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DEPARTMENT OF THE INTERIOR

DEFENSE MINERALS EXPLORATION ADMINISTRATION

FIELD TEAM, REGION I
Northwest District

FINAL REPORT

Contract Idm-E380

by

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U. S. Geological Survey

HYPOTHEEK MINING AND MILLING COMPANY
510 Bank Street
Wallace, Idaho

Docket No.:	DMEA-2420
Commodity:	Lead-Zinc
Contract date:	August 4, 1952
Completion date:	October 4, 1954

EAST HYPOTHEEK MINE
Yreka Mining District
Shoshone County, Idaho

Spokane, Washington

August 1955

FINAL REPORT

HYPOTHEEK MINING AND MILLING COMPANY
East Hypothook Mine
Yreka Mining District
Shoshone County, Idaho

Contract Idm-E380

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INTRODUCTION

This report describes an exploration project conducted jointly by the Hypothook Mining and Milling Company and the Defense Minerals Exploration Administration for zinc-lead ores at the East Hypothook mine, Yreka Mining District, Shoshone County, Idaho.

Summary

The exploration project at the East Hypothook mine had three objectives: (1) to explore for the faulted extension of a known lead- and zinc-bearing vein in the North Adit; (2) to explore the downward continuity of ore disclosed in the drift prior to the exploration project contract; and (3) to explore for possible parallel or intersecting veins to the northeast of the North Adit vein.

The project consisted of surface plant installation, 325 feet of adit tunnel enlarging, 732 feet of drifting and cross-cutting, 1,402 feet of diamond drilling, and 12 feet of back enlargement for diamond drill station. The exploration work at drift elevation failed to find an extension of the known vein. It is now believed that the fault which terminates the vein was a pre-mineral fault. Intersecting veins were cut, but none appeared to warrant additional exploration. Two diamond drill holes cut ore in the Main Vein under the known ore about 140 feet below the North Adit level. (Diamond drill hole logs in pocket.)

Recommendations

Certification of Discovery or Development was made, and the Operator was notified of this action in a letter from the Administrator, DMEA, dated October 29, 1954.

The ore exposures seen in the North Adit and in Diamond Drill Holes No. 2 and No. 3, and shown on the 300-level map, indicate the existence of only a small marginal ore shoot; therefore, additional work on the vein between this adit and the 300 level does not warrant Government participation.

Available geologic maps and other data show no justification for Government participation in further exploration; however, should the shaft workings be dewatered an examination may disclose a worthwhile exploration target.

LOCATION AND ACCESSIBILITY

The mine property is in secs. 17, 18, 19, and 20, T. 43 N., R. 2 E., B.M., Yreka Mining District, Shoshone County, Idaho. The property may be reached by road from Kellogg, Idaho, by traveling west on U. S. Highway 10 to Pinehurst, Idaho, then south on the Pine Creek road for a distance of about 3.5 miles. The mine site including three buildings and the portal can be seen on the west side of the narrow valley at road level.

The area is mountainous with a relief in the immediate vicinity of the mine of about 1,300 feet. Winters are moderately severe with heavy snowfall, but the mine is located on an all-weather road so that a year around operation at the property would be feasible.

PROPERTY

The Operator's property rights, located in Pine Creek area of the Yreka Mining District, are set forth in Annex I of the exploration project contract as follows:

South Half (S½) of Southeast Quarter (SE¼) of Southeast Quarter (SE¼), being a part of Lot 8, of Section Eighteen (18), Township Forty-eight (48) North, Range Two (2) East B.M.

All Mines and minerals, lodes, veins, mineral deposits, mineral oils and natural gases of every kind and nature contained in or upon the North Half (N½) of the Southeast Quarter (SE¼) and Lots Seven (7) and Eight (8) of Section Eighteen (18), Township Forty-eight (48), North, Range Two (2) East B.M., containing 149.75 acres.

Together with all easements and rights of way necessary therein for the lawful exploration, development and mining operations necessary for the operation of said mineral property for the extraction of ores and natural resources heretofore named and the marketing of the same, if any.

"All of the foregoing property is described in a deed from Charles Houck, a widower, recorded in Book 56 of Deeds, page 16, Official Records of Shoshone County, Idaho.

"Lot Three (3) and the Northeast Quarter (NE¼) of Southwest Quarter (SW¼) and the Southeast Quarter (SE¼) of Southwest Quarter (SW¼) of Section Eighteen (18) and the Northeast Quarter (NE¼) of Northwest Quarter (NW¼) of Section Nineteen (19), Township Forty-eight (48), North, Range Two (2) East of Boise Meridian, containing 159.53 acres, known as the George Lightbody Homestead.

"E-29, P-38 and Catalonn Fraction Unpatented Lode Mining claims, notices of location of which said claims are of record in Book 27 of Quartz Locations, at pages 475, 476 and 477 respectively, official Records of Shoshone County, Idaho.

"Monty Fraction, Monty Christo, Olson the Minor, Otto Fraction, Olson the Minor Fraction, and the Rose Bird patented lode mining claims, Mineral Survey No. 3197, United States patent for which is recorded in Book 64 of Deeds, pages 142, 143 and 144, Official Records of Shoshone County, Idaho.

However, excluded from the above is the following:

"A portion of the Rose Bird Claim, Survey No. 3197, situated in the SW¼ of Section 17, Township 48 North, Range 2 East B. M., in Shoshone County. Beginning at Corner No. 4 of said Rose Bird Lode which is also the NE corner of the tract, and running thence South 4° 14' East 240.77 feet to intersection of line 1-4 Gold Standard Lode, Survey No. 2641 to a point; thence South 9° 34' West 144.23 feet to corner No. 1 of said Gold Standard Lode: thence South 77° 48' East 35.41 feet to intersection of line 4-1 Rose Bird Lode; thence S. 4° 04' East 139.19 feet to the South East corner of the tract; thence North 88° 43' 30" West 180 foot to the South West corner of the tract; thence North 4° 04' West 530 foot to the North West corner of the tract; thence South 88° 43' 30" East 180 feet to the North East Corner of the tract and the place of beginning; containing 2.1 acres; recorded in Book 76 of Deeds, Page 31, records of Shoshone County, Idaho."

The East Hypothook mine was formerly known as the King of Pine Creek property. In 1904 the King of Pine Creek Mining Company was incorporated to explore the property. Exploration work has been intermittent up to the present time. During the period 1904 to August 1952, the date of the exploration project contract, exploration work included a 300-foot, two-compartment vertical shaft and two working levels, a total of about 1,250 feet of crosscut and drift. About 700 feet of drift and crosscut had also been driven from a portal located approximately 200 feet north of the shaft.

A south adit, about 300 feet south of the shaft, had been driven about 400 feet. The north adit workings were extended by 788 feet of drift and crosscut, and 1,048 feet of diamond drilling was performed from the level under the RFC contract.

The mine plant includes three buildings, a main compressor house, workshop and dry house, a smaller combination compressor house, and a store house. The compressor housed in the main building is an Ingersoll Imperial No. 10; a 240 c.f.m. auxiliary compressor is housed in the smaller compressor building.

The mine is equipped with mechanical loader, battery locomotive, several mine cars, and sufficient miscellaneous mine tools and equipment adequate for a small operation employing about six to ten men.

The mine workings stand well and do not require timber or other support except in faults and adjacent sheared areas.

The shaft and lower workings are presently flooded. All ventilation is by mechanical blowers.

GEOLOGY

Summary of Regional Geology

The country rock of the Coeur d'Alene district is composed of metasedimentary rocks of the Precambrian Belt series that have been folded, faulted, and intruded by monzonite stocks and by dikes of various compositions. Although no stocks are known in the Pine Creek area, there is a possibility, based on the interpretation of an aerial magnetometer survey, that an intrusive body may exist at depth. The column of metasedimentary rocks consists of some 20,000 to 25,000 feet of quartzites and quartz argillites; it has been subdivided into six formations on the basis of lithology. Only the Prichard formation is in the vicinity of the East Hypothesis mine.

Recent work by the U. S. Geological Survey has shown that the productive veins of the Coeur d'Alene district occur in seven distinct zones. These zones have a generally northwesterly trend that is at a slight but definite angle to the Osburn fault, the most striking structural element of the area. Five of the zones are north and two are south of the Osburn fault. The Yreka shear zone, one of the zones south of the fault, contains the mines of the Pine Creek area, including the East Hypothesis mine.

A comprehensive coverage of the regional geology may be gained through a review of the literature listed in the selected bibliography at the end of this report.

Local geology

The Yreka shear strikes generally N. 70° W. and varies in width from 500 to 2,500 feet. It cuts the north limb of the Pine Creek anticline and, in part, parallels the fold axis. The East Hypothesis mine is at the western end of the known extent of the shear zone, near the axis of the anticline.

The Prichard formation at the mine consists of light-gray to tan, fine-grained, quartzites and dark-gray quartz argillites, with some rocks present that are intermediate between these two types. Local alteration along the vein has differentially leached the cement from some of the quartzites resulting in 1- to 4-foot irregular shaped masses of friable sand. Two lamprophyre dikes were cut in the mine but age relationship with the ore could not be determined.

The quartzites occur interbedded with the more argillaceous rocks in a stratigraphic member about 2,100 feet thick that strikes northwesterly paralleling both the Yreka shear zone and the axis of the Pine Creek anticline. Some geologists in the Coeur d'Alene area believe that these competent quartzite and incompetent argillite beds have been a controlling factor in the deposition of ore in the Pine Creek area, but the occurrence of large ore shoots in other mines in the Yreka shear zone but not in this quartzitic member indicates that this is not an exclusive control.

The strike of the bedding in the mine is generally northwest with a northeast dip but small scale folding causes local variations.

Mineral Deposits

The ore-bearing structure in the East Hypothesis mine has a general strike of N. 45° W. and an average dip of 60° SW. The vein is a replacement deposit within a relatively narrow zone of shearing. The ore minerals are galena, sphalerite, and minor amounts of chalcopyrite in a gangue of pyrrhotite and quartz. Accessory minerals are pyrite and a carbonate (probably ankerite). It is common to find the vein composed of many stringers of fine-grained galena and sphalerite without gangue minerals and separated only by unreplaced country rock. No specific paragenetic information was gained at this property, but the established sequence for ores in other mines in the Pine Creek district is pyrite, carbonate, pyrrhotite, sphalerite, galena, and quartz.

Ore minerals are exposed in the North drift from the portal back about 400 feet, where the mineralized portion of the vein pinches

out against a relatively tight fault striking N. 25° W. and dipping 67° SW. The width of ore is erratic throughout the 400-foot length of vein and only one section about 60 foot long located near the vein-fault intersection is of economic interest. Plate I shows vein widths and assay values along this portion of the vein.

The contact of the vein and the fault is accompanied by shearing of the ore minerals and a minor amount of dragging of ore into the fault. This evidence suggested the possibility that post-mineral faulting cut the vein and that a faulted segment of the ore shoot might be found to the north or northeast. Drag folding in the country rock indicates a reverse movement on the fault, thus throwing any possible faulted vein segments to the north. A misinterpretation of the movement on the fault was conceivable as drag folding is not always a reliable indication of the direction of movement in this area, so the exploration work was designed to test both possibilities. Additional drifting, crosscutting, and diamond drilling were negative in the search for the faulted segment and the additional evidence gained supports the contention that the fault was pre-mineral and that the highly impermeable gouge acted as a dam to the advancing mineralizing solutions. Post-mineral movement, probably slight, along the fault resulted in the sheared ore minerals found along the contact today.

The shear followed to the north from the ore shoot was barren except for a few scattered small stringers of galena and rare sphalerite. Several east-west-trending veins of barren quartz were cut on the footwall of the fault, but none appeared to warrant further exploration. The largest of these intersecting veins was cut soon after the DMEA advance was begun and is a barren quartz vein nearly 7 feet wide. This is undoubtedly one of the several barren quartz veins known to crop out north of the portal of the mine.

THE PROJECT

The DMEA contract area was a large block of virtually unexplored ground between two producing mines (Hypothesis and Sunset Minerals mines) in a structural belt having an impressive history of lead-zinc-silver-copper production. Following is a summary of production from major mines in the Yreka shear zone, viz., the Sidney, Constitution, Highland Surprise, Sunset Minerals, Douglas, and Nabob, as of the end of 1953:

Ore (tons)	Lead (pounds)	Zinc (pounds)	Silver (ounces)	Copper (pounds)	Gold oz.
2,443,422	173,510,430	389,168,837	3,976,201	2,971,285	8,281

At the time this application was under consideration (February-March 1952) the drift was following a well-developed mineralized vein similar to the productive veins in the area. Knowledge at that time indicated that the geologic target was commensurate with the planned exploration program.

The contract authorized Government participation in the following program:

1.	Rehabilitate, enlarge, and straighten 320 foot of Adit drift	$ 2,560.00
2.	Drift on Main Vein and others, a maximum of 1,300 foot	39,000.00
3.	Excavate 3 diamond drill stations	1,050.00
4.	Drill 1,000 foot AX diamond drill holes at $4.60/foot	4,600.00
5.	Drill 500 foot AX diamond drill holes at $5.00/ foot	2,500.00
6.	Operating equipment to be rented	2,500.00
7.	" " " " purchased	12,200.00
8.	Miscellaneous	1,000.00
9.	Contingencies	5,000.00
	Total	$70,410.00

The drifting was planned to follow the vein structure in a search for possible ore shoots of commercial importance. The drifting would also test the intersections of the Main vein with a series of east-west-striking veins believed to exist north of the North Adit. Two diamond drill holes directed northward were also planned to intersect the east-west vein system. Two shorter diamond drill holes directed southward were intended to test for the projection of a parallel vein believed to exist on the flooded 200 level.

The vein had apparently been cut by a fault, and the drift had been turned north to follow the fault by the time the contract was signed. At that time it was decided that the drift

should follow the fault in an attempt to find the faulted segment in the hanging wall. The fault was drifted on for about 180 feet, except where it was left in the west wall for short distances because the drift miners neglected to turn the heading soon enough to follow irregularities. With only minor exceptions the fault was barren for the entire distance. The drift ran out into the hanging wall of the fault at a point near the north dike. The drift was being turned back to the northeast to intersect the fault again when it was decided to stop the drifting and to test the walls of the fault in that area with a diamond drill hole from the drift face.

The diamond drilling to the north which had been planned was omitted because the ground to be explored by the holes was cut by the drift which had been turned more northerly than originally expected.

At that time it was still believed that a faulted segment of the vein existed somewhere in the hanging wall of the fault. The fact that no such segment had been found in the drift suggested three possibilities: (1) the faulted segment of the vein had been missed in an area where the fault had been left in the drift's west wall; (2) the segment of the vein west of the fault was a tight barren break at the point of intersection with the fault and was not recognized; or (3) the interpretation of reverse movement on the fault had been wrong and that normal movement had displaced the vein farther to the west than had been thought.

These possibilities were checked by three diamond drill holes (DDH Nos. 4, 5, and 6) southwest from the drift. None of these holes cut ore minerals.

It was then decided to drive a crosscut to the southwest from a point northwest of the intersection of the vein and fault to: (1) test for a possible faulted vein segment (assuming normal movement on the fault), (2) test for a parallel vein believed to exist on the 200 level and which originally was to have been explored by diamond drilling, and (3) serve as a diamond drill station. No mineralized structure was cut by the crosscut. Two diamond drill holes (DDH Nos. 2 and 3) were drilled down to the southeast from the end of the crosscut. Both holes encountered ore in the downward extension of the vein seen in the adit. Ore widths and assays of these cores are included elsewhere in this report. The two planned diamond drill holes to the south from the drift were omitted after the crosscut had proven the lack of a parallel structure.

The final phase of the project was a diamond drill hole (DDH No. 7) drilled to the northeast from the north end of the adit. The purpose of this hole was to test for the continuation of a sparsely mineralized but well-developed vein structure known to exist at the Sunset Minerals mine property about 3,000 feet east of and across the Pine Creek valley from the East Hypothesis adit. The hole was drilled to a length of 445 feet, but no significant vein structure was cut.

The exploration project started August 4, 1952, and was completed October 4, 1954. The initial preparation and enlargement of the existing adit drift was prolonged over a period of 4 months. Although more enlarging was necessary than originally anticipated, this phase of the project could have been completed sooner had the Operator been financially able to employ more than one shift. The drifting and crosscutting completed in June 1953 could also have been completed earlier if two or more shifts had been employed. Diamond Drill Holes No. 2 to 6, inclusive, were completed during the period July 7 to August 6, 1953 (Hole No. 1 was drilled prior to the exploration project contract).

The project was officially recessed from August 4, 1953, to July 1, 1954. During the recess period the Operator requested several contract changes that were not approved. Contract work was terminated on October 4, 1954, with the completion of Diamond Drill Hole No. 7.

Ore Reserves

The ore reserves are below the adit drift and are based on available maps of the 200 and 300 levels, by the ore exposed in the drift, and by the two diamond drill hole intersections. The ore reserves are estimated to be 5,000 to 10,000 tons and, because of the small tonnage, reserves are lumped and not classified as to measured, indicated, and inferred. The reserves based on the two diamond drill hole intersections are estimated to contain 6.2 percent zinc and 1.0 percent lead. Factors of 10 cu. ft. per ton and a mining width of 5 feet were used for estimating reserves. The reserves are considered submarginal in view of the small tonnage, high mining cost, and refractory nature of the ore. No production is expected in the foreseeable future.

One hundred and eighty-four tons of ore extracted from the adit drift and stockpiled prior to the DMEA contract was milled at the Sunset Mines mill. The ore had been on the dump several years and had oxidized. The mill produced 7.29 tons of zinc concentrates and 2.862 tons of lead concentrates from this ore. The

zinc concentrates assayed 47.9 percent zinc, 5.4 percent lead, 2.2 ounces of silver, 0.007 ounce of gold, 1.7 percent insoluble, and 11.1 percent iron. The lead concentrates assayed 0.08 ounce of gold, 10.2 ounces of silver, 1.45 percent copper, 35.4 percent lead, 22.9 percent iron, 0.3 percent insoluble, 27.0 percent sulfur, 5.5 percent zinc, 0.07 percent antimony, 0.36 percent arsenic, and 0.0176 percent bismuth. The recovery, estimated to be about 70 percent, and the grade of the concentrates were considerably lower than average for the producing mines in the vicinity, but it is expected that both could be improved if the ore treated was newly mined and not oxidized. There was some question as to whether this ore, which was mined before the contract was subject to DMEA royalty, and in a Field Team letter dated December 10, 1954, the problem was presented to the Operating Committee. In a letter to the Executive Officer dated January 6, 1955, the Operating Committee stated that in the case no royalty was due.

The present ore reserves do not warrant rehabilitation of the shaft and lower workings for the sole purpose of extracting them. Winzing or underhand stoping would also prove too costly. A larger program including further exploration would have to be undertaken to justify the rehabilitation cost. Therefore, exploitation of present reserves as a single objective appears quite remote at present metal prices.

Summary of Factual Data

Following is a tabulation of costs as allowed by the final audit:

Item	Allowed by Audit
(1) Independent Contracts	
Drilling	$ 5,506.44
Bulldozing	224.00
(2) Labor and Supervision	
Labor	13,730.39
Supervision	2,805.00
Technical Services	105.00
(3) Operating Materials and Supplies	
Timber	201.61
Explosives	2,259.21
Pipe	471.56
Track	493.05
Drill steel	856.33
Core boxes	142.30
Ventilation pipe	195.00
Electric cable	51.80
Electric power	2,238.99
Miscellaneous	495.53
(4) Operating Equipment	
Rental	-0-
Purchase	1,833.32
Depreciation	455.00
(5) Initial Rehabilitation	-0-
(7) Miscellaneous	
Payroll taxes	376.27
Compensation insurance	581.41
Power	-0-
(8) Contingencies	
Compressor installation	1,537.30
Total	$34,559.51

The following tabulation shows the main work items, number of units, unit cost, and total cost:

Item	No. of units	Unit cost	Total cost
Drifting and crosscutting	731.9 ft.	$33.41/ft.	$24,453.57 1/
Drill station	1	292.80	292.80
Core drilling	1402.0 ft.	5.20/ft.	7,292.83
Drift preparation	320.0 ft.	7.88/ft.	2,520.31 2/
			$34,559.51

1/ Includes Contingencies ($1,537.30) and Operating Equipment Purchase ($1,833.32).

2/ Includes bulldozing portal site.

The following tabulation shows the equipment items purchased, cost to the project, and appraised value at time of liquidation:

Item	Allowable cost	Appraised value	Cost to project
Compressor and installation	$3,422.74	$2,200.00	$1,222.74
Elmco B-12 mechanical loader	2,500.00	1,900.00	600.00
Drill and accessories	553.00	300.00	253.00
4 mine cars	1,550.00	1,000.00	550.00
	$8,025.74	$5,400.00	$2,625.74

The Operator's bid of $2,700.00 for the Government's 50 percent equity in the appraised value of the equipment was accepted, and his bid of $200.00 for the Government's equity in the probable salvage value of pipe, track, etc., was also accepted. All items of equipment except the drill and accessories were secondhand when purchased for the project.

Discussion of Conclusions

There were no unusual difficulties encountered during the course of the project work. The work completed was performed in a workmanlike manner, and the standard of work was good. The greatest handicap to the performance of the project work was financing. The financing for lead and zinc exploration became more difficult as the market price for these metals became weaker. Acquisition of the compressor was delayed, which also affected the time schedule. The over-all costs for the project work compare well with costs of like work under similar conditions at other projects.

The Operator's progress reports were unduly late, probably because of the company's activity at other properties, including uranium, which overtaxed their small working staff.

Government participation in further exploration based on available data is not recommended.

Enclosures

Distribution:
- DMEA (4)
- USBM (5)
- USGS (SRO)
- Docket
- Campbell

Selected Bibliography

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East Hypotheek Mine

Diamond Drill Hole No. 2

Core Log (by V. Hammerand)

Level-North adit
Collar Coordinates-N 9854.0, E 8079.5
Bearing-S 57° E.
Inclination--58°
Length-198'-0"

0 to 84'-10"-Moderately coarse-grained gray and white quartzite locally stained by brown and red iron oxide.

At 12'-0"-A little disseminated pyrite.

At 34'-0"-18" disseminated pyrite.

At 43'-7" to 60'-0"-Scant to moderately abundant disseminated pyrite and chlorite. Some is partly oxidized.

At 57'-0"-12" band of irregular vuggy pyrite stringers each about 1/4" wide. Also scattered blebs of pyrite.

At 63'-0"-One 1/2" core fragment of pyrite recovered.

At 60'-0" to 77'-0"-Disseminated pyrite and chlorite at intervals along course of the hole.

At 70'-0"-One 1/2" "vuggy" quartz stringer and one 1/4" "vuggy" stringer; about 2" apart.

At 77'-0"-32" of core partly silicified. At 78'-0" 1/2" to 1" vein quartz stringer, at 79'-6" one 2" glossy quartz stringer.

At 82'-8"-4" of core nearly replaced by vein quartz.

84'-10" to 86'-1"-15" bed dense gray-green argillaceous quartzite with 3" coarse gray quartzite near center.

86'-1" to 97'-0"-Moderately coarse-grained white and gray quartzite locally stained brown or red by iron oxide.

97'-0" to 101'-0"-Very fine-grained to dense dark-gray argillaceous quartz and siliceous argillite.

At 99'-8"-Disseminated pyrite on beds, rock is partly silicified.

101'-0" to 157'-0"-Fine to medium-grained gray quartzite. Rock here and there stained by iron oxide.

At 141'-9"-40" scattered bunches, stringers and disseminated grains of sphalerite, galena, and pyrite. Grade of 40-inch band showing lead and zinc estimated to be moderate.

At 147'-5"-20" band of abundant pyrite as fine and coarse disseminated grains and as tiny seams.

Diamond Drill Hole No. 2

At 151'-6" to 162'-0"-Core partly silicified and cut by scattered quartz stringers up to 2" wide. Scattered grains and small stringers of pyrite. A few grains of sphalerite observed in two places. (Mineralized core recovered-20'-3". True width of vein, about 10 feet)

157'-0" to 192'-6"-Laminated dark-gray siliceous argillite.

At 162'-0" to 167'-0"-Ten 1/4" to 1/2" barren quartz stringers.

192'-6" to 198'-0"-Laminated dark-gray argillite.

East Hypotheek Mine

Diamond Drill Hole No. 3

Core Log (by U. Hammeran)

Level-North adit
Collar Coordinates-N 9853.0, E 8078.5
Bearing-S. 46° E.
Inclination-67°
Length-199'-0"

0 to 76'-0"-Gray and white quartzite, in places stained by red iron oxide. Locally a little disseminated pyrite and chlorite.

At 62'-0"-34" core partly silicified and cut by a few small irregular quartz stringers. Also a little disseminated pyrite and chlorite.

At 76'-0"-1/4" quartz stringer parallel to direction of hole.

76'-0" to 103'-0"-Gray quartzite here and there stained brown by iron oxide.

At 76'-0"-A 12" band argillaceous quartzite interbedded with quartzite.

At 83'-2"-1/4" quartz stringer, crosses hole at 45 degrees.

At 84'-5"-1/4" quartz stringer, crosses hole at 30 degrees.

At 88'-7"-1/4" quartz stringer nearly parallel to direction of hole.

103'-0" to 120'-6"-Fine to medium-grained gray quartzite, somewhat argillaceous 118'-0" to 120'-6".

120'-6" to 133'-0"-Black and gray laminated argillite, some beds bordering on siliceous argillite.

133'-0" to 169'-0"-Black laminated argillite including a 24" band of siliceous argillite at 133'-0".

At 141'-0"-Two small irregular quartz-pyrite stringers.

At 148'-0"-Two 0 to 1/2" pyrite stringers.

At 149'-4"-1/2" to 1" stringer sphalerite and pyrite. A tiny sphalerite seam and 2" disseminated pyrrhotite alongside.

At 150'-0"-1/8" pyrite stringer.

At 150'-8"-15" small blebs, irregular seams pyrite-sphalerite-galena-chalcopyrite. Core partly silicified.

At 151'-2"-7" irregular bands and small blebs of pyrrhotite, pyrite, chalcopyrite. Core partly silicified.

At 154'-10"-One 4" band consisting of irregular stringers (1/16" to 1/2" wide) of pyrite, pyrrhotite and very minor sphalerite.

Diamond Drill Hole No. 3

At 156'-6"-Three 0 to 1/4" irregular quartz-carbonate stringers.

At 160'-0"-1/4" irregular quartz stringer.

At 161'-0" to 168'-3"-Argillite partly silicified and cut by small quartz stringers ranging from 1/16" to 1½" wide. Scattered irregular stringers and grains of pyrite and pyrrhotite. At 165'-0"-7" core partly replaced (40%) by pyrite, quartz, and sphalerite.
(Mineralized core recovered 15 feet. True width of vein about 9 feet.)

169'-0" to 199'-0"-Black laminated argillite. Beds cross hole at 30 to 40 degrees to 180'-0". From 180'-0" to 190'-0" beds cross hole at 50 to 60 degrees.

At 190'-7"-1" pyrrhotite-pyrite-siderite stringer with 1/2" to 1" quartz-carbonate alongside.

East Hypotheek Mine

Diamond Drill Hole No. 4

Core Log (by V. Hammerand)

Level-North adit
Collar Coordinates-N 10,265.5, E 8061.5
Bearing-S 42° 30' W.
Inclination-0°
Length-255'-0"

0 to 11'-0"-Poor recovery (32%), 42" basic dike recovered, partly to well bleached.

11'-0" to 18'-6"-Gray to greenish-gray banded argillite. Beds parallel to 30 degrees to hole.

18'-6" to 19'-6"-Thin-bedded tan to dark-gray quartzite grading into argillaceous quartzite.

19'-6" to 27'-6"-Gray to greenish-gray banded argillite. Beds nearly parallel to hole. At 26'-0"-1½ 40% quartz.

27'-6" to 31'-0"-Argillite grades into beds of mixed rocks consisting of argillaceous quartzite, siliceous argillite and quartzite.

At 28'-6"-3/4" core fragment consisting of 70% quartz.

31'-0" to 41'-6"-Gray and greenish-gray banded argillite. Beds nearly parallel to hole except at 34'-0" where they cross hole at 30 degrees.

At 37'-6"-11" core is very siliceous argillite bordering on quartzite.

41'-6" to 43'-6"-Gray quartzite.

43'-6" to 56'-0"-Gray to greenish-gray banded argillite. Some beds are siliceous argillite. Beds cross hole at variable angles-parallet to 30 degrees. Rock well stained by iron oxide at 52'-6" to 54'-0".

56'-0" to 72'-0"-Gray to black banded argillite. Beds 5 to 20 degrees, locally nearby parallel.

At 64'-6"-18" core stained by iron oxide.

72'-0" to 87'-0"-Varied gray and black argillite. Beds average about 40 degrees but 60 degrees at two places.

At 73'-6"-12" very sandy argillite.

87'-0" to 94'-0"-Black banded argillite. Beds parallel to 30 degrees. Folded.

94'-0" to 102'-5"-Black banded argillite. Beds cross hole at 30 to 50 degrees.

102'-5" to 122'-6"-Gray banded argillite, beds 30 to 50 degrees. Locally contorted. Several sandy argillite beds.

122'-6" to 139'-6"-Gray siliceous argillite. Poorly banded, 60 to 70 degrees.

At 136'-5"-11" core bordering on gray quartzite (mixed rock).

Diamond Drill Hole No. 4

139'-6" to 143'-6"-Tan sandy argillite. Banded at 50 degrees.

143'-6" to 150'-6"-Poorly banded impure quartzite.

150'-6" to 152'-6"-Tan very sandy argillite, faintly banded. Beds appear to be parallel to direction of hole.

152'-6" to 154'-6"-Gray banded siliceous argillite. Beds parallel to direction of hole.

154'-6" to 158'-9"-Light-gray dense and poorly banded (parallel to 30 degrees) impure quartzite.

158'-9" to 159'-9"-Banded argillite. Beds at 30 degrees.

At 157'-6"-12" core well silicified and contains scattered tiny grains pyrrhotite and some pyrite.

159'-9" to 170'-6"-Dense, gray poorly banded argillite. Beds at 40 to 50 degrees to direction of hole.

170'-6" to 175'-6"-Gray banded argillite. Beds at 40 to 50 degrees to direction of hole.

175'-6" to 187'-0"-Gray and black banded argillite. Beds parallel to 60 degrees (folded).

At 187'-2" tan gouge recovered.

187'-0" to 196'-0"-Gray banded argillite. Beds 40 to 50 degrees.

196'-0" to 205'-0"-Gray quartzite interbedded with narrow argillaceous-quartzite bands.

At 191'-9"-1/2" quartz stringer on beds.

At 195'-4"-1" quartz on beds. Contains a few grains pyrite.

At 196'-0"-20" core containing disseminated chlorite.

205'-0" to 217'-0"-Gray to greenish-gray argillite. Beds at 50 to 60 degrees.

At 209'-8"-1/4" quartz stringer on beds.

At 216'-6"-Two 1/8" to 1/4" "vuggy" quartz stringers cross hole at 60 degrees.

217'-0" to 230'-6"-Gray banded to poorly banded (at 60 degrees) quartzite.

At 221'-6"-3" abundant chlorite.

230'-6" to 233'-0"-Tan massive quartzite.

233'-0" to 255'-0"-Massive tan and gray quartzite. At 237'-8"-1/4" "vuggy" quartz stringer at 60 degrees. At 251'-3"-1" "vuggy" quartz stringer.

East Hypotheek Mine

Diamond Drill Hole No. 5

Core Log (by V. Hammerstrand)

Level-North adit
Collar Coordinates-N 10,443.0, E 8004.0
Bearing-S 27°W.
Inclination-0°
Length-200'-0"

0 to 21'-6"-Dark gray quartzite, locally impure. Beds cross hole 30 to 35 degrees.

21'-6" to 108'-0"-Tan massive quartzite. One 7" greenish argillaceous quartzite bed at 31'-0".

At 24'-6"-1/4" to 1/2" vein quartz. Crosses hole at 30 degrees.

At 29'-10"-1" vein quartz.

At 37'-0"-Three 1/2" to 1" core fragments of vein quartz recovered.

At 50'-0"-Soft, poorly cemented quartzite well stained by iron oxide.

At 57'-10"-2" vein quartz.

At 65'-0"-Small core fragment of vein quartz recovered.

At 76'-6"-1/4" to 1/2" vein quartz. Crosses hole at 45 degrees.

At 87'-0"-1" vein quartz.

At 89'-0"-Basic dike 11" wide, well altered.

At 102'-0"-10" core silicified. A few small core fragments of vein quartz.

108'-0" to 115'-0"-Dark gray siliceous argillite. Beds cross hole at 30 to 40 degrees. At 111'-0"-24" coarse-grained tan quartzite band interbedded with argillite.

At 110'-0"-Two small core fragments of vein quartz.

115'-0" to 127'-6"-Laminated dark gray somewhat sandy argillite. Beds cross hole 40 to 60 degrees. At 121'-6" one 6" quartzite bed.

At 126'-0" One 1/2" vein quartz core fragment.

127'-6" to 139'-6"-Poorly laminated argillaceous quartzite interbedded with bands of fairly pure gray and white quartzite. Beds cross hole at 60 degrees.

At 131'-0"-2" vein quartz.

139'-6" to 152'-0"-Black laminated argillite. Beds cross hole at 50 to 60 degrees.

152'-0" to 175'-6"-Black laminated argillite. Beds appear folded. Cross hole at 2 to 70 degrees.

Diamond Drill Hole No. 5

175'-6" to 191'-0"-Black laminated argillite. Beds cross hole 30 to 50 degrees.

At 177'-4"-One 4" sandy quartzite bed.

191'-0" to 200'-0"-Poorly laminated gray and black argillite. Beds cross hole at 50 degrees.

East Hypotheek Mine

Diamond Drill Hole No. 6

Core Log (by V. Hammrand)

Level-North adit
Collar Coordinated-N 10,052.5, E 8180.5
Bearing-S 56° 30' W.
Inclination-0°
Length-105'-0"

0 to 8'-0"-Tan coarse-grained quartzite.

8'-0" to 15'-0"-Laminated gray and black argillite. Beds cross hole at 35 degrees. Beds locally contorted.

15'-0" to 24'-6"-Poorly laminated greenish sandy argillite. Beds cross hole at 35 to 40 degrees.

24'-6" to 49'10"-Poorly laminated mixed rock ranging from siliceous argillite to argillaceous quartzite.

49'-10" to 50'-6"-Coarse sandy quartzite bed.

50'-6" to 52'-0"-Poorly laminated argillaceous quartzite.

52'-0" to 59'-0"-Black and gray laminated argillite. Beds 50-60 degrees.

59'-0" to 105'-0"-Gray and black laminated argillite. Beds cross hole 50 to 60 degrees. At 98'-6" one 24" band poorly laminated siliceous argillite.

East Hypotheek Mine

Diamond Drill Hole No. 7

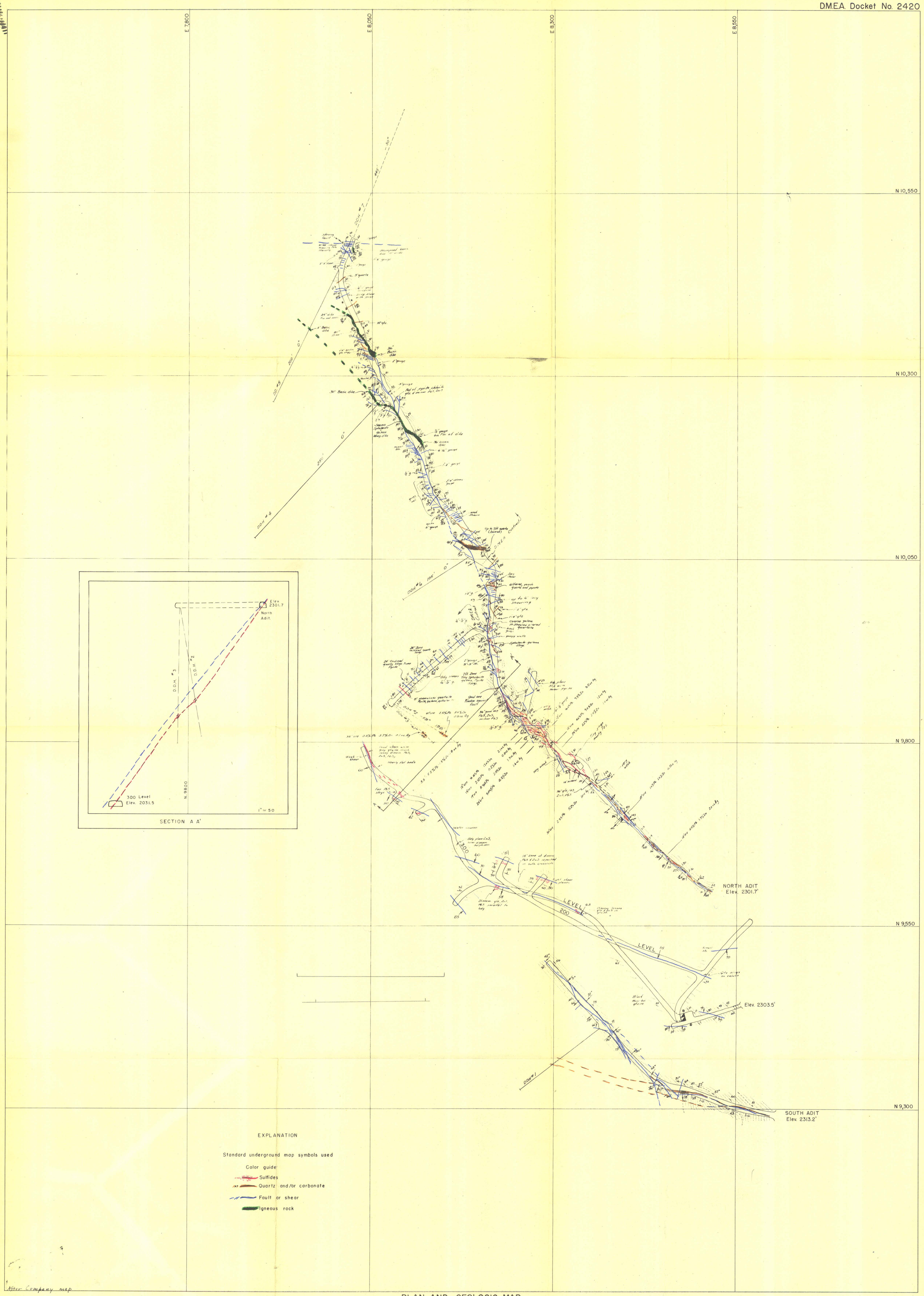
Core Log

Level - North adit
Collar Coordinates - N. 10,484.0, E. 8,023.0
Bearing - N. 22 E.
Inclination - (-)30°
Length - 445'0"

0 to 63'0"	Black and gray laminated argillite, much is quite siliceous. Fine-grained, widely disseminated pyrite is common.
	At 10'0" (0-20") minor fracturing of rock, some thin quartz stringers, much FeO_x in fractures.
	At 16'0" (0-7") altered dioritic dike.
	At 22'4" (0-4") isolated pods of pyrite and pyrrhotite.
	At 37'0" a 1" quartz stringer.
	At 44'2" a 1/2" quartz stringer at 45° to hole.
	At 45'5" a do.
	At 46'4" (0-6") scattered small pods of pyrite.
	At 57'0" (0-3") cluster of 1/4" quartz stringers.
	At 58'0" small stringer of pyrite grains in bedding.
63'0" to 80'0"	At 64'6" a 1"-2" stringer barren quartz.
	At 76'9" a 1/2" pod of pyrite and pyrrhotite.
80'0" to 111'7"	Poorly laminated, medium-gray argillite with many arenaceous laminae.
	At 98'0" (0-6") sheared rock.
	At 102'2" is 1"-2" broken tan siliceous quartzite.
	At 106'0" is 1/2" quartz stringer normal to hole.

111'7" to 112'4"	Fine-grained dioritic dike.
112'4" to 143'0"	Well-laminated, light- and dark-gray argillite and siliceous argillite. Minor disseminated pyrite. At 124'0" is 1/2" stringer quartz and pyrite normal to the hole. At 137'6" is 1/4" quartz and pyrite stringer. At 138'6" is 1/2" quartz and pyrite stringer at 45° to hole.
143'0" to 169'6"	Laminated, light-gray argillitic quartzite with many bands of medium-gray siliceous argillite. At 166'6" is 3" zone of small quartz stringers.
169'6" to 185'0"	Light-gray, medium-grained, sub-vitreous to vitreous quartzite. Bedding 30° - 45° to hole. At 176'2" is 1/2" quartz stringer nearly parallel to hole. At 179'10" is 1" quartz stringer at 45° to hole. At 184'8" is 1" quartz stringer normal to hole.
185'0" to 202'0"	Light- and dark-gray laminated siliceous argillite. Bedding 30°-40° to hole.
202'0" to 228'0"	Rocks become more siliceous with many sub-vitreous quartzite layers in a siliceous argillite. Some laminations. Bedding becomes nearly parallel to hole.
228'0" to 239'0"	Medium-gray siliceous argillite, laminated by many argillaceous quartzite layers. Bedding 10°-30° to hole.
239'0 to 239'8"	Light-tan sub-vitreous quartzite.
239'8" to 241'6"	Laminated, light- and dark-gray siliceous argillite.

241'6" to 265'0"	Light-gray vitreous to sub-vitreous quartzite. Bedding 50°-70° to hole. At 247'0" a 2" barren quartz stringer normal to hole. At 249'0" a 10" bed of dark-gray siliceous argillite. At 264'6" a 2" seam of intensely bleached quartzite.
265'0" to 269'6"	Irregularly interbedded, light-gray sub-vitreous quartzite and medium-gray siliceous argillite. Bedding 20°-40° to hole.
269'6" to 289'0"	Light-gray sub-vitreous to vitreous quartzite. At 273'0" a 1" barren quartz stringer normal to hole. At 275'6" a 1½" barren quartz stringer normal to hole.
289'0" to 291'0"	Interbedded siliceous argillite and vitreous quartzite. Bedding 10°-20° to hole.
291'0" to 445'0"	Light-gray to tan, sub-vitreous to vitreous, quartzite, sericitic in part. Occasional thin (1"-3") bed of medium-gray siliceous argillite. Scattered 1/2"-2" quartz stringers at high angle to hole. Occasional small pyrite pod. Bedding 20°-40° to hole. At 334'0" the bedding turns nearly parallel to the hole. At 340' bedding turns back to high angle to hole. No noteworthy changes in lithology in this interval.



After Company map

PLAN AND GEOLOGIC MAP
EAST HYPOTHEEK MINE
Shoshone County, Idaho
1"=50'