	0.037		0.50	0.14		
1812 - 1816.5	0.076		0.40	0.12		
1816 - 1821.5	0.048		Tr	Tr		
1820.5	1.9		6.1	.35	.02	.13
1821.5 - 1826.5	.029		Tr	Tr		
1826.5 - 1831	.029		Tr	Tr		
1831 - 1836	.037		Tr	Tr		
1836 - 1841	.029		Tr	Tr		
1841.5 - 1845.5	0.037		Tr	Tr		
1845.5 - 1850.5	0.029		.02	.05		
1850.5 - 1854.5	0.21		1.12	0.92		0.0025
1850.5	0.15	0.2			.01	
1854.5 - 1858.5	0.087		.12	.10		
1886 - 1889.5	0.029		Tr	.02		
1893 - 1896.5	0.057		Tr	Tr		
1896.5 - 1901	0.029		Tr	Tr		
1901 - 1905	0.037		Tr	.08		
1905 - 1910.5	0.029		Tr	Tr		
1910.5 - 1915.5	0.038		Tr	.02		
1915.5 - 1919	0.019		Tr	Tr		
1923	.05		14.7			
1858.5 - 1862.5	.048		.7	.34		
1862.5 - 1867.5	.04		Tr	Tr		
1867.5 - 1872.5	.052		Tr	Tr		
1872 - 1876.5	.028		Tr	Tr		
1876.5 - 1881	.042		.05	Tr		
1881 - 1886	.028		.03	.03		
1937.5 - 1941.5	.030		.05	Tr		
1941.5 - 1946.5	.049		.03	Tr		
1946.5 - 1951	.032		Tr	Tr		
1951 - 1956	.049		Tr	Tr		
1956 - 1961.5	.031		Tr	Tr		
1961.5 - 1965.5	.042		.07	Tr		
1965.5 - 1969	.04		Tr	Tr		
1969 - 1974	.029		.05	Tr		
1974 - 1978.6	.041		Tr	Tr		
1978.6 - 1983.6	.03		.04	Tr		
1983.6 - 1988	.028		Tr	Tr		
1988 - 1993	.032		Tr	Tr		
1993 - 1998.5	.052		Tr	Tr		
1923.5	.041		2.20	1.80		

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Sheet 2-A

Charleston Mine - Assay Summary - Hole #2

Depth	% Cu	Oz.AG	% ZN	% Pb	Oz. Au	% Mo
1923.5 - 1928	.028		Tr	Tr		
1928 - 1931.5	.037		.07	Tr		
1931.5 - 1935	.039		.05	Tr		
1935 - 1937.5	.038		.06	Tr		
1998 - 2002	.03		Tr	Tr		
2002 - 2007	.028		.02	Tr		
2007 - 2011	.032		.07	Tr		
2011 - 2015	.04		.06	Tr		
2015 - 2021	.042		.12	Tr		
2021 - 2024	.032		Tr	Tr		
2024 - 2027.5	.021		Tr	Tr		
2027 - 2031.5	.029		Tr	Tr		
2031.5 - 2036	.030		Tr	Tr		
2036 - 2040.5	.042		Tr	Tr		
2040 - 2045	.061		Tr	Tr		
2045 - 2050	.04		Tr	Tr		
2050 - 2054	.049		Tr	Tr		
2054 - 2058	.027		Tr	Tr		
2058 - 2063	.041		Tr	Tr		
2063 - 2068	.039			Tr		
2068 - 2073	.03			Tr		
2073 - 2078	.032		.05	Tr		
2078 - 2082	.040		.03	Tr		
2082 - 2087	.059		.05	Tr		
2087 - 2092	.05		.05	Tr		
2092 - 2097	.042		.045	Tr		
2097 - 2103	.06		Tr	Tr		
2103 - 2107	.072		Tr	Tr		
2107 - 2113	.039		Tr	Tr		
2113 - 2116	.04		Tr	Tr		
2116 - 2121	.062		Tr	Tr		
2121 - 2125	.03		.12	Tr		
2125 - 2130	.042		Tr	Tr		
2130 - 2135	.049		Tr	Tr		
2135 - 2139	.041		.07	Tr		
2139 - 2144	.03		.07			
2144 - 2149	.039		Tr			
2149 - 2154	.038		.05			
2154 - 2157	.04		.03			
2157 - 2162	.031		.05			
2162 - 2167	.052		.04			

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Sheet 3

Charleston Mine - Assay Summary - Hole #2

Depth	% Cu	Oz. AG	% ZN	% Pb	Oz. Au	% MoS_2
2167 5 - 2172 5	.03		.07	Tr		
2172 5 - 2176 5	.06		.10	Tr		
2176 5 - 2181 7	.06		1.0	Tr		
2181 5 - 2185 7	.05		0.9	Tr		
2185 7 - 2189	.07		0.4	Tr		
2189 - 2195	.03		.15	.15		
2195 - 2200	.03		.12	.12		
2200 - 2205 5	.04		.07	.05		
2205 5 - 2209 5	.03		.12	.12		
2209 5 - 2214	.06		.25	Tr		
2214 - 2219	.07		.25	Tr		
2219 - 2223 5	.06		.22	.14		
2223 5 - 2229 5	.11		Tr	Tr		
2229 - 2236	.10		Tr	Tr		
2236 - 2241 5	.05		Tr	Tr		
2241 5 - 2246 5	.04		.05	Tr		
2246 5 - 2251 5	.05		.05	Tr		
2251 5 - 2256 5	.05		Tr	Tr		
2256 5 - 2261 5	.16		Tr	Tr		
2261 5 - 2266	3.40		.07	Tr		
2266 - 2272	3.11	.70	.05	Tr	.02	0.0066
2272 - 2278	0.28		Tr	Tr		
2278 - 2283	0.05		Tr	Tr		
2283 - 2288 5	0.05		1.25	Tr		
2288 5 - 2291 5	.037		.12	Tr		
2291 5 - 2293 7	.049		.05	Tr		
2293 7 - 2301	.041		Tr	Tr		
2306 5 - 2309 5	.021		.03	Tr		
2309 5 - 2314 5	.019		.05	Tr		
2314 5 - 2318 5	.020		Tr	Tr		
2318 5 - 2323 5	.022		Tr	Tr		
2323 5 - 2328 5	.039		.40	Tr		
2328 5 - 2332 5	.018		.07	Tr		
2332 5 - 2337	.04		Tr	Tr		
2337 - 2342	.06		.07	Tr		
2342 - 2347 5	.04		Tr	Tr		
2347 5 - 2351 5	.027		Tr	Tr		
2351 5 - 2356 5	.031		Tr	Tr		
2356 5 - 2361 5	.029		Tr	Tr		
2361 5 - 2366	.027		Tr	Tr		
2366 - 2371	.042		.03	Tr		
2371 - 2375	.031		.05	Tr		
2375 - 2380	.032		.07	Tr		
2380 - 2384	.029		Tr	Tr		
2384 - 2388	.030		Tr	Tr		
2388 - 2393 5	.042		Tr	Tr		
2393 5 - 2397 5	.029		Tr	Tr		
2397 5 - 2402	.07		Tr	Tr		
2402 - 2407	.97		.03	Tr		
2407 - 2412	.049		.02	Tr		
2412 - 2417	.03		.02	Tr		
2417 - 2421 5	.041		Tr	Tr		
2421 - 2426	.032		Tr	Tr		

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Sheet 4

Charleston Mine - Assay Summary - Hole #2

Depth	% Cu	Oz.AG	% ZN	% Pb	Oz. Au	% MoS_2
2426^{5}_{5} - 2430^{5}_{7}	.029		Tr	Tr		
2430^{5}_{7} - 2435	.019		Tr	Tr		
2435^{7} - 2440_{9}	.042		Tr	Tr		
2440_{9} - 2445	.027		.07	Tr		
2445 - 2450	.038		.05	Tr		
2450 - 2456	.04		.04	Tr		
2456 - 2461	.042		Tr	Tr		
2461 - 2464	.027		.06	Tr		
2464 - 2470	.019		Tr	Tr		
2470 - 2474	.041		.05	Tr		
2474 - 2479	.02		Tr	Tr		
2479 - 2483	.032		Tr	Tr		
2483 - 2488	.029		.07	Tr		
2488 - 2492	.031		Tr	Tr		
2492 - 2497	.019		Tr	Tr		
2497 - 2502	.029		Tr	Tr		
2512 - 2515	.020		.03	Tr		0.0027
2515 - 2526	.10		2.40	Tr		
2512 - 2516	.028					
2516 - 2520	.056					0.0029
Lab #23025	.16					
Lab #23026	.12					
2578^{25} - 2583	.09		.30	Tr		
2583 - 2588	.028		.07	Tr		
2588 - 2593	.042		1.20	Tr		
2593 - 2598	.031		.12	Tr		
2598 - 2603	.029		Tr	Tr		
2603 - 2607	.037		.07	Tr		
2607 - 2610	.04		.05	Tr		
2610 - 2615	.028		Tr	Tr		
2615 - 2620	.031		.08	Tr		
2620 - 2624_{5}	.088		.03	Tr		
2624 - 2628^{5}	.12		1.12	Tr		
2640_{5}	1.0	1.6	26.2	Tr		
2628^{5} - 2633^{5}	.010					
2633^{5}_{5} - 2639^{5}	.010					
2639^{5} - 2644	.028					0.0021
2644 - 2648^{6}	.048					
2648^{6} - 2652	.010					
2652 - 2657^{4}	.026					
2657^{4} - 2662_{7}	.036					
2662_{7} - 2666^{7}	.026					
2666^{7} - 2672	.018					
2672 - 2677	.018					
2677 - 2682	.027					
2682 - 2687	.018					
2687 - 2692	.016					

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Charleston Mine - Assay Summary - Hole #2 Sheet 5

Depth	% Cu	Oz.AG	% ZN	% Pb	Oz. Au	% MoS_2
2692 - 2695.5	.016					
2695.5 - 2701	.010					
2701 - 2705	.028					
2705 - 2709	.016					
2709 - 2714	.010					
2714 - 2719	.028					
2719 - 2724.5	.010					
2724.5 - 2728	.029					
2728 - 2733	.016					
2733 - 2737.5	.018					
2845 -	.016					
2850 -	.027					
2854 -	.028					
2857.5 -	.026					
2862 -	.017					
2866.5 -	.025					
2871 -	.016					
2876 -	.028					
2880.5 -	.027					
2884.5 -	.016					
2889 -	.620					
2894 -	.027					
2898 -	.016					
2903 -	.048					
2907.5 -	.027					
2912 -	.016					
2916 -	.010					
2920 -	.010					
2926.5 -	.018					
2930 -	.018					
2935.5 -	.010					
2940 -	.039					
2945 - 2947	.048					
2947 - 2949	.83		0.70		0.02	0.0027
2949 - 2951	.076					0.0022
2951 - 2953	.67					
2953 - 2955	.36					0.0018
2955 - 2957	.048					0.0021
2957 - 2959	5.52					
2959 - 2961	6.76		0.90		0.03	0.0020
2961 - 2963	.067					
2963 - 2964.5	.028					
2964.5 - 2966.5	.036					
2966.5 - 2968.5	.048					
2968.5 - 2969.5	.027					
2969.5 - 2971.5	.088					
2971.5 - 2973.5	.19					
2973.5 - 2975.5	.076					
2975.5 - 2977.5	.14					
2977 - 2979.5	.11					
2962 - (grab)	8.71	2.8				

Charleston Mine - Assay Summary - Hole #2 Sheet 6

Depth	% Cu.	Oz.AG	% ZN	% Pb	Oz. Au	% MoS_2
3129.5 - 3134.5	.029					
3134 - 3138	.029					
3175 - 3178	.018					
3178 - 3181	.036					
3181 - 3183	.048					
3183 - 3185	.078					
3185 - 3187	.057					
3187 - 3189	.220					
3189 - 3190	.150					
3190 - 3195	.048					
3195 - 3199.5	.027					

CHARLESTON PROPERTY ASSAYS

Borehole # 2

Footage	% Cu	% Pb	% Zn	oz/ton Pd	Pt	Au	Ag
1028 - 1032	.084	.65	1.22	Nil	Nil	.003	.14
1028 - 1032	.049	.66	1.03	Nil	Nil	Nil	.11
1175 - 1185	.113	<.05	1.35	Nil	Nil	Nil	.42
1323 - 1331	.038	.40	.56	Nil	Nil	Nil	.11
1333.5 - 1337.5	.080	<.05	.10	Nil	Nil	Nil	.04
1726.5 - 1732	.101	.44	.64	Nil	Nil	Nil	1.49
1850.5 - 1854	.239	.78	1.64	Nil	Nil	Nil	.27
2261 - 2266	3.36	<.05	.10	Nil	Nil	Nil	.86
2266 - 2272	3.38	<.05	.08	Nil	Nil	.002	.82
2266 - 2272	3.56	<.05	.09	Nil	Nil	Nil	.97
2516 - 2520	.053	<.05	<.05	Nil	Nil	Nil	.02
2945 - 2947	.057	<.05	<.05	Nil	Nil	Nil	Nil
2947 - 2949	1.03	<.05	<.05	Nil	Nil	.002	.15
2947 - 2949	1.11	<.05	<.05	Nil	Nil	Nil	.19
2953 - 2955	3.40	<.05	.22	Nil	Nil	Nil	.08
2959 - 2961	5.66	-	-	Nil	Nil	.002	1.09
2959 - 2961	4.57	<.05	<.05	Nil	Nil	Nil	1.09
2963 - 2964.5	.048	<.05	<.05	Nil	Nil	Nil	.46

January 2, 1970

File 3-13

CHARLESTON PROPERTY

Assay Summary
Drill Hole #2

Footage	% Cu	% Pb	% Zn	% MoS_2	oz/ton Au	oz/ton Ag
580	.045					0.4
598	.03					0.3
620	.04					0.4
660	.035					0.3
750	.02	Tr				1.6 ✓
781	.03		0.9 ✓		.01	0.6 ✓
1005 - 1008	.43	4.88 ✓	9.2 ✓			
1028 - 1032	.07	.6	5.0	0.0021		
1028 - 1032	.084	.65 ✓	1.22 ✓		.003	.14
1028 - 1032	.049	.66	1.03			.11
1098 - 1107	.030	Tr	.08			
1107 - 1116.6	.041	Tr	.12			
1116.6 - 1128	.029	Tr	Tr			
1128 - 1138	.030	Tr	Tr			
1138 - 1148	.042	Tr	.05			
1148 - 1158	.021	Tr	Tr			
1158 - 1167	.068	Tr	.07			
1167 - 1179	.041	Tr	.05			
1175 - 1185	.16	.44	1.48 ✓	0.0028	.02	
1175 - 1185	.113	.05	1.35			.42
1175 - 1185				0.0028	.02	
1179 - 1188	.022	Tr	.06			
1188 - 1197	.051	Tr	.05			
1323 - 1331	.01	?	1.50 ✓	0.0021	.01	
1323 - 1331	.038	.40	.56			.11
1333.5 - 1337.5	.02	?	1.10	0.0023	.01	
1333.5 - 1337.5	.080	.05	.10 ✓			.04
1377 - 1382.5	.019	.12	.25			
1382.5 - 1387.5	.030	.07	.27			
1387.5 - 1391.75	.032	.07	.15			
1391.75 - 1396	.048	.24	.70 ✓			
1407 - 1411.5	.14	1.45 ✓	2.87 ✓			
1411.5 - 1416	.048	.10	Tr			
1416 - 1422.5	.029	.07	Tr			
1422.5 - 1429	.038	.10	.20			
1429 - 1434	.047	.12	.25			
1434 - 1439	.048	.02	.05			
1439 - 1444	.049	.30	.32			
1444 - 1448.5	.028	.25	.12			
1448.5 - 1453	.038	.13	.20			
1453 - 1457	.07	.66 ✓	1.40 ✓			
1457 - 1462	.16	.65 ✓	1.75 ✓			
1462 - 1467	.03	.05	.25			
1532 - 1534	.026	.21	.40			
1656.5 - 1661	.038	Tr	Tr			
1661 - 1665	.029	Tr	Tr			
1665 - 1670	.038	Tr	Tr			
1670 - 1675	.029	Tr	Tr			
1678 - 1680	.030	Tr	Tr			
1680 - 1685.5	.019	Tr	Tr			
1690.5 - 1694.5	.028	.05	.12			

Footage	% Cu	% Pb	% Zn	% FeS2	oz/ton Au	oz/ton Ag
1694 - 1699	.028	.05	.10			
1699 - 1703	.029	.05	.12			
1703 - 1708	.027	.03	.12			
1708 - 1713	.049	.06	Tr			
1721.5 - 1726.5	.038	.36	.60 ✓			1.49 ✓
1726.5 - 1732	.101	.44	.64			1.49 ✓
1726.5 - 1732				0.0024	.02	
1726 - 1732	.10	.42	3.70 ✓	0.0024	.02	0.7
1732 -1737	.047	.46	3.40 ✓			
1737 - 1741	.076	.03	.17			
1741 - 1745.5	.028	.12	.25			
1745.5 - 1750	.020	.07	.30			
1750.5 - 1755	.037	.07	.25			
1755 - 1759.5	.028	Tr	.05			
1759.5 - 1763.5	.047	Tr	.05			
1763.5 - 1767.5	.036	.05	.12			
1767.5 - 1772.5	.029	.03	.12			
1772.5 - 1776.5	.029	.03	Tr			
1776.5 - 1780	.037	.02	Tr			
1780.5 - 1785	.029	.03	Tr			
1785 - 1789.5	.048	.05	Tr			
1789.5 - 1793.5	.029	.02	Tr			
1793.5 - 1798.5	.048	.03	.05			
1798.5 - 1803	.037	.03	.07			
1803 -1808	.029	.03	.07			
1808 -1812	.037	.14	.50 ✓			
1812 - 1816	.076	.12	.40			
1816 - 1821.5	.048	Tr	Tr			
1820.5 -	1.9 ✓	.35	6.1 ✓		.02	
1821.5 - 1826.5	.029	Tr	Tr			
1826.5 - 1831	.029	Tr	Tr			
1831 - 1836	.037	Tr	Tr			
1836 - 1841	.029	Tr	Tr			
1841 - 1845	.037	Tr	Tr			
1845.5 - 1850.5	.029.	.05	.02			
1850.5 - 1854.5	.21	.92 ✓	1.12 ✓	0.0025		
1850					.01	0.2
1850.5 - 1854	.239	.78	1.64			.27
1854.5 - 1858.5	.087	.10	.12			
1886 - 1889.5	.029	.02	Tr			
1893 - 1896.5	.057	Tr	Tr			
1896.5 - 1901	.029	Tr	Tr			
1901 - 1905	.037	.08	Tr			
1905 - 1910	.029	Tr	Tr			
1910 - 1915.5	.038	.02	Tr			
1915.5 - 1919	.019	Tr	Tr			
1923	.05		14.7 ✓			
1858.5 - 1862	.048	.34	.7 ✓			
1862 - 1867	.04	Tr	Tr			
1867.5 - 1872	.052	Tr	Tr			
1872 - 1876	.028	Tr	Tr			
1876.5 - 1881	.042	Tr	.05			
1881 - 1886	.028	.03	.03			
- 1923.5	.041	1.80 ✓	2.20			
1923.5 - 1928	.028	Tr	Tr			
1928 - 1931.5	.037	Tr	.07			

Footage	% Cu	% Pb	% Zn	% MoS_2	oz/ton Au	oz/ton Ag
1931.5 - 1935	.039	Tr	.05			
1935 - 1937.5	.038	Tr	.06			
1937.5 - 1941	.030	Tr	.05			
1941 - 1946.5	.049	Tr	.03			
1946.5 - 1951	.032	Tr	Tr			
1951 - 1956	.049	Tr	Tr			
1956 - 1961	.031	Tr	Tr			
1961 - 1965.5	.042	Tr	.07			
1965.5 - 1969	.04	Tr	Tr			
1969 - 1974	.029	Tr	.05			
1974 - 1978	.041	Tr	Tr			
1978 - 1983.6	.03	Tr	.04			
1983.6 - 1988	.028	Tr	Tr			
1988 - 1993	.032	Tr	Tr			
1993 - 1998	.052	Tr	Tr			
1998 - 2002	.03	Tr	Tr			
2002 - 2007	.028	Tr	.02			
2007 - 2011	.032	Tr	.07			
2011 - 2015	.04	Tr	.04			
2015 -2021	.042	Tr	.12			
2021 - 2024	.032	Tr	Tr			
2024 - 2027	.021	Tr	Tr			
2027 - 2031.5	.029	Tr	Tr			
2031.5 - 2036	.030	Tr	Tr			
2036 - 2040.5	.042	Tr	Tr			
2040 - 2045	.061	Tr	Tr			
2045 - 2050	.04	Tr	Tr			
2050 -2054	.049	Tr	Tr			
2054 - 2058	.027	Tr	Tr			
2058 -2063	.041	Tr	Tr			
2063 -2068	.039	Tr				
2068 - 2073	.03	Tr				
2073 - 2078	.032	Tr	.05			
2078 - 2082	.040	Tr	.03			
2082 - 2087	.059	Tr	.05			
2087 - 2092	.05	Tr	.05			
2093 - 2097	.042	Tr	.045			
2097 - 2103	.06	Tr	Tr			
2103 - 2107	.072	Tr	Tr			
2107 - 2113	.039	Tr	Tr			
2113 - 2116	.04	Tr	Tr			
2116 - 2121	.062	Tr	Tr			
2121 - 2125	.03	Tr	.12			
2125 - 2130	.042	Tr	Tr			
2130 - 2135	.049	Tr	Tr			
135 - 2139	.041	Tr	.07			
-139 - 2144	.03		.07			
2144 - 2149	.039		Tr			
2149 - 2154	.038		.05			
2154 - 2157	.04		.03			
2157 - 2162	.031		.05			
.62 - 2167	.052		.04			
167.5 - 2172.	.03	Tr	.07			
2172 - 2176.5	.06	Tr	.10			
2176.5 - 2181	.06	Tr	1.0 /			
2181.5 - 2185.7	.05	Tr	.9 /			
2185.7 - 2189.7	.07	Tr	.4			

Footage	% Cu	% Pb	% Zn	% MoS_2	oz/ton Au	oz/ton Ag
2189.7 - 2195	.03	.15	.15			
2195 - 2200	.03	.12	.12			
2200 - 2205	.04	.05	.07			
2205 - 2209.5	.03	.12	.12			
2209.5 - 2214	.06	Tr	.25			
2214 - 2219	.07	Tr	.25			
2219 - 2223	.06	.14	.22			
2223 - 2229.5	.11	Tr	Tr			
2229.5 - 2236	.10	Tr	Tr			
2236 - 2241	.05	Tr	Tr			
2241 - 2245.5	.04	Tr	.05			
2246.5 - 2251.5	.05	Tr	.05			
2251.5 - 2256.5	.05	Tr	Tr			
2256.5 - 2261.5	.16	Tr	Tr			
2261.5 - 2266.5	3.40	Tr	.07			.86
2261 - 2266	3.36	.05	.10			.86
2266.5 - 2272	3.56	Tr	.05	0.0066	.02	.97
2266 - 2272	3.38	.05	.08		.002	.82
2266 - 2272	2.56	.05	.09			.97
2266.5 - 2272				0.0066	.02	.70
2272 - 2278	.28	Tr	Tr			
2278 - 2283	.05	Tr	Tr			
2283 - 2288	.05	Tr	1.25			
2288 - 2291.5	.037	Tr	.12			
2291.5 - 2293.7	.049	Tr	.05			
2293.7 - 2301	.041	Tr	Tr			
2306 - 2309	.021	Tr	.03			
2309.5 - 2314.5	.019	Tr	.05			
2314.5 - 2318.5	.020	Tr	Tr			
2318.5 - 2323.5	.022	Tr	Tr			
2323.5 - 2328	.039	Tr	.40			
2328 - 2332.5	.018	Tr	.07			
2332.5 -2337	.04	Tr	Tr			
2337 - 2342	.06	Tr	.07			
2342 - 2347	.04	Tr	Tr			
2347 - 2351.5	.027	Tr	Tr			
2351 - 2356.5	.031	Tr	Tr			
2356.5 - 2361.5	.029	Tr	Tr			
2361.5 - 2366	.027	Tr	Tr			
2366 -2371	.042	Tr	.03			
2371 - 2375	.031	Tr	.05			
2375 - 2380	.032	Tr	.07			
2380 - 2384	.029	Tr	Tr			
2384 - 2388	.030	Tr	Tr			
2388 - 2393	.042	Tr	Tr			
2393 - 2397.5	.029	Tr	Tr			
2397.5 - 2402	.07	Tr	Tr			
2402 - 2407	.07	Tr	.03			
2407 - 2412	.049	Tr	.02			
2412 - 2417	.03	Tr	.02			
417 - 2421	.041	Tr	Tr			
2421 - 242625	.032	Tr	Tr			
2426.5 - 2430.5	.029	Tr	Tr			
2430.5 - 2435.7	.019	Tr	Tr			
2435.7 - 2440	.042	Tr	Tr			
2440 - 2445.9	.027	Tr	.07			
2445.9 - 2450	.038	Tr	.05			

Footage	% Cu	% Pb	% Zn	% MoS_2	oz/ton Au	oz/ton Ag
2450 - 2456	.04	Tr	.04			
2456 - 2461	.042	Tr	Tr			
2461 - 2464	.027	Tr	.06			
2464 - 2470	.019	Tr	Tr			
2470 - 2474	.041	Tr	.05			
2474 - 2479	.02	Tr	Tr			
2479 - 2483	.032	Tr	Tr			
2483 - 2488	.029	Tr	.07			
2488 - 2492	.031	Tr	Tr			
2492 - 2497	.019	Tr	Tr			
2497 - 2502	.029	Tr	Tr			
2512 - 2515	.020	Tr	.03	0.0027		
2512 - 2516	.028					
2515 - 2526	.10	Tr	2.40			
2516 - 2520	.056			0.0029		
2516 - 2520	.053	.05	.05			.02
2578.25 - 2583	.09	Tr	.30			
2583 - 2588	.028	Tr	.07			
2588 - 2593	.042	Tr	1.20 ✓			
2593 - 2598	.031	Tr	.12			
2598 - 2603	.029	Tr	Tr			
2603 - 2607	.037	Tr	.07			
2607 - 2610	.04	Tr	.05			
2610 - 2615	.028	Tr	Tr			
2615 - 2620	.031	Tr	.08			
2620 - 2624	.088	Tr	.03			
2624 - 2628.5	.12	Tr	1.12 ✓			
2628.5 - 2633.5	.010					
2633.5 - 2639.5	.010					
2639.5 - 2644	.028			0.0021		
2644 - 2648.6	.048					
2648.6 - 2652	.010					
2652 - 2657.4	.026					
2657.4 - 2662	.036					
2662 - 2666.7	.026					
2666.7 - 2672	.018					
2672 - 2677	.018					
2677 - 2682	.027					
2682 - 2687	.018					
2687 - 2692	.016					
2692 - 2695.5	.016					
2695.5 - 2701	.010					
2701 - 2705	.028					
705 - 2709	.016					
2709 - 2714	.010					
2714 - 2719	.028					
2719 - 2724.5	.010					
2724.5 - 2728	.029					
2728 - 2733	.016					
733 - 2737.5	.018					
2845	.016					
2850	.027					
2854	.028					
2857 - 2862	.020					
2866 - 2871	.020					

Footage	% Cu	% Pb	% Zn	% MoS_2	oz/ton Au	oz/ton Ag
2930 - 3935.5	.015					
2945 - 2947	.048					
2945 - 2947	.057	.05	.05			
2947 - 2949	1.03	.05	.05		.002	.15
2947 - 2949	1.11	.05	.05			.19
2947 - 2949	.83		.70	0.0027	.02	
2949 - 2951	.076			0.0022		
2951 - 2953	.67					
2953 - 2955	.36			0.0018		
2953 - 2955	3.40	.05	.22			.08
2955 - 2967	.048			0.0021		
2957 - 2959	5.52					
2959 - 2961	5.66				.002	1.09
2959 - 2961	4.57	.05	.05			1.09
2959 - 2961	6.76		.90	0.0020	.03	
2961 - 2963	.067					
2963 - 2964.5	.028					
2963 - 2964.5	.048	.05	.05			.46
2964.5 - 2966.5	.036					
2966.5 - 2968.5	.048					
2968.5 - 2969.5	.027					
2969.5 - 2971.5	.088					
2971.5 - 2973.5	.19					
2973.5 - 2975.5	.076					
2975.5 - 2977.5	.14					
2977.5 - 2979.5	.11					
3129.5 - 3134	.029					
3134 - 3138.5	.029					
3175 - 3178	.018					
3178 - 3181	.036					
3181 - 3183	.048					
3183 - 3185	.078					
3185 - 3187	.057					
3187 - 3189	.220					
3189 - 3190	.150					
3190 - 3195	.048					
3195 - 3199.5	.027					
1180 - 1184.5	.08	.73	2.03		.002	.30
1186 - 1191	.05	.50	.92		.003	.22
1197 - 1200	.05	1.15	1.85		.002	.40

D.D. #3 LOGS

PHELPS DODGE CORPORATION

WESTERN EXPLORATION OFFICE

GEOLOGIC LOG

COLLAR ELEVATION _____
COORDINATES _____
TYPE DRILL Diamond BIT SIZE _____
INCLINATION Vertical BEARING _____
TOTAL DEPTH _____
LENGTH CORED _____ CORE RECOVERY ____ %

PROJECT Charleston Lead Mine
LOCATION N½ Tombstone Quadrangle

HOLE NO. Horne #3
LOGGED BY HEM/WJW SURVEYED BY _____
CONTRACTOR _____
DATE STARTED 1968 DATE COMPLETED _____
SCALE 1"=100'

NOTE. FOLIATION AND STRUCTURE ARE MEASURED FROM THE CORE AXIS.

INTERVAL FROM	INTERVAL TO	FEET OF CORE RECOVERED	ROCK TYPE	ROCK DESCRIPTION AND REMARKS	ALTERATION PROP	ARG	SIL	SER	TOUR	SUL	METALLIZATION (EST. %) PYRITE	COPPER	MOLYBDENUM	GRAPHIC LOG FOLIATION	AXIS	STRUCTURE	DEPTH	ASSAYS COPPER	MOLYBDENUM
0	140'			Rotary drill - no core recovered													0, 100		
140	405		Granodiorite, intercalated with quartz latite porph.	Medium to coarse grained, qts. phenocrysts 2%, feldspar and biotite strongly weathered in places, accompanied by bleaching; mafites altered to feox; no hydrothermal alteration observed. Manganese dendrites; feox (goethite, etc) at 405 feet may be after pyrite. The granodiorite appears to be coarser-grained with biotite partly altered to hydromica + feox; qts phenocrysts and "bleached" feldspars make up most of the rock. The porphyry is gray to light brown in color, very fine grained feldspar with only a minor amount of feldspar phenocrysts. Large quartz phenocrysts make up about 5-7% of total. Minor biotite appears fresh.												200, 300		
405	550		quartz latite	Logged to 405 by HEM, thereafter by WJW. Weathered, feox stain, 1-2 mm qts. phenocrysts, becoming fresh at 490.	✓												400, 500, 550		

CONTINUATION OF GEOLOGIC LOG

HOLE NO. Horne #3 SHEET NO. 2

PROJECT Charleston Lead Mine

NOTE. FOLIATION AND STRUCTURE ARE MEASURED FROM THE CORE AXIS.

INTERVAL FROM	INTERVAL TO	FEET OF CORE RECOVERED	ROCK TYPE	ROCK DESCRIPTION AND REMARKS	ALTERATION PROP	ALTERATION ARG	ALTERATION SIL	ALTERATION SER	ALTERATION TOUR	ALTERATION SUL	METALLIZATION (EST. %) PYRITE	METALLIZATION COPPER	METALLIZATION MOLY	GRAPHIC LOG FOLIATION	GRAPHIC LOG AXIS	GRAPHIC LOG STRUCTURE	DEPTH	ASSAYS COPPER	ASSAYS MOLY
550			quartz latite														550		
																	600		
				704. Sulfides (pyrite) pick up at 704	✓	✓				✓	<2%						700		
																	800		
			quartz latite ↓ grano-diorite ↓ quartz latite	gradational change															
				1-2 mm granular, very fine crystalline matrix surrounds phenocrysts. Spec. 922½, Spec. 932 } gradational contact between specimens. locally nearly holocrystalline. Xenoliths of meta-andesite?							<1%						900		
				Spec. 999 Altered zone, 1035-1040, minor pyrite, argillic alteration bleaching. Fault 1055-1059. Fresh latite above, somewhat bleached below.	✓						1-2					50?	1000		
			quartz latite to latite	Spec. 1113 - Fresh quartz latite. Fault gouge 1127-1133. Fresher before 1127 (specimen) altered after 1133 (specimen). Fault at 1151												50? 50?	1100		
	1200																1200		

CONTINUATION OF GEOLOGIC LOG

HOLE NO. Horne #3 SHEET NO. 3.

PROJECT Charleston Lead Mine

NOTE. FOLIATION AND STRUCTURE ARE MEASURED FROM THE CORE AXIS.

INTERVAL FROM	INTERVAL TO	FEET OF CORE RECOVERED	ROCK TYPE	ROCK DESCRIPTION AND REMARKS	ALTERATION PROP	ALTERATION ARG	ALTERATION SIL	ALTERATION SER	ALTERATION TOUR	ALTERATION SUL	METALLIZATION (EST. %) PYRITE	METALLIZATION (EST. %) COPPER	METALLIZATION (EST. %) MOLY	GRAPHIC LOG FOLIATION	GRAPHIC LOG AXIS	GRAPHIC LOG STRUCTURE	DEPTH	ASSAYS COPPER	ASSAYS MOLY
1200			quartz latite	Glassy porphyry, phenocrysts look shredded, biotite altered to chlorite and hydromica. Spec. 1215 Some very fine pyrite on margins of chlorite, possibly some chalcopyrite ?	✓			✓			<1%	?					1200		
				Spec. at 1279. Porphyritic quartz latite, argillic alteration adjacent to sericitized slips. Fractures are 10' to 15' apart. Small fault 1305½-1306. Infrequent inclusions of dark andesite?	✓	✓		✓								50°?	1300		
				Spec. 1417. Fresh, 1-2 mm qtz phenocrysts, resorbed. Minor pyrite. Argillic alteration and sericite associated with infrequent small slips.		✓		✓			<1%						1400		
				Spec. 1555. Fresh quartz latite, aphanitic ground mass, light dusting of fine pyrite on seams, ~~to 1686½~~. to 1730½. Fault zone 1730½-1738, breccia. Chloritic and argillic alteration to 1742½, then quite fresh. Matrix appears stony to glassy except adjacent to infrequent shears, which show argillic alteration in the walls and sericite in the faults themselves. very small faults, 1/16" between walls, or less.													1500		
																	1600		
																	1700		
				Spec. 1807. 1-3 mm qtz latite porphyry, minor biotite, most biotite altered to hydramica (?) and chlorite. No pyrite or sulfides to 1857. Sheared fault zone to 1872, then broken qtz. latite with 1/16" calcite seams at 50° to axis of core.	✓	✓		✓									1800		
	1850																1850		

CONTINUATION OF GEOLOGIC LOG

HOLE NO. Horne #3 SHEET NO. 4

PROJECT Charleston Lead mine

NOTE. FOLIATION AND STRUCTURE ARE MEASURED FROM THE CORE AXIS.

INTERVAL FROM	INTERVAL TO	FEET OF CORE RECOVERED	ROCK TYPE	ROCK DESCRIPTION AND REMARKS	ALTERATION PROP	ALTERATION ARG	ALTERATION SIL	ALTERATION SER	ALTERATION TOUR	ALTERATION SUL	METALLIZATION (EST. %) PYRITE	METALLIZATION (EST. %) COPPER	METALLIZATION (EST. %) MOLY	GRAPHIC LOG FOLIATION	GRAPHIC LOG AXIS	GRAPHIC LOG STRUCTURE	DEPTH	ASSAYS COPPER	ASSAYS MOLY
1850			quartz latite	Core is broken to 1885½, then shattered, argillic alteration in shattered zone, sericite on seams, minor epidote. Rock is traversed by numerous small seams at 50° to core axis. Sericite + clay alteration on seams, bleaching extends ⅛" or so into wall of each seam, minor pyrite on seams	✓	✓		✓			<1%					50°	1850		
				Sil. (?) lt. gray to 1902, broken tan core, some jarosite ?, argillic alt. to 1908, shattered and broken to 1917½, then gouge and breccia to 1922½. Spec. 1923 + 1930. Shattered zone 1957-1964, chloritic-sericitic zone 1965-1967, core sheared to fault zone 1971-1974. Speck of bornite, 1975		✓ ✓ ✓	✓ ✓ ✓	✓			<1%					50?	1900		
	1975			3/8/68 - Hole in progress.												50?			
				Quartz latite porphyry, very fine pyrite adjacent to chlorite, less than 1% pyrite. Argillic alteration increases with depth. 12" shattered zone at 2021, some gouge. 3' broken core at 2025-2028, breccia + minor gouge. Spec. at 2034. Heavy gouge and breccia 2034½-2046½. Shattered qtz latite, broken core,												50°	2000		
	2072			Some breccia intervals to 2062, fair core to 2066, broken to 2071, granulated breccia for 6", broken core to 2072. 3/15/68													2100		
				Argillic alteration and minor pyrite adjacent to seams. Total sulfide in this and balance of core less than 1%, usually less than 0.1%.													2200		
			Quartz latite														2300		
				Fault breccia 2367-2374												30°			
				Argillic alteration adjacent to frequent small seams that are nearly parallel to axis of core. Otherwise little alteration. Minor pyrite in argillic zones, flesh colored feldspar (?) locally.													2400		
				Seams less frequent than above. Minor pyrite													2500		

CONTINUATION OF GEOLOGIC LOG

HOLE NO. Horne #3 SHEET NO. 5

PROJECT Charleston Lead Mine

NOTE. FOLIATION AND STRUCTURE ARE MEASURED FROM THE CORE AXIS.

INTERVAL FROM	INTERVAL TO	FEET OF CORE RECOVERED	ROCK TYPE	ROCK DESCRIPTION AND REMARKS	ALTERATION PROP	ALTERATION ARG	ALTERATION SIL	ALTERATION SER	ALTERATION TOUR	ALTERATION SUL	METALLIZATION (EST. %) PYRITE	METALLIZATION (EST. %) COPPER	METALLIZATION (EST. %) MOLY	GRAPHIC LOG FOLIATION	GRAPHIC LOG AXIS	GRAPHIC LOG STRUCTURE	DEPTH	ASSAYS COPPER	ASSAYS MOLY
2500			Qtz. latite	Fresh quartz latite except for argillic alteration adjacent to fractures. Minor pyrite, some chlorite in altered areas. Fault breccia 2517-2519 Fault breccia 2583-2584.												30°	2500		
																12°			
	2617			2617 5/24/68													2600		

D.D. #3 ASSAYS

Shop No 270 2046 SI

File No.

VALUES
Latest Quotation

1 oz. Gold
1 oz. Silver
1 lb. Copper
1 lb. Lead
1 lb. Zinc

THIS CERTIFIES
Samples submitted for assay contain as follows:

Date 25 April 1968

Arizona Assay Office

815 NORTH FIRST STREET
Phone: 253-4001

Phoenix, Arizona 85001
P. O. BOX 1148

JAMES STEWART CO
PHOENIX ARIZONA

Short Ton ..... 2000 Lbs.
Short Ton Unit ..... 20 Lbs.
Long Ton ..... 2240 Lbs.
Long Ton Unit ..... 22.4 Lbs.

MARKS	SILVER PER TON Ozs.	SILVER PER TON Tenths	VALUE PER TON	GOLD PER TON Ozs.	GOLD PER TON 100ths	VALUE PER TON	TOTAL VALUE PER TON of Gold & Silver	PERCENTAGE COPPER	REMARKS
E B - 1 2040		.40		TRACE				0.045	
L-1 - 2660		.40						0.04	
#3 - 2218 2218'		.40						0.038	

REGISTERED ASSAYER
CHEMICAL LABORATORY
ARIZONA, U.S.A.

Charges $ 17.50

Assayer
JACK STONE Reg. No. 5479

ANDY CHUKA, PRINT

87

Shop No. 149
File No. 2037 ST

Date 18 March 1968

Charleston

Arizona Assay Office

815 NORTH FIRST STREET
Phone: 253-4001

Phoenix, Arizona 85001
P. O. BOX 1148

VALUES
Latest Quotation

1 oz. Gold.....
1 oz. Silver.....
1 lb. Copper.....
1 lb. Lead.....
1 lb. Zinc.....

THIS CERTIFIES
Samples submitted for assay contain as follows:

JAMES STEWART CO
Phoenix Arizona

Short Ton ..... 2000 Lbs.
Short Ton Unit ..... 20 Lbs
Long Ton ..... 2240 Lbs.
Long Ton Unit ..... 22.4 Lbs.

MARKS	SILVER PER TON Ozs.	SILVER PER TON Tenths	VALUE PER TON	GOLD PER TON Ozs.	GOLD PER TON 100ths	VALUE PER TON	TOTAL VALUE PER TON of Gold & Silver	PERCENTAGE COPPER	REMARKS
B-1-1135		.3	$ .45	TRACE				0.035	
3-2077 Charleston #3								0.05	

REGISTERED ASSAYER
CERTIFICATE EXPIRES
DEC. 31, 19
ARIZONA, U.S.A.

Charges 2.00.....

Assayer.....

ANDY CHUKA, PRINT

JACK STONE REG. No. 5479

Shop No. 141
File No. 2036 ST

Date 11 MARCH 1968

Charleston

Arizona Assay Office

815 NORTH FIRST STREET
Phone: 253-4001

Phoenix, Arizona 85001
P. O. BOX 1148

VALUES
Latest Quotation

1 oz. Gold.....
1 oz. Silver.....
1 lb. Copper.....
1 lb. Lead.....
1 lb. Zinc.....

THIS CERTIFIES
Samples submitted for assay contain as follows:

JAMES STEWART CO
PHOENIX
ARIZONA

Short Ton ..... 2000 Lbs.
Short Ton Unit ..... 20 Lbs.
Long Ton ..... 2240 Lbs
Long Ton Unit ..... 22.4 Lbs.

MARKS	SILVER PER TON Ozs.	SILVER PER TON Tenths	VALUE PER TON	GOLD PER TON Ozs.	GOLD PER TON 100ths	VALUE PER TON	TOTAL VALUE PER TON of Gold & Silver	PERCENTAGE COPPER	REMARKS
B - 1 - 960		.3	$.45	TRACE				0.04	
B - 1 - 900								0.04	
1980								0.04	
Hole #3 Chandler									

REGISTERED ASSAYER
CERTIFICATE EXPIRES
JACK E. A. STONE
DEC. 31 1968

Charges 11.50

Assayer.....

JACK STONE Reg. No. 5479

ANDY CHUKA, PRINT

189

Shop No. 109
File No. 2031 ST

Date 26 FEB 1968

VALUES
Latest Quotation

1 oz. Gold.....
1 oz. Silver.....
1 lb. Copper.....
1 lb. Lead.....
1 lb. Zinc.....

THIS CERTIFIES
Samples submitted for assay contain as follows:

Arizona Assay Office

815 NORTH FIRST STREET
Phone: 253-4001

Phoenix, Arizona 85001
P. O. BOX 1148

JAMES STEWART CO
PHOENIX ARIZONA

Short Ton ..... 2000 Lbs.
Short Ton Unit ..... 20 Lbs
Long Ton ..... 2240 Lbs.
Long Ton Unit ..... 22.4 Lbs.

MARKS	SILVER PER TON Ozs.	SILVER PER TON Tenths	VALUE PER TON	GOLD PER TON Ozs.	GOLD PER TON 100ths	VALUE PER TON	TOTAL VALUE PER TON of Gold & Silver	PERCENTAGE COPPER	REMARKS
2962 CHARLESTON # 2	2	.8	$ 4.20	TRACE				8.71	
29X CHARLESTON # 2		.8	$1.20	TRACE				1.50	
2920 CHARLESTON # 2		.8	$1.20	TRACE				0.035	
1375 CHARLESTON # 3		.4	$.60	TRACE				0.035	
1460 CHARLESTON # 3		.4	$.60	TRACE				0.035	
1470 CHARLESTON # 3		.4	$.60	TRACE				0.035	
1480 CHARLESTON # 3		.4	$.60	.01	$.35			0.03	

REGISTERED ASSAYER
CERTIFICATE EXPIRES
JACK E.A. STONE
DEC. 31, 19
ARIZONA, U.S.A.

Charges $ 45.50

Assayer.....
JACK STONE REG. NO. 5479

ANDY CHUKA, PRINT

180

HECTOR C. ROCHIN
MANAGER
REGISTERED ASSAYER
ARIZONA REG. No. 4073

ROCHIN ENGINEERING AND ASSAY OFFICE

P. O. BOX 218 PHONE 364-8092
DOUGLAS, ARIZONA - 85607

HECTOR A. ROCHIN
MINING ENGINEER AND
LAND SURVEYOR
ARIZONA REG. No. 2472

CERTIFICATE OF ASSAY

Name ...WESTERN EXPLORATION OFFICE..... Address ..Drawer 1217 - Douglas, Arizona.....

	GOLD OZS	SILVER OZS	COPPER %	LEAD %	NAME		HOLE No.	DEPTH From	DEPTH To
23025 - B - 10519			0.160						
23026 - B - 10520			0.120						
23027 - B - 9739			0.019	James Stewart			JSC #3	1197	1206
23028 - B - 9740			0.028	Co.				1206	1215
23029 - B - 9741			0.046					1215	1223
23030 - B - 9742			0.048				JSC #2	2945	2947
23031 - B - 9743			0.830					2947	2949
23032 - B - 9744			0.076					2949	2951
23033 - B - 9745			0.670					2951	2953
23034 - B - 9746			0.360					2953	2955
23035 - B - 9748			0.048					2955	2957
23036 - B - 9748			5.52					2957	2959
23037 - B - 9749			6.76					2959	2961
23038 - B - 9750			0.067					2961	2963
23039 - B - 12051			0.028					2963	2964.5
23040 - B - 12052			0.036					2964.5	2966.5
23041 - B - 12053			0.048					2966.5	2968.5
23042 - B - 12054			0.027					2968.5	2969.5
23043 - B - 12055			0.088					2969.5	2971.5
23044 - B - 12056			0.190					2971.5	2973.5
23045 - B - 12057			0.076					2973.5	2975.5
23046 - B - 12058			0.140					2975.5	2977.5
23047 - B - 12059			0.110					2977.5	2979.5

REGISTERED ASSAYER CERTIFICATE NO. 4073 H. ROCHIN Date Signed..... ARIZONA, U.S.A.

MARKS: Diamond Drill Core.

DATE: 3/12/68

CHARGES: $ 46.00
" 5.75
$ 51.75

192

HECTOR C. ROCHIN
MANAGER
REGISTERED ASSAYER
ARIZONA REG. No. 4073

ROCHIN ENGINEERING AND ASSAY OFFICE

P. O. BOX 216 PHONE 364-8092
DOUGLAS, ARIZONA - 85607

HECTOR A. ROCHIN
MINING ENGINEER AND
LAND SURVEYOR
ARIZONA REG. No. 2472

CERTIFICATE OF ASSAY

Name Western Exploration Office ..... Address Drawer 1217 Douglas, Arizona 85607 .....

Att: Mr. W.J. Walker	GOLD Oz	SILVER Oz	COPPER %	LEAD %	Zn %		HOLE NO.	DEPTH From	DEPTH To:
22905 R-9731	James	Stewart	0.029	Tr	Tr	Core	JS#3	1116.6	1128
22906 R-9732	Co.		0.030	Tr	Tr			1128	1138
22907 R-9733			0.042	Tr	0.05			1138	1148
22908 R-9734			0.021	Tr	Tr			1148	1158
22909 R-9735			0.068	Tr	0.07			1158	1167
22910 R-9736			0.041	Tr	0.05			1167	1179
22911 R-9737			0.022	Tr	0.06			1179	1188
22912 R-9738			0.051	Tr	0.05			1188	1197

REGISTERED ASSAYER CERTIFICATE NO. 4073 H. C. ROCHIN Registered ARIZONA, U.S.A.

REMARKS:

DATE: 29 Feb 68

CHARGES: $ 64.00
Prep. 2.00
$ 66.00

HECTOR C. ROCHIN
MANAGER
REGISTERED ASSAYER
ARIZONA REG. No. 4073

ROCHIN ENGINEERING AND ASSAY OFFICE

P. O. BOX 218 PHONE EMpire 4-8092
DOUGLAS, ARIZONA

HECTOR A. ROCHIN
MINING ENGINEER AND
LAND SURVEYOR
ARIZONA REG. No. 2472

193

CERTIFICATE OF ASSAY

Name Western Exploration Office Address Drawer 1217 Douglas, Arizona

Att: Mr. W.J. Walker	GOLD OZS. NAME	SILVER OZS.	COPPER %	LEAD %	Zn %		HOLE NO.	DEPTH From	DEPTH To:
Lab 22738 B-9706	James	Stewart	0.090	Tr	0.30	Core	JSC#2	2578.75	2583
22739 B-9707	do.		0.028	Tr	0.07			2585	2588.1
22740 B-9708			0.042	Tr	1.20			2588.1	2593.3
22741 B-9709			0.031	Tr	0.12			2593.3	2598
22742 B-9710			0.029	Tr	Tr			2598	2603.7
22743 B-9711			0.037	Tr	0.07			2603.7	2607
22744 B-9712			0.040	Tr	0.05			2607	2610
22745 B-9713			0.028	Tr	Tr			2610	2615
22746 B-9714			0.031	Tr	0.08			2615	2620
22747 B-9715			0.088	Tr	0.30			2620	2624
22748 B-9716			0.12	Tr	1.12			2624	2628.5
22749 B-9717			0.029	Tr	Tr		JSC#3	996	1003
22750 B-9718			0.031	Tr	0.07			1003	1011
22751 B-9719			0.030	Tr	0.05			1011	1019
22752 B-9720			0.022	Tr	0.04			1019	1028.9
22753 B-9721			0.028	Tr	0.06			1028.9	1036
22754 B-9722			0.020	Tr	0.03			1036	1045
22755 B-9723			0.032	Tr	0.05			1045	1053
22756 B-9724			0.029	Tr	0.04			[illegible]	1062
22757 B-9725			0.042	Tr	0.05			1062	1071
22758 B-9726			0.031	Tr	0.03			1071	1080
22759 B-9727			0.041	Tr	0.07			[illegible]	1088.6
22760 B-9728			0.022	Tr	0.06			1088.6	1096

REGISTERED CERTIFICATE 4073 ROCHIN ARIZONA U.S.A.

REMARKS:

ANALYSIS CERT. BY:

DATE: 29 Feb 1968

CHARGES: $ 184.00
5.75
$ 189.75

HECTOR C. ROCHIN
MANAGER
REGISTERED ASSAYER
ARIZONA REG. No. 4073

ROCHIN ENGINEERING AND ASSAY OFFICE

P. O. BOX 218 PHONE EMpire 4-8092
DOUGLAS, ARIZONA

HECTOR A. ROCHIN
MINING ENGINEER AND
LAND SURVEYOR
ARIZONA REG. No. 2472

194

CERTIFICATE OF ASSAY

Name Western Exploration office Address Drawer 1217 Douglas, Arizona

Att: Mr.W.J.Walker	GOLD OZS.	SILVER OZS.	COPPER %	LEAD %	Zn %		HOLE NO.	DEPTH From:	DEPTH To:
	NAME								
Lab 22761 R-9729	James	Stewart	0.030	Tr	0.08	Core	JSC#3	1098	1107
22762 R-9730	Co.		0.041	Tr	0.12			1107	1116
22763 R-9932			0.019	0.12	0.25		JSC#2	1377	1382.5
22764 R-9933			0.030	0.07	0.27			1382.5	1387.5
22765 R-9934			0.032	0.07	0.15			1387.5	1391.25
22766 R-9935			0.048	0.24	0.70			1391.25	1396
22767 R-9936			0.16	0.65	1.75			1457	1462
22768 R-9937			0.030	0.05	0.25			1462	1467
22769 R-9938			0.048	0.34	0.70			1858.5	1862
22770 R-9939			0.040	Tr	Tr			1862	1867.5
22771 R-9940			0.052	Tr	Tr			1867.5	1872
22772 R-9941			0.028	Tr	Tr			1872	1876.5
22773 R-9942			0.042	Tr	0.05			1876.5	1881
22774 R-9943			0.028	0.03	0.03			1881	1886
22775 R-9944			0.030	Tr	0.05			1937.5	1941
22776 R-9945			0.049	Tr	0.03			1941	1946.5
22777 R-9946			0.032	Tr	Tr			1946.5	1951
22778 R-9947			0.049	Tr	Tr			1951	1956
22779 R-9948			0.031	Tr	Tr			1956	1961
22780 R-9949			0.042	Tr	0.07			1961	1965.5
22781 R-9950			0.040	Tr	Tr			1965.5	1969
22782 R-9851			0.029	Tr	0.05			1969	1974
22783 R-9852			0.041	Tr	Tr			1974	1978

REGISTERED ASSAYER CERTIFICATE NO. 4073 H. C. ROCHIN Date Signed ARIZONA, U.S.A.

REMARKS:

ANALYSIS CERT. BY:

DATE: 29 Feb 1968

CHARGES: $ 184.00
5.75
189.75

CHARLESTON MINE

Assay Summary

HOLE #3

Depth	% Cu	Oz/Ton Ag	oz/Ton Au	% Ni	% Pb	% Zn
996 - 1003	.029	--			Tr	Tr
1003 - 1011	.031	--			Tr	.07
1011 - 1019	.030	--			Tr	.05
1019 - 1028	.022	--			Tr	.04
1028 - 1036	.028	--			Tr	.06
1036 - 1045	.020	--			Tr	.03
1045 - 1053	.032	--			Tr	.05
1053 - 1062	.029	--			Tr	.04
1062 - 1071	.042	--			Tr	.05
1071 - 1080	.031	--			Tr	.03
1080 - 1088	.041	--			Tr	.07
1088 - 1098	.022	--			Tr	.06
1098 - 1107	.03	--			Tr	.08
1107 - 1116	.041	--			Tr	.12
1116 - 1128	.029	--			Tr	Tr
1128 - 1138	.030	--			Tr	Tr
1138 - 1148	.042	--			Tr	.05
1148 - 1158	.021	--			Tr	Tr
1158 - 1167	.068	--			Tr.	.07
1167 - 1179	.041	--			Tr	.05
1179 - 1188	.022	--			Tr	.06
1188 - 1197	.051	--			Tr	.05
1197 - 1206	.019					
1206 - 1215	.028					
1215 - 1223	.046					
1460	.035					
1470	.035					
1480	.035					
1980	.04					
2077	.05					
2107	.04	.40				

D.D. #4 L0655

Bear Creek

196

THIN SECTION REPORT OF SPECIMENS

FROM CHARLESTON MINE

September 24, 1969

No. C-69-3977

Location: U.S.A.; Charleston Mine; Hole #4 @ 1,481'; H. L. Jones, Albuquerque, N. Mexico; Assay No. E-7853.

Classification: Highly altered rhyodacitic volcanic. Strongly carbonatized and saussuritized. Contains about 5% euhedral pyrite, minor v.f.g. disseminated sphalerite, and a trace of chalcopyrite. No molybdenite is present.

No. C-69-3978

Location: Ditto -3977; @ 1,500'; Assay No. E-7854.

Classification: Sample consists of small fragments up to 1/2" in size. Mineralogy as follows:

pale golden yellow sphalerite	60%
galena	10%
pyrite	5%
chalcopyrite	15%
gangue	10%

The sulphides are c.g. except for pyrite which is almost invariably surrounded and corroded by chalcopyrite. No molybdenite.

P.S. enriched in sulphide relative to sample.

No. C-69-3979

Location: Ditto -3977; @ 1,546'; Assay No. E-7855.

Classification: Porphyritic rhyodacite. Consists of rounded and corroded phenocrysts of quartz, phenocrysts of plagioclase and a rhyodacitic matrix. Sulphide mineralization is restricted to minor, f.g., disseminated pyrite.

EFP/lk

.....

GEOLOGICAL SAMPLE RECORD

No: E 7853-785
Per: C.O.P
C693977-37

Name & Address: H.L. JONES, ALBUQUERQUE, NEW MEXICO

Sample Location: U.S.A. CHARLESTON MINE (80 mi. SE Tombstone, Arizona) HOLE #6

Correspondence Rec'ed

Samples Received: 9-19-69

Description

C693977 @ 1061' Altd rhyolite porph py

C693978 @ 1500' See P.S. Description

C693979 @ 1546' Heavy porphyritic rhyolite

See attached sheet.

Analysis Requested

E 7853	Cu	MoS_2	S	
7854	"	"	"	Pb Zn
7855	"	"	"	

Sample Sent For Preparation: 9-19-69

Pulp Submitted For Assay: 9-22-69

Assays Rec'd

	Cu	MoS_2	S	Pb	Zn
E 7853	.02	<.05	3.65	—	—
E 7854	.50	<.05	11.46	5.81	19.37
E 7855	.02	<.05	.55	—	—

— no sample left for dry assay

Interim Letter

Final Reply

Remarks: Not at all similar to porphyry copper deposits but rather has a close resemblance to massive Cu-Pb-Zn-Ag deposits associated with acid volcanics e.g. Tres Cruces, New Mex. Also etc. RSP 9-25-69 JKR

FORM 225-A
11-66

PROPERTY Charleston Mine Area

Wager's log

Geo.

SHEET NO.

CO-ORDINATES

HOLE NO. 4 DEPTH ANGLE STRIKE ELEVATION

DEPTH FEET	FORMATION	SAMPLE NO.	LENGTH FT.	ANALYSIS COPPER %	ANALYSIS NICKEL %	ANALYSIS CU. & NI. %	LENGTH FEET	PROGRESSIVE TOTALS FEET X PER CENT COPPER	PROGRESSIVE TOTALS NICKEL	PROGRESSIVE TOTALS CU.
1424'	Core seen from 1424'. Reported to be bray, arkosic quartzite for most of upper portion.									
1477'	Quartzite, gry med g mass, no apparent bedding local bxtd zones w/rare sulp mnly py. Enty becomes grayer and less uniform as next unit is approached-bx zone more common									
1487'	(Pb 1-3%) 'split zone) arkosic qutzite rubbly and alt'd w/much soft serrcite sulp mnly py and galena									
1499'	(Pb + Cu 1-2%) Latite pale gy green varigated w/purple zones abundant py as diss cubes loc structure zones w/bleached, alt'd and broken core. Heavier Cu & Pb in shr'd sects grade est?? no sphalerite observed.									
1501'	(Pb-Cu 1-2%) Shr'd zone rock prob as pre but strongly alt'd and bleached Chip Sample 1479-1501									
1510'	Bx Zone - poorly cemented bx, rock mainly green porphyry (leucite?) light green phenos in dk mx. no imp't sulph									
1522'	Ditto, but less shr'd and bxt'd bot of enty is good mass green porphyry									

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FORM 225-A
11-66

PROPERTY Charleston Mine Area

SHEET NO. 2

HOLE NO. 4 DEPTH ANGLE STRIKE ELEVATION

CO-ORDINATES

DEPTH FEET	FORMATION	SAMPLE NO.	LENGTH FT.	ANALYSIS COPPER %	ANALYSIS NICKEL %	ANALYSIS CU. & NI. %	LENGTH FEET	PROGRESSIVE TOTALS FEET X PER CENT COPPER	PROGRESSIVE TOTALS NICKEL	PROGRESSIVE TOTALS CU. & NI.
1592'	Ditto-unit much fresher,									
	phenos def. plag with occ									
	alt'd cores									
1600'	Latite-gy green to purple									
	varigated contact w/pre									
	enty abrupt and shr'd -									
	w/development of py and									
	minor sphalinte enty									
	strongly shr'd and broken									
	1594-1598'									
1611'	Ditto-last 2' strongly									
	shr'd and broken @ 300									
	End of Mx core									
1762'	Latite - gy green - prple									
	varigated poss flow bx or									
	tuff - shr'd 1611' to									
	1616' split and smpld									
	rubble w/occ stringers									
	galena, cpy grade est??									
	looking back over core from									
	1600, could be tuff sect w/									
	vuggy to elongate frags in									
	fg mx. Dk diss patches									
	poss Pb or Zn spec for Ps and									
	assay 1729' enty strongly									
	shr'd, alt'd and bxt'd									
	1745'-1762'									
1791	Green porphyry - as enty									
	to 1510 and 1592 - bot of unit									
	strongly shr'd									
1796	(Cu-5%) shr'd porphyry									
	as pre hvy diss and xline									
	Cpy (Sample 1791'-1796')									
1824.5	Shr'd zone - tuff and									
	porphyry as pre heavy diss									
	much sericite overall sample									

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FORM 225-A
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PROPERTY Charleston Mine Area

SHEET NO. 3

HOLE NO. 4 DEPTH ANGLE STRIKE ELEVATION

CO-ORDINATES

DEPTH FEET	FORMATION	SAMPLE NO.	LENGTH FT.	ANALYSIS COPPER %	ANALYSIS NICKEL %	ANALYSIS CU. & NI. %	LENGTH FEET	PROGRESSIVE TOTALS FEET X PER CENT COPPER	PROGRESSIVE TOTALS NICKEL	PROGRESSIVE TOTALS CU. & NI
	1762' - 1830'									
1896	Quartzite - gry to pk variable appears to be interbedded w/varigated tuff suspect sphal last several feet and poss Ag sulp salts - spec for P.S and assay @ 1890'									
1903'	(Cu-2%, Zn-10%, Pb-2%??) metased as pre with hvy diss and xline sphal, galena, Cpy Sample 1896-1903'									
1941'	Tuff, pale gy grn varigated occ dk gy "slaty" zones									
1965'	Quartzite-bot of enty shr'd and broken contact obscure									
1999'	Tuff-gry green varigated									
2002	Dike-dk gy felsite good upper contact @ 45° w/ frags of tuff lower contact gradational into qtzite									
2025	Quartzite-pyritic zone last 4' typical spec @ 2424 for Ps and assay									
2041	Latite? gy green poss amydg flow not like pre tuffs, more granular contains irregular incls.									
2097	Interbedded sediments and volcanics									
2099	(Zn-10%, Cu-2%) Porphyry hvy sphalinte in porphy 45° contacts in pre enty									
2104'	(Zn-2%, Cu-1%) mineralized									

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FORM 223-A
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PROPERTY Charleston Mine Area

SHEET NO. 4

HOLE NO. 4 DEPTH _____ ANGLE _____ STRIKE _____ ELEVATION _____

CO-ORDINATES _____

DEPTH FEET	FORMATION	SAMPLE NO.	LENGTH FT.	ANALYSIS COPPER %	ANALYSIS NICKEL %	ANALYSIS CU. & NI. %	LENGTH FEET	PROGRESSIVE TOTALS FEET X PER CENT COPPER	NICKEL	CU. & N
	gray quartzite									
2129'	Volcanics-fg tuff-flows									
	varigated bands of purple									
	andisite									
2183	Volcanics-sht runs w/much									
	broken core									
2241'	Volcanics - includes runs									
	of purple andisite									
2290	Green porphyry									
2314	Gray quartzite									
2384	Seds and volcanics - runs									
	of purple andisite									
2430	Ditto-last core shows traces									
	of cpy.									

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FORM 223-B
11-66

PROPERTY Charleston Mine

Inco

SHEET NO. 7

HOLE NO. #4 DEPTH _____ ANGLE V STRIKE _____ ELEVATION _____

CO-ORDINATES _____ _____

DEPTH FEET	FORMATION	SAMPLE NO.	LENGTH FT.	ANALYSIS COPPER %	ANALYSIS NICKEL %	ANALYSIS CU. & NI. %	LENGTH FEET	PROGRESSIVE TOTALS FEET X PER CENT COPPER	NICKEL	CU. & N
	relationships are complex but overall enty is a thick repetitous sequence.									

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6 file - 203

CHARLESTON MINE AREA
DRILL HOLE NO. 4

0	- 852	Meta andesite
852	- 941	Meta andesite, with calcite stringers.
941	- 948	Fault gouge.
948	-1080	Meta andesite breccia; fragments of andesite, quartzite, red silstone and arkose. Arkose contains minor disseminated pyrite.
1080	-1106	Arkose with less than 1% finely desseminated pyrite (minor epidote stringers at 1100-1104).
1106	-1130	Fault gouge - epidote on fractures.
1130	-1133	Siltstone.
1133	-1134	Arkose, banding 50° to core axis, possibly bedding.
1134	-1137	Red siltstone.
1137	-1156	White quartzite, very minor disseminated fine grained pyrite.
1156	-1159	Quartzite breccia, gougy with inclusions of porphyritic rock.
1159	-1162	Quartzite.
1162	-1167	Quartzite breccia with angular fragment of prophyry, gougy material with sericite.
1167	-1210	Porphyry, highly altered with much sericite and clay, 1167 to 1185 broken with much gouge, pyrite more abundant in gouge zones.
1210	-1222	Arkose, .5% pyrite, crushed zone.
1222	-1229	Porphyry, 1% pyrite altered with some sericite.
1229	-1277	Fine ground white quartzite with very minor disseminated pyrite, 1% banding 50° to core axis.
1277	-1307	Fine grained gray hornfels, very little quartz. Rock mottled 1284 to 1292, fine grained pyrite disseminated throughout, approximately 2%, grades into quartzite.
1307	-1326	White quartzite, fine grained, very minor disseminated pyrite, .1% or less.
1326	-1391	Arkose, crushed zone 1331 to 1336, healed fault zone 30° to core axis at 1332, mottled and fine grained 1357-1359, mottled and fine grained 1388-1391. Disseminated pyrite-.5%.
1391	-1398	Arkose, minor disseminated pyrite - .5%.
1398	-1402	Crushed zone with clay and sericite, disseminated sulphides, minor sphalerite - 3% total sulphide.
1402	-1424	Arkose, grades to quartzite at 1424.
1424	-1455	Quartzite, grades to arkose at 1455.
1455	-1487	Arkose, 1478-pyrite, galena, sphalerite and chalcopyrite disseminated throughout the rock, sphalerite 20%, lead [illegible], cpy 1%. 1479 1" solid galena and sphalerite; 1480-1481 gouge with sericite; 1483-1484 gouge with sericite; 1480-1481 disseminated sphalerite and pyrite, 5% sulphides.
1487	-1494	Stony arkose or hornfels, strong silicification, disseminated pyrite - 5%.
1494	-1496	Same

1496 -1498.5	Mottled arkose mineralized 5% - 10% pyrite some chlorite.
1498.5-1501	Porphyry highly altered some sericite with chlorite and sulphides 5% pyrite 3% lead 5% sphalerite.
1501 -1590	Porphyry broken and altered but less sericite, more chlorite sulphide, mostly pyrite - 1% mineralized plus 3% sulphides, some sphalerite and lead 190-191, several 1/2 inch stringers, minerals 10° to core axis.
1590 -1688	Greenish grey arkose, 3% sulphide 1590-1591; badly broken and gougy 1594-1598; fractures 10° to core axis, calcite filling on fractures. Some epidote and chlorite? Mottled, 1611-1612 no core, 1612-1616 60% core, 1612-1616 chlorite with 2% pyrite 1% galena 2% sphalerite .5% cpy; 1626-1631 grades to silstone, 1631-1636 highly silicified, quartz and epidote stringers 10° to core axis. 1636-1643 badly broken with some sericite. 1626-1688 silicified pink colored arkose some introduce fine grained pink K feldspar. 1663-1665 gouge and broken, badly broken and gouge 1672-1713.
1688 -1726	Coarse grey arkose, some chlorite, pyrite 2% sericite and clay in gouge zone. 1727-1730 minor disseminated sphalerite, galena.
1726 -1745	Grades back into silicified pink arkose.
1746 -1747	White quartzite.
1747 -1762	White quartz ground to powder.
1762 -1773	Grades from arkose to prophyry, very soft and highly altered, some chlorite, 5% pyrite, .5% cpy.
1773 -1791.5	Porphyry, green altered feldspars, some introduced pink K feldspar.
1791.5-1802	Mineralized zone originally arkosic quartzite, primarily cpy 10-15% average. Minor galena and sphalerite.
1802 -1812	Arkose, 1802-1803 20% core recovery, gouge 1806-1810 60% core recovery, 3% sulphides mostly pyrite, 3% disseminated cpy 1810-1812.
1812 -1822	Arkose with disseminated 5% cpy, minor galena and sphalerite 1820-1822.
1822 -1824	Arkose with numerous calcite stringers 2% sulphides mostly pyrite.
1824 -1831	Quartzite 2% sulphides, mostly pyrite.
1831 -1833	Quartzite, light grey 1-2% pyrite, silicified vein 6" width sphalerite and lead, 5% sulphides.
1833 -1854	Silicified arkose, purple and coarse grained with disseminated galena and sphalerite, 1852.5-1853.5, 6% sulphides.
1854 -1871	Arkose, light gray to light purple, pyrite .5%.
1871 -1874	Broken fine grained gray quartzite with 1% pyrite, minor sphalerite specks, some chlorite blebs.
1874 -1882	Light gray arkose, pyrite filled fracture 45° to core at 1875 sulphides -.5%.
1882 -1895.5	Grey arkosic quartzite, disseminated pyrite and sphalerite 1% sulphides, chlorite in last one foot.
1895.5-1903	Mineralized arkose which appears to be almost porphrytic with introduce pink K feldspar and chlorite (cpy, sphalerite, pyrite) 5-6% sulphides.
1903 -1906	Dark gray very fine grained arkose with blebs of olivine, disseminated sulphides, mostly pyrite 3-5%.

1906	-1929	Brecciated and cemented arkose very much mottled with chlorite, olivine and introduce K feldspar present. Rock appears pink, pyrite -.5%. 1920-1925 very dark gray siltstone silicified with 2% pyrite. Very highly altered and bleached.
1929	-1957	Light gray arkose, 1938-1940 similar to previous section, sulphides .5%, blebs of olivine surrounded by chlorite.
1957	-1969	Highly altered arkose? with much sericite and minor chlorite highly bleached, banding 50° to core axis, disseminated sphalerite at 1963, 6" minor pyrite in section -.5%.
1969	-2001	Very similar to section from 1906-1929, broken with sericite 1978-1979, 1" sphalerite vein 15° to core axis at 1993, pyrite approximately 1%.
2001	-2003	Very dark arkose, .5% pyrite, minor specks of cpy.
2003	-2072	Light grey arkose, pyrite -.5%, 10% pyrite 2023-2026, 2034-2041 finer grained with more pyrite and more highly altered, 1% pyrite, fault zone with sericite, 2044-2046. Fault gouge 2053-2054. Strong alteration 50° to core axis 2057-2058, bleached bedding or banding 50° to core axis at 2071.
2072	-2196	Hornfels or siltstone, strong silicification with olivine blebs and minor chlorite patches, some sericite, arkose 2090.5-2094; 2097.5-2104 healed breccia, mineralized zone with introduce quartz phenocrysts. 1.5' core lost, 10% sphalerite, 2% cpy, 5% pyrite, 2101-2104 30% core recovery 2123-2124 core is deep purple colored with white splotches, 2161-2181 core badly broken with much sericite. Mineralized arkose, sphalerite 6%, cpy 2%, pyrite 8%, 2183-2190, one foot core missing. 2190-2196 broken with sericite.
2196	-2225	Purple siltstone, bleached and broken with sericite 2198-2206, very dark purple 2214-2223.
2225	-2242	Arkose, light gray becomes porphyritic 2241 some sericite development near porphyry contact. Mineralized zone 2230.5-2236, sphalerite 4%, cpy 1%.
2242	-2290	Porphyry, 2249-2250 test for sphalerite. Mineralized porphyry silicified altered with gouge and cpy 2% sphalerite 3% pyrite 5%, sericite 30% core recovery, 2276-2283. 2277-2283 only 2 feet core recovered.
2290	-2313	Arkose 2290-2291 2" salmon colored igneous veinlet 10° to core axis at 2290 looks aplitic, quartzitic 2300-2309.
2213	-2334	Very fine grained gray silicified hornfels with minute angular quartz crystals as eyes look slightly oplitic from 2329-2334, becomes arkosic about 2330.
2334	-2336	Dark purple arkose, white splotches.

GENERALIZED DESCRIPTIVE LOG

Charleston Lead Mine — Cochise County — James Stewart Construction Co.

HORNE(STEWART) #4 DRILL HOLE

0-15	No core
15-32	Fraglomerate, coarse, angular, sedimentary rock fragments in fine-milled matrix. 26-32: Fracture zone, broken core
32-46	Volcanic, Latitic-andesitic flow, argillic along fractures; feldspar phenocrysts 1-2 mm slightly altered, fresh hornblende 44-46: Fracture zone, highly argillized, no mineralization, 25°
46-79	Fraglomerate, volcanic rock fragments up to 1 1/2" diam., matrix locally serpentinized. Fractures: at 54', quartz vein 20°; 58-60' shear zone with quartz-calcite vein, 5°-15°; 65-70, broken core, gouge, fracture zone minor Fe oxide.
79-99	Graywacke, composed of reworked volcanic fragments; 87-89' fracture zone 15°; 95-98' fractures, fresh core, high angle shears with minor argillization; calcite stringers throughout; minor Fe oxide along shears
99-100	Fracture zone with strong argillization and possible alunization; weak Fe oxide staining; some calcite veining; shear directions diverse
128-256	Graywacke, reworked volcanic material, chloritic, argillic with alteration decreasing away from fracture zone. Color changes from green-gray to maroon 152+156: 6" fractures with calcite stringers, minor pyrolusite, high angle 161-163: Bleached zone, minor Fe oxide fracture controlled, 30° color variegated maroon to green 195-203: Bleaching, fracturing <1% pyrite mostly oxidized, 60° 210-215: Crushed core, minor calcite veining, gouge, no sulfides. 215-230: Core irregularly broken, argillic 238-246: Broken core
256-273	Graywacke, fine-grained, gray, conglomeratic, similar to above, 1-5% disseminated pyrite.
273-559	Reworked volcanics, chloritic, argillic 292-295: Fracture zone, gouge, no sulfides 323-327: Fracture zone, irregular calcite stringers 357-359: Fracture zone, 30°, minor pyrite 373-387: Disseminated pyrite 1-3%, bleached, color mottled green to maroon 380-381: Quartz vein with pyrite 30°, 3" gouge at top 474-476: Fracture zone, 15°, chloritized, pyritized, kaolinized

	512-518: Fracture zone with pyrite 1%, slight bleaching
	530-537: 1% disseminated pyrite, slight bleaching, quartz-calcite vein 10° rock becomes grayer and finer grained.
559-564	Volcanic, gray, porphyritic, feldspars slightly altered, 1% magnetite in clumps.
564-587	Graywacke, fine-grained, gray similar to 530-559
	567: Bleached with disseminated pyrite
	567-569: <1/2% pyrite disseminated, weak bleaching, fracture control
587-617	Breccia, matrix same as above, volcanic and sediment fragments up to 4" diam.
617-721	Graywacke, of reworked volcanics, gray to maroon, abundant calcite stringers
	720: 1-1/2" calcite vein
721-803	Gradational contact of graywacke as above with graywacke, with calcite stringers, trace of disseminated pyrite
	779-781: Fe oxide on fractures 5-30°
803-1133	Arkosic graywacke, red, abundant calcite stringers, no pyrite
	828-835: Broken core, abundant calcite and clay stringers
	982-1017: Highly broken core, no alteration
	1017-1036: Red arkosic breccia, clasts of shales and volcanics
	1036-1042: Graywacke gray volcanoclastic sediment
	1042-1060: Broken core, minor Fe oxide, no pyrite
	1060-1085: Breccia with fine, arkosic matrix, fragments up to 1" diam.
	1085-1104: Graywacke of sandy breccia, fragments up to 2" diam.; strongly fractured drusy quartz and calcite on fracture surface; minor Fe oxide staining
	1104-1133: Major fracture zone; gouge, broken core, sandy to arkosic, no alteration
1133-1167	Sandstone, light gray, very thin contorted bedding; trace pyrite on fracture, core highly broken
	1143-1162: Massive beds
	1162-1166: Conglomeratic with sandstone and volcanic clasts, highly broken
	1166-1167: Barren quartzite
1167-1175	Gouge, barren
1175-1229	Volcanics; hornblende dacite porphyry, light gray, phenocrysts of hornblende and feldspar, argillized, traces of pyrite locally, epidotized, highly broken throughout
	1180-1184: Gouge
	1185-1199: Possible K-spar phenocrysts
	1207-1209: Gouge
	1220-1222: Gouge
	1222-1229: Brecciated picking up quartzite fragments from below; 0.5% pyrite

1229-1488	Quartzite, white, fine-grained, clay cement, massive, locally broken 1277-1292: Broken zone, argillic, locally conglomeratic, quartzite clasts. 1331-1335: Gouge 1335-1351: Broken core 1374-1376: Bedding 25° 1470 Pyrite content small but increasing with depth 1478 Altered quartzite, blebs of sphalerite with accessory pyrite, chalcopyrite; stringers of sphalerite and galena; highly fractured with chlorite in seams. Chlorite in matrix increases with depth 1480-1481: Gouge 1481 Argillized quartzite, pyrite, chloritic, epidote, highly broken
1488-1496	Shale, green, highly broken, mineralized
1496-1591	Gradational fault contact to gray hornblende dacite, highly broken 1499-1520: Highly broken, epidotized, trace pyr., all hornblende and most feldspar altered to epidote, 15% phenocrysts, hornblende decreasing with depth
1591-1721	Shale, gray, mottled: broken core to 1630; disseminated pyrite 0.1-0.2% calcite stringers 1630 and below: Epidote-chlorite-calcite-pyrite nodules with epidote-chlorite alteration in rock 1662-1665: Gouge 1670 Disseminated pyrite >0.2% 1688-1696: Gouge 1696-1709: Broken core and gouge, grain size increases with depth
1721-1762	Gradational contact with fine-grained, white-gray, quartzite, 0.1-0.5% pyrite; epidotization, silicification 1730-1762: Crush core, transitional fault contact with volcanics below, gouge near bottom
1762-1822	Gray dacite, porphyritic, epidotized plagoclase phenocrysts; 1% pyrite with disseminated galena and chalcopyrite; gouged and broken up to 1774 1783-1822: Highly broken with local gouge 1794-1795: Chalcopyrite-quartz vein, chalcopyrite 15%, trace galena, possible tetraledrite, no pyrite 1795 Vein quartz or highly silicified volcanics 1810 Minor chalcopyrite 1818-1820: Quartz-chalcopyrite vein, 8% chalcopyrite
1822-2027	White quartzite, local shaley zones, 2% disseminated pyrite 1894-1899: Sphalerite-chalcopyrite stringers, minerals become disseminated after 1896: 0.5% chalcopyrite, 2% sphalerite, minor pyrite

1904-1911: Epidotized quartzite, fine-grained
1912: Black shale, trace pyrite, epidote stringers
1924-1930: Bleached, epidotized, pink shaley quartzite
1930: White quartzite, epidotized <0.1% pyrite
1950: Quartzite becomes argillic and crushed; abundant vertical fractures
1959-1967: Vertical fractures, epidote stringers and nodules
1978-1982: Quartz-pyrite-sphalerite stringers
1989-1992: Epidote tactite with disseminated epidote-sphalerite-galena
1990-1994: Quartz-sphalerite-chalcopyrite veins
1992-1996: Quartz-pyrite-sphalerite stringers
Epidotization disappears at 2001
2001-2024: Trace pyrite
2024-2025: 1% coarse euhedral pyrite, 0.1% chalcopyrite
2025: Quartzite with epidote stringers and nodules

2027-2087 Very fine-grained, gray quartzite; 0.1% disseminated pyrite, pyrite on fractures, epidote-chlorite-calcite nodules, hornfelsic

2087-2105 Medium to fine-grained quartzite, 0.1% pyrite
2095: Epidote-garnet tactite; disseminated sphalerite-pyrite-chalcopyrite
2097-2105: 15-20% sphalerite, 0.5-1% pyrite

2105-2243 Hornfelsic quartzite, epidotized; epidote-chalcopyrite-pyrite nodules
2115: Sulfides disappear, alteration continues but weakens with depth to 2170
2161-2206: Broken core
2184-2190: Epidote tactite, sphalerite, chalcopyrite, quartz. Sphalerite 15-20% in nodules, 0.3-0.4% chalcopyrite over interval increase to 1% with depth
2190-2214: Shaley quartzite, epidotic; some arkosic sediments
2214: Maroon mudstone becoming coarser grained and grayer with depth, at 2224 passes into gray quartzite
2224: Disseminated euhedral pyrite, epidote
2230-2236: Sphalerite and chalcopyrite in stringers; 0.5% pyrite disseminated

2243-2290 Dark gray hornfelsic quartzite or volcanic rock, epidote blebs, trace pyrite
2277-2283: Fracture zone, broken rock, quartz-chalcopyrite stringers. Host pyritized 4' on both sides of fracture; 2% pyrite
2290: Silicified hornfelsic quartzite, 1% pyrite

2293-2487 Arkosic quartzite, hornfelsic, epidotic, argillic; epidote in stringers and nodules white to gray, medium-to fine-grained; local pyritic zones up to 0.5% pyrite local maroon arkosic zones.
2364-2388: Maroon mudstone becomes coarser with depth
2388: Fined-grained shaley gray quartzite, trace pyrite

2398-2408: Maroon mudstone
2408: Fine-grained gray quartzite, 0.2-0.4% pyrite, epidote nodules
2413-2473: Epidotic, hornfelsic, shaley, very fine-grained quartzite. Top and bottom strongly mottled with epidote stringers-intensity decreased toward middle, epidote nodules throughout, disseminated pyrite and chalcopyrite
2429-2430: Sphalerite stringers 1/8" wide
2434-2438: Sphalerite stringers
2438-2473: 1% disseminated pyrite

2487-2501 Medium-grained argillic quartzite, thin beds, 70°, varying epidote, no pyrite
2490: Pyrite increases to 3% with depth, epidote
2497: Sphalerite veins

2501-2510 Shaley hornfels, epidote and clay stringers, 0.5% disseminated pyrite grain size increases downward.

2510-2765 Fine grained, white quartzite, locally argillic, clear, variable disseminated pyrite
2560-2578: Shaley quartzite, epidotic, hornfelsic, epidote nodules, trace pyrite
2597-2605: Disseminated pyrite, chalcopyrite, galena, sphalerite, epidotic
2611-2642: Fine-grained argillic quartzite, epidotic, local pyrite, trace chalcopyrite
2642-2674: Fine-grained quartzite, 0.1-0.2% pyrite, a few sphalerite-galena-chalcopyrite-pyrite stringers
2674: Argillic quartzite, epidote nodules, 0.5% pyrite
2699-2706: Quartz-epidote-chlorite tactite and veins, trace pyrite and chalcopyrite
2706-2709: Very fine-grained white argillic quartzite, trace pyrite
2709-2758: Very fine-grained, highly epidotized, argillic quartzite, 0.5% pyrite
2758-2765: Red arkosic quartzite, no pyrite

2765-2881 Alternating gray quartzite and maroon mudstone, no pyrite or epidote
2765-2789: Quartzite
2789-2791: Mudstone
2791-2797: Quartzite
2797-2802: Mudstone
2802-2809: Quartzite
2809-2810: Mudstone, some epidote
2810-2881: Quartzite, some epidote

2881-3415 Alternating hornfelsic shales and gray quartzites, both epidotized
2881-2884: Hornfelsic shale, 1% pyrite, trace chalcopyrite
2884-2895: Quartzite
2895-2961: Hornfelsic shale, no pyrite, pink, bedding 60°
2961-2982: Quartzite, heavy epidote below 2975, trace galena, sphalerite, very vuggy

2982-3002:	Hornfelsic shale	no disseminated pyrite
3002-3019:	Quartzite	
3019-3044:	Hornfelsic shale	
3044-3059:	Mudstone, pyrite on fractures	
3059-3080:	Bleached hornfelsic shale, abundant epidote nodules	
3080-3140:	Quartzite, trace of pyrite and chalcopyrite, minor epidote, locally arkosic	
3140-3145:	Bleached epidotic hornfelsic shale	no disseminated pyrite
3145-3177:	Quartzite, spotty epidote	
3177-3209:	Bleached epidotic hornfelsic shale	
3207-3230:	Quartzite, spotty epidote	
3230-3240:	Epidotic hornfelsic shale 3231-3234 bornite and chaclopyrite along seams	
3240-3267:	Quartzite, minor epidote	
3267-3278:	Epidotic hornfelsic shale	
3278-3291:	Quartzite	
3291-3312:	Epidote hornfelsic shale	
3312-3337:	Quartzite	
3337-3357:	Epidote hornfelsic shale 0.5% pyrite, trace chalcopyrite	
3357-3362:	Quartzite, no pyrite	
3362-3367:	Epidote hornfelsic shale	
3367-3415:	Quartzite, some pyrite on fractures	
3415	End of hole	

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THIN SECTION REPORT

ON CHARLESTON PROPERTY

November 5, 1969

Preliminary thin section work was done on fifty-four diamond drill core specimens from borehole #4, Charleston Property. The specimen classification with brief explanatory notes is presented below:

Sample	Footage	Classification	Remarks
S69-920	1435'	Quartzite	Consists to over 90% of quartz grains with overgrowth in fg cementing quartz-chlorite matrix. Minor carbonate, feldspar. Well sorted.
S69-921	1460'	Quartzite	Ditto S69-920
S69-922	1477'	Quartzite	Ditto S69-920
S69-923	1488'	Quartzite	Ditto S69-920
S69-924	1506'	Quartz-andesite porphyry	Fg plagioclase-chlorite-(hornblende) matrix with phenocryst of quartz, partly saussuritized plagioclase and hornblende. Minor carbonate replacement. Green colour of phenocrysts in hand specimen is due to epidote replacing plagioclase.
S69-925	1520'	Quartz-andesite porphyry	Ditto S69-924
S69-926	1535'	Quartz-andesite porphyry	Ditto S69-924
S69-927	1570'	Quartz-andesite porphyry	Ditto S69-924

Sample	Footage	Classification	Remarks
S69-928	1604'	Lapilli tuff	Aphanitic quartz-chlorite rich matrix, holds strongly altered fragments of silicates, now largely consisting of epidote and carbonate. Some admixed clastic material.
S69-929	1630'	Tuffaceous sandstone, possibly brecciated	Very fragmental; partly a poorly sorted quartzite, but mostly a fg chlorite carbonate rock with particles of angular quartzite. Strong carbonate metasomatism.
S69-930	1640'	Tuffaceous sandstone to greywacke	A fg quartz-chlorite matrix holds abundant angular grains of quartz and some volcanic rock fragments.
S69-931	1650'	Quartzite, poorly sorted	Abundant angular quartz cemented by fg quartz matrix, partly replaced by carbonate with epidote. Some sericite.
S69-932	1670'	Arkosic quartzite	Poorly sorted, more plagioclase grains than in S69-931.
S69-933	1700'	Quartzite, poorly sorted	Mostly quartz cemented by quartz-sericite-chlorite. Some zeolites.
S69-934	1704'	Quartzite, poorly sorted	As S69-933
S69-935	1747'	Quartzite	As S69-920; quartz shows overgrowth.
69=936	1768'	Quartz-andesite porphyry	Ditto S69-924
S69-937	1788'	Andesite porphyry	Ditto S69-924, no quartz phenocrysts
69-938	1800'	Recrystallized greywacke?	Fragmental. A matrix of lathy quartz contains fragments of tuff, chloritic volcanics. Abundant disseminated pyrite cubes. True nature of this rock remains doubtful.

Sample	Footage	Classification	Remarks
S69-939	1812'	Arkosic quartzite	Ditto S69-932
S69-940	1817'	Recrystallized quartzite	Consists essentially of lathy quartz, some carbon metasomatism.
S69-941	1830'	Quartzite	Ditto S69-920
S69-942	1840'	Altered intermed. volcanic	Basically an altered andesite without phenocrysts
S69-943	1860'	Arkosic quartzite	Poorly sorted, as S69-932
S69-944	1880'	Arkosic quartzite	Poorly sorted.
S69-945	1890'	Quartzite	Ditto S69-920
S69-946	1898'	Quartzite	A somewhat pebbly appearance, otherwise as entry above.
S69-947	1900'	Quartzite	Ditto S69-920
S69-948	1902'	Tuffaceous sandstone?	Very fg matrix with clastic quartz grains, disseminated pyrite. Border case between a type of mudstone and tuffaceous sandstone.
S69-949	1930'	Quartzite	Ditto S69-920, but more interstitial fg matrix with much epidote and carbonate. Minor feldspar.
S69-950	1950'	Quartzite	Poorly sorted, ditto S69-931
S69-951	1975'	Quartzite	Poorly sorted, ditto S69-931
S69-952	1994'	Altered tuff	Much replacement by carbonate in coarse particles, and by epidote-amphibole in an interlocking intergrowth.
S69-953	2002'	Greywacke	Contains abundant clastic quartz and lithic fragments in a very fg interstial quartz-chlorite-carbonate matrix.

Sample	Footage	Classification	Remarks
S69-954	2007'	Arkosic quartzite	Ditto S69-932, with abundant clastic feldspar.
S69-955	2045'	Dacite porphyry	Basically a quartz-feldspar porphyry, strong carbonate-epidote alteration. In general more sodic and silica rich than the quartz-andesite porphyries
S69-956	2070'	Arkosic quartzite	Ditto S69-954
S69-957	2090'	Arkosic quartzite	Ditto S69-954, transitional to a greywacke.
S69-958	2115'	Tuffaceous sandstone	Mixture of clastic quartz and lithic fragments in very fg matrix; similar to S69-930.
S69-959	2125'	Tuffaceous sandstone	As above entry, less coarse particles, much matrix of ashy nature.
S69-960	2140'	Quartzite	Poorly sorted, ditto S69-931
S69-961	2150'	Quartzite	As above entry
S69-962	2180'	Quartzite	Ditto S69-920; well sorted with overgrowth of quartz.
S69-963	2210'	Greywacke	Similar to S69-953. Mixture of clastic particles in an interstial fg quartz-chlorite-sericite-carbonate matrix.
S69-964	2240'	Arkosic quartzite	Transitional to a greywacke and a quartzite. Similar to S69-956
S69-965	2256'	Andesite porphyry	Ditto S69-937
S69-966	2276'	Andesite porphyry	Ditto S69-937
S69-967	2290'	Andesite porphyry	Ditto S69-937
S69-968	2300'	Quartzite	Poorly sorted, angular quartz, as S69-931

Sample	Footage	Classification	Remarks
S69-969	2330'	Tuff	A tuff with minor quartz sand; some lapilli; minor epidote.
S69-970	2340'	Tuffaceous sandstone	Mixture of quartz and lithic fragments in an ashy matrix; similar to S69-958
S69-971	2364'	Tuff to tuffaceous sandstone	Similar to above entry, finer grained.
S69-972	2374'	Tuff	Similar to S69-969
S69-973	2386'	Tuff	Similar to S69-969

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POLISHED SECTION REPORT

ON CHARLESTON MINE

October 28, 1969

Three chips of diamond drill core from borehole #4, Charleston Property, Arizona, were received for polished section examination. The footages of the three specimens are given as: 1729' (S69-915); 1890' (S69-916) and 2424' (S69-917).

Specimen S69-915 @ 1729': A fine grained quartz-feldspar rich rock (latite?) carries about 5% disseminated sulfides. These are major pyrite, minor sphalerite, some galena and a very few specks of chalcopyrite. Pyrite occurs as euhedral cubes measuring up to 400 microns in diameter. Sphalerite forms very ragged, amoeba-like particles (figure 1) ranging in size up to one millimeter across. Smaller and more euhedral sphalerite grains are scattered throughout the rock matrix in minor amounts. Galena is present in trace amounts, usually in close association with sphalerite. Figure 1 shows a typical occurrence of galena as inclusions in sphalerite and as an intermittent rim around the sphalerite particle. In other places galena occurs as small isolated grains in the rock matrix. Small specks of chalcopyrite are found as inclusions in sphalerite.

Pyrite does not contain any visible inclusions of sphalerite, galena or chalcopyrite, but carries numerous inclusions of gangue constituents. A rough estimate of the relative sulfide proportion in the rock is about 85% pyrite, 10% sphalerite, $\leq$5% galena and $<<$1% chalcopyrite.

Specimen S69-916 @ 1890': A fine grained quartz rich rock with about 12 to 15% sulfides. Again the bulk of the sulfides is pyrite, here forming coarse grained lensoid to stringery aggregates. A small proportion of pyrite occurs as small disseminated euhedral grains in the rock matrix. Sphalerite and galena are present in minor amounts and form

angular disseminated grains, again showing a close affinity for each other (figure 2). Chalcopyrite occurs as small inclusions in sphalerite and also as minute grains disseminated throughout the matrix.

Sphalerite in this specimen lacks the ragged, amoeba shaped grain boundaries. It may contain inclusions of galena and chalcopyrite. Pyrite is full of inclusions of gangue constituents but free of other sulfide components. The relative sulfide proportions are estimated at 90% pyrite, 5% sphalerite and galena each and a trace of chalcopyrite. Silver minerals and lead sulfosalts were not observed.

Specimen S69-917 @ 2424': A fine grained volcanic (?) containing about 7% disseminated sulfides. These are mainly coarse grains of pyrite, small particles of sphalerite and a few specks of chalcopyrite. Galena was not observed.

Pyrite tends to form stringery aggregates measuring up to five millimeter in length. The individual euhedral pyrite grains measure up to half a millimeter across. Gangue inclusions in pyrite are less common than in the other two specimens, but a few minute specks of chalcopyrite were seen in some of the pyrites. Sphalerite is present as disseminated grains measuring up to 100 microns across. The relative sulfide proportions are roughly 95% pyrite, >3% sphalerite and <2% chalcopyrite.

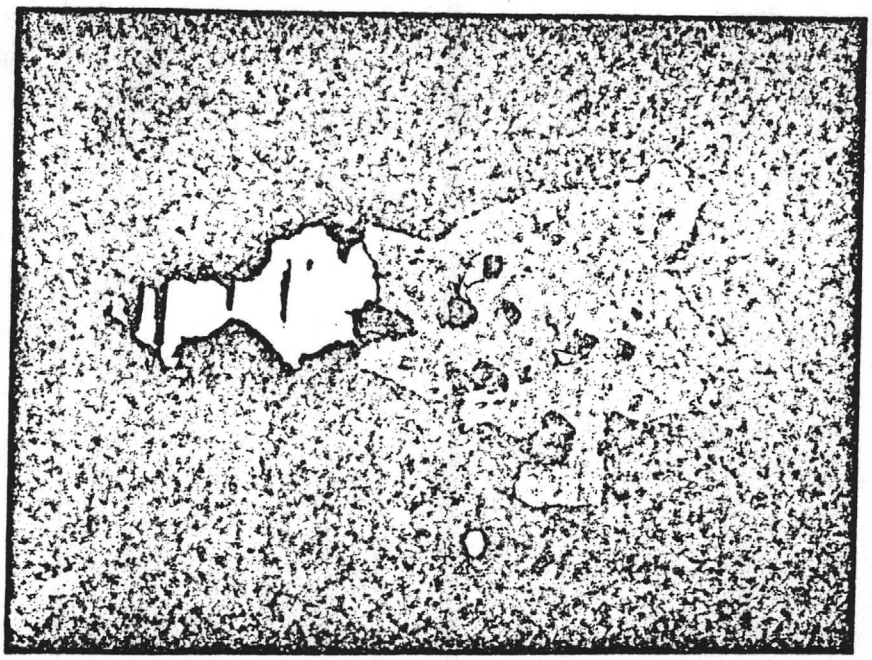
The specimens were submitted for chemical analysis; the assay data will be reported when they become available.

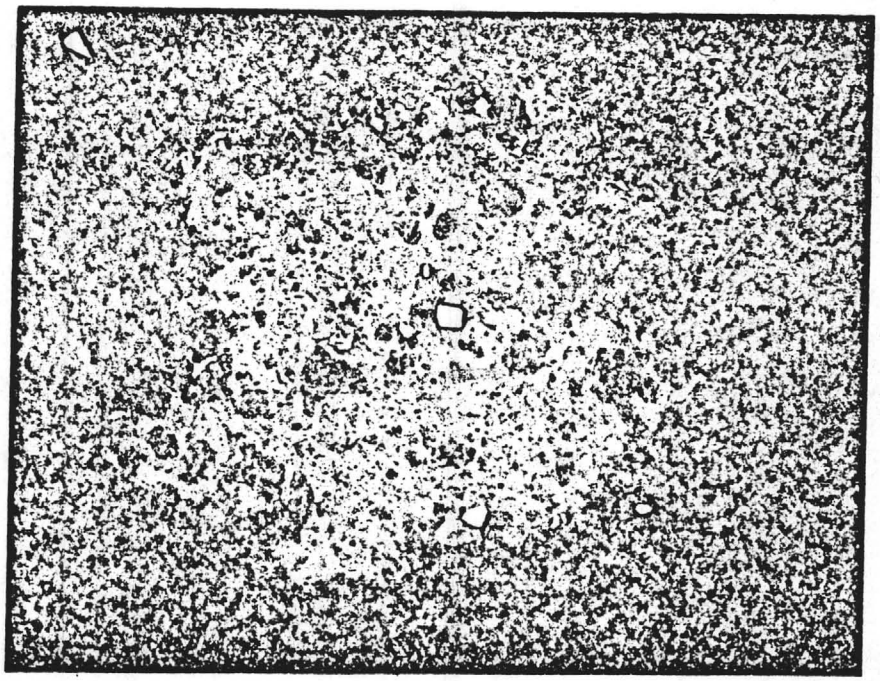
Figure 1: Specimen S69-915 @ 1729';
Polished Section;
magnification 90X.

A ragged grain of sphalerite (medium grey) contains abundant inclusions of gangue (dark grey), some pyrite (bright, relief), galena and chalcopyrite (light grey). Along the outside of the sphalerite a thin rim of galena occurs intermittently.

Figure 2: Specimen S69-916 @ 1890';
Polished Section;
magnification 120X.

Sphalerite (medium grey, left) and galena (bright, right). The sphalerite contains a few inclusions of galena (central area, slight relief) and chalcopyrite (bottom area) in addition to some particles of gangue. Another particle of sphalerite is seen in the upper right corner.





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Alteration	Chalcopyrite	Sphalerite	Galena	Ag	Pyrite	Rock Type

Alteration

	Sericite		Garnet
	Kaolin		Serpentine
	Silica		Biotite
	Chlorite		K Feldspar

0-S52 Meta andesite

50

100

150

200

250

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Alteration	Chalcopyrite	Sphalerite	Galena	Ag	Pyrite	Rock Type	
							300
							350
							400
							450
							500

Alteration

	Sericite		Garnet
	Kaolin		Serpentine
	Silica		Biotite
	Chlorite		K Feldspar

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Alteration	Chalcopyrite	Sphalerite	Galena	Ag	Pyrite	Rock Type	
							550
							600
							650
							700
							750

Alteration

	Sericite		Garnet
	Kaolin		Serpentine
	Silica		Biotite
	Chlorite		K Feldspar

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Alteration	Chalcopyrite	Sphalerite	Galena	Ag	Pyrite	Rock Type

Alteration

	Sericite		Garnet
	Kaolin		Serpentine
	Silica		Biotite
	Chlorite		K Feldspar

800

850

852-941 Meta andesite, with calcite stringers

900

941-948 Fault gouge

948-1080 Meta andesite breccia; fragments of andesite, quartzite, red siltstone and arkose. Arkose contains minor diss py.

950

1000

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Alteration	Chalcopyrite	Sphalerite	Galena	Ag	Pyrite	Rock Type

Alteration

	Sericite		Garnet
	Kaolin		Serpentine
	Silica		Biotite
	Chlorite		K Feldspar

1050

1080-1106 Arkose with less than 1% finely diss py (minor epidote stringers at 1100-1104)

1106-1130 Fault gouge - epidote on fractures

1100

1130-1133 Siltstone

1133-1134 Arkose, banding 50° to core axis, possibly bedding

1134-1137 Red siltstone

1137-1156 White quartzite, very minor diss fine grained py

1150

1156-1159 Quartzite breccia, gougy with inclusions of porphyritic rock

1159-1162 Quartzite

1162-1167 Quartzite breccia with angular fragment of porphyry, gougy material with sericite

1200 1167-1210 Porphyry, highly altered with much sericite and clay, 1167 to 1185 brokern with much gouge, py more abundant in gouge zones

1210-1222 Arkose, .5% py, crushed zone

1222-1229 Porphyry, 1% py altered with some sericite

1229-1277 Fine ground white quartzite with very minor diss py, 1% banding 50° to core axis

1250

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Alteration	Chalcopyrite	Sphalerite	Galena	Ag	Pyrite	Rock Type

Alteration

	Sericite		Garnet
	Kaolin		Serpentine
	Silica		Biotite
	Chlorite		K Feldspar

1277-1307 Fine grained gray hornfels, very little quartz. Rock mottled 1284-1292; fine grained py diss throughout, approx 2%, grades into quartzite

1300

1307-1326 White qtzt, fine grained, very minor diss py, 1% or le
1326-1391 Arkose, crushed zone 1331-1336, healed fault zone 30° to core axis at 1332, mottled and fine grained 1357-1359, mottled and fine grained 1388-1391, Diss py-.5%

1350

1391-1398 Arkose, minor diss py -.5%
1398-1402 Crushed zone with clay and sericite, diss sulphides, minor sphalerite - 3% total sulphide

1400

1402-1424 Arkose, grades to qtzt at 1424
1424-1455 Qtzt, grades to arkose at 1455

1455-1487 Arkose qtzt, 1478-py, galena, sphal and cpy diss through the rock, spal 20%, galena 2%, cpy 1%. 1479 1" solid galena and sphal; 1480-1481 gouge with sericite; 1483-1484 gouge with sericite; 1480-1481 diss sphal and py, 5% sulphides

1450

1487-1494 Stony arkose or qtz, strong silicification, diss py-5%
1494-1496 Same

1500 1496-1498.5 Mottled arkosic qtzt mineralized 5%-10% py some chlorite

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Alteration	Chalcopyrite	Sphalerite	Galena	Ag	Pyrite	Rock Type

Alteration

	Sericite		Garnet
	Kaolin		Serpentine
	Silica		Biotite
	Chlorite		K Feldspar

1498.5-1501 Qtz andesite - porphyry highly altered some sericite w/chlorite and sulphides 5% py 3% gal. 5% sphal

1501-1590 Porphyry broken and altered but less sericite, more chlorite, sulphide, mostly py-1% mineralized plus 3% sulphides some sphal and gal 190-191, several ½" stringers, minerals 10° to core axis

1550

1590-1688 Greenish grey tuffaceous qtzt, 3% sulphide 1590-1591; badly broken and gougy 1594-1598; fractures 10° to core axis calcite filling on fractures. Some epidote and chlorite? Mottled, 1611-1612 no core, 1612-1616 60% core, 1612-1616 chlorite with 2% py 1% galena 2% sphal .5% cpy; 1626-1631 grades to siltstone, 1631-1636 highly silicified, quarts and epidote stringers 10° to core axis. 1636-1643 badly broken with some sericite. 1626-1688 silicified pink colored tuff. 1663-1665 gouge and broken, badly broken and gouge 1672-1713

1600

1650

1688-1726 Coarse grey qtzt, some chlorite, py 2%, sericite and clay in gouge zone. 1727-1730 minor diss sphal, galena

1726-1745 Grades back into silicified pink arkose

1700 1746-1747 White quartzite

1747-1762 White qtzt. ground to powder

1750

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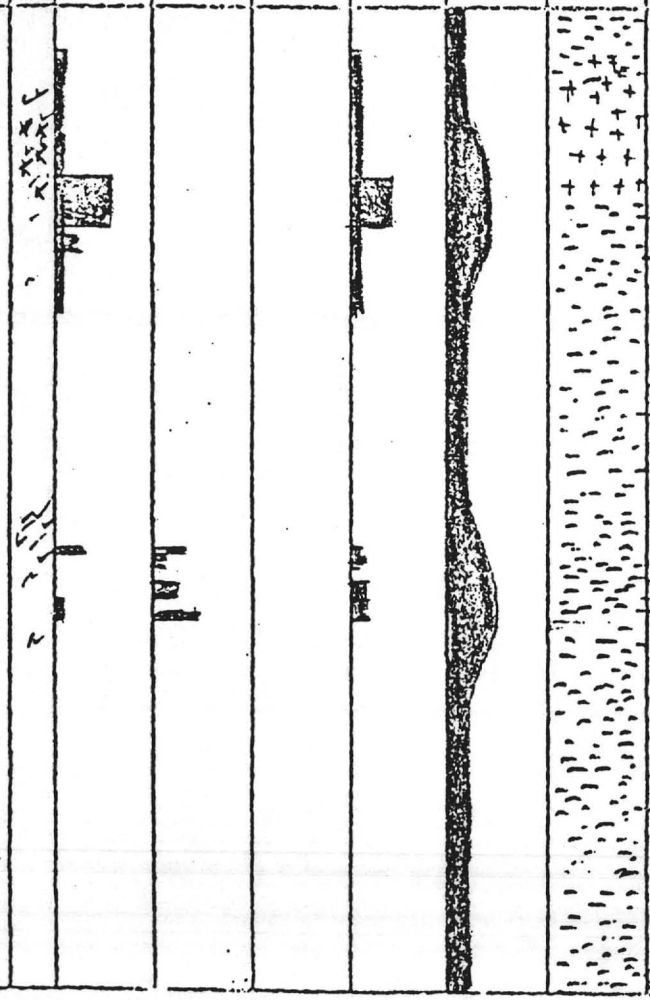

Alteration

	Sericite		Garnet
	Kaolin		Serpentine
	Silica		Biotite
	Chlorite		K Feldspar

1762-1773 Grades from quartzite to andesite porphyry, very soft and highly altered, some chlorite, 5% py, .5% cpy.

1773-1791.5 Andesite porphyry, green altered feldspars, some introduced pink K feldspar?

1791.5-1802 Mineralized zone, originally arkosic quartzite or greywacke primarily cpy 10-15% average. Minor galena and sphalerite

1800

1802-1812 Arkosic quartzite, 1802-1803 20% core recovery, gouge 1806-1810 60% core recovery, 3% sulphides mostly py, 3% dis cpy 1810-1812

1812-1822 Quartzite with diss 5% cpy, minor galena and sphal

1850 1822-1824 Arkose with numerous calcite stringers 2% sulphides mostly py

1824-1831 Quartzite, 2% sulphides, mostly py

1831-1833 Quartzite, light grey, 1-2% py, silicified vein 6" wid sphalerite and lead, 5% sulphides

1833-1854 Silicified arkose, purple and coarse grained with diss galena and sphal, 1852.5-1853.5, 6% sulphides

1900

1854-1871 Arkosic quartzite, light gray to light purple, py .5%

1871-1874 Broken fine grained gray qtzt, with 1% py, minor sphal specks, some chlorite blebs

1874-1882 Light gray qtzt, py filled fracture 45° to core at 18 sulphides -.5%

1950 1882-1895.5 Gray quartzite, diss py and sphal 1% sulphides, chlorite in last one foot.

1895.5-1903 Mineralized arkosic qtz which appears to be almost porphrytic with introduce chlorite (cpy, sphal, py) 5-6% sulphides

1903-1906 Dark gray very fine grained tuffaceous sandstone with blebs of olivine, diss sulphides, mostly py 3-5%

2000

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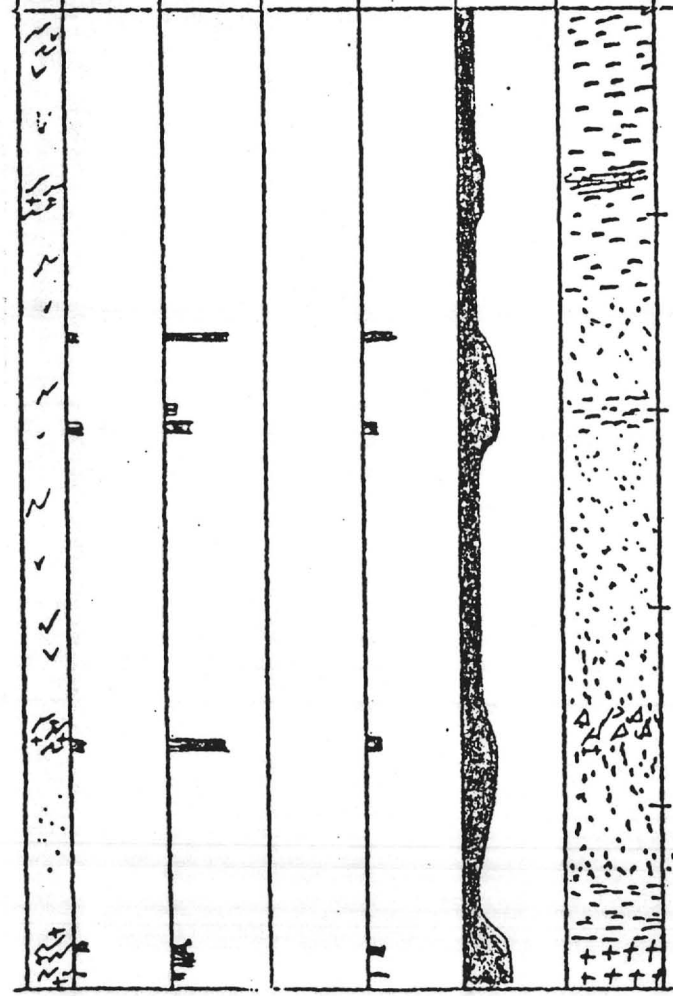
Alteration	Chalcopyrite	Sphalerite	Galena	Ag	Pyrite	Rock Type

Alteration

	Sericite		Garnet
	Kaolin		Serpentine
	Silica		Biotite
	Chlorite		K Feldspar



1906-1939 Brecciated & cemented arkosic qtzt very much mottled w/chlorite, olivine. Rock appears pink, py -.5%. 1920-1925 very dark gray siltstone silicified with 2% py. Very highly altered and bleached.

1929-1957 Light gray qtzt, 1938-1940 similar to pre section, sulphides .5%, blebs of olivine surrounded by chlorite

2050

1957-1969 Highly altered arkose? with much sericite and minor chlorite highly bleached, banding 50° to core axis, diss sphal at 1963, 6" minor py in section -.5%

1969-2001 Very similar to section from 1906-1929, broken with sericite 1978-1979, 1" sphal vein 15° to core axis at 1998, py approx 1%

2100

2001-2003 Very dark gy-wacke, 3% py, minor specks of cpy

2003-2072 Lt gy arkosic qtzt, py -.5%, 10% py 2023-2026, 2034-2041 finer grained with more py and more highly altered, 1% py, fault zone with sericite, 2044-2046. Fault gouge 2053-2054. Strong alteration 50° to core axis at 2071.

2150

2072-2196 Siltstone, strong silicification w/olivine blebs and minor chlorite patches, some sericite; Arkose 2090.5-2094; 2097.5-2104 healed breccia, mineralized zone, with introduce quartz phenocrysts, 1.5' core lost, 10% sphal, 2% cpy, 5% py; 2101-2104 30% core recovery; 2123-2124 core is deep purple colored with white splotches; 2161-2181 core badly broken with much sericite; mineralized arkose, sphal 6%, cpy 2%, py 8%, 2183-2190, one foot core missing; 2190-2196 broken with sericite.

2200

2196-2225 Purple siltstone, bleached and broken with sericite 2198-2206, very dark purple 2214-2223

2250

2225-2242 Arkosic qtzt lt gy becomes porphyritic 2241 some sericite development near porphyry contact. Mineralized zone 22[illegible]5-2236, sphalerite [illegible] cpy 1%

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Alteration: Sericite, Kaolin, Silica, Chlorite; Garnet, Serpentine, Biotite, K Feldspar

Alteration | Chalcopyrite | Sphalerite | Galena | Ag | Pyrite | Rock Type

2242-2290 Andesite porphyry, 2249-2250 test for sphal. Mineraliz porphyry silicified altered with gouge and cpy 2% sphal 3% py 5%, sericite 30% core recovery, 2276-2283. 2277-2283 only 2' core recovered.

2290-2313 Arkose 2290-2291, 2" salmon colored igneous veinlet 10° to core axis at 2290, looks aplitic; quartzitic 2300-2309.

2300

2313-2334 Very fine grained gray silicified hornfels with minute angular quartz crystals as eyes look slightly oplitic from 2329-2334, becomes arkosic about 2330.

2334-2336 Dark Purple arkose, white splotches.

2336-2354 Purple siltstone, white lime silicates splotches. Grades to gray arkose at 2347 grades to gray arkose

2350

2354-2362 Gray arkose becoming very white quartzitic arkose at 2356, becomes gray arkose at 2358

2362-2377 Siltstone, gray to 2364 then purple to2377

2377-2384 Lime silicates with epidote splotches

2384-2387 Purple siltstone

2400

2387-2398 Greenish gray very fine grained silicified arkose ribbon rock or serpentinized 2392 grades into pink fine grained silicified arkose grades to gray 2394 -1% py.

2398-2408 Purple siltstone py -1%

2408-2413 Light gray to light purple arkose

2413-2472 Chlorite & epidote present. Lime silicates, considerable sericite, 10" sphal vein 30° to core axis 2438 gray arkose with sericite 2455-2456, 6" mineralization 2459, 3% sphal 3% cpy, 6' mineralization 2465 2% sphal 3% cpy overall py plus 1%

2450

2472-2487 White silicified tuff, 20% core recovery 2476-2487

2487-2497 Banded grayish purple siltstone grading to qtzt 2489-2497

2500

Hole No. 4
Elevation
Coordinates
Bearing
Depth
Inclination 90°

Charleston Project
Cochise County Arizona
Scale
Started
Completed

By

Alteration	Chalcopyrite	Sphalerite	Galena	Ag	Pyrite	Rock Type

Alteration: Sericite, Kaolin, Silica, Chlorite, Garnet, Serpentine, Biotite, K Feldspar

2497-2510 Gray arkosic qtzt mixed. 6" sphal at 2500 3% sphal.
2510-2559 White arkosic quartzite with sericite fairly well broken 2% py.
2559-2575 Light gray lime silicates and qzt, grades to gray arkosic qtzt
2550
2575-2613 Light gray arkosic qtzt & tuff, with purple bands 30° to core axis, 4% py, gouge zone 2578-2579, mineralized 2597
2613-2643 Light gray qtz, 5% py, white splotches

2643-2680 Tuff, gray to 2653 then changes to white arkosic qtzt to 2669 then gray qtzt to 2673 then grades to highly bleached tuff 2680, 8% py.
2600
2680-2693 Fine grained bleached arkosic qtzt, mineralized zone mostly py 5-8% 2691-2693 brecciated with sericite some cpy -.2 average 2% py.

2650

2693-2699 Andesite porphyry py -1%
2699.5-2705.5 Mineralized zone brecciated with much sericite, 50% core recovery split, py 5%, minor diss cpy and sphal.
2700
2705.5-2712 Gray fine grained silicified qtzt, by 3%, very minor specs cpy.
2712-2743 Very fine grained silicified qtz grades from white to gray containing py 1% with minor sphal argillaeous in spots. Brecciated and healed pink quartzite healed fractures 20° to core axis, py not present 2717-2722 white argillaeous qtzt
2750
2729-2740

Drill Hole No. 4
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Coordinates
Bearing
Depth
Inclination 90°

Charleston Project
Cochise County Arizona

Scale
Started
Completed

By

Alteration	Chalcopyrite	Sphalerite	Galena	Ag	Pyrite	Rock Type

Alteration

	Sericite		Garnet
	Kaolin		Serpentine
	Silica		Biotite
	Chlorite		K Feldspar

2743-2755 Light purple arkosic qtzt. Sulphides oxidized limonite on fractures 1' cpy and sphal 2754' Cu -.5 Zn 2.0

2755-2781 Light pink to purple siltstone purple 2758-2767. All oxidized. 6" mineralization 2768 (split) bleached hornfels 2769-2781. Splotches of epodite and chlorite

2800

2781-2802 Argillaeous quartzite grades to purple siltstone at 2788-2791, mineralized 1' 2784 (split) Bleached with splotches of epidote. Bleached siltstone 2791-2797. Purple siltstone 2797-2802

2802-2824 Bleached fine grained arkosic qtz

2824-2840 White coarse grained silicified arkosic qtzt. Very minor specks black mineral possibly bornite

2850

2840-2852 Fine grained siltstone bleached

2852-2889 Coarse grained white qtzt and tuff, sericite present, minor black specs present. 2882-2885 siltstone dark gray in color 2881-2884 contains 2% py.

2889-2929 Light gray arkosic qtzt banding 40-50° to core axis grades to silicified lime 2895-2929

2900

2929-2958 Bleached siltstone with sections of lime silicates, purple siltstone, large patches of epidote

2958-2973.5 Light gray, fine grained tuff

2973.5-2981 Very coarse grained greenish gray tuff and qtzt. Mineralized slickenside at 2973.5

2950

2981-3001 Bleached siltstone, white to purple same as 2929-2958

3001-3018 Find grained gray arkosic qtzt. Coarse grained 3011-3018

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Charleston Project
Cochise County Arizona

Scale
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By

Alteration	Chalcopyrite	Sphalerite	Galena	Ag	Pyrite	Rock Type

Alteration

	Sericite		Garnet
	Kaolin		Serpentine
	Silica		Biotite
	Chlorite		K Feldspar

3018-3100 Bleached siltstone white to purple numerous slikensides some sericite present, same as 2929-2958, numerous broken zones

3050

3100-3119 White arkosic quartzite

3100

3119-3242 Bleached siltstone white to purple some dark gray argillite same as 2929-2958. 3232-3234 borinite and cpy.

3150

3200

3242-3293 Arkosic quartzite, minor specs of black mineral with green (halos not copper)

3250

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Charleston Project
Cochise County Arizona

Scale
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Completed

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By

Alteration	Chalcopyrite	Sphalerite	Galena	Ag	Pyrite	Rock Type	

Alteration

	Sericite		Garnet
	Kaolin		Serpentine
	Silica		Biotite
	Chlorite		K Feldspar

3293-3301 Bleached siltstone white to purple same as 2929-2958

3300

3301-3303 Brecciated and calcite filled arkosic qtzt.
Beginning of sulphide zone again 6" cpy at 3303

3350

3400

3450

3500

6

Hole #4. pg 1

0' – 124½' Surface rock - fractured in places - manganese in water courses & seams.

124½' – 127' appears to be brown dirty mud - slick between the fingers, probably a form of sericite

127' – 128' Gray clay sericitic in nature, presence of few pyrites well dispersed throughout material.

128' – 153' alternates between gray andesite & Brown red andesite. Calcite in seams - 144-149 seams vertical. No pyrites -

153' – 154' altered sericite very siliceous, rock gray brown, No pyrites.

154' – 186' alternating gray - red, more red than gray - manganese present in gray. some vertical calcite seams - no pyrites.

186' – 188' dark flinty gray - all material to date is finely textured. No pyrites

188' – 193' Continues a lighter gray. No pyrites

193'. broken altered sericite

193' – 203' blocks inside do not correspond to footage on outside - footages given are two feet per tube. Gray fine grained - lots of iron stain in seams beginning to pick up a few pyrites. footage 203 is marked by block 197.

BX #20 199.

203' (block 197) – 205' altered sericite - well dispersed pyrites less than 1% concentration. Most in gray andesite. Lots of iron stain & manganese present in seams.

205' – 209' Gray more siliceous but finely textured - pyrites stay throughout this box.

Hole #4 pg 2

Adjust to footage according to markings on box.

Run 21. – 209' – 212' (there are 3 footing in box)
from gray to red brown. No pyrite –
4 inches of altered material at 212 – may not be sericite, stiff red
but stick to touch – seams are very slick.

212 } red to gray.
216 }

216 } fractured and mostly altered sericite. No pyrite.
228 }

228 } red to gray. No pyrite
235 }

35 – 6" altered sericite. ~~Same~~ No pyrite.

235 } same (red to gray)
238 }

238 } highly fractured – about 1% altered sericite. No pyrite
245 }

245 } same (light + dark gray)
259 }

259 – light pyrite
261 } pyrite heavier exceds 1% of content. well dispersed throughout
272 } material.

272 } pyrite congregate in seams.
274 }

274 } lose pyrite.

274 ft – 11:00 Wed – 30 July – [signature]
I respectfully request permission to take care of loss. Will resume next week!

2-24-4 231

File Hole 4 - (from Clark & Hughes)

HO64 - pg1.

274 } alternate dark gray - red brown - No pyrite. (1 fine pyrite at 275)
293 } gray material not real fine grained - all material with calcite seams, iron stain

293 } altered sericite. Very few ~~light~~ disseminated pyrite.
295 }

295 } dark gray - red brown alternating - fairly color gray with pink and
303 } and green with somewhat mottled at 300 ft.

303 } very broken calcite seams - iron + manganese stains.
307 } lighter gray.

307 } still broken - iron stain + a few pyrites.
310 }

310 } dark gray - to reddish brown - to greenish gray - somewhat more siliceous -
323 } granular + siliceous, not broken but lots of calcite seams, iron stains.

323 } very broken - some altered sericite - same alternating darker
328 } + lighter - no pyrites.

328 } same, ~~less~~ not broken.
332 }

332 8 inches altered sericite.

332 } same - gray to red brown.
341 }

341 } pyrites in a lighter gray
342 }

342 } same
372 }

372 } good pyrites in dark gray to light gray - sample at 381 -
384 }

384 } material darker - pyrites lighter fewer - stop at 390.
390 }

390 } ~~same~~ dark gray - granular - no pyrites.
408 }

408 } few pyrites in lighter gray
410 }

410 } same - as sample # 459 - No pyrites (this is the green, red, brown, gray material
472 }

Angle 2 from 60° to vertical at bo

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479 } [illegible] gray [illegible] brown. pyrite disseminated throughout
480 } [illegible] concentration - [illegible] inch calcite vein [illegible]
Vertical - contains pyrite.
480 } Same similar to sample 459 a little [illegible].
510

510 } Pyrite 510-515 light gray. 15[illegible] goes into red-brown + gray.
519

519 } as sample 459 to a ~~light~~ dark gray - as layers.
580

530 } pyrite in light gray
537

537 } dark gray no pyrite.
543

---

sample 459 - typical red brown gray green material.
" 541 - " dark gray material.
" 531 - " light gray with pyrite.

sample 381 - found only at 381

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Yellow gray to red brown material are in 2 to 3 ft layers -

Good
Clark