CONTACT INFORMATION
Mining Records Curator
Arizona Geological Survey
416 W. Congress St., Suite 100
Tucson, Arizona 85701
602-771-1601
http://www.azgs.az.gov
inquiries@azgs.az.gov

The following file is part of the Grover Heinrichs Mining Collection

ACCESS STATEMENT

These digitized collections are accessible for purposes of education and research. We have indicated what we know about copyright and rights of privacy, publicity, or trademark. Due to the nature of archival collections, we are not always able to identify this information. We are eager to hear from any rights owners, so that we may obtain accurate information. Upon request, we will remove material from public view while we address a rights issue.

CONSTRAINTS STATEMENT

The Arizona Geological Survey does not claim to control all rights for all materials in its collection. These rights include, but are not limited to: copyright, privacy rights, and cultural protection rights. The User hereby assumes all responsibility for obtaining any rights to use the material in excess of "fair use."

The Survey makes no intellectual property claims to the products created by individual authors in the manuscript collections, except when the author deeded those rights to the Survey or when those authors were employed by the State of Arizona and created intellectual products as a function of their official duties. The Survey does maintain property rights to the physical and digital representations of the works.

QUALITY STATEMENT

The Arizona Geological Survey is not responsible for the accuracy of the records, information, or opinions that may be contained in the files. The Survey collects, catalogs, and archives data on mineral properties regardless of its views of the veracity or accuracy of those data.

7

The American Mining Congress

RING BUILDING
WASHINGTON 6, D. C.

Publication of excerpts or summaries of this paper, not to exceed one-third of the full text, with appropriate credit line, by daily, trade or business publications is welcomed. For any fuller publication, permission of the American Mining Congress, Ring Building, Washington 6, D. C., is required.

GEOLOGY OF THE YERINGTON MINE IN NEVADA*

By

James R. Wilson, Geologist
Western Exploration Office
The Anaconda Co.
Reno, Nevada

INTRODUCTION

Discovery and development of the Yerington orebody at Weed Heights, Nevada, predate the decade of major discoveries reviewed by Dr. Park in the paper he is giving on this program, but it was during this era he discusses that Yerington joined the growing list of important, copper producers. After nearly nine years of operation, the deposit has yielded in excess of one-half billion pounds of copper.

Recognition of an ore potential and subsequent successful development of the deposit can be credited to thorough geologic appraisal and to management's recognition of the need for aggressive exploration to insure a continuing source of raw materials. Geologically, many features of the Yerington orebody are similar to other porphyry copper deposits but some aspects restrict its similarity to a limited group of these occurrences.

PREVIOUS WORK-SCOPE

Published geologic reference to the property is limited to a brief discussion by Knopf in U. S. G. S. Professional Paper 114 covering the geology of the Yerington District. Data conveyed herein are drawn from records of the company's geological department which have been maintained since initial stages of exploration. Mining has provided opportunity for detailed mapping of a porphyry copper literally from "grass roots."

LOCAL

The agricultural community of Yerington, located in the fertile Mason Valley of Lyon County fifty airline miles southeast of Reno, is the geographic center of the Yerington Mining District. Early copper production came from deposits situated in the central portion of the Singatse Range which flanks Mason Valley on the west and rises some 1900 feet above the valley floor. The Yerington Mine occupies a position on the alluvial fan one to two miles east of the sharp front of the range. The present meandering channel of the Walker River passes within 1200 feet of the eastern edge of the pit.

* Presented at the 1962 Metal Mining and Industrial Minerals Convention and Exposition, American Mining Congress, San Francisco, California, September 23-27, 1962.

DISTRICT HISTORY - PRODUCTION

Discovery of copper in the district is credited to the Comstock miners who sought copper sulphates for use in extraction of silver from their rich ores. Despite the early discovery date of 1865, substantial production was not recorded until 1912 by which time railroad access and smelting facilities had been provided. Flotation was introduced in 1918 and from that date until organized activity ceased in 1930, the early productive phase of the area attained its peak. By 1930, the district is credited with a production in excess of 116,000,000 pounds of copper derived from 3,000,000 tons of ore. Of this, approximately 30,000 tons was produced through leaser operations from the Yerington Mine property.

YERINGTON MINE - HISTORY AND DEVELOPMENT

Prior to 1910 the Yerington property was prospected by the Empire Nevada Copper Mining and Smelting Company. In 1913 and 1914 a drilling program was conducted by the General Development Company which indicated a limited tonnage of low grade oxide copper mineralization. At that time the property was considered uneconomic and all work was suspended. Many years later Messrs. Guild, Adams and Herron acquired the principal mining claims of the Empire-Nevada group and in 1941 the property was optioned from them by Anaconda. William Braden acted as Anaconda's agent in the business negotiations.

Interest by Anaconda was expressed as early as 1917 when on an examination trip to the district Reno Sales made note of the attractive character of the porphyry outcrops which had been drilled several years earlier. In 1940, at the suggestion of Mr. Sales, detailed mapping of the limited exposure was initiated by Robert S. Moehlman under the direction of V. D. Perry. This work defined structural relationships which suggested projections of the earlier drilled mineralization and the possibility of important ore under surrounding gravel cover.

Impetus for an accelerated development program was provided by the second world conflict. Between November, 1941, and February, 1945, nearly 70,000 feet of exploratory drilling and 3500 feet of underground advance were completed under the able direction of the late Alex M. McDonald. Drilling was carried out on a systematic grid pattern with holes spaced at 200-foot intervals. Both churn and diamond drills were employed. More often than not, drill core recoveries were poor, and both diamond and churn drills frequently yielded excessive volumes of cuttings. As a means of checking the validity of sample results and to provide bulk metallurgical samples, a 400-foot, vertical shaft was sunk from which crosscuts and laterals were extended in oxide at 200 feet, and in sulphide at 300 feet. A number of raises were driven on drill holes in both sulphide and oxide mineralization and thorough bulk sampling of these excavations provided essential confirmation of drill hole assays. Upon conclusion of this work, an important reserve of oxide copper mineralization had been established and a significant tonnage of sulphide ore indicated. Exploitation of the deposit was initially deferred, and for a number of years the project was maintained on an inactive basis representing a reserve for the future.

Early in the Korean conflict, the Federal Government was prompted to seek additional copper production to supplement war-time requirements. As part of that program and under the general direction of C. E. Weed, then vice-president in charge of mining operations for Anaconda, plans were made to bring the property into production. Under the management and aggressive supervision of A. E. Millar first copper was produced two years later.

GENERAL GEOLOGY

Triassic rocks invaded by one or more granitic and porphyritic intrusives provide the geologic setting for mineralization of the district. A thick section of post-mineral volcanics and extensive accumulations of late detrital material obscure broad areas of the older rocks.

Triassic Rocks The Triassic rocks are variable in character and all have been subjected to severe metamorphism. Principal units consist of andesitic flows and pyroclastic accumulations, dense felsites, and a sedimentary section including limestone, some quartzite and minor argillaceous members. It is noteworthy that with the exception of the Yerington Mine, essentially all of the district's mineral production has been derived from rocks of Triassic age.

Intrusive Rocks Granodiorite and quartz monzonite are the most widespread of the intrusive rocks which are believed to be of Cretaceous age. The earlier granodiorite is medium grained and exhibits but little variation in character. In contrast, the quartz monzonite displays striking textural differences varying from a coarse grained, porphyritic habit to a fine grained, equigranular texture. It is probably significant that the finer grained varieties appear to be limited in occurrence to loci of known mineralization.

Quartz monzonite porphyry is the principal host of the orebody. Typically it is composed of phenocrysts of oligoclase, perthite and quartz in a consistently aplitic groundmass of quartz and oligoclase. Some variation occurs in the proportion of phenocrysts to groundmass but the ratio is approximately one to one. Ferromagnesium minerals are biotite and hornblende.

Youngest of the intrusives is a porphyry referred to as tonalite which occurs abundantly throughout the district as dikes and small apophyses. Megascopically this porphyry may resemble the ore porphyry but can be distinguished by its distinct granophyric, groundmass texture.

Volcanic Rocks Volcanic rocks of probable Tertiary age are represented by several thousand feet of flows and pyroclastics underlain by a conglomerate of variable thickness. Quartz latite and overlying rhyolitic units comprise most of the section and have been designated as Hartford Hill Rhyolite by the U. S. Geological Survey. Andesite breccia conformably overlies the thyolites in one area, while a distinctive hornblende andesite with somewhat broader distribution unconformably overlies the section. Isolated areas of flat lying basalt represent the close of volcanic activity. Dikes of andesite, dacite and rhyolite cut all pre-Tertiary rocks and are considered the same age as the surface flows.

Structure The scattered distribution of formations underlying the late volcanics precludes a satisfactory understanding of the early structural history of the district. Exposures of the Triassic units exhibit northerly strikes and steep west dips. Significant folding of these rocks has not been observed. Within a radius of several miles from the mine, the Tertiary volcanic section maintains a north, to slightly east of north strike, and units dip from 45 to 70 degrees west with the steeper attitudes common.

Widespread pre-Tertiary shearing is evidenced by the numerous tonalite dikes which exhibit remarkable parallelism and, with but few exceptions, are limited in strike from N-60°-W to due west. Some movement along these same shear zones extended into the period of late vulcanism and provided channelways for emplacement of younger dike rocks.

The distribution of late volcanic rocks defines a complex structural history during late Tertiary time. Prominent east-west discontinuities sharply interrupt the thick volcanic section on strike and represent earliest faulting. Movement on a later braided system of strong, north-south, basin-range type faults has continued until recent time. Displacements of several thousand feet are indicated on strands of this system.

THE OREBODY

An elongate mass of quartz monzonite porphyry defines the locus of the orebody. The intrusive is recognized for a distance of approximately 6000 feet on its longitudinal axis of North-60°-West. Limited observations suggest that the northern edge of the porphyry is steep. The southern limit, though exhibiting numerous local irregularities, dips northerly at a moderate angle; thus, a cross-sectional view is that of a distorted "V". From a maximum width of approximately 2200 feet at its easternmost exposure, the porphyry narrows to about 1000 feet at the western limit of sub-gravel development.

On the north, host rocks of the porphyry are granodiorite and quartz monzonite. Granodiorite and fine grained rocks of variable character occur marginal to the porphyry on the south. Fine grained hybrid rocks, in part similar to those bounding the porphyry on the south, have been exposed by drill holes in other portions of the deposit, and although some appear to be derived from granodiorite by alteration, additional exposures and further study are necessary to determine their full genetic significance.

The porphyry is cut by a few southwest dipping, post-mineral andesite and rhyolite dikes. Tonalite occupies rather significant areas in the western portion of the deposit.

Distribution Of Mineralization In broad perspective, the distribution of ore conforms with that of the quartz monzonite porphyry. However, portions of the intrusive are unmineralized and significant ore values may extend into adjacent rocks. Important copper mineralization has been developed for a longitudinal distance of approximately 5400 feet. A maximum ore width of 1600 feet in the eastern part of the deposit decreases to about 600 feet at the western limit of development.

The cross-sectional shape of the eastern portion of the orebody is that of a flat lying lens with a maximum thickness of approximately 500 feet. Westerly, as the upper width of mineralization decreases in conformity with the narrowing of the porphyry, ore progressively increases in depth. Thus, at a position some 1500 feet from the western limit of development, the orebody attains its greatest thickness of 800 feet and in cross section resembles the distorted "V" outline of the intrusive host.

Mineralization occurs at the bedrock surface along nearly the entire length of the orebody. What portion of the original deposit was removed by erosion is not known.

Faulting Faulting with significant displacement has not been observed within the deposit, however, two prominent conjugate shear systems traverse the orebody and adjacent wall rock. One system parallels the longitudinal axis and exhibits moderate north and south dips; the second, with steep dips, varies little in strike from north-south. These opposing systems provided a closely spaced network of fractures which aided in the thorough oxidation of primary mineralization. Fragmentation during mining operations has been significantly enhanced by these fracture systems.

MINERALIZATION

The central portion of the orebody is the locus of maximum intensity of copper mineralization. It is characterized by vaguely bounded zones which conform in attitude with the deposit as a whole and whose copper content may exceed the average of the deposit by several times. Outward from this high grade core, copper values gradually decrease, though not uniformly. Economic limits are ultimately established by assay control.

Primary Minerals Primary sulphide minerals are essentially limited to pyrite and chalcopyrite. The relative proportions of these is variable but the average ratio of pyrite to chalcopyrite is substantially less than one to one. Minor bornite and covellite are observed and primary chalcocite has been detected microscopically. Molybdenite has only rarely been noted. The primary ore contains no appreciable gold or silver values.

Sulphide typically occurs as minute, discrete grains in the groundmass of the porphyry and as narrow, randomly oriented, discontinuous seams. Sulphide grains are not uncommonly enclosed within feldspar and quartz phenocrysts.

Aligned sulphide seams and veinlets attain their maximum development in the central, high grade portion of the deposit. This zone exhibits prominent quartz diking and pervasive quartz flooding of the porphyry. Elsewhere in the deposit, quartz diking is rare.

Oxidized Minerals and Secondary Enrichment The orebody is one of the few porphyries where geologic conditions were optimum for the formation of an important economic concentration of oxidized ore and one which manifests a minimum economic effect of secondary enrichment.

Viewed broadly, the lower limit of oxidation is sharp and distinct. It is slightly undulating and exhibits some minor fault displacements but in general conforms with the pre-gravel surface in being concave downward. Maximum vertical extent of oxidized ore is confined to the eastern one-half of the deposit where essentially the full vertical column of mineralization has been converted to oxide.

Redeposition of oxidized copper products is considered to have occurred for the most part in-situ. Some migration and deposition of exotic copper is evidenced by restricted concentrations within the oxide zone and by shallow secondary sulphide enrichment of the primary zone.

Principal oxidation product is the copper silicate chrysocolla which occurs irregularly dispersed throughout the rock and as narrow seams along fractures. Locally, clay-altered phenocrysts of the porphyry contain sufficient finely divided chrysocolla to constitute important ore. Massive concentrations of the silicate are limited to discontinuous, vein-like occurrences along fissures and as interstitial filling of breccia zones.

Cuprite, tenorite and melaconite all have a wide distribution, but within the oxide zone proper, significant concentrations of these minerals are of limited extent. Malachite and azurite occur but are not abundant. Certain ore grade zones exhibit only slight evidence of recognizable copper minerals. In these the copper has been determined to occur as an amorphous, hydrated, iron-copper oxide of variable copper content.

Lying between primary sulphide and the chrysocolla horizon is a transition zone in which chalcocite, cuprite, melaconite, native copper and chrysocolla occur super-

imposed upon primary mineralization. Limits of the zone are irregular in detail but seldom does the vertical range of this mineral assemblage exceed twenty feet. Immediately underlying the transition zone, prominent chalcocite replacement of chalcopyrite, and to a lesser degree pyrite, has developed through an average vertical range of thirty to forty feet. Secondary chalcocite has been detected as deep as 100 feet below the top of sulphide, but in such instances it is confined to narrow widths along recognizable post-mineral structures.

ALTERATION

Detailed reference to rock alteration must await completion of work now in progress. The following comments are based on field observations supported by limited petrographic study of specific problems.

Excluding the locus of high grade mineralization previously referred to as being characterized by intense silicification, porphyry of the primary zone is not appreciably altered. Feldspars exhibit only light to moderate clay or sericitic alteration. Biotite and hornblende may be completely altered to chlorite. Ordinarily neither quartz nor sulphide veinlets exhibit alteration halos although strong pyritic mineralization may be bounded by prominent sericite. Most intense clay alteration develops in the oxide zone where it is clearly of supergene origin.

Albitic alteration is prominently developed in wall rocks bounding portions of the porphyry. Intensity varies from slight bleaching to development of a dense porcelaneous product in which rock texture has been completely destroyed. Some of the fine grained hybrid rocks in proximity to the orebody may prove to be the product of albitic alteration. The oligoclase and perthite of the porphyry itself suggest a possible genetic connection between the process of albitization and ore deposition.

INDICATED VERTICAL RANGE OF PRIMARY MINERALIZATION - GENESIS

Structural features of the area encompassing the mine provide interesting speculation as to the original geometry of the orebody and as to the implied vertical range of primary mineralization.

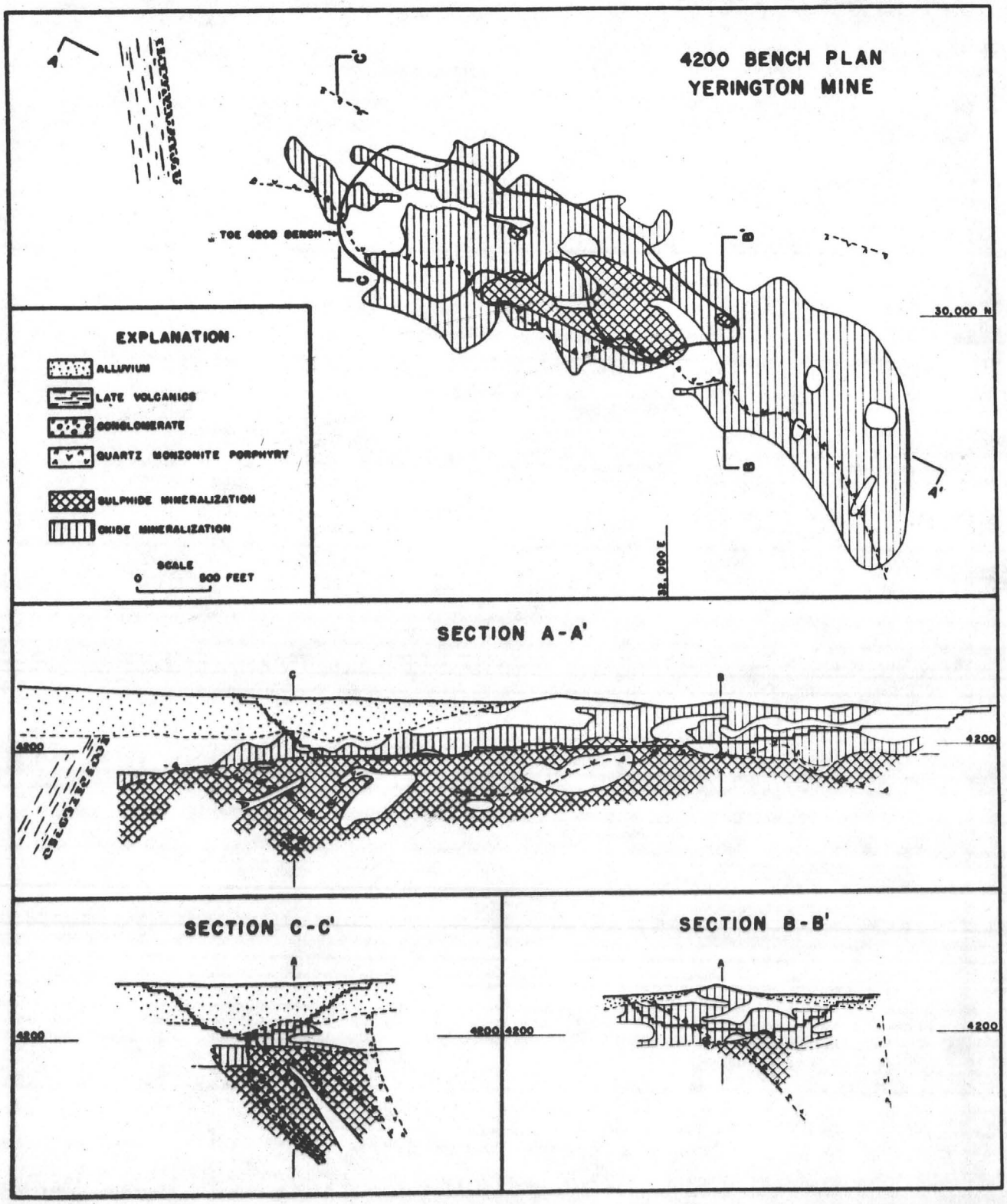
Acknowledging the probability of some initial dip, the late volcanic rocks define a westward tilting on the order of 50 to 60 degrees. By returning the deposit to a pre-tilt position, the elongate ore zone assumes the geometry of a steep, southeast plunging body. What is recognized today as the "bottom" of the orebody would have originally represented the western end of a tabular body of porphyry. Such a reconstructed picture suggests an original vertical range of copper mineralization in excess of 4000 feet.

Existing concepts of ore genesis are subject to modification as more extensive observations are provided by future advance in the sulphide zone. Interpretations of drill core and existing exposures, however, indicate that mineralizing solutions responsible for formation of the orebody were in chemical equilibrium with the wall rock. Evidence for the addition of any substantial amount of late hydrothermal sulphide mineralization with associated strong wall rock alteration is not obvious. In this sense, the orebody resembles those of Potrerillos and Ajo.

CONCLUSION

The Yerington orebody, concealed in large part under a cover of late volcanic rocks and valley wash, typifies the kind of exploration target that has produced several of the important ore discoveries of the past two decades. By understanding the nature of their geological settings and origins, we will sharpen our search for additional copper ore.

James R. Wilson



With compliments of the Author

THE COPPER DEPOSITS OF YERINGTON, NEVADA

Kn

D. H. McLAUGHLIN
ROTCH BUILDING
CAMBRIDGE, MASS., U. S. A.

By Adolph Knopf
Yale University, New Haven, Connecticut

MAR 2 1936

From "Copper Resources of the World"
XVI International Geological Congress
Washington, 1933

The copper deposits of Yerington, Nevada

By Adolph Knopf

Yale University, New Haven, Connecticut

The Yerington district is in Lyon County, western Nevada, 50 miles southeast of Reno. (See fig. 36.) In the early days of mining on the Comstock lode it supplied bluestone from its oxidized outcrops for the silver mills, but before 1912 there was no great output of copper. Since then, to the end of 1930, it has produced about 110,000,000 pounds of copper.

The rocks of the district fall naturally into two sharply contrasted groups, separated by a great unconformity—an older, Mesozoic group, to which the copper deposits are restricted, and a younger group of Tertiary rocks, chiefly lavas and tuffs. The oldest rocks, of Triassic age, comprise andesites, keratophyres, and limestone, with subordinate quartzite, shale, and gypsum. They are at least 8,000 feet in total thickness, of which the volcanic portion comprises 3,200 feet. They were intruded, at or near the end of Jurassic time, by a medium-grained basic granodiorite, which was followed in larger volume by quartz monzonite. These intrusions intensely metamorphosed the andesites and keratophyres and converted much of the limestone into wollastonite and other calcium hornfelses, among which aphanitic grossularite garnetites predominate. About one-half of the Triassic area consists of such calcium silicate rocks. After this metamorphism an immense number of quartz monzonite porphyry dikes were injected into the granodiorite, the quartz monzonite, and the adjacent garnetites. Faulting then ensued, breaking and displacing the dikes, and along some of the faults metalliferous solutions rose and formed the copper deposits.

The main ore bodies consist of chalcopyrite and pyrite in a gangue of pyroxene, andradite, or epidote. They are thus of the contact-metamorphic type, but magnetite and hematite are conspicuously absent. The ore, essentially unenriched by supergene sulphides, averaged, prior to 1920, from 2.75 to 6 percent of copper, with gold and silver present in traces only. Later, ore carrying less than 2 percent was worked, and in 1928 the Bluestone mine operated on ore carrying as little as 1.13 percent of copper.

The ore bodies were formed by the replacement of comparatively pure limestones. Andradite and a pyroxene intermediate between diopside and hedenbergite, which forms radial aggregates as much as 10 inches in diameter, are the principal silicates. Most of the ore bodies are small fractions of the associated garnet-pyroxene masses. As much as 200 feet of barren andradite rock in places underlies the ore. In general the ore tends to occur between the garnet-pyroxene rock and the limestone: it lies on the "limestone side" of the contact zone. The greatest distance at which an andradite mass occurs from the exposed contact of plutonic rock is 2,500 feet.

Specially notable features are breccias of grossularite garnetite that are cemented by high-iron andradite and sporadic chalcopyrite, thus clearly showing the distinctness of the two periods of garnetization. The ore of one of the principal mines (the Bluestone) is a breccia composed of angular fragments of

garnetite, of quartz-pyroxene hornfels, and of quartz monzonite porphyry intrusive into the garnetite, all the fragments cemented and partly replaced by chalcopyrite, epidote, quartz, and pyroxene.

Although in places the pyroxene has been altered to actinolite, this alteration appears not to have been connected with the introduction of the sulphides, for sulphides are not uncommonly embedded in pyroxene that shows no trace of alteration to actinolite. Broadly considered, the sulphides and associated silicates were formed essentially at the same time. However, the tendency of the ore to occur on the "limestone side" of the silicate masses suggests that in these deposits the maximum deposition of the sulphides occurred later than the maximum deposition of the silicates.

An enigmatic feature in the geology of the ore deposits is that, although large veins of coarse marialitic scapolite occur in the quartz monzonite, no traces of scapolite were detected in the pyrometasomatic deposits, and therefore in the Yerington district, as in so many other districts of pyrometasomatic deposits, the problem remains open as to whether chlorine was or was not the agent that facilitated the migration of the copper, iron, and other elements from the magma into the contact zone.

Reference

Knopf, Adolph, Geology and ore deposits of the Yerington district, Nevada: U. S. Geol. Survey Prof. Paper 114, 1918. Contains a bibliography of 8 entries.

ASSAY LOG OF DIAMOND DRILL HOLE BJ-1

Blue Jay Group
Yerington Mining District
Lyon County, Nevada

Location: N-85°-E, 716 feet from
collar of Blue Jay Shaft
Collar Elevation: +5000'
Bearing: N-65°-W
Inclination: -70°

Note: All assays from core

% Core Recovery	Depth	Interval	% Total Copper	% Oxide Copper
93	369.4 - 374.3	4.9	0.05	
71	459.6 - 463.0	3.4	0.258	0.138
98	463.0 - 467.0	4.0	0.308	0.189
85	467.0 - 472.3	5.3	1.467	0.459
40	472.3 - 478.0	5.7	0.258	0.176
54	478.0 - 483.0	5.0	0.195	0.094
81	483.0 - 487.3	4.3	0.277	0.226
64	487.3 - 489.8	2.5	0.371	0.302
Average:	459.6 - 489.8	30.2	0.478	0.227
100	489.8 - 494.2	4.4	0.522	0.340
100	494.2 - 498.9	4.7	2.201	1.872
100	498.9 - 503.4	4.5	2.024	1.265
85	503.4 - 508.0	4.6	1.391	0.403
90	508.0 - 512.8	4.8	0.784	0.258
93	512.8 - 517.3	4.5	0.531	0.201
91	517.3 - 521.9	4.6	0.860	0.378
98	521.9 - 526.5	4.6	0.531	0.252
90	526.5 - 531.2	4.7	1.037	0.860
80	531.2 - 534.5	3.3	1.745	0.489
97	534.5 - 539.0	4.5	2.251	0.784
94	539.0 - 549.0	10.0	1.189	0.531
100	549.0 - 558.4	9.4	3.213	0.354
98	558.4 - 564.5	6.1	1.644	
90	564.5 - 572.1	7.6	2.454	2.378
80	572.1 - 577.1	5.0	0.683	0.455
60	577.1 - 579.7	2.6	0.607	0.151
89	579.7 - 584.3	4.6	1.518	[illegible]
87	584.3 - 589.0	4.7	0.428	0.170
Average:	489.8 - 589.0	99.2	1.474	0.679
83	589.0 - 594.0	5.0	0.371	0.157
60	594.0 - 596.0	2.0	0.371	0.138
73	596.0 - 599.5	3.5	0.359	0.144
82	599.5 - 604.0	4.5	0.220	0.088
59	604.0 - 606.8	2.8	0.176	0.056

% Core Recovery	Depth	Interval	% Total Copper	% Oxide Copper
45	606.8 - 612.4	5.6	0.094	0.025
37	612.4 - 615.1	2.7	0.132	0.044
35	615.1 - 619.0	3.9	0.176	0.075
77	619.0 - 623.7	4.7	0.365	
73	623.7 - 628.5	4.8	0.296	
78	628.5 - 631.7	3.2	0.195	0.063
[illegible]	631.7 - 635.5	3.8	0.182	
69	635.5 - 641.0	5.5	1.442	
87	641.0 - 645.7	4.7	0.233	
84	645.7 - 650.0	4.3	0.113	
Average:	589.0 - 650.0	61.0	0.342	
44	681.3 - 685.7	4.4	0.182	
52	685.7 - 690.8	5.1	0.113	
39	696.3 - 702.5	6.2	0.245	0.163
15	715.8 - 725.7	9.9	0.044	
20	733.0 - 737.0	4.0	0.018	
59	737.0 - 741.0	4.0	0.176	
85	741.0 - 746.3	5.3	0.283	
71	746.3 - 751.4	5.1	1.062	
92	751.4 - 756.5	5.1	1.619	
51	756.5 - 761.3	4.8	0.76	None
81	761.3 - 766.1	4.8	0.321	
72	766.1 - 770.8	4.7	0.340	
75	770.8 - 772.6	1.8	0.157	
85	772.6 - 777.0	4.4	0.126	
Average:	737.0 - 777.0	40.0	0.588	
63	777.0 - 779.0	2.0	0.075	
9	779.0 - 784.0	5.0	0.063	
48	784.0 - 786.3	2.3	0.018	
54	786.3 - 792.0	5.7	0.050	
18	792.0 - 797.0	5.0	0.025	
61	797.0 - 800.5	3.5	0.031	
18	800.5 - 806.8	6.3	0.050	
67	806.8 - 810.4	3.6	0.050	
10	810.4 - 815.8	5.4	0.050	
51	815.8 - 820.1	4.3	0.050	
72	820.1 - 824.0	3.9	0.050	
59	824.0 - 829.0	5.0	0.050	
63	829.0 - 832.2	3.2	0.050	
77	832.2 - 837.3	5.1	0.030	
81	837.3 - 841.2	3.9	0.200	
75	841.2 - 847.7	6.5	0.122	
Average:	777.0 - 847.7	70.7	0.061	

ASSAY SUMMARY:

	Depth	Interval	% Total Copper	% Oxide Copper
	459.6 - 489.8	30.2	0.478	0.227
	489.8 - 589.0	99.2	1.474	0.679
Average:	459.6 - 589.0	129.4	1.241	0.573
	589.0 - 650.0	61.0	0.342	
	737.0 - 777.0	40.0	0.588	
	777.0 - 847.7	70.7	0.061	

Hole started August 31, 1955; stopped at depth of 847.7 feet on November 3, 1955

ASSAY LOG OF DIAMOND DRILL HOLE BJ-2

Blue Jay Group
Yerington Mining District
Lyon County, Nevada

Location: S-89°-E, 638 feet from
collar of Blue Jay Shaft
Collar Elevation: +5015'
Bearing: N-45°-E
Inclination: -60°

Note: All assays from core

% Core Recovery	Depth	Interval	% Total Copper	% Oxide Copper
31	566.0 - 572.0	6.0	0.195	0.078
54	572.0 - 577.2	5.2	1.100	0.972
25	577.2 - 583.1	5.9	0.512	0.318
78	583.1 - 588.1	5.0	0.921	0.819
83	588.1 - 597.8	9.7	1.126	0.793
88	597.8 - 602.0	4.2	1.253	1.049
79	602.0 - 608.7	6.7	0.307	0.201
93	608.7 - 613.0	4.3	0.460	0.318
88	613.0 - 617.8	4.8	0.844	0.691
58	617.8 - 621.6	3.8	0.614	0.460
24	621.6 - 627.0	5.4	0.685	0.188
10	627.0 - 628.0	1.0	(not assayed)	
0	628.0 - 630.3	2.3	No Core	
30	630.3 - 635.3	5.0	0.889	0.609
18	635.3 - 640.3	5.0	1.752	1.574
58	640.3 - 646.3	6.0	0.500	0.331
63	646.3 - 652.1	5.8	0.299	0.169
48	652.1 - 654.3	2.2	0.260	0.104
65	654.3 - 658.7	4.4	0.305	0.175
100	658.7 - 662.7	4.0	0.635	0.457
45	662.7 - 666.9	4.2	0.736	0.508
73	666.9 - 669.8	2.9	0.227	0.136
69	669.8 - 675.0	5.2	0.344	0.247
56	675.0 - 679.5	4.5	0.585	0.312
42	679.5 - 683.0	3.5	0.494	0.318
38	683.0 - 686.2	3.2	0.914	0.762
Ave. Age:	572.0 - 686.2	114.2	0.711	0.518
28	686.2 - 691.3	5.1	0.071	None
41	691.3 - 695.2	3.9	0.045	None
46	695.2 - 696.3	1.1	0.100	
10	696.3 - 701.3	5.0	0.119	
3	701.3 - 706.0	4.7	0.113	
6	706.0 - 710.3	4.3	0.113	
6	710.3 - 715.2	4.9	0.100	
2	715.2 - 720.2	5.0	0.026	
10	720.2 - 725.2	5.0	0.201	
11	725.2 - 730.2	5.0	0.113	
8	730.2 - 734.0	3.8	0.081	
25	734.0 - 738.0	4.0	0.302	

% Core Recovery	Depth	Interval	% Total Copper	% Oxide Copper
28	738.0 - 740.3	2.3	0.063	
67	740.3 - 742.4	2.1	0.081	
47	742.4 - 744.0	1.6	0.056	
75	744.0 - 745.8	1.8	0.113	
71	745.8 - 748.5	2.7	0.0[illegible]	
Average:	686.[illegible] - 748.5	62.3	0.109	
22	768.1 - 769.0	0.9	0.138	
89	781.0 - 785.6	4.6	0.075	
68	785.6 - 788.1	2.5	0.010	
48	788.1 - 790.7	2.6	0.010	
57	790.7 - 793.0	2.3	0.010	

ASSAY SUMMARY:

Depth	Interval	% Total Copper	% Oxide Copper
572.0 - 686.2	114.2	0.711	0.518
686.2 - 748.5	62.3	0.109	

Hole started November 9, 1955; stopped at depth of 793.0 feet on February 2, 1956.

ASSAY LOG OF DIAMOND DRILL HOLE BJ-3

Blue Jay Group
Yerington Mining District
Lyon County, Nevada

Location: S-9°30"-W, 250 feet from
collar of D.D.H. BJ-1
Collar Elevation: ±4980
Bearing: due North
Inclination: -70°

Note: All assays from core

% Core Recovery	Depth	Interval	% Total Copper	% Oxide Copper
82	534.3 - 539.8	5.5	none	
84	539.8 - 543.0	3.2	none	
82	543.0 - 545.2	2.2	none	
50	545.2 - 551.0	5.8	none	
39	551.0 - 558.5	7.5	none	
35	558.5 - 568.0	9.5	none	
17	568.0 - 579.0	11.0	0.010	
10	579.0 - 589.0	10.0	0.157	
11	589.0 - 599.0	10.0	0.020	
9	599.0 - 605.5	6.5	0.010	
Average:	568.0 - 605.5	37.5	0.052	
5	605.5 - 614.3	8.8	none	
85	877.5 - 882.3	4.8	none	
82	980.7 - 985.7	5.0	0.03	
58	985.7 - 990.0	4.3	0.03	
74	990.0 - 993.8	3.8	0.03	
76	1016.4 - 1021.4	5.0	0.056	
75	1021.4 - 1023.0	1.6	0.258	
63	1023.0 - 1026.5	3.5	0.021	
68	1026.5 - 1031.2	4.7	0.031	
84	1031.2 - 1036.1	4.9	0.069	
30	1036.1 - 1041.1	5.0	0.025	
12	1041.1 - 1046.3	5.2	0.025	
47	1046.3 - 1050.8	4.5	0.044	
Average:	1016.4 - 1050.8	34.4	0.051	

Hole started February 13, 1956; stopped at
depth of 1,122.0 feet on May 23, 1956.

ASSAY LOG OF DIAMOND DRILL HOLE BJ-4

Blue Jay Group
Yerington Mining District
Lyon County, Nevada

Location: S-88°-E, 347 feet from the SE corner Grubstake patented claim
Collar Elevation: ±4750
Bearing: due North
Inclination: -60°

Note: All assays from core

% Core Recovery	Depth	Interval	% Total Copper	% Oxide Copper
61	216.0 - 218.8	2.8	0.05	none
64	218.8 - 221.6	2.8	0.06	none
93	227.1 - 229.8	2.7	0.13	none
57	229.8 - 232.8	3.0	0.16	0.07
82	232.8 - 235.0	2.2	0.11	0.06
73	235.0 - 239.0	4.0	0.23	0.10
80	239.0 - 244.0	5.0	0.13	0.04
82	244.0 - 249.4	5.4	0.06	0.02
81	249.4 - 253.0	3.6	0.06	0.02
90	253.0 - 257.0	4.0	0.37	0.29
Average:	227.1 - 257.0	29.9	0.16	0.08
100	257.0 - 261.0	4.0	0.84	0.64
98	261.0 - 266.0	5.0	0.53	0.25
81	266.0 - 270.3	4.3	0.69	0.41
89	270.3 - 275.8	5.5	1.20	0.69
85	275.8 - 279.7	3.9	0.76	0.61
97	279.7 - 282.8	3.1	0.56	0.41
90	282.8 - 288.0	5.2	0.76	0.53
100	288.0 - 290.0	2.0	1.22	0.97
90	290.0 - 294.0	4.0	0.51	0.30
84	294.0 - 299.0	5.0	0.26	0.14
84	299.0 - 304.0	5.0	0.36	0.26
83	304.0 - 308.8	4.8	1.10	0.87
62	308.8 - 313.0	4.2	1.71	1.02
86	313.0 - 318.0	5.0	1.45	0.82
90	318.0 - 322.0	4.0	1.10	0.92
100	322.0 - 324.0	2.0	1.71	1.66
Average:	257.0 - 324.0	67.0	0.89	0.60
63	324.0 - 327.0	3.0	0.26	0.21
66	327.0 - 330.2	3.2	0.18	0.12
Average:	324.0 - 330.2	6.2	0.22	0.16
100	435.0 - 437.4	2.4	0.07	
98	437.4 - 442.0	4.6	0.03	
73	442.0 - 446.0	4.0	0.06	
68	459.7 - 463.8	4.1	0.02	
79	463.8 - 465.2	1.4	0.01	

% Core Recovery	Depth	Interval	% Total Copper	% Oxide Copper
77	486.0 - 490.7	4.7	0.01	
54	521.5 - 525.8	4.3	0.01	
78	525.8 - 530.4	4.6	0.02	

ASSAY SUMMARY:

227.1 - 257.0	29.9	0.16	0.08
257.0 - 324.0	67.0	0.89	0.60
324.0 - 330.2	6.2	0.22	0.16

Hole stopped at 589.0 feet on June 26, 1956

ASSAY LOG OF DIAMOND DRILL HOLE BJ-5

Blue Jay Group
Yerington Mining District
Lyon County, Nevada

Location: N-40°-E, 83 feet from corner No.4, Blue Jay patent
Bearing: N-15°-W
Inclination: -60°

Note: All assays from core

% Core Recovery	Depth	Interval	% Total Copper	% Oxide Copper
67	312.0 - 315.0	3.0	0.05	
70	329.0 - 334.0	5.0	0.07	
60	336.8 - 339.3	2.5	0.03	
91	431.6 - 440.0	8.4	0.30	
70	440.0 - 445.0	5.0	0.26	
89	464.7 - 469.0	4.3	0.16	
73	469.0 - 472.0	3.0	0.12	
50	472.0 - 472.7	0.7	0.14	
100	472.7 - 477.0	4.3	0.09	
60	477.0 - 479.0	2.0	0.16	
82	479.0 - 482.4	3.4	0.08	
83	482.4 - 487.2	4.8	0.11	
61	487.2 - 489.0	1.8	0.06	
100	489.0 - 491.7	2.7	0.06	
94	491.7 - 496.7	5.0	0.21	
86	496.7 - 501.7	5.0	0.20	
89	501.7 - 506.3	4.6	0.11	
88	506.3 - 511.1	4.8	0.08	
67	511.1 - 514.7	3.6	0.09	
100	514.7 - 516.0	1.3	0.13	
86	516.0 - 519.6	3.6	0.15	
55	519.6 - 520.7	1.1	0.12	
29	520.7 - 523.5	2.8	0.17	
67	523.5 - 524.1	0.6	0.11	
55	524.1 - 527.4	3.3	0.32	
24	527.4 - 529.9	2.5	0.14	
100	529.9 - 530.3	0.4	0.13	
50	530.3 - 533.7	3.4	0.23	
73	533.7 - 534.8	1.1	0.08	
73	534.8 - 537.0	2.2	0.11	
38	537.0 - 541.8	4.8	0.14	
35	541.8 - 543.5	1.7	0.19	
Average:	464.7 - 543.5	78.8	0.14	
40	543.5 - 544.5	1.0	0.06	
67	544.5 - 546.0	1.5	0.09	
100	546.0 - 548.3	2.3	0.04	
83	548.3 - 552.3	4.0	0.06	

% Core Recovery	Depth	Interval	% Total Copper	% Oxide Copper
67	552.3 - 553.8	1.5	0.10	
91	553.8 - 558.3	4.5	0.24	
88	558.3 - 561.5	3.2	0.05	
72	561.5 - 564.0	2.5	0.02	
Average:	543.5 - 564.0	20.5	0.10	
29	564.0 - 567.4	3.4	0.02	
74	567.4 - 569.7	2.3	0.02	
78	569.7 - 570.6	0.9	0.07	
50	570.6 - 571.2	0.6	0.05	
85	571.2 - 573.2	2.0	0.02	
53	577.1 - 579.0	1.9	0.06	
39	596.4 - 598.2	1.8	0.10	
23	598.2 - 599.5	1.3	0.12	
7	599.5 - 600.9	1.4	0.02	
91	600.9 - 603.0	2.1	0.06	

Hole stopped at 603.0 feet on August 30, 1956

Return to
Anton Silva
Box 243
Yerington

SXM
JUL 19 1972
RECEIVED

ASSAY LOG OF DIAMOND DRILL HOLE BJ-1

Blue Jay Group
Yerington Mining District
Lyon County, Nevada

Location: N-85°-E, 716 feet from collar of Blue Jay Shaft
Collar Elevation: ±5000'
Bearing: N-65°-W
Inclination: -70°

Note: All assays from core

% Core Recovery	Depth	Interval	% Total Copper	% Oxide Copper
93	369.4 - 374.3	4.9	0.05	
71	459.6 - 463.0	3.4	0.258	0.138
98	463.0 - 467.0	4.0	0.308	0.189
85	467.0 - 472.3	5.3	1.467	0.459
40	472.3 - 478.0	5.7	0.258	0.176
54	478.0 - 483.0	5.0	0.195	0.094
81	483.0 - 487.3	4.3	0.277	0.226
64	487.3 - 489.8	2.5	0.371	0.302
Average:	459.6 - 489.8	30.2	0.478	0.227
100	489.8 - 494.2	4.4	0.522	0.340
100	494.2 - 498.9	4.7	2.201	1.872
100	498.9 - 503.4	4.5	2.024	1.265
85	503.4 - 508.0	4.6	1.391	0.403
90	508.0 - 512.8	4.8	0.784	0.258
93	512.8 - 517.3	4.5	0.531	0.201
91	517.3 - 521.9	4.6	0.860	0.378
98	521.9 - 526.5	4.6	0.531	0.252
90	526.5 - 531.2	4.7	1.037	0.860
80	531.2 - 534.5	3.3	1.745	0.489
97	534.5 - 539.0	4.5	2.251	0.784
94	539.0 - 549.0	10.0	1.189	0.531
100	549.0 - 558.4	9.4	3.213	0.354
98	558.4 - 564.5	6.1	1.644	
90	564.5 - 572.1	7.6	2.454	2.378
80	572.1 - 577.1	5.0	0.683	0.455
60	577.1 - 579.7	2.6	0.607	0.151
89	579.7 - 584.3	4.6	1.518	0.220
87	584.3 - 589.0	4.7	0.428	0.170
Average:	489.8 - 589.0	99.2	1.474	0.679
83	589.0 - 594.0	5.0	0.371	0.157
60	594.0 - 596.0	2.0	0.371	0.138
73	596.0 - 599.5	3.5	0.359	0.144
82	599.5 - 604.0	4.5	0.220	0.088
59	604.0 - 606.8	2.8	0.176	0.056

% Core Recovery	Depth	Interval	% Total Copper	% Oxide Copper
45	606.8 - 612.4	5.6	0.094	0.025
37	612.4 - 615.1	2.7	0.132	0.044
35	615.1 - 619.0	3.9	0.176	0.075
77	619.0 - 623.7	4.7	0.365	
73	623.7 - 628.5	4.8	0.296	
78	628.5 - 631.7	3.2	0.195	0.063
63	631.7 - 635.5	3.8	0.182	
69	635.5 - 641.0	5.5	1.442	
87	641.0 - 645.7	4.7	0.233	
84	645.7 - 650.0	4.3	0.113	
Average:	589.0 - 650.0	61.0	0.342	
44	681.3 - 685.7	4.4	0.182	
52	685.7 - 690.8	5.1	0.113	
39	696.3 - 702.5	6.2	0.245	0.163
15	715.8 - 725.7	9.9	0.044	
20	733.0 - 737.0	4.0	0.018	
59	737.0 - 741.0	4.0	0.176	
85	741.0 - 746.3	5.3	0.283	
71	746.3 - 751.4	5.1	1.062	
92	751.4 - 756.5	5.1	1.619	
51	756.5 - 761.3	4.8	0.76	None
81	761.3 - 766.1	4.8	0.321	
72	766.1 - 770.8	4.7	0.340	
75	770.8 - 772.6	1.8	0.157	
85	772.6 - 777.0	4.4	0.126	
Average:	737.0 - 777.0	40.0	0.588	
63	777.0 - 779.0	2.0	0.075	
9	779.0 - 784.0	5.0	0.063	
48	784.0 - 786.3	2.3	0.018	
54	786.3 - 792.0	5.7	0.050	
18	792.0 - 797.0	5.0	0.025	
61	797.0 - 800.5	3.5	0.031	
18	800.5 - 806.8	6.3	0.050	
67	806.8 - 810.4	3.6	0.050	
10	810.4 - 815.8	5.4	0.050	
51	815.8 - 820.1	4.3	0.050	
72	820.1 - 824.0	3.9	0.050	
89	824.0 - 829.0	5.0	0.050	
63	829.0 - 832.2	3.2	0.050	
77	832.2 - 837.3	5.1	0.030	
81	837.3 - 841.2	3.9	0.200	
75	841.2 - 847.7	6.5	0.122	
Average:	777.0 - 847.7	70.7	0.061	

ASSAY SUMMARY:

	Depth	Interval	% Total Copper	% Oxide Copper
	459.6 - 489.8	30.2	0.478	0.227
	489.8 - 589.0	99.2	1.474	0.679
Average:	459.6 - 589.0	129.4	1.241	0.573
	589.0 - 650.0	61.0	0.342	
	737.0 - 777.0	40.0	0.588	
	777.0 - 847.7	70.7	0.061	

Hole started August 31, 1955; stopped at depth of 847.7 feet on November 3, 1955

ASSAY LOG OF DIAMOND DRILL HOLE BJ-2

Blue Jay Group
Yerington Mining District
Lyon County, Nevada

Location: S-89°-E, 638 feet from
collar of Blue Jay Shaft
Collar Elevation: ±5015'
Bearing: N-45°-E
Inclination: -60°

Note: All assays from core

% Core Recovery	Depth	Interval	% Total Copper	% Oxide Copper
31	566.0 - 572.0	6.0	0.195	0.078
54	572.0 - 577.2	5.2	1.100	0.972
25	577.2 - 583.1	5.9	0.512	0.318
78	583.1 - 588.1	5.0	0.921	0.819
83	588.1 - 597.8	9.7	1.126	0.793
88	597.8 - 602.0	4.2	1.253	1.049
79	602.0 - 608.7	6.7	0.307	0.201
93	608.7 - 613.0	4.3	0.460	0.318
88	613.0 - 617.8	4.8	0.844	0.691
58	617.8 - 621.6	3.8	0.614	0.460
24	621.6 - 627.0	5.4	0.685	0.188
10	627.0 - 628.0	1.0	(not assayed)	
0	628.0 - 630.3	2.3	No Core	
30	630.3 - 635.3	5.0	0.889	0.609
18	635.3 - 640.3	5.0	1.752	1.574
58	640.3 - 646.3	6.0	0.500	0.331
63	646.3 - 652.1	5.8	0.299	0.169
48	652.1 - 654.3	2.2	0.260	0.104
65	654.3 - 658.7	4.4	0.305	0.175
100	658.7 - 662.7	4.0	0.635	0.457
45	662.7 - 666.9	4.2	0.736	0.508
73	666.9 - 669.8	2.9	0.227	0.136
69	669.8 - 675.0	5.2	0.344	0.247
56	675.0 - 679.5	4.5	0.585	0.312
42	679.5 - 683.0	3.5	0.494	0.318
38	683.0 - 686.2	3.2	0.914	0.762
Average:	572.0 - 686.2	114.2	0.711	0.518
28	686.2 - 691.3	5.1	0.071	None
41	691.3 - 695.2	3.9	0.045	None
46	695.2 - 696.3	1.1	0.100	
10	696.3 - 701.3	5.0	0.119	
3	701.3 - 706.0	4.7	0.113	
6	706.0 - 710.3	4.3	0.113	
6	710.3 - 715.2	4.9	0.100	
2	715.2 - 720.2	5.0	0.026	
10	720.2 - 725.2	5.0	0.201	
11	725.2 - 730.2	5.0	0.113	
8	730.2 - 734.0	3.8	0.081	
25	734.0 - 738.0	4.0	0.302	

% Core Recovery	Depth	Interval	% Total Copper	% Oxide Copper
28	738.0 - 740.3	2.3	0.063	
67	740.3 - 742.4	2.1	0.081	
47	742.4 - 744.0	1.6	0.056	
75	744.0 - 745.8	1.8	0.113	
71	745.8 - 748.5	2.7	0.081	
Average:	686.2 - 748.5	62.3	0.109	
22	768.1 - 769.0	0.9	0.138	
89	781.0 - 785.6	4.6	0.075	
68	785.6 - 788.1	2.5	0.010	
48	788.1 - 790.7	2.6	0.010	
57	790.7 - 793.0	2.3	0.010	

ASSAY SUMMARY:

Depth	Interval	% Total Copper	% Oxide Copper
572.0 - 686.2	114.2	0.711	0.518
686.2 - 748.5	62.3	0.109	

Hole started November 9, 1955; stopped at depth of 793.0 feet on February 2, 1956.

ASSAY LOG OF DIAMOND DRILL HOLE BJ-3

Blue Jay Group
Yerington Mining District
Lyon County, Nevada

Location: S-9°30"-W, 250 feet from
collar of D.D.H. BJ-1
Collar Elevation: ±4980
Bearing: due North
Inclination: -70°

Note: All assays from core

% Core Recovery	Depth	Interval	% Total Copper	% Oxide Copper
82	534.3 - 539.8	5.5	none	
84	539.8 - 543.0	3.2	none	
82	543.0 - 545.2	2.2	none	
50	545.2 - 551.0	5.8	none	
39	551.0 - 558.5	7.5	none	
35	558.5 - 568.0	9.5	none	
17	568.0 - 579.0	11.0	0.010	
10	579.0 - 589.0	10.0	0.157	
11	589.0 - 599.0	10.0	0.020	
9	599.0 - 605.5	6.5	0.010	
Average:	568.0 - 605.5	37.5	0.052	
5	605.5 - 614.3	8.8	none	
85	877.5 - 882.3	4.8	none	
82	980.7 - 985.7	5.0	0.03	
58	985.7 - 990.0	4.3	0.03	
74	990.0 - 993.8	3.8	0.03	
76	1016.4 - 1021.4	5.0	0.056	
75	1021.4 - 1023.0	1.6	0.258	
63	1023.0 - 1026.5	3.5	0.021	
68	1026.5 - 1031.2	4.7	0.031	
84	1031.2 - 1036.1	4.9	0.069	
30	1036.1 - 1041.1	5.0	0.025	
12	1041.1 - 1046.3	5.2	0.025	
47	1046.3 - 1050.8	4.5	0.044	
Average:	1016.4 - 1050.8	34.4	0.051	

Hole started February 13, 1956; stopped at
depth of 1,122.0 feet on May 23, 1956.

ASSAY LOG OF DIAMOND DRILL HOLE BJ-4

Blue Jay Group
Yerington Mining District
Lyon County, Nevada

Location: S-88°-E, 347 feet from the SE corner Grubstake patented claim
Collar Elevation: ±4750
Bearing: due North
Inclination: -60°

Note: All assays from core

% Core Recovery	Depth	Interval	% Total Copper	% Oxide Copper
61	216.0 - 218.8	2.8	0.05	none
64	218.8 - 221.6	2.8	0.06	none
93	227.1 - 229.8	2.7	0.13	none
57	229.8 - 232.8	3.0	0.16	0.07
82	232.8 - 235.0	2.2	0.11	0.06
73	235.0 - 239.0	4.0	0.23	0.10
80	239.0 - 244.0	5.0	0.13	0.04
82	244.0 - 249.4	5.4	0.06	0.02
81	249.4 - 253.0	3.6	0.06	0.02
90	253.0 - 257.0	4.0	0.37	0.29
Average:	227.1 - 257.0	29.9	0.16	0.08
100	257.0 - 261.0	4.0	0.84	0.64
98	261.0 - 266.0	5.0	0.53	0.25
81	266.0 - 270.3	4.3	0.69	0.41
89	270.3 - 275.8	5.5	1.20	0.69
85	275.8 - 279.7	3.9	0.76	0.61
97	279.7 - 282.8	3.1	0.56	0.41
90	282.8 - 288.0	5.2	0.76	0.53
100	288.0 - 290.0	2.0	1.22	0.97
90	290.0 - 294.0	4.0	0.51	0.30
84	294.0 - 299.0	5.0	0.26	0.14
84	299.0 - 304.0	5.0	0.36	0.26
83	304.0 - 308.8	4.8	1.10	0.87
62	308.8 - 313.0	4.2	1.71	1.02
86	313.0 - 318.0	5.0	1.45	0.82
90	318.0 - 322.0	4.0	1.10	0.92
100	322.0 - 324.0	2.0	1.71	1.66
Average:	257.0 - 324.0	67.0	0.89	0.60
63	324.0 - 327.0	3.0	0.26	0.21
66	327.0 - 330.2	3.2	0.18	0.12
Average:	324.0 - 330.2	6.2	0.22	0.16
100	435.0 - 437.4	2.4	0.07	
98	437.4 - 442.0	4.6	0.03	
73	442.0 - 446.0	4.0	0.06	
68	459.7 - 463.8	4.1	0.02	
79	463.8 - 465.2	1.4	0.01	

% Core Recovery	Depth	Interval	% Total Copper	% Oxide Copper
77	486.0 - 490.7	4.7	0.01	
54	521.5 - 525.8	4.3	0.01	
78	525.8 - 530.4	4.6	0.02	

ASSAY SUMMARY:

227.1 - 257.0	29.9	0.16	0.08
257.0 - 324.0	67.0	0.89	0.60
324.0 - 330.2	6.2	0.22	0.16

Hole stopped at 589.0 feet on June 26, 1956

ASSAY LOG OF DIAMOND DRILL HOLE BJ-5

Blue Jay Group
Yerington Mining District
Lyon County, Nevada

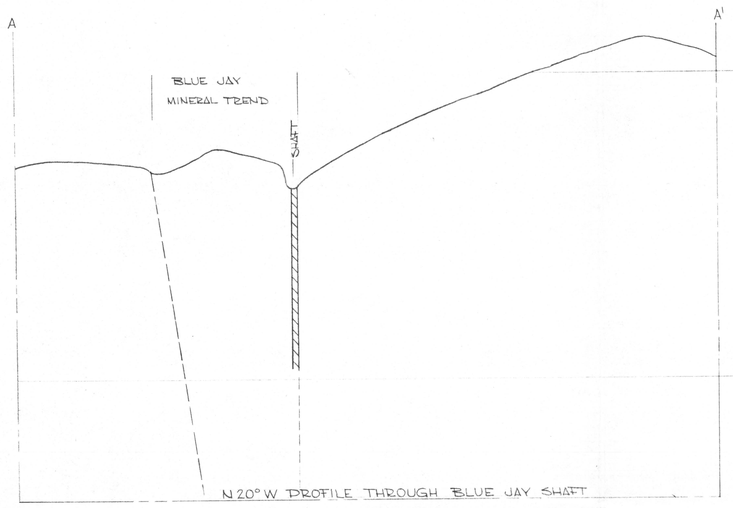
Location: N-40°-E, 83 feet from
corner No.4, Blue Jay patent
Bearing: N-15°-W
Inclination: -60°

Note: All assays from core

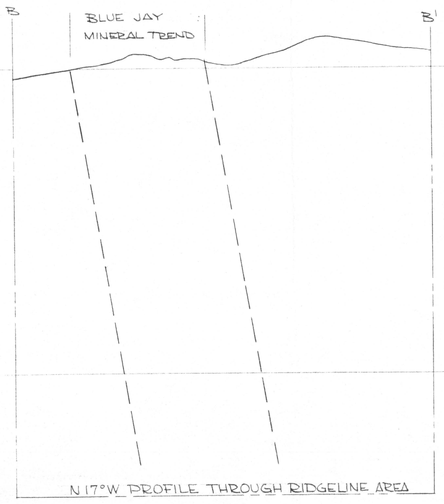
% Core Recovery	Depth	Interval	% Total Copper	% Oxide Copper
67	312.0 - 315.0	3.0	0.05	
70	329.0 - 334.0	5.0	0.07	
60	336.8 - 339.3	2.5	0.03	
91	431.6 - 440.0	8.4	0.30	
70	440.0 - 445.0	5.0	0.26	
89	464.7 - 469.0	4.3	0.16	
73	469.0 - 472.0	3.0	0.12	
50	472.0 - 472.7	0.7	0.14	
100	472.7 - 477.0	4.3	0.09	
60	477.0 - 479.0	2.0	0.16	
82	479.0 - 482.4	3.4	0.08	
83	482.4 - 487.2	4.8	0.11	
61	487.2 - 489.0	1.8	0.06	
100	489.0 - 491.7	2.7	0.06	
94	491.7 - 496.7	5.0	0.21	
86	496.7 - 501.7	5.0	0.20	
89	501.7 - 506.3	4.6	0.11	
88	506.3 - 511.1	4.8	0.08	
67	511.1 - 514.7	3.6	0.09	
100	514.7 - 516.0	1.3	0.13	
86	516.0 - 519.6	3.6	0.15	
55	519.6 - 520.7	1.1	0.12	
29	520.7 - 523.5	2.8	0.17	
67	523.5 - 524.1	0.6	0.11	
55	524.1 - 527.4	3.3	0.32	
24	527.4 - 529.9	2.5	0.14	
100	529.9 - 530.3	0.4	0.13	
50	530.3 - 533.7	3.4	0.23	
73	533.7 - 534.8	1.1	0.08	
73	534.8 - 537.0	2.2	0.11	
38	537.0 - 541.8	4.8	0.14	
35	541.8 - 543.5	1.7	0.19	
Average:	464.7 - 543.5	78.8	0.14	
40	543.5 - 544.5	1.0	0.06	
67	544.5 - 546.0	1.5	0.09	
100	546.0 - 548.3	2.3	0.04	
83	548.3 - 552.3	4.0	0.06	

% Core Recovery	Depth	Interval	% Total Copper	% Oxide Copper
67	552.3 - 553.8	1.5	0.10	
91	553.8 - 558.3	4.5	0.24	
88	558.3 - 561.5	3.2	0.05	
72	561.5 - 564.0	2.5	0.02	
Average:	543.5 - 564.0	20.5	0.10	
29	564.0 - 567.4	3.4	0.02	
74	567.4 - 569.7	2.3	0.02	
78	569.7 - 570.6	0.9	0.07	
50	570.6 - 571.2	0.6	0.05	
85	571.2 - 573.2	2.0	0.02	
53	577.1 - 579.0	1.9	0.06	
39	596.4 - 598.2	1.8	0.10	
23	598.2 - 599.5	1.3	0.12	
7	599.5 - 600.9	1.4	0.02	
91	600.9 - 603.0	2.1	0.06	

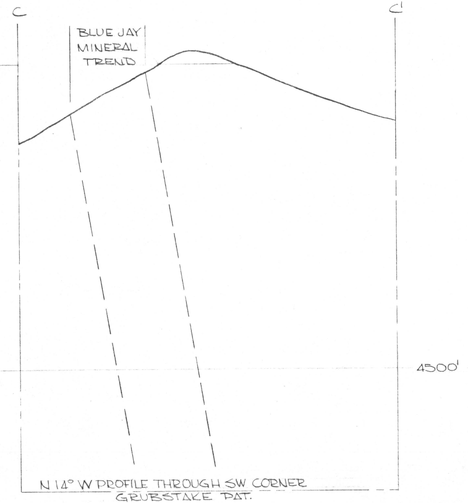
Hole stopped at 603.0 feet on August 30, 1956



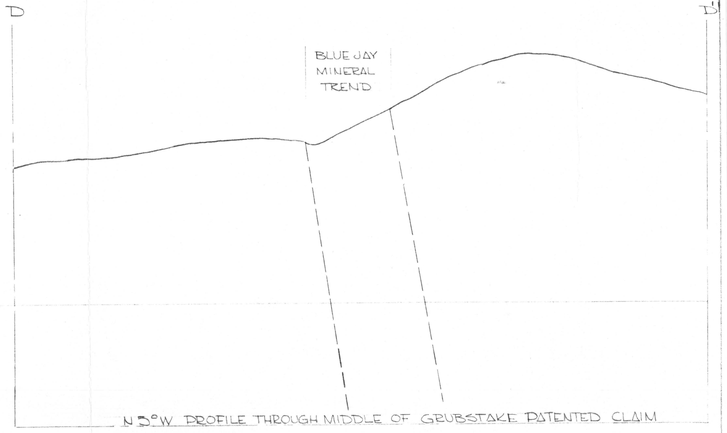
N 20° W PROFILE THROUGH BLUE JAY SHAFT



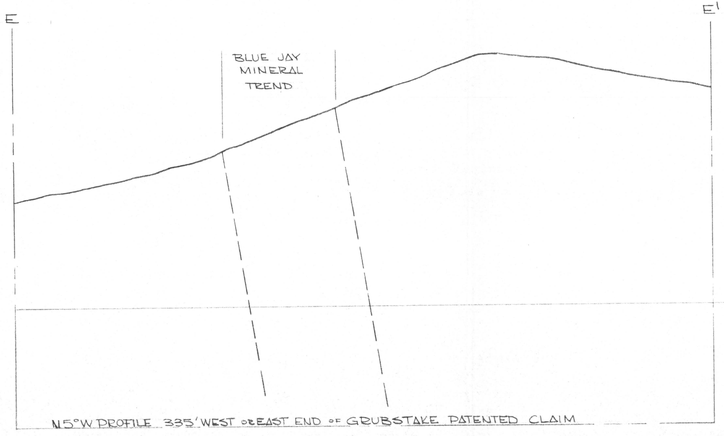
N 17° W PROFILE THROUGH RIDGELINE AREA



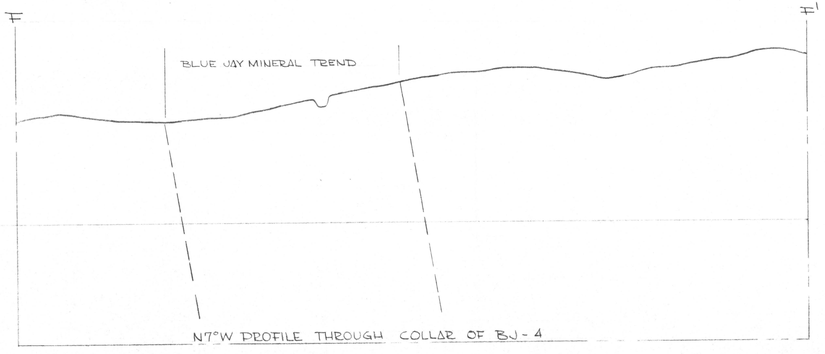
N 14° W PROFILE THROUGH SW CORNER
GRUBSTAKE PAT.



N 5° W PROFILE THROUGH MIDDLE OF GRUBSTAKE PATENTED CLAIM



N 5° W PROFILE 335' WEST OF EAST END OF GRUBSTAKE PATENTED CLAIM

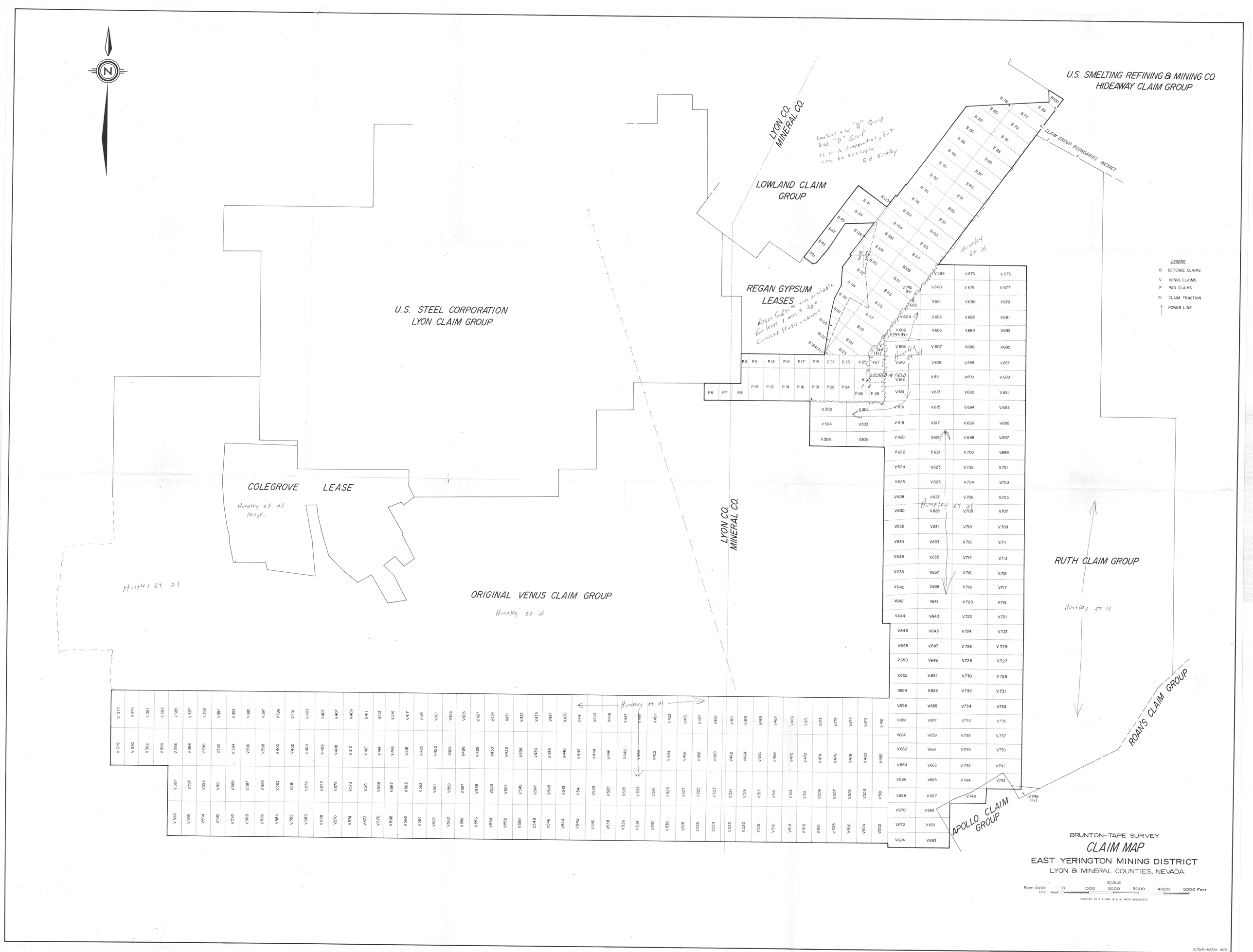


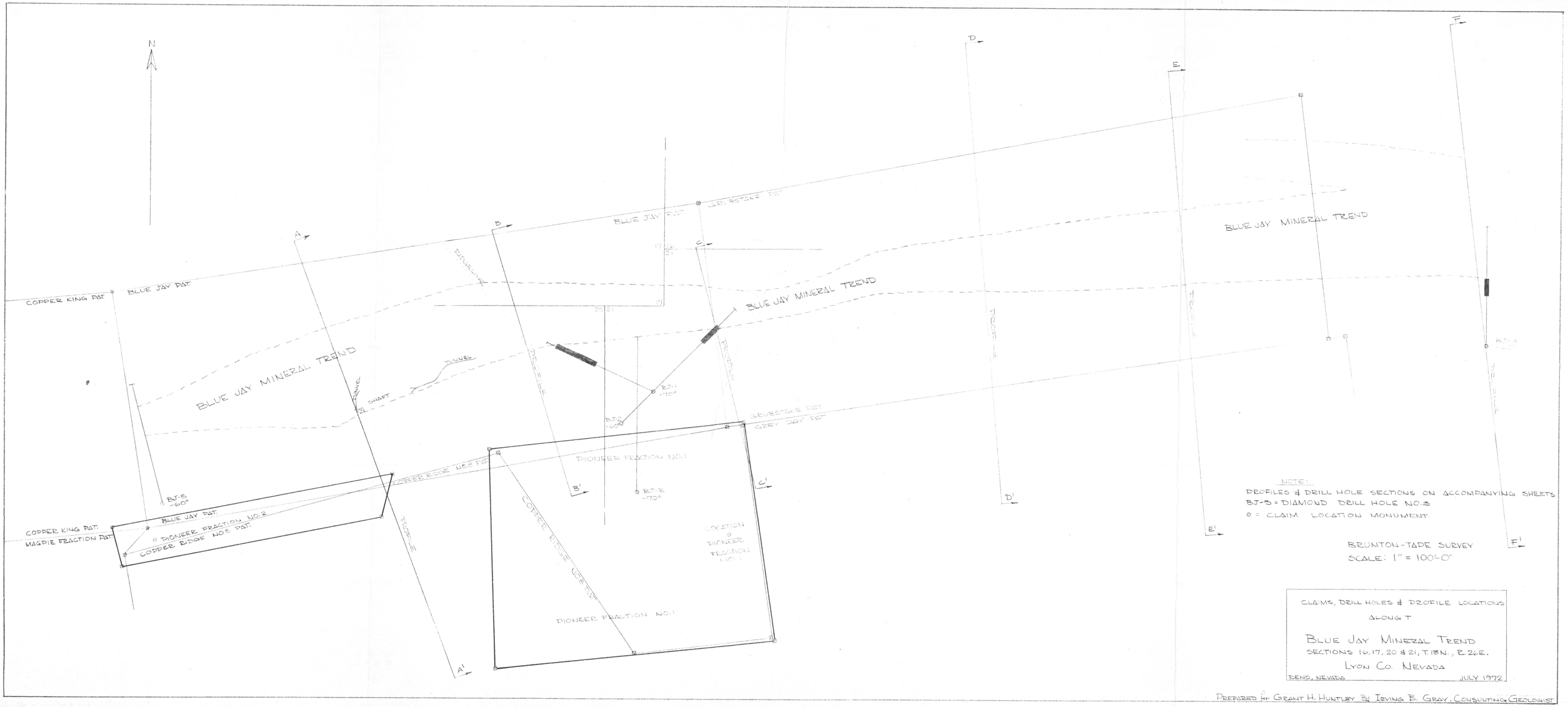
N 7° W PROFILE THROUGH COLLAR OF BJ-4

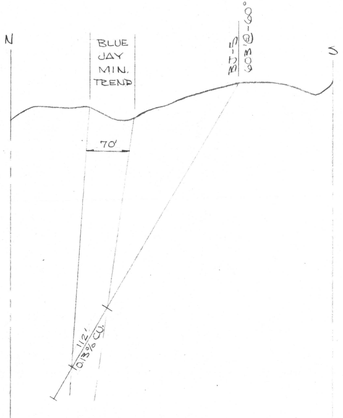
SCALE: 1" = 100'-0"
BRUNTON-TAPE SURVEY

PROFILES
ON THE
BLUE JAY MINERAL TREND
SECTIONS 16, 17, 20 & 21, T.13N., R.26E.
LYON CO., NEVADA

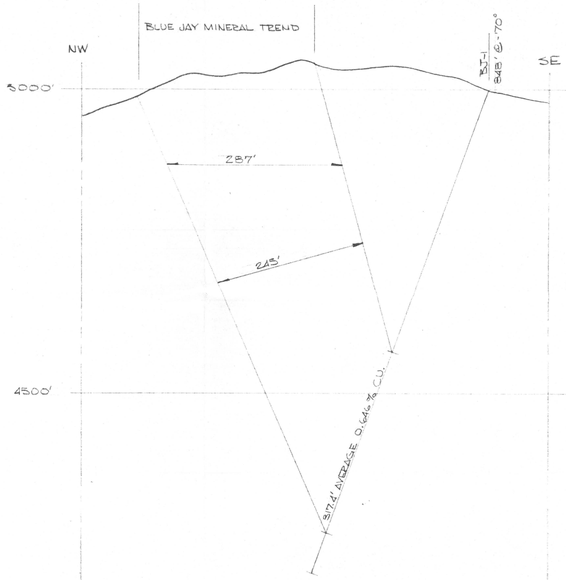
PREPARED for GRANT H. HUNTLEY BY IRVING B GRAY, CONSULTING GEOLOGIST


N
U.S. SMELTING REFINING & MINING CO.
HIDEAWAY CLAIM GROUP
LYON CO.
MINERAL CO.
Lowland was "B" Group and "P" Group is in a corporation but can be available G H Huntley
LOWLAND CLAIM GROUP
CLAIM GROUP BOUNDARIES INEXACT
Huntley et al
REGAN GYPSUM LEASES
Regan Gypsum was available for lease prior to Current Status unknown
U.S. STEEL CORPORATION
LYON CLAIM GROUP
LOCATED IN FIELD
COLEGROVE LEASE
Huntley et al lease
LEGEND
B BETERBE CLAIMS
V VENUS CLAIMS
P PAD CLAIMS
Fr. CLAIM FRACTION
POWER LINE
LYON CO.
MINERAL CO.
RUTH CLAIM GROUP
Huntley et al
Huntley et al
ORIGINAL VENUS CLAIM GROUP
Huntley et al
Huntley et al
ROAN'S CLAIM GROUP
APOLLO CLAIM GROUP
BRUNTON-TAPE SURVEY
CLAIM MAP
EAST YERINGTON MINING DISTRICT
LYON & MINERAL COUNTIES, NEVADA
SCALE
Feet 1000 0 1000 2000 3000 4000 5000 Feet
COMPILED BY L.B. GRAY & E.W. SMITH GEOLOGISTS
ALTAIR-MARCH 1970

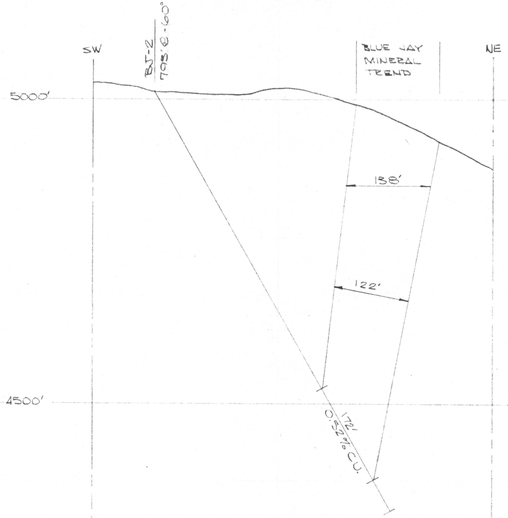

N
A
A'
B
B'
C
C'
D
D'
E
E'
F
F'
BLUE JAY PAT.
GRUBSTAKE PAT.
COPPER KING PAT.
BLUE JAY PAT.
BLUE JAY MINERAL TREND
BLUE JAY MINERAL TREND
BLUE JAY MINERAL TREND
TUNNEL
TUNNEL
TUNNEL
SHAFT
PROFILE
PROFILE
PROFILE
PROFILE
PROFILE
PROFILE
BJ-1 -70°
BJ-2 -60°
BJ-3 -70°
BJ-4 -60°
BJ-5 -60°
GRUBSTAKE PAT.
GREY DAY PAT.
COPPER RIDGE NO.2 PAT.
PIONEER FRACTION NO.1
PIONEER FRACTION NO.1
COPPER RIDGE NO.3 PAT.
LOCATION OF PIONEER FRACTION NO.1
COPPER KING PAT.
MAGDIE FRACTION PAT.
BLUE JAY PAT.
PIONEER FRACTION NO.2
COPPER RIDGE NO.2 PAT.
NOTE:
PROFILES & DRILL HOLE SECTIONS ON ACCOMPANYING SHEETS
BJ-3 = DIAMOND DRILL HOLE NO.3
⊙ = CLAIM LOCATION MONUMENT
BRUNTON-TAPE SURVEY
SCALE: 1" = 100'-0"
CLAIMS, DRILL HOLES & PROFILE LOCATIONS
ALONG T
BLUE JAY MINERAL TREND
SECTIONS 16, 17, 20 & 21, T.18N., R.26E.
LYON CO. NEVADA
RENO, NEVADA
JULY 1972
PREPARED for GRANT H. HUNTLEY BY IRVING B. GRAY, CONSULTING GEOLOGIST



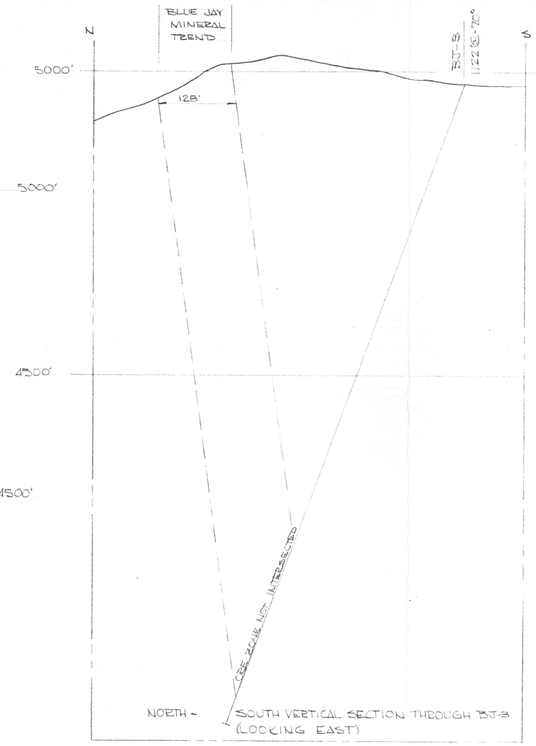
N15°W VERTICAL SECTION THROUGH BJ-5
(LOOKING EASTERLY)



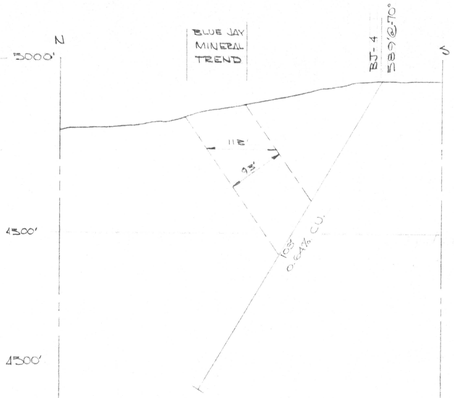
N65°W VERTICAL SECTION THROUGH BJ-1
(LOOKING NORTHEASTERLY)



N45°E VERTICAL SECTION THROUGH BJ-2
(LOOKING NORTHWESTERLY)



NORTH - SOUTH VERTICAL SECTION THROUGH BJ-3
(LOOKING EAST)



NORTH - SOUTH VERTICAL SECTION THROUGH BJ-4
(LOOKING EAST)

SCALE: 1" = 100'-0"
BRUNTON - TAPE SURVEY

SECTIONS THROUGH DIAMOND DRILL HOLES
BJ-1, BJ-2, BJ-3, BJ-4 & BJ-5
ON THE
BLUE JAY MINERAL TREND
SECTIONS 16, 17, 20 & 21, T.13N., R.26E.
LYON CO. NEVADA

RENO, NEV. JULY 1972

PREPARED FOR GRANT H. HUNTLEY BY IRVING B. GRAY, CONSULTING GEOLOGIST