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Item 6

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November 29, 1969

Mr. W. R. Ransone
Geochemical Surveys
P. O. Box 19508
Dallas, Texas 75219

Dear Bill:

Enclosed are the descriptions of the drill samples of Bear Creek's diamond drill holes on the Cucomungo Spring prospect. Most of the samples are core. In some of the holes, the core was ground up by Molycorp for assay, in which cases I examined the ground material. In a few of the holes only a few samples are preserved. All this is explained for each hole in the descriptions . Following the description of each hole I summarized the important points under "General Impressions".

I would appreciate your sending two xerox copies of the logs.

Sincerely yours,

Robert A. Zeller, Jr.

ROBERT A. ZELLER, JR.
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November 27, 1969

Logs of Core Holes Drilled by Bear Creek Mining Company, Cucomungo Spring Prospect, Nevada

Samples from Bear Creek's drill holes on the Cucomungo Spring prospect are stored at the Nevada Bureau of Mines in Reno. All the holes were core drilled. However, some of the cores of the more interesting holes were ground up for assay by Molybdenum Corporation of America. These ground samples were examined and described as were the core samples. Some intervals of samples are missing.

The samples were logged rapidly and not in detail. Greatest attention was given to rock types, contacts, and degree of alteration of the Cottonwood granite. Molybdenite was noted where observed, but the samples were not examined specifically or carefully for molybdenum minerals. The assays are more reliable in indicating the amounts of molybdenum than are the core descriptions. The sample descriptions follow:

Cuco #1

location unknown; John Schilling believes that this hole is located on the rim at the nothwestern egde of the badlands area; this was the deepest hole drilled, the depth being 1438 feet; core samples logged.

10' - 60'	altered light gray Cottonwood granite, much clay and sericite, quartz stringers, some iron staining, some feldspars fairly fresh, phaneritic porphyritic texture common in most of interval, alteration confined to zones, a few veinlets of pyrite noted at 29 ft., primary quartz grains distinct in altered zones having finely crystalline groundmass, yellow stains common, bright yellow stains at 47 ft. probably ferrimolybdite, many zones of soft crumbly clay having original quartz grains and some soft sericite.
60-164.1	soft crumbly light gray to white clay and sericite with original quartz grains, iron stained, a few sringers of quartz up to 1 inch thick, some yellowish stains, a few thin zones have fresh feldspars and phaneritic texture, 1 ft. zone at 158 ft. of fresh granite with much finely crystalline quartz and some disseminated pyrite.
164.1-172	moderately fresh medium gray granite porohyry, large fresh feldspars, groundmass largely of finely crystalline quartz aggregate, disseminated small grains of pyrite, a few quartz stringers, a few small areas of sericite, a few 6" to 1' zones of soft crumbly white clay and sericite material stained with iron, a few yellow stains in clay intervals.
172-208	mostly moderately fresh gray granite as above but has crumbly gray zones composed of finely crystalline aggregates of sericite and quartz with disseminated pyrite, original large quartz grains

Drill logs, Cucomungo Spring prospect, continued

present, a few white clay-sericite zones, single partly decomposed grain of molybdenite at 195 ft, small quartz veinlet at 205 ft. has much pyrite and sphalerite in close association.

208-275.7 mostly soft white crumbly clay-sericite, some zones of moderately fresh granite as above, disseminated pyrite in some zones, a few zones of altered rock partly hardened by secondary silica, molybdenite with pyrite in quartz veinlets at 270-271 ft.

275.7-361.9 granite, cream-gray color, fairly fresh appearance, hard due probably to pervasive secondary quartz, feldspars have bright cleavages, disseminated pyrite and a few pyrite stringers, disseminated patches of sericite, a few flakes of unaltered biotite preserved at 280-285 ft. , several zones of white soft crumbly sericitic material, several thin zones of aplite, a few grains of sphalerite at 276 feet, a little molybdenite paint on fracture at 308 ft., much moly paint and several 1/8" very finely crystalline molybdenite veinlets at 325-327 ft., granite in moly zones is fresh-looking though probably has been silicified, 6-inch quartz vein at 360 ft. has moly paint on fractures.

361.9-420 alternate zones of white crumbly sericite rock, fractured quartz vein material, and fairly fresh granite with disseminated pyrite and a few fresh biotite grains; change from above unit gradual; "fresh rock" has bright feldspar cleavages but also has blobs of finely crystalline quartz-sericite aggregates (feldspar undoubtedly secondary); most sericite-rich zones soft and white but a few are fairly hard; molybdenum paint on some fractures; a $\frac{1}{4}$ inch vein of finely crystallized molybdenite at 374 ft., much bright yellow ferrimolybdite throughout.

420-440 fairly fresh-looking medium gray and cream mottled granite with some fresh biotite and with areas of sericite; also, some zones especially rich in sericite while retaining granitic texture; pyrite quite common as disseminated grains and in a few veinlets; some quartz veinlets with pyrite and with moly paint; very few soft crumbly sericite zones; a little dull yellow stain.

440-462 mottled medium gray and cream-yellow, soft, crumbly, sericitic granite preserving granitic texture in many zones; fresh biotite (secondary?) in some zones; a few zones of hard "fresh" granite with blebs of biotite and sericite; dull yellow stains common; disseminated pyrite.

462-596 white soft sericite-rich clay that came from drill hole as soft mud; a few 1-foot hard zones of "fresh" granite having feldspars and with disseminated pyrite and with areas of sericite; some pyrite in veinlets; a little moly paint and slickensides at 530 ft, dull yellow stains in some zones, some moly at 573 ft.; soft zones have less disseminated pyrite than hard zones.

Drill logs, Cucomungo Spring prospect, continued

596-632 medium gray altered hard granite with some cream-colored zones having fresh (secondary?) feldspar and biotite, most of gray hard rock is silicified and does not preserve biotite or feldspar but retains granitic-like texture due to original quartz and sericite areas, much disseminated pyrite, a few fractures with moly paint, a few zones of soft crumbly white sericite with dull yellow stains.

632-697.9 mostly white soft crumbly sericite-rich rock, some of harder zones preserve a little original granitic texture, a little disseminated pyrite throughout but not nearly as much as in hard rock, some of soft material is clay, some of texture suggests brecciation.

697.9-782 mostly hard medium gray "fresh" and silicified granite with feldspar and biotite in some zones, disseminated pyrite throughout, veinlets of quartz and of pyrite, some of quartz veins have pyrite, some of the hard rock composed of finely crystalline quartz-sericite groundmass with original large quartz grains, a few white soft sericite-clay (low in pyrite) zones, molybdenite noted in a few of the quartz and the quartz-pyrite veinlets.

782-940 mostly white soft crumbly sericite-clay material with only a small amount of disseminated pyrite, a very few 1-2 ft. zones of "fresh" cream-colored hard granite with fresh-looking biotite and feldspar and with areas of sericite, a few quartz veinlets and disseminated pyrite in hard rock, a few fracture surfaces have molybdenite paint.

940-998 light gray and cream finely phaneritic aplite, some zones hard, some are crumbly and soft; finely disseminated pyrite; the fresh rock shows fresh feldspar, no biotite, and is much finer grained than the granite; apparently much pervasive secondary silica; small masses and flakes of sericite; some soft zones of sericite-clay; a few pyrite veinlets; a few fracture surfaces have moly paint.

998-1012 coarse grained fresh(?) hard granite porphyry, a little disseminated pyrite, white zones of clay-sericite, a 6 inch zone of crushed quartz and pyrite at 1012 ft.

1012-1111 white soft crumbly sericite-clay material with very little disseminated pyrite, a few 6 inch to 1 ft. zones of medium gray "fresh" coarse grained granite with cream mottling.

1111-1116 dark gray finely crystalline altered diorite with a little disseminated pyrite: a dike or a xenolith.

1116-1432 white soft crumbly sericite-clay material as above; a few 6 inch to 2 ft. zones of hard "fresh" coarsely crystalline granite (with fresh-looking feldspar and biotite probably of secondary origin) with small patches and aggregates of sericite-quartz and much disseminated pyrite, a 10 ft. interval of such hard granite 1164-1174, a little molybdenum in thin stringers at 1218 in hard granite zone, a little moly paint on fracture at 1305 in hard granite.

Drill logs, Cucomungo Spring prospect, continued

1432-1438 hard mottled "fresh" granite porphyry with disseminated pyrite and areas of pyrite

1438 bottom of hole

General impressions of Cuco #1:

1. About 80% of core is soft white sericite-clay material lean in pyrite. This may have formed by deep weathering.
2. The granite that looks fresh is probably quite altered. The fresh feldspars and biotite may be secondary. Much of the groundmass seems to be made of finely crystalline quartz that is probably pervasive secondary silicification. Thus, this rock is probably highly siliceous.
3. There is no obvious change in degree of alteration or of content of molybdenum with depth in the hole.
4. Except for the small diorite interval, there are no changes in rock type in the hole. The changes described from one paragraph to the next are gradational and not abrupt.

2AA (Cuco#2)

located near Poison Spring; all core was ground up so that no core is available for study; ground samples were examined from 58 ft. to the bottom of the hole at 832 ft.; not every bag of samples was examined so that many zones containing molybdenum were undoubtedly missed.

58-832 fragments of silicified hard Cottonwood granite composed mostly of quartz with disseminated pyrite and small patches of fine grained mixture of quartz and sericite, both original quartz grains and secondary quartz noted, fresh feldspar and biotite crystals (probably secondary); some sample bags have soft sericite fragments that suggest the presence of soft intervals in core, some fragments are composed entirely of sericite, sericite is very conspicuous throughout, many quartz fragments have patches of sericite; molybdenite flakes at 330 ft., molybdenite flakes in sericite at 660 ft.

General impressions of 2AA:

Cottonwood granite continues from top to the last ground core at 832 ft. Sericite-quartz alteration and pyrite content do not change from the surface down to the last sample. Not enough of the samples were seen to judge whether the molybdenum content changes with depth.

3AA

located in badlands area east of Alum Creek; total depth 737 ft.; ground-up samples from 10 ft to 395 ft.; core samples 395 ft. to bottom of hole at 737 ft.

10-395 hard light gray siliceous Cottonwood granite with disseminated pyrite, much silica, and some sericite; some areas almost entirely sericite; some pieces of nearly pure quartz with sericite; residual quartz grains; some soft zones indicated by finely ground white

Drill logs, Cucomungo Spring, continued

powder; molybdenite flakes at 185 ft., a few flakes of molybdenite disseminated in solid sericite at 215 ft., molybdenite flakes at 225 ft.

394.6-460 hard altered light gray Cottonwood granite with much sericite and quartz, much of silica is finely crystalline and replaced feldspar, original quartz grains preserved, pyrite fairly abundant in disseminated grains and in veinlets, some zones of "fresh" granite with fresh feldspar and biotite of probable secondary origin, a few zones of soft clay-sericite white material, molybdenite flakes noted in a soft pure sericite zone at 434 ft.

460-528 same as above except proportion of hard silicified granite to soft sericite-clay material about 50-50; disseminated pyrite common in hard material but scarce in clayey material.

528-538 white nearly pure sericite, moderately soft, little or no clay, scattered original quartz grains, some areas of secondary silica, some flakes of secondary biotite, disseminated pyrite moderately abundant in some zones and rare in others.

538-584 white soft crumbly sericite-clay material; some zones almost completely of sericite, very little disseminated pyrite, a little secondary biotite.

584-597 alternate zones of hard siliceous granite having fresh secondary feldspar and of white soft crumbly sericite-clay material.

597-676 white soft crumbly sericite-clay material with small amount of disseminated pyrite and some secondary biotite; several 6 inch to 1 ft. zones of hard siliceous granite having more pyrite, especially in quartz veinlets; several zones of almost pure sericite having little pyrite; a few zones of the "fresh" hard rock show fresh secondary feldspar and biotite.

676-713 light gray hard "fresh" Cottonwood granite with some fresh secondary feldspar and biotite, much of rock is quartz (secondary), small amount of sericite in patches, disseminated pyrite and pyrite in veinlets, a few soft light gray zones of crumbly clay with little or no sericite.

713-737 light gray hard "fresh" granite with many 1/8th inch diameter dark brown clusters of finely crystalline secondary biotite, disseminated pyrite, groundmass has glassy original quartz grains, porcelaneous areas of secondary quartz, some zones of nearly pure quartz that resemble quartzite, a few quartz veinlets with pyrite blebs, some sericite in fractures; last rock of core is fairly fresh looking Cottonwood granite with fresh feldspar.

737 bottom of hole

General impression of 3AA:

Altered Cottonwood granite continues from surface to bottom of hole. Amount of sericite decreases with depth but silica content either remains about the same or increases. Thus, there seems to be less intense alteration with depth.

Drill logs, Cucomungo Spring, continued

4AA

located west of Alum Creek in metasediments; samples of sludge and cuttings labeled "4RBAA" are assumed to be from this hole ("RB" may stand for rotary bit); sludge and cuttings samples to depth of 480 ft.; total depth of hole 587 ft; in addition to the cuttings, 3 bags of ground up core are present and were examined.

10- 15 brown soft metasediments

45- 50 mixture of brown metsediments(?) and grains of quartz and feldspar

90- 95 light gray quartz and feldspar sand (derived from Cottonwood granite)

100-105 light gray quartz and feldspar sand

140-145 Cottonwood granite; a little sericite noted though sericite is not well preserved in these cuttings which have been washed.

205-210 Cottonwood granite

295-300 " "

355-360 " " ; mostly fine grained clay fragments with a few quartz grains

375-380 " " " " " " " " " " "

395-400 " " " " " " " " " " "

400-480 typical Cottonwood granite; quartz, pyrite, biotite, light color.

descriptions of 3 bags of ground up core from 4AA:

125-130 most hard chips are of silicified Cottonwood granite, mostly white quartz with a little disseminated pyrite; much white clay; one fragment has much pyrite and sphalerite.

535-540 soft light gray sericite and clay with original quartz grains; altered Cottonwood granite.

575-580 altered light gray Cottonwood granite; much quartz, sericite, disseminated pyrite.

General impressions of 4AA:

Samples are quite unsatisfactory: only the three bags of ground core are known to be from this drill hole. The sludge and cuttings samples are probably from this hole. According to the sludge samples, the first 50 feet of the hole is in metasediments and the remainder is in altered Cottonwood granite. This seems a likely sequence for the hole as it started in metasediments not far from the granite contact.

Drill logs, Cucomungo Spring, continued

5AA

located on rim northwest of badlands; drill cores from surface to the bottom of the hole at 650 feet were examined.

0- 52 light gray altered Cottonwood aplite with much silica, sericite present and abundant in some zones, original quartz grains, iron stained, some clay zones, pyrite weathered from rock, some soft white zones of clay and sericite.

52-156 light gray altered aplite, groundmass mostly of fine and medium grained secondary quartz and some sericite, no biotite preserved, veinlets of quartz and sericite and pyrite, larger original quartz grains preserved, some soft light gray and white crumbly zones of sericite and clay, a little disseminated pyrite in hard rock, hard rock composed mostly of silca but with feldspar crystals about the same size as quartz grains.

156-178 white and light gray soft crumbly sericite and clay, disseminated pyrite, some parts brecciated, a few thin zones of aplite as above, a zone of soft brown clayey material from 225 to 229 ft. has a 1 inch zone of pyrite quite rich in molybdenite.

178-240(?) typical Cottonwood granite, medium grained, phaneritic, patches of cream feldspar and grains of quartz, a few fresh feldspar and biotite grains, disseminated pyrite.

240-286 soft white clay-sericite material with some disseminated pyrite, some zones with crushed quartz vein material, most of material has large residual quartz grains and cream colored clay that represents the former large grains of feldspar; this was derived from alteration of typical coarsely crystalline Cottonwood granite; a few patches of sericite.

286-350 altered hard to medium hard altered coarsely crystalline Cottonwood granite, some parts composed almost entirely of sericite-quartz groundmass and original quartz grains, much disseminated pyrite, a few crystals of fresh feldspar, some zones of soft clay-sericite with residual quartz grains.

350-351 milky quartz vein with some disseminated pyrite and molybdenite.

351-418 same altered coarsely crystalline Cottonwood granite with cream colored patches of clayey and sericitic feldspar, disseminated pyrite, , residual quartz grains, some parts hard, much of rock somewhat soft, some hard zones are aplitic with sericite and quartz, disseminated pyrite, most of rock is white soft crumbly clay sericite.

418-500 soft white crumbly clay-sericite, a few 6 inch zones of hard sericite rock with original quartz grains, a few 6 inch zones of hard siliceous granite, most of rock conspicuously rich in sericite; disseminated pyrite, some veins of pyrite, single small specks of molybdenite noted at 421', 433', 498'; concentration of moly flakes at 435'; some thin zones of quartz with disseminated pyrite and molybdenite flecks, one such zone at 495'.

500-650 fairly hard white sericite-quartz rock with disseminated pyrite, some

Drill logs, Cucomungo Spring, continued

pyrite veinlets, some zones hard due to more silica, as core is muddy no molybdenite showings were noted; a few zones of soft clayey material derived from alteration or deep weathering of typical coarse-grained Cottonwood granite, quartz grains preserved, some sericite in these zones; many zones extremely rich in sericite, a few thin zones of fairly fresh looking granite with some fresh feldspar and biotite (probably secondary), some zones of secondary finely crystalline silica with vugs.

650 bottom of hole

General impressions of 5AA

Typical silificied and sericitized Cottonwood granite occurs from surface to bottom of hole. There is no change in degree of alteration or of mineralization with depth.

6AA

located on andesite capped hill northwest of badlands area: samples are core.

0-279.6 andesite, black, translucent on thin edge; some of andesite in lower hole is medium gray and may be somewhat tuffaceous; last foot of core is black hard typical andesite

300.6 bottom of hole

General impressions of 6AA

The andesite is the same that caps several of the hills of the area.

7AA

this is an angle hole drilled from the rim along the northwestrn end of the badlands area; samples are of unsplit core; core recovery good.

0- 20 altered or weathered Cottonwood granite, feldspars converted partly to clay, original quartz grains present, iron stained, hard, brecciated.

20- 79 hard siliceous granite, residual quartz grains, patches of silica and sericite, fracture zones that are vuggy, a few zones of soft white crumbly sericite, brecciated quartz vein 36-38 ft., some zones of intermediate hardness with some sericite and clay, one 2 ft. zone of white moderately firm clay with few grains of quartz or sericite.

79-126 soft crumbly white sericite-clay material particularly rich in sericite, some zones moderately firm, disseminated pyrite, a few thin zones of hard silicified granite.

126-245 hard light gray sericite-quartz rock with enough secondary quartz to make it hard, disseminated pyrite, primary quartz grains, a few thin zones of soft pure sericite; due to the small size of primary quartz grains, this rock may have been finely phanertitic originally; molybdenite paint at 179', 189', and 225'; some of pyrite in blebs and veinlets.

Drill logs, Cucomungo Spring, continued

245-278 crumbly sericite-quartz rock, similar to above except that it is broken into small pieces, some parts of interval are of soft rock, several soft zones of pure sericite, several 6 inch zones of massive pyrite.

278-402 hard sericite-quartz rock with disseminated pyrite, some softer zones have greater proportion of sericite, original texture is finely phaneritic, a few intervals of fairly fresh fine grained granite with only small patches of sericite and silica, some soft intervals consist almost entirely of sericite; molybdenite flakes at 302', moly paint at 350' in 3 inch mass of pyrite.

402-421 white soft crumbly material composed mostly of sericite with lesser amount of clay, disseminated pyrite,

421-428 hard white silica rock with areas of sericite, a few quartz veins, disseminated pyrite.

428-476 firm white sericite rock with disseminated pyrite, some clay, a few zones of hard siliceous rock with less sericite, residual quartz grains present and small.

476-492 hard finely crystalline granite, some fresh biotite and feldspar, disseminated pyrite, granite medium to finely crystalline with glassy original quartz grains, a 1 inch quartz vein with pyrite noted, a few thin soft intervals with sericite.

492-550 firm sericite rock, disseminated pyrite, brecciated, a few quartz-pyrite veinlets, a few zones of fresh fine-grained granite, a few zones of finely crystalline silica, some zones of soft clay with minor amount of sericite.

550-616 hard moderately fresh finely crystalline granite, fractured to small pieces, disseminated pyrite, no sericite, fresh biotite, much silica (secondary), a few zones not fractured, sericite in zones and especially in fractures near 600'.

616-671.2 coarse grained Cottonwood granite, fairly fresh, hard, biotite crystals, cream patches of quartz-sericite in fine grained mixtures, disseminated pyrite, a few soft white zones rich in sericite and residual quartz grains, most of soft zones have more clay than sericite.

671.2 bottom of hole

General impression of 7AA:

The entire hole is in Cottonwood granite which gets coarser grained in lower part of hole; the intensity of alteration fluctuates but seems less intense in lower part of hole; molybdenum mineralization in less in lowerpart of hole

Drill logs, Cucomungo Spring, continued

8AA

located in floor of Alum Creek; samples are unsplit muddy core.

10- 26 breccia composed of fragments of aplite with a little pyrite; yellowish stains, porous with many vugs: some fragments look like hornfels.

26- 34.1 breccia of hornfels interbedded with soft white and tan clay zones.

34.1- 43 altered light gray Cottonwood granite, rich in silica, some clay, disseminated pyrite, zones of white soft crumbly clay.

43- 60.4 white soft crumbly sericite-clay material (altered Cottonwood granite) disseminated pyrite, some parts show original quartz grains.

60.4- 88 white soft crumbly sericite-clay material, tiny crystals of disseminated pyrite, residual quartz grains: some zones of sericite-quartz rock with little clay, more resistant than clay zones.

88-113 light gray altered granite composed mostly of sericite and secondary quartz, a little biotite noted, disseminated pyrite, some zones of white soft crumbly clay material with sericite and residual quartz.

113-171 altered hard light gray granite mottled with cream patches, some parts are of fairly fresh Cottonwood granite having fresh feldspar and biotite, most of altered rock very rich in silica, cream patches consist of finely crystalline mixture of quartz and sericite, disseminated pyrite, most of interval hard though some parts are of soft clay material; sphalerite noted at 114 ft., small bleb of molybdenite with quartz and pyrite at 160 ft.

171-202 white altered crumbly clay-sericite material with minor zones of fresh-looking (probably silicified) hard granite as above, a little finely disseminated pyrite in clay zones and hard zones.

202-305 hard altered light gray granite with cream-colored patches of finely crystalline mixtures of quartz and sericite, probably pervasive quartz alteration through most of rock, zones of fresh feldspar and biotite (secondary) disseminated pyrite throughout, a few soft zones of sericite-clay, some zones composed entirely of coarsely crystalline sericite and quartz, some zones of nearly pure quartz with lesser amount of sericite and with disseminated pyrite, some zones brecciated, original glassy quartz grains present throughout.

305-306 typical Uncle Sam quartz monzonite porphyry; biotite occurs as finely crystalline aggregates along grain boundaries, color medium gray, large scattered feldspar phenocrysts, disseminated pyrite; probably a xenolith.

317-320.5 dark gray fine textured rock composed mostly of silica - probably hornfels; no disseminated pyrite; slickensided surfaces with mica (chlorite?); rock is apparently ~~xx~~ a xenolith.

320.5-346 hard light gray silicified Cottonwood granite, disseminated pyrite, large fresh (secondary) feldspar in some parts, some zones brecciated,

Drill logs, Cucomungo Spring, continued

no sericite in this interval except for a little on fracture surfaces, some dark gary zones of possible fault gouge, chlorite and pyrite on some fracture surfaces, slickensides common on small fragments.

346-351 breccia composed of dark gray fine grained material (hornfels?) with very fine grained disseminated pyrite.

351-355 light gray clay and breccia

355-362 dark gray hornfels breccia, crumbly, some pieces banded, a little disseminated pyrite, some of soft zones are of clay and sericite.

362-368.9 light gray Cottonwood granite, hard zones rich in silica, some white soft clayey zones, disseminated pyrite throughout, a little sericite present but not conspicuous.

368.9-376.6 mostly medium gray altered granite with some zones of $\frac{1}{4}$ inch diameter finely crystalline biotite clusters, disseminated pyrite, much quartz, a few disseminated flakes of molybdenite at 376 ft.; this rock is not Uncle Sam porphyry.

376.6-389 mostly light gray altered Cottonwood granite, much silicification, no sericite, disseminated pyrite, a few $\frac{1}{4}$ inch clusters of dark brown finely crystalline biotite, much pervasive silica, a few flakes of molybdenite at 386 ft.; though this looks like Cottonwood granite, it is not typical.

389-398 hornfels, dark gray, fine textured, a little very finely crystalline pyrite, a few concentrations of finely crystalline biotite or chlorite with pyrite and brown oxide, slickensides, several thin zones of light gray silicified granite as above.

398-405.8 slickensided chlorite with thick zones of nearly solid pyrite having patches of epidote, one such epidote zone more than 1 ft. thick, one 6 inch zone of white tremolite with a little disseminated pyrite.

405.8-408.5 hornfels, dark gray, a little fine disseminated pyrite.

408.5-410.5 light gray almost completely silicified Cottonwood-like granite with traces of original texture and with a little disseminated pyrite.

410.5-415.2 mostly soft crumbly dark gray hornfels, mostly clayey.

415.2-418 light gray hard medium crystalline marble, a little disseminated pyrite, several half inch diameter blebs of pyrite.

418-419.3 dark gray finely crystalline marble

419.3-420.3 white hard tremolite

420.3-429 light gray Cottonwood-like granite, mostly silicified, a little biotite and fresh feldspar, disseminated pyrite, mostly fractured to small fragments.

429 bottom of hole

Drill logs, Cucomungo Spring, continued

General impressions of 8AA:

The location of this hole is in the Cottonwood granite only a short distance east of the contact with the metasediments. The first part of the hole, except for the upper 30 feet, passed through Cottonwood granite. The lower part alternately passed through granite of Cottonwood type and hornfels. Thus, the hole must have cut along the intrusive Cottonwood-hornfels contact. Assuming that the hole was drilled vertically (we have no information on the angle, if any, of the hole), the contact must have a steep dip to the east.

9AA

located on rim at northwest end of badlands near base point; Molycorp also drilled near here; one of the holes is an angle hole drilled at an angle of minus 54° in a S. 17° W. direction; thus, 9AA may have been an angle hole.

0-157	hard siliceous coarsely crystalline Cottonwood granite, sericite in patches, disseminated pyrite, some of granite has clay instead of sericite replacing feldspar, large residual quartz grains, a few soft clay-sericite zones, a few intervals of moderately fresh looking granite with fresh feldspar (probably secondary).
157-178	soft white crumbly clay-sericite material, some fractured, hard silicified granite zones.
178-184	hard moderately fresh-looking Cottonwood granite with disseminated quartz, feldspar and biotite fresh (secondary?).
184-286	soft white clay material, little sericite, a few intervals of hard fresh-looking granite, a few small concentration of sericite noted though sericite is not very abundant in this interval, disseminated pyrite, some quartz veinlets, a few soft zones have abundant sericite, sphalerite noted at 215 ft.
286-309	hard fairly fresh granite with fractured zones, some zones of soft clay and minor sericite, disseminated pyrite, yellowish stains.
309-329	soft white crumbly sericite-clay material with abundant sericite in some zones, brecciated.
329-405	hard siliceous fresh-looking granite, some zones especially hard and with fresh biotite and feldspar, disseminated pyrite throughout, a few 1 ft. zones of soft white pure sericite, molybdenite paint on fractures in sericite at 398 ft.
405-431	soft white crumbly clay material with some intervals rich in sericite, some zones of hard quartz-sericite rock with disseminated pyrite.
431-485	hard fairly fresh looking granite with disseminated pyrite, some zones of quartz with disseminated pyrite, a little sericite, a few sericite-quartz zones have pyrite veinlets.
485-509.8	soft crumbly white sericite-rich material, some hard zones of silica

Drill logs, Cucomungo Spring, continued

with vugs and pyrite and disseminated flakes of molybdenite, moly flakes noted at 494 ft., 498 ft., and 502 ft.

659 bottom of hole; cores from the lower part of the hole are missing.

General impressions of 9AA:

The entire hole was in altered Cottonwood granite. Alteration increases with depth. Molybdenum shows apparently increase with depth. The missing core of the lower 150 feet was probably ground up for assay by Molycorp; assays show higher molybdenum values in this part of the hole.

10AA

located between Alum and Cottonwood Creeks north of "Cinder Cone"; as this hole had good values in molybdenum the core was ground up for assay by Molycorp; the ground up material was examine and is described below; only a small portion of the samples are present; the log below is not complete or detailed, and only general lithologies are given.

36.4-40 white altered Cottonwood granite, much sericite, original granitic texture preserved, no pyrite, much pervasive quartz.

155-164.4 white altered Cottonwood granite, much sericite and quartz, some disseminated pyrite.

164.4-166.9 same as above

227-699 same as above; most of rock is silica though original granitic texture still visible; rock shows no biotite or fresh feldspar and is quite siliceous; some of material of cuttings is soft white crumbly clay indicating the presence of some zones of soft clay in hole; disseminated molybdenite visible in many of samples, molybdenite closely associated with pyrite; molybdenite flakes noted at 272 ft. and at 359 ft.

699-717 dark gray fine textured hornfels with a little disseminated pyrite; probably a xenolith.

717-733 light gray silicified Cottonwood granite with disseminated pyrite; much quartz, some sericite, a few biotite crystals preserved near lower part of samples; flakes of molybdenite occur with pyrite crystals.

774.7 bottom of hole

General impressions of 10AA:

Except for 18 feet of hornfels, all the hole is in Cottonwood granite. Granite is altered more by silicification than by sericite-silica type. Molybdenite shows are rather abundant.

Drill logs, Cucomungo Spring, continued

11AA

located in floor of Cottonwood Canyon; samples are of unsplit core.

0- 20	dark gray andesite (float material)
20-35	fresh-looking Cottonwood granite, large fresh biotite crystals and fresh feldspar, a little disseminated pyrite, iron stained, very poor core recovery.
35-45	altered Cottonwood granite, much sericite and quartz, disseminated pyrite, some zones of fresh granite, poor core recovery.
45-53	white soft clay-sericite material
53-59	dark gray, weathered, andesite or diorite.
59-105	breccia composed mostly of soft crumbly fractured clay-altered Cottonwood granite with much clay,sericite, and quartz; disseminated pyrite, some zones of gray clay, residual quartz grains.
105-106.5	hard altered granite with disseminated pyrite, quartz veinlets with borders of coarse sericite, areas of sericite in rock.
106.5-190	soft white sericite-clay rock with disseminated pyrite, some parts distinctly brecciated, a few thin hard zones of altered granite which have pyrite, a few thin hard zones have fresh feldspar and biotite, molybdenite paint on sericite at 157 ft., molybdenite flakes in silicified granite at 178 ft.
190-254	mostly hard light gray altered Cottonwood granite, some areas with fresh feldspar and biotite, some quartz and pyrite veinlets, disseminated pyrite, some of rock almost entirely quartz, some patches of sericite, a few white thin soft zonesrich in sericite and clay
254-327	white soft sericite and clay, disseminated pyrite, residual quartz grains, a few hard zones of siliceous granite with disseminated pyrite, 219.9-301.4 ft. soft mud of clay and sericite.
327-349	light gray hard altered Cottonwood granite composed mostly of quartz (primary and secondary), patches of quartz-sericite mixture, disseminated pyrite, molybdenite in flakes with pyrite in sericite rock at 333 ft.
349-365	soft white crumbly sericite and clay, a few zones of hard siliceous granite with sericite-quartz veins having pyrite and occasional flakes of molybdenite.
365-381	medium to light gray hard silicified granite with disseminated pyrite, biotite flakes, a few fresh feldspar crystals, composed mostly of silica, some patches of sericite especially on fracture surfaces.
381-445.2	soft white crumbly sericite and clay with disseminated pyrite, a very few streaks of hard silicified granite, same intense degree of sericitization and lesser silicification of typical Cottonwood

Drill logs, Cucomungo Spring, continued

granite to bottom of hole, molybdenite paint on fracture in hard siliceous granite at 419 ft.

445.2 bottom of hole

General impressions of 11AA:

Altered Cottonwood granite extends from top to bottom of hole. Silicification is stronger near the surface and sericitization is stronger near the bottom. Molybdenum is present. This hole is particularly signicant in showing that the zone of altered Cottonwood granite and of potential molybdenum ore extends far to the southeast of the badlands area.

12AA

located in metasediments southeast of base point; samples are of core.

0-190 dark and medium gray hornfels that is soft and gives poor core recovery, hard streaks of siliceous dark gray limestone, some zones of white soft crumbly clay, a little pyrite in fractures in upper 40 feet, iron staining common in upper part, light brown garnet in many zones, some white zones of quartzite, much silica in the hard intervals of rock, a few cream colored beds of marble, pyrite at 169', many zones of breccia and soft crumbly material, disseminated tiny pyrite crystals in area near 189 ft.

190-203 marble, white and cream, finely crystalline, some crumbly zones of probable breccia.

203-249.5 mostly hornfels, hard and siliceous, banded light and dark gray; crumbly zones of white clay and breccia, some beds of white marble, some light brown crystals of garnet in marble, much of rock is nearly pure silica that has been brecciated.

249.5-263.5 typical fairly fresh Cottonwood granite, biotite, some fresh cream-colored feldspars, some of feldspars slightly clay-altered, hard, disseminated pyrite, pyrite in a few minor quartz veinlets; the cream colored areas have much pervasive silica; no sericite.

263.5 bottom of hole

General impression of 12AA:

The hole penetrated the intrusive contact at 249.5 ft., a fact that indicates a fairly gentle dip of the contact to the east.

13AA

located east of Cottonwood Creek; samples are core that has not been split.

61.9-111 Cottonwood granite, light gray, looks fresh but may be silicified, much quartz, disseminated pyrite, hard, fractured to small fragments,

Drill logs, Cucomungo Spring, continued

some quartz veinlets with borders of sericite and with pyrite, some apparently fresh biotite(flakes are large which may suggest primary origin), a little sericite in silica patches in many parts of core though sericite is not abundant, a few flakes of molybdenite in 1 inch bleb of pyrite at about 68 ft.

111-116 white soft crumbly sericite-rich material with some clay.

116-228 same siliceous hard granite as above with some biotite flakes, disseminated pyrite, some 1 inch feldspar phenocrysts, patches of sericite near quartz-pyrite concentrations, much silica in groundmass seems to be pervasive, poor core recovery, rock mostly shattered to small fragments, zone rich in molybdenite flakes at 150 ft., some zones medium gray due to much secondary biotite in finely crystalline masses, a few thin clayey zones, sericite patches with quartz present but not abundant, some small xenoliths resemble Uncle Sam porphyry.

228-250 white soft clay with quartz vein fragments, some sericite, disseminated pyrite, sericite on fracture surfaces and with quartz veins, many 1 ft. zones of hard siliceous granite that has been finely brecciated.

250-295 same as above but with more hard granite and less soft clay material, small xenoliths that resemble Uncle Sam porphyry, disseminated pyrite,possible xenoliths of other rock types, molybdenum paint with quartz and pyrite veinlet at 264 ft., molybdenum paint on side of quartz vein at 280 ft.

295-327 white soft crumbly clay-sericite material with minor amount of sericite, also quartz vein fragments, pyrite, a few zones of hard siliceous granite, molybdenite flakes in hard zone at 303 ft..

327-330 Uncle Sam porphyry, disseminated pyrite, a few patches of sericite, undoubtedly a xenolith.

330-347 white soft clay-sericite with quartz fragments, also hard siliceous typical light gray Cottonwwod granite with biotite and disseminated pyrite, concentrations of quartz and sericite.

347 bottom of hole

General impressions of 13AA:

This hole was in altered Cottonwood granite all the way. It is the farthest southeast of the holes drilled.

14AA

located east of Alum Creek in metasediments; samples are cores.

0- 30 light gray siliceous Cottonwood granite, coarse grained, cream patches of secondary quartz and sericite, some parts medium crystalline, may be float material or an apophysis of the Cottonwood stock.

Drill logs, Cucomungo Spring, continued

30-261 brown and dark gray metasediments, calcareous silty hornfels, some parts soft and shaly, other parts hard and banded with bedding, masses of pyrite and epidote up to 2 inch diameter, disseminated pyrite, veinlets of pyrite, some zones fractured, most parts are hard with only minor intervals of soft or fractured material.

261-264 white aplite dike with disseminated pyrite, fine grained, no biotite.

262-382 dark gray banded calcareous hornfels with disseminated pyrite as above, a few minor zones of white marble with a little pyrite, a few 6 inch zones of garnetized limestone with disseminated pyrite, zone of hard white fractured quartz and possible clay minerals 377 ft. to 379 ft.

382-396 white medium crystalline marble, a brown 1½ ft. zone very rich in disseminated pyrite, a few zones of dark gray crumbly hornfels.

396-422 dark gray finely fractured, mostly mud, pyrite, very little material hard enough to core.

422-427 soft white clay-sericite material with small fragments of quartz, disseminated pyrite in a few zones hard enough to core, residual quartz grains, a few flakes of molybdenite; this is obviously the altered Cottonwood granite.

427-445 soft clayey dark gray banded hornfels, 1 ft. of altered light gray silicified Cottonwood granite with disseminated pyrite and a little sericite at 442 ft.

445-461 mixture of dark gray clayey material from hornfels and light gray sericite and fractured quartz material from Cottonwood granite; all material soft and clayey and probably in a fault zone.

461-465.2 medium gray typical Uncle Sam granite, large gray phenocrysts, biotite in small crystals concentrated on grain boundaries, disseminated pyrite.

465.2 bottom of hole

General impressions of 14AA:

The hole passed through the Uncle Sam fault into Uncle Sam porphyry at 461 ft. which indicates that the Uncle Sam fault has a steep dip to the northeast in this area. The small intervals of Cottonwood granite penetrated may be horses or apophyses.

15AA

location of hole unknown; core to depth of 560.2 feet examined; all the core was of fresh Cottonwood granite with no sericite or clay alteration.

CM-24, copy

BEAR CREEK DRILL HOLES NOS. 2 to 15, Inclusive.
CUCAMONGA MOLYBDENUM PROPERTY
ESMERALDA COUNTY, NEVADA

There is no Drill Hole No. 1.

DDH #2 vertical (2)

0' - 832.0' Medium grained quartz monzonite, (cottonwood granite), clay, sericite, quartz alteration; first sign pyrite @ -15.0', first sign molybdenite @ - 17.0'. Pyrite content varies from 0.5% to 1.0%, molybdenite contact is less than 0.5%.

DDH #3 vertical (3)

0' - 461.0' quartz monzonite (cottonwood granite), clay, quartz, sericite alteration; first pyrite occurs @ - 32.0' first molybdenite occurs @ - 45.0', pyrite content ranges from 0.5% to 3.0%, molybdenite less than 0.5%. 461.0' - 626.0' strong sericite alteration destroying original rock texture. Estimates of sulfides remain as above.

626' - 737.0' quartz monzonite (cottonwood granite) as from 0.461.0'.

DDH #4 vertical (4)

0' - 168.0' marble with strong chlorite zones; first pyrite noted at 72.0'.

168.0' - 258.0' quartz monzonite (cotton granite), clay, sericite alteration.

258.0' - 320.0' quartz monzonite porphyry (Uncle Sam QMP)

320.0' - 363.0' quartz monzonite (cottonwood granite) clay alteration.

363.0' - 423.0' quartz monzonite clay, alteration porphyry (Uncle Sam QMP) clay alteration.

423.0' - 587.0' quartz monzonite (cottonwood granite) clay alteration.

Pyrite content varies from 0% to 4% from 72.0' to 587.0', molybdenite content is less 0.5% from 168.0' to 587.0'

DDH #5 vertical (5)

0' - 229.0' fine grained quartz monzonite (cottonwood granite); clay and sericite alteration. First sulfides occur at - 66.0'.

229.0' - 650.0' medium grained quartz monzonite (cottonwood granite) clay to sericite alteration exhibiting considerable variation in intensity.

Pyrite content varies from 0.5% to 4.0%, molybdenite less than 0.5%

DDH #6 vertical (6)

0' - 300.0' basalt

DDH #7 - 40 degrees, bg S20W (7)

0' - 671.2' fine to medium grained quartz monzonite (cottonwood granite), clay, sericite alteration of varying intensity.

First sulfide occur at 83.0'; pyrite content varies from 0 - 4.0%, molybdenite is less than 0.5%.

DDH #8 vertical (8)

0' - 36.0' conglomerate and hornfels

36.0' - 429.0' medium grained quartz monzonite (cottonwood granite), intrusive into (?) case quartz monzonite porphyry from 205.0' - 315.0'; clay, sericite alteration varying in intensity.

Pyrite first occurs at 22.0', molybdenite at 36.0'. Pyrite content varies from 0% to 4.0%, molybdenite in trace amounts only.

DDH #9 -55 degrees, bg. S10W (9)

0' - 659.0' fine to medium grained quartz monzonite (cottonwood granite); clay and sericite alteration with narrow silicified zones. Pyrite first occurs at 83.0', pyrite content varies from 0-4.0%; molybdenite first occurs at 104.0', molybdenite content less than 0.5%.

DDH #10 vertical (10)

0' - 774.7' fine grained quartz monzonite (cottonwood granite); clay, sericite, quartz alteration of varying intensity. Pyrite first occurs at 42.0'; pyrite content varies from 0 - 5.0%. Molybdenite first occurs at 91.5'; molybdenite content is less than 0.5%.

DDH #11 vertical (11)

0' - 445.2' fine-medium grained quartz monzonite (cottonwood granite); clay and sericite alteration. Pyrite and molybdenite first occur at 30.0'; pyrite content 0-4.0%, molybdenite less than 0.5%.

DDH #12 vertical (12)

0' - 137.8' metasediments, locally altered to hornfels, epidote - garnet and garnet.

137.8' - 157.0' aplite dyke

157.0' - 249.5' metasediments, locally altered to epidote-garnet skarn.

249.5' - 263.5' medium grained quartz monzonite (cottonwood granite); clay alteration. Pyrite in trace amounts from 137.8', very rare molybdenite from 249.5'.

DDH #13 vertical (13)

0' - 347.0' medium grained quartz monzonite (cottonwood granite); clay and sericite alteration. Pyrite first occurs at 54.5'; pyrite content 0-4.0%, molybdenite in trace amounts from 138.0'

DDH #14 vertical (14)

0' - 444.0' hornfels

444.0' - 465.2' quartz monzonite porphyry (Uncle Sam), clay alteration. First pyrite occurs at 51.0', pyrite content 0 - 2.0%. Trace of molybdenite at 444.0'