FILE COPY
SURNAME:

Keating

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UNITED STATES
DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS EXPLORATION ADMINISTRATION
WASHINGTON 25, D. C.

OCT 1 1952

Mr. A. C. Furman
1424 K Street, N. W.
Washington, D. C.

Re: Docket No. DMA-860 (Lead-Zinc)
Ibex Extension Mine, Colorado

Dear Mr. Furman:

This office wrote you July 31, 1952, requesting information as to your plans regarding your request for an exploration loan. To date we have received no reply to that letter, and assume that you are no longer interested in receiving exploration assistance from the Government. Therefore, your docket is being removed from the active file and sent to the closed files.

If in the future it should develop that you again wish to make application for exploration assistance, we will be pleased to consider your request.

Sincerely yours,

C. O. Mittendorf
Administrator

(for) J.H. 10-1-52

AGKeating/bjl (written 9/30/52)

Copy to: Docket
Adm. R. File
Op. Committee
H. F. Keller (2)
Mr. Keating
Mr. Bishop
Mr. McKnight
Region IV(2)
Chron.

Mining Division
Region IV

September 6, 1951

Memorandum

To: DMA Field Team, Region IV

From: Chief, Mining Division, Region IV

Subject: Final Report, Docket No. 860, Green Chandler Furman, Helena-Ibex Extension, Leadville District, Lake County, Colorado

The application of the subject docket was for an exploration loan of an estimated cost of $[illegible], with the objectives of exploring the blue limestone in two fault blocks and to explore the Helena Vein north of the present workings. The proposed methods of exploring were by diamond core drilling and drifting.

A review by the examining engineer of the applicant's cost estimates shows that they are low, and even after reducing their proposed drilling program from [illegible],500 feet to 9,750 feet, the estimated total cost of the program by the Bureau of Mines was $374,000.

The examining team state that the entire proposal has merit from a strictly geological point of view, and that it is entirely feasible and logical. They recommend, however, that the exploration be started with a first stage of surface diamond core drilling to explore the shallow blue limestone west of the Hellena Shaft and the Hellena Vein in the unexplored area north of the Hellena Shaft. This work would consist of roughly 5500 feet of diamond core drilling at an actual cost of $63,750. Supervision, geology, assaying, and bookkeeping is estimated at a cost of $11,250, bringing the total to $75,000.

The report contains the essential data for processing a contract, and we concur with the recommendations of the field examiners that the first stage of the project should be approved.

Paul T. Allsman

Paul T. Allsman

[illegible]

Building 20
Denver Federal Center
Denver 14, Colorado
August 31, 1951

Memorandum

To: Chief, Mining Division, Region IV

From: W. M. Traver, Jr.

Subject: DMA-860, Hellena - Ibex Extension, Lake County, Colorado

Please find enclosed the original and seven copies of the "Summary, Conclusions, and Recommendations", by Salsbury and Twete, and the same number of copies of Salsbury's engineering report on the subject docket.

The examining team recommend an alternate exploration program, the first stage to comprise preliminary surface drilling to determine the extent of mineralization in the Hellena vein north of the shaft and vertical surface drill holes west of the Western fault to verify possible blanket ore bodies reported in the favorable Mine limestone horizon. Depending upon the outcome of this preliminary program, the more elaborate plan of the applicants can be considered, if justified.

Enclosed also please find the brochure submitted by the Field Team, copy of the lease agreement, and a copy of Twete's preliminary geologic report.

W. M. Traver, Jr.

W. M. Traver, Jr.

enclosures

UNITED STATES
DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS ADMINISTRATION
WASHINGTON 25, D. C.

200 New Customhouse
Denver 2, Colorado

June 22, 1951

Memorandum

To: DMA Field Team, Region IV

From: Ogden Tweto

Subject: DMA Docket 860--Hellena-Ibex Extension, Leadville, Colorado
Greene Chandler Furman, applicant

Enclosed are the original and 7 copies of the above statement by Ogden Tweto.

Ogden Tweto

Ogden Tweto, Alternate
Supervising Geologist
Colorado-Wyoming

Enclosures (8)

UNITED STATES
DEPARTMENT OF THE INTERIOR
OSCAR L. CHAPMAN, SECRETARY

DEFENSE MINERALS ADMINISTRATION

REPORT OF EXAMINATION BY FIELD TEAM
REGION IV

DMA-860, Hellena - Ibex Extension

Leadville, Colorado

M. H. Salsbury, Mining Engineer
U. S. Bureau of Mines

Ogden Tweto, Geologist
U. S. Geological Survey

August 30, 1951

HELLENA - IBEX EXTENSION
LEADVILLE, COLORADO

Summary, Conclusions, and Recommendations

By M. H. Salsbury
Mining Engineer
U. S. Bureau of Mines

and

Ogden Tweto
Geologist
U. S. Geological Survey

HELLENA - IBEX EXTENSION
LEADVILLE, COLORADO

SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

By M. H. Salsbury and Ogden Tweto

The Hellena mine on the so-called Ibex Extension property is in the southern part of the Leadville district, in Iowa Gulch. The mine is in an area of rather closely spaced and intersecting large faults and the workings are principally in porphyry and "Weber Grits" which overlie the Leadville "Blue" limestone, the chief productive horizon of the Leadville district. The Hellena mine was productive from the Hellena fissure, and the nearby First National mine was productive from shallow replacement bodies in the Blue limestone.

The applicants request an exploration loan of $326.619.60 for the two general objectives of diamond drilling and underground development-one, to explore the Blue limestone in two fault blocks, a relatively shallow horizon west of the Hellena shaft and a deeply down-faulted one below the Hellena shaft, and, two, to explore the Hellena vein north of the present workings. The proposal has merit from a strictly geological point of view. The geologic picture is almost identical to that of the present American Smelting and Refining Company project which adjoins the Ibex Extension ground on the north. On that property the American Smelting and Refining Company has found ore in the deeply down-faulted Blue limestone by core drilling and is now developing this ore.

The Hellena vein has certain characteristics similar to the Sunday vein which is now being mined successfully through the Garibaldi tunnel to the north.

Low grade ore and mineralization was intersected for an interval of 88 feet in a churn drill hole west of the Hellena mine in the shallow Leadville limestone ore horizon, and good ore was mined from small bodies in the Hellena fissure near the shaft. Milling ore reported as aggregating 6,000 tons was mined through the First National shaft from workings in the shallow Blue limestone some 2,400 feet west of the Hellena shaft.

The Ibex Extension property thus warrants further exploration, but it is questionable if the rather elaborate program planned by the applicants should be undertaken as the initial step. It is clear that the applicants' cost estimate for their program is low. Even after scaling down the proposed drilling program from 14,500 feet to 9,750 feet, the cost of the proposed program is estimated by the Bureau of Mines examining engineer at $376,000.00 as contrasted to the figure of $326,619.00 in the applicants' estimate.

The applicants' plan of developing the relatively shallow Blue limestone in the area west of the Weston fault and along the Hellena fissure north of the shaft before doing anything more than preliminary work on the deep-seated Blue limestone below the Hellena workings is logical.

However, because of the high cost of equipping and rehabilitating the Hellena shaft, it is recommended that the exploration be undertaken in two stages, the second dependent on the results of the first.

The suggested first stage, core drilling from surface, can be completed at a cost of not over $75,000.00 and in seven months under favorable conditions. If winter operations are contemplated, the cost and difficulties will be greater.

The shallow Blue limestone ore horizon west of the Hellena shaft could be outlined by 10 holes aggregating 4,500 feet of drilling, while the extent and grade of ore in the Hellena fissure in the unexplored area north of the Hellena shaft could be roughly indicated by 4,000 feet of drilling from angle holes located along the east side of the Hellena fissure.

Eight thousand-five-hundred feet of drilling at $7.50 per foot will cost $63,750.00 to which can be added $11,250.00 for supervision, geological work, assaying and overhead, or a total of $75,000.00.

The above work will not necessarily provide enough information on which to base a development loan but it should prove whether or not the second stage of exploration is warranted.

The second stage would include equipping and rehabilitating the Hellena shaft and further exploration with probably additional diamond drilling, to form a basis for raising development capital by a Defense Minerals Administration development loan, or other means. It would involve the expenditure of the funds estimated for the original project less the cost of exploratory core drilling, or a sum slightly more than $300,000.00. The total cost of the two phases will probably not aggregate more than the examining engineer's estimate of the exploration project proposed by the applicants in their original application.

Accordingly, it is recommended that an exploration loan of $37,500.00, 50 percent of the estimated cost of $75,000.00, be granted for stage one, exploratory drilling from surface, with the understanding that if the results prove favorable, funds for the second stage will be made available.

Geology

Hellena-Ibex Extension, Leadville, Colo.

Greene Chandler Furman, applicant

DMA DOCKET 860

Statement by Ogden Tweto, U. S. Geological Survey

Hellena-Ibex Extension, Leadville, Colo.

In accordance with the request of Mr. Lyons in his letter of transmittal for Docket 860, and of the Field Team for Region IV, I have investigated the application for an Exploration Loan of $326,619, on a 50-50 basis, for the Hellena-Ibex Extension area. This project has merit geologically, and I recommend it for engineering investigation.

The project is designed to explore the Blue limestone in an area in which this limestone is deeply down-faulted and relatively unexplored. Such a project is almost identical to that now being prosecuted by the A.S.& R. in this same fault block about a mile farther north. The success of the A.S.& R. in this venture is one of the chief arguments in favor of the Hellena project. Another strong argument is that ore was found in the upper 40 feet of the Blue limestone in the churn drill hole 1200 feet west of the Hellena shaft, as shown in the brochure. As stated in the brochure, the Hellena vein has been worked only a short distance on each side of the shaft, and there are good possibilities of finding more ore in the vein as well as in blanket deposits in the Blue limestone.

Certain representations made by the applicants are misleading or erroneous, and cognizance should be taken of them.

(1) It is stated that the Hellena vein is an extension of the Sunday vein. Although this may possibly be true, it has never been proved, and the information available at present suggests that they are two distinct veins. Both, however, are elements of a broad and persistent fissure zone that trends diagonally across the block between the Weston and Ball mountain faults. The Hellena vein, insofar as known, is similar in character and in direction and amount of fault displacement to the Sunday vein. The long strike length of workable ore proved by the current

Jones and Nylene operation on the Sunday vein, together with drilling done by A.S.& R., is grounds for some optimism concerning wide distribution of ore on the Hellena vein.

(2) The inference is made in the brochure that practically all the drifting on the Hellena vein was in ore. This is not true; the 500-foot level was extended northward on the vein by the Golden Rod Corporation in 1927-29, and the results were classed as "disappointing". Thus, as should be expected, the vein is not everywhere ore-bearing, as the brochure might lead one to believe, but on the other hand, it is a strong vein and has been notably productive within a small area near the shaft. By analogy with many other major veins in the eastern part of the Leadville district, ore should be expected to be widely distributed along the vein.

(3) The point is made in some of the earlier reports included in the brochure that several "contacts" are available for exploration. It should be noted that two of these were reached and found barren in 1927-29. These are the top contact of the Blue limestone with the White porphyry east of the shaft, and the lower contact of the Blue limestone west of the shaft and just west of the Weston fault. By analogy with the Eclipse-Garbutt-Sunday area of the A.S.& R., however, it is the block between the Hellena vein and the Weston fault that offers most promise of blanket deposits in the upper part of the Blue limestone, and this has not been tested.

(4) The similarity of this project to that of the A.S.& R. suggests a similarity of problems and costs. The A.S.& R. found that drilling was difficult and costly, and is now experienceing difficulty in getting down to the ore. I am not informed of the costs to date of the A.S. & R. project, but am sure that they are far in excess of the estimates made in the present application. As mentioned in the brochure, this is an "all or nothing" project, and there is

little reason for going into it if the financial resources of the applicant should be so strained by paying his proportionate share of the loan that he could not carry on afterward. In other words, the amount of the loan should be revised upward to cover the entire costs, or assurance should be gained that the applicant will be in a position to carry on financially after the program of government participation has been completed.

(5) Even a most cursory examination of the cost estimates submitted shows them to be unrealistic. Most of the drilling is computed at $3.00 per foot, and some for even less. Present direct costs for such drilling in the Leadville district are $5.00 to $6.50 per foot, or about double the estimated costs. On the other hand, the brochure proposes many more holes than may be needed, and elimination of some of the holes would partly balance the deficiency in cost estimates.

(6) The brochure lists an inventory of $73,129 of mining and milling equipment presumed to be available for use on the Hellena project. This is grossly overestimated with respect to present condition of the equipment. The shaft house and mill at the First National shaft are standing open. All motors and much small equipment have apparently been stolen; some heavy equipment such as the ball mill, has evidently been maliciously wrecked by means of explosives; parts such as wheels, gears, belts, and valves, have been pilfered from much of the equipment; and some equipment, such as the concentrating tables, has deteriorated badly since last used, in 1937. The buildings, and the First National headframe, are in a poor state of repair, but both the First National and the Hellena shafts are in good shape at the collars and therefore presumably at depth. Water stood about 30 feet below the Hellena collar, and about 60 feet below the First National collar on June 20, 1951.

HELLENA - IBEX EXTENSION
LEADVILLE, COLORADO

Engineering Report

By M. H. Salsbury
Mining Engineer
U. S. Bureau of Mines

Engineering

HELLENA - IBEX EXTENSION
LEADVILLE, COLORADO

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HELLENA - IBEX EXTENSION
LEADVILLE, COLORADO

ENGINEERING REPORT

By

M. H. Salsbury

INTRODUCTION

On July 11 - 13 an examining engineer of the Bureau of Mines visited the Hellena - Ibex Extension group in Iowa Gulch, Leadville Mining District, Lake County, Colo., for the purpose of checking the physical condition of the property and verifying the equipment as listed in the application submitted under the Defense Production Act of 1950 in Defense Minerals Administration docket 860.

The docket makes application for a loan of $163,309.50, being 50 percent of an estimated exploration cost of $326,619.00.

The proposed exploration program includes installation of a complete surface plant at the Hellena shaft consisting of headframe, buildings, hoist, pumping equipment, and air compressor. Actual exploration planned consists of 2,400 feet of drifting and 9,300 feet of diamond drilling underground and 4,500 feet of diamond drilling from surface.

ACKNOWLEDGMENTS

Acknowledgment is made of information in reports by Robert D. Elder, A. O. Nichols, R. D. George, and F. J. McNair. These reports accpmpanied the loan application. In addition, U. S. Geological Survey Professional Paper 148 and two reports of the Colorado Scientific Society, Volume 12, No. 3, and Volume 14, No. 2, were drawn upon. Former employees have also been consulted.

LOCATION, TOPOGRAPHY, AND PHYSICAL FEATURES

The Ibex Extension group is located in upper Iowa Gulch in the southeast corner of Leadville Mining District, Lake County, Colo. (fig. 1). It is 6 miles by good county road from the county seat, Leadville, where are found railroad connections, repair facilities, supply sources and, most important, the lead smelting plant of the American Smelting and Refining Company.

Power lines of the Public Service Company of Colorado pass close by the several shafts of the property.

The claims lie along the floor of the east and west gulch and on the north slope. The holdings are in two blocks of claims separated by several claims with different ownership. The two main shafts are easily accessible. The Hellena shaft is 250 feet north of Iowa Creek at an altitude of 10,975. The First National shaft and mill are 2,400 feet west of the Hellena shaft at about the same elevation but some 400 feet north of the creek bed and 150 feet above it. Both shafts are flooded to the elevation of creek drainage.

The topography of the area is rugged but the shaft sites are good. There is ample dumping room and an adequate tailings disposal site already prepared and previously used at the First National shaft.

The climate is characterized by cool summers and severe winters with heavy snowfall. The road to the mine was kept open by the county during periods of previous operation but there are likely to be brief periods following severe storms when the road will be blocked by snow. One of the water intakes of Leadville's water supply is only a short distance west of the First National shaft and the road to this is kept open. Year around operation is feasible.

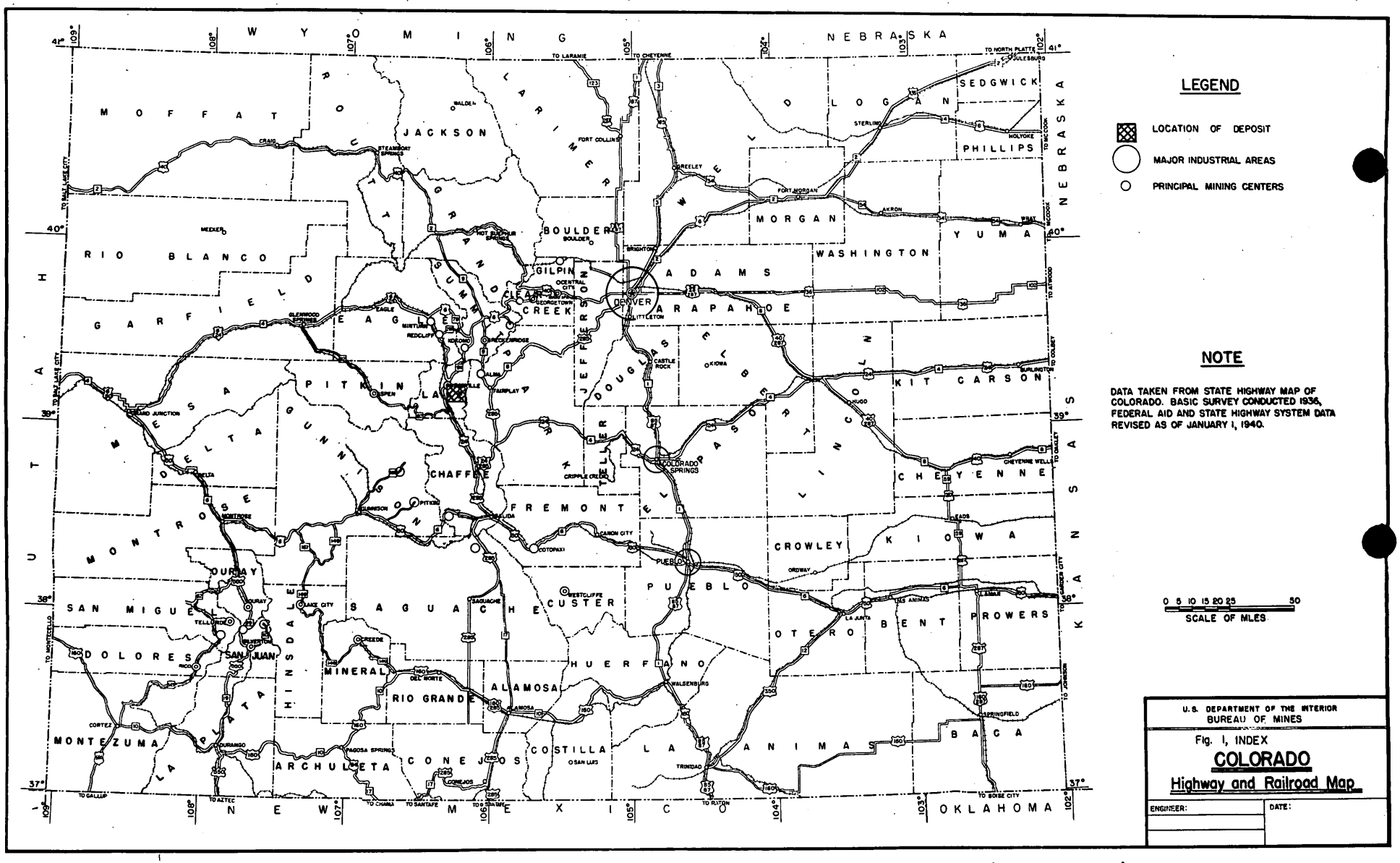


Fig.1-LOCATION MAP HELLENA-IBEX EXTENSION, LAKE CO. COLORADO. (DMA-860)

There is an ample water supply for milling obtainable from shafts on the property and from Iowa Creek.

The water inflow into the First National workings is reported as very moderate, while the flow into the Hellena is reported as from 300 to 500 gallons per minute with present development openings.

HISTORY AND PRODUCTION

The early history of the Ibex Extension group is fragmental. Professional Paper 148 of the U. S. Geological Survey does not mention the property although the general geology is covered and the adjoining mines on the south-The Clear Grit, Ella Beeler, and Fortuna-are covered briefly in connection with a description of the Weston fault (page 78). The mines on the north, including the Ibex and Sunday, are covered more fully.

The area is described on page 77, Volume 14, No. 2, and page 49, Volume 12, No. 3, publications of the Colorado Scientific Society, by C. H. Behre, Jr.

The earliest direct mention of operation is a period of mining at the First National shaft in 1887. This shaft was also operated in 1917 and 1939 and possibly at other times. In 1887 and 1917 lead-silver ore with as little zinc as possible was mined. In 1939 Elder mined lead-zinc sulfide ore. In 1887 there was a concentration mill on the property, and Elder operated a selective flotation mill in 1937-39. There are no production records available for the earlier periods. Elder mined and milled 6,000 tons of low-grade lead-zinc sulfides from shallow workings during the 1939 operations.

The earliest mention in reports now available on the Hellena is 1906-09. It was unwatered and operated in 1927 by the Golden Rod

Mining and Smelting Corporation, tri-state operators. Closed down in 1929, it has since remained idle. Total production through 1915 is reported as $580,000.00. The operation in 1927-29 produced no ore but Elder milled 4,000 tons of the Hellena dump in his 1937-39 mill project at the First National shaft.

The operations of the Golden Rod Mining and Smelting Corporation in 1927-29, cut short by the depression, gave promise of successful exploration, particularly of the deep-seated Leadville limestone contact below the lowest workings. An intersecting body of lead-zinc sulfide ore was also penetrated by a churn drill hole from surface 1,200 feet west of the Hellena shaft. The ore bodies sought at that time are still the logical targets for exploration. Figure 2 is a diagrammatic sketch showing likely ore horizons that should be explored.

OWNERSHIP AND EXTENT

The Ibex Extension group comprises 186.209 acres of patented mining claims in two blocks separated by the Montreal claim of different ownership, in secs. 28 and 33, T. 9 S., R. 79 W., Leadville Mining District, Lake County, Colo., owned by Robert D. and Margaret H. Elder, of 310 W. 8th Street, Leadville, Colo., now residing at 4233 32nd Road, South Arlington County, Virginia. They have given a 30-year lease and option* to Greene Chandler Furman, Highland Apartments, Connecticut Avenue and California N. W., Washington, D. C. The claims involved are listed and royalties are graduated from 7.0 percent of net returns on all ores extracted from the claims to and including a net return of $10.00 per ton to 32.0 percent of the net returns on ore over a net return of $100.00 per ton. Net returns shall be determined by deducting actual competitive transportation costs from net smelter

* A copy of the bond and lease agreement including a list of the mining claims was furnished after the field examination and is filed with the application. It differs considerably from the usual Leadville form.

returns on all ore or concentrates sold to a smelter or to a United States mint. If the lessee creates any dumps he shall determine the weights and values of any ores therein according to the facts and pay royalties thereon if and when marketed during the term of the lease. The lessee has the option of purchasing the property before January 1, 1954, for $600,000.00 or before January 1, 1960, for $1,600,000.00. Advance monthly rental of $500.00 starts January 1, 1952. Other stipulations in the lease-option agreement are common to such legal instruments.

A check of the records at the Lake County Courthouse shows the taxes are assessed to the owners as listed above. Taxes through 1949 are fully paid. Taxes for 1950 are delinquent at this date.

The area covered by the claims of this group includes a substantial part of the ground between the Ibex group to the north and Iowa Gulch to the south, some 2,500 feet on the Hellena - Weston fault zone, considered as potential ore-bearing ground, as well as an area covering much of the shallower Blue limestone ore horizons west of the Weston fault.

DESCRIPTION OF THE DEPOSITS

Inasmuch as the Hellena, First National, and other shafts on the property are flooded, no examination of the underground workings is possible. From descriptions in several reports and by analogy with similar ore deposits in other mines of the Leadville district, some conclusions can be reached.

There are two distinct types of ore occurrences on the property. One type, flat dipping replacement deposits at the upper contact of the Leadville or Blue limestone at shallow depths, lies west of the Weston fault. These are probably lead-zinc sulfide deposits of low- to medium-grade. Some of them, more especially the portions higher in lead and silver, have been mined to a limited extent through the First National and Fisk-Julia and other shafts.

The other type, a fissure vein deposit, is found east of the Weston reverse fault in the Hellena vein. This steep-dipping vein is on the west, or footwall, of the Hellena reverse fault, an east branch of the Weston fault which it joins just south of the property. Laughlin so describes it in the description of the Clear Grit mine on page 78 of Professional Paper 148.

The ore occurs as lenses of lead-silver and lead-zinc ore occurring irregularly in a zone some twenty to thirty feet wide. High grade gold stringers were found along the footwall in early mining. The east-dipping vein has beds of the Weber formation with several intruded white porphyry sills on the footwall. At greater depth the Leadville Blue limestone and Parting quartzite will be encountered. The hanging wall of the Hellena vein is a wide, white porphyry intrusive which appears to be a dike occupying much of the Hellena fault. East of this, beds of the Weber formation and the Leadville Blue limestone are again encountered.

The entire block between the Weston fault on the west, the Ball Mountain fault on the east, and the Iowa fault on the south, is faulted downward. This places the upper contact of the Leadville Blue limestone an estimated 1,100 to 1,200 feet below the surface and some 400 feet below the present bottom of the Hellena shaft.

Exploration of this deep ore horizon is one of the objectives of the present proposal. The geological conditions are very similar to those in the downward faulted block to the north where the American Smelting and Refining Company is exploring the Blue limestone through the Eclipse shaft; on the latter property, the ore was diamond drilled and its grade and extent delineated before sinking operations were started. Assay results and other information on the diamond drilling are not available.

The Hellena vertical vein is similar to the Sunday vein which is now being mined through the Garibaldi tunnel to the north of the Ibex Extension. This is a successful operation by lessees on American Smelting and Refining Company property, producing low-grade lead-zinc ore which is shipped to the Resurrection mill in Leadville.

The ground in the Hellena vein is heavy and close support is needed. Mining is likely to be expensive. Mine openings outside of the vein stand well and do not usually require support.

The Leadville Blue limestone replacement deposits in the First National mine are hard and do not require more than an occasional pillar for support. The above information was obtained from a former workman on the properties.

The grade of ore to be expected may be judged by past shipments, bearing in mind that some of these may have been selected.

An average of 6 smelter shipments from the First National shaft in 1917 returned 0.133 ounce gold and 8.00 ounces silver per ton, 5.08 percent lead, and 6.06 percent zinc. The zinc was not paid for and no penalty was reported. In 1938 a trial shipment by Elder from the same mine to the smelter returned 0.115 ounce of gold 7.7 ounces of silver per ton, 8.55 percent lead, and 10.7 percent zinc. Elder states that this was a representative sample of his mill heads.

The lower grade ore, particularly material high in zinc, was reported as not mined by early operators. Elder mined and milled 6,000 tons of this material in his 1939 operation.

An average of 15 shipments of sorted ore from the Hellena vein to the Ohio and Colorado Smelting and Refining Company, at Salida, in 1906-12 ran 0.148 ounce gold and 9.73 ounces silver per ton, 30.91 percent lead, and 7.96 percent zinc.

A similar group of shipments to the Leadville smelter of the American Smelting and Refining Company in 1906 and 1907 assayed 0.182 ounce gold and 9.54 ounces silver per ton, 26.31 percent lead, and 11.0 percent zinc. This was undoubtedly selected ore from high-grade lenses. The only other information available on production from the Hellena shaft is a statement that the production through 1915 was $580,000.00.

ORE RESERVES

It is impossible to estimate probable reserves in either the First National or the Hellena. Records are fragmentary and future possibilities of ore horizons already partly developed and mined can be only surmised.

At the First National, Fisk-Julia, and perhaps other minor shafts, it can be assumed that there are substantial tonnages of low-grade ore available for milling, particularly high zinc ores.

A churn drill hole, one of five put down from the surface by the Golden Rod Mining and Smelting Company in 1927 and the only one which ever reached its objective-the upper contact of the Leadville limestone, west of the Weston fault-encountered 26 feet of heavy lead-zinc-iron mineralization underlain by 40 odd feet of lower-grade mineralization (Elder's Report). Assay figures were not released by the operators.

The Hellena vein has been worked some 150 feet north and 150 feet south of the shaft down to the sixth level. The ore is not continuous. Probably the richest lenses have been mined from this section.

There is not much room for further development south of the shaft as the south endline of the property is close by, but to the north there is ample room. The ore is not likely to be continuous to the north but,

by analogy with the Sunday vein previously mentioned, should produce bodies of commercial ore.

Of the value and extent of ore to be expected in the deep Leadville Blue limestone ore horizons nothing can be predicted, except that the possibilities are good.

In general, the prospect for commercial ore which can be mined at present prices and under present costs is excellent.

PRESENT STATUS

The present development includes the Hellena shaft, 766 feet deep under water but probably in good condition, with 10 levels and 6,600 linear feet of lateral workings; the First National shaft, 245 feet deep with 2 levels; and the Fisk-Julia shaft, 660 feet deep. All three of these shafts are in good condition, except the upper 100 feet of the Fisk-Julia which is above water level and probably needs retimbering.

A churn drill hole 1,200 feet west of the Hellena shaft on the Hazelholm claim, sunk to a depth of about 605 feet, cut low-grade ore in the Leadville Blue limestone, as previously mentioned.(fig. 2).

A 900-foot crosscut west on the 500-foot level penetrated the Weston fault and is reported to have encountered considerable water.

A 150-foot vertical diamond drill hole from the sump of the Hellena shaft encountered disseminated lead and silver minerals in the white porphyry, according to F. J. McNair. According to a former workman, it also cut a flow of water which could not be handled by the pump and the hole had to be discontinued.

The water flow in the First National is reported as small, never over 40 gallons per minute. In the Hellena shaft the flow is

unknown from previous operating records but it could exceed that experienced elsewhere in the district.

It can be predicted that any further work either by lateral development to the west through the Weston fault, or by diamond drilling below the 700-foot level, will encounter heavy flows of water. That is the experience of the American Smelting and Refining Company in the Eclipse mine where they are almost at the capacity of 1,300 gallons per minute pump installation.

Inasmuch as two of the logical exploration targets involve like development, the possibility of greater water inflow must be prepared for.

PROJECT PROPOSALS, WITH COSTS

Under this heading will be presented the proposals in the application with the applicants' estimates and Bureau of Mines estimates compared.

The applicants list in their proposal a mining and milling plant at the First National shaft to the value of $73,125.00 which is available for use by them.

Unfortunately, the plant is badly deteriorated. Of the equipment listed, only the Telesmith crusher, the flotation machines, classifier, concentrating tables, compressor, hoist, skip, headframe, and buildings are usable. All electric motors have been stolen and the ball mill and head motions of the concentrating tables wrecked. The mill building is now only a shell with the windows and corrugated roof and part of the siding gone.

Of the equipment above nothing can be used to advantage in the proposed exploration program except possibly the skip and dumper, and

negligible amounts of pipe and rail. Possibly some of the items, such as the sinking pump, have been stored elsewhere but, if so, there is no indication shown in the application.

The compressor could be used to augment the larger compressor recommended for the Hellena operation if more air is needed.

Exploration and Development

Applicants' Estimate		Bureau's Estimate	
2,400 ft. of drifting on Hellena vein various levels at $20.00/ft.	$48,000.00	2,400 ft. of drifting at $30.00/ft.	$72,000.00
3 drill holes below 700-ft. level, average 500 ft. each, at $3.00/ft.	4,500.00	Omit	
10 drill holes below 500-ft. level, average 700 ft. each, at $3.00/ft.	21,000.00	Same at $6.00/ft.	42,000.00
2 drill holes upwards in west end of 500 level crosscut to penetrate Blue limestone ore horizon located by surface churn drill hole, 500 ft. at $3.00	1,500.00	Same at $7.00/ft.	3,500.00
10 diamond drill holes from surface, averaging 450 ft. each, to explore Leadville limestone ore horizon west of Weston fault. 2700 ft. at $3.00/ft. (This does not check 10 holes at 450 ft. each)	8,100.00	5 holes, 450 ft. each, at $7.50/ft.	16,875.00
Power cost for 19 months - pumping, hoisting, drilling, and miscellaneous, at $2,200.00/month	$41,800.00	Power cost based on estimate made in consultation with Public Service official, 19 months at $1,600.00	$30,406.00

NEW EQUIPMENT

Applicants' Estimate		Bureau's Estimate	
Shaft signal system	$ 60.00	Shaft signal system	$ 250.00
2 - 6-ft. sheave wheels	900.00	2 - sheave wheels	1,000.00
1 - 125-hp. hoist 6,600 lb. rope pull single drum complete with motor and control equipment	9.700.00	1 - 100-hp. hoist 7500 lb. rope pull with motor and control equipment 300-ft. per minute rope speed	10,500.00
1,500 ft. 1-inch plow steel hoisting cable	1,950.00	1,200 ft. 3/4-inch plow steel cable at $.35 a ft.	420.00
1 - Electric deep well turbine pump for 700-ft. head no capacity given	18,400.00	1 - Electric deep well pump 700-ft. head 1,500 GPM capacity from 500-ft. level	18,400.00
1 - 1,100-ft. two stage air compressor complete with motor receiver, etc.	9,800.00	1 - 914-ft. two stage compressor w/150-hp. synchronous motor	14,700.00
		36-inch x 8-ft. receiver and piping	500.00
1 - Electric winch for lowering turbine pump column complete w/cable	3,600.00	1 - Winch for hauling turbine pump and column	2,000.00
2 - DA30 IR drills	2,080.00	2 - 3-inch automatic drift drills	1,350.00
1 - R58 stoper	735.00	1 - 99-lb. stoper	650.00
1 - J50 jackhammer	365.00	1 - 55-lb. jackhammer	330.00
4 - 50-ft. lengths air hose	149.60	4 sets 50-ft. air hose w/fittings	200.00
4 sets water hose, pressure tank, and fittings	860.00	4 - sets 50-ft. water hose 1/2-inch (eliminate tanks and use gravity water system in shaft)	120.00
		3,000 ft. 3/4-inch black pipe air line	300.00
2,400 ft. 4-inch black pipe air lines	3,200.00	2,000 ft. 4-inch black pipe air line	2,000.00
3,000 ft. 2-inch black pipe air lines	1,660.00	2,000 ft. 2-inch black pipe air line	600.00
Pipe fittings	110.00	Pipe fittings	250.00
Pipe fitting tools	60.00	Tools under miscellaneous tools	
		NOTE: Use Victaulic couplings preferably.	

NEW EQUIPMENT (continued)

Applicants' Estimate		Bureau's Estimate	
1 - Steel sharpener complete with dies	$ 2,900.00	Omit - Use detachable bits either standard or carbide insert and have them serviced in Leadville	
1 - Oil forge	350.00		
1 - Coke forge	40.00	1 - Coke forge	$ 40.00
Supply of drill steel	600.00	Drill steel - Fabricated, 40 sets threaded and shanked (steel renewal and bit cost is in footage cost of lateral work)	650.00
Auxiliary drilling equipment cross bars, columns, etc.	560.00	Auxiliary drilling equipment	400.00
1 - Mancha tramming locomotive with battery and charger	4,900.00	Substitute 1 - 6-hp. Universal "Tram Aire" which will be satisfactory up to 1,000-ft. Tram is much cheaper and more economical in operation.	1,750.00
1 - Mucking machine	4,750.00	1 - Mucking machine Eimco 12B	2,967.00
20 - 16-cu.ft. mine cars at $160.00 each	3,200.00	20 - 16-cu.ft. mine cars	3,200.00
Miscellaneous tools and supplies for blacksmith shop	250.00	Miscellaneous equipment, tools, and supplies for blacksmith shop and mine	3,000.00
Wrenches and miscellaneous tools for mine	1,200.00		
10 tons 12-lb. rail with splice bars, bolts and spikes, enough for 2,500-ft. track	1,300.00	5,000 ft. 16-lb. rail (more suitable for motor haulage and mucking machine operation)	1,960.00
		Splice bars	150.00
		Spikes	88.00
		Ties	480.00
1 - 20-cu.ft. self dumping skip	400.00	1 - 20-cu.ft. skip	1,000.00
1 - 60-ft. head frame	4,800.00	1 - 60-ft. head frame with skip dumper	6,000.00
Hoist room, compressor room, and dry	4,000.00	Hoist room, compressor room, dry and storeroom	3,000.00
Blacksmith shop and storeroom	1,200.00	Blacksmith shop	500.00
Powder Magazine	450.00	Powder Magazine	450.00
Carbide shack	90.00	Carbide shack omit	

NEW EQUIPMENT (continued)

Applicants' Estimate		Bureau's Estimate	
3 - Transformers 6,600 to 440	$ 3,900.00	Transformers 500 KVA	$ 4,383.00
Power hookup	1,300.00	Power hookup (Public Service estimate)	1,000.00
Fluming creek 500 ft. to keep water out of fissures, vein, cutting pumping expense	3,200.00	Possibly omit; value unknown	
Labor overhead 19 months: 1 mine foreman, 3 hoist engineers, 1 blacksmith, 2 top men at $2,400.00 a month.	45,600.00	Labor 19 months, 2 shifts/day:	
		Mine foreman at $525.00 month	10,000.00
		2 hoistmen at $16.00 a day each	15,200.00
		2 top men at $11.60 a day each	11,020.00
		1 repair man at $18.00 a day	8,850.00
		1 watchman for graveyard at $12.00 a day	5,700.00
		Comp. Ins. and Social Security on above	5,000.00
Management 24 months	14,400.00	Management 24 months	14,400.00
Interpetation of drill cores and mapping of formations by independent geologist	8,000.00	Same (consulting geologist employed part time)	5,000.00
Mine Surveying	1,400.00	Mine surveying	1,400.00
		Assaying (wet and fire)	2,000.00
Accounting supervisor 24 months	1,200.00	Accounting supervisor	1,200.00
Bookkeeping and clerical 24 months	4,800.00	Bookkeeping and clerical storekeeper	6,000.00
Established cost of power labor involved in initial unwatering Hellena shaft	2,700.00	Freight and hauling on equipment and supplies	3,000.00
Foundation for deep well pump	600.00	Install hoist, compressor, and pump	2,500.00
		1 - 1-ton truck (second hand)	1,200.00
Total	$296,619.60	Total	$341,839.00
Estimated marginal funds	30,000.00	Add for contingencies	34,161.00
Grand Total	$326,619.60	Grand Total	$376,000.00

Referring to the cost estimates, it may be seen that the applicants' costs on many items are at variance with the prices shown in the Bureau's estimate. The Bureau figures are based on current equipment prices and local labor costs now in effect.

Some items which the applicant includes the Bureau has eliminated as of doubtful value. On some equipment the Bureau has suggested alternatives where it seems advisable.

Because of the possibility of increased water flow being encountered in exploration work at any time, the Bureau engineers recommend pump capacity of 1,500 G.P.M. as a safety precaution. Although it is recommended that diamond drilling be carried on from the 500-foot level, at least in the preliminary stages, the Bureau recommends a pump suitable up to a 700-foot head in order that it can be used for deeper work. For the same reason, 500 KVA transformer capacity is recommended, although not needed at first.

Some items may be obtained second-hand at lower prices with a considerable saving. For instance, it may be possible to dismantle and move a headframe from some local property. It may be possible to buy second-hand hoists, compressor, or transformers. The possibility of rental of some equipment has not been considered, as the accumulated rental on the major items for the period covered would be more than the outright purchase price. No road building will be necessary for this project. Man power requirements will be a maximum of 25 men, including heading crews and diamond drill crews. Water and power requirements are met by installations at hand or provided for.

PRODUCTION PLAN

The time schedule for the completion of the exploration phase suggested by the applicant - 19 months after the operating plant is ready to go - seems high. On a two shift basis, the 2,400 feet of lateral development should be accomplished in 8 months. This is only 300 feet per month. The underground diamond drilling, totaling 7,500 feet as shown in the revised Bureau's estimate, should be completed within 10 to 12 months with two crews. This is only 750 to 625 feet per month.

The surface plant is adequate for a production of 75 tons per shift. An initial mill capacity of 150 tons, which can be stepped up by installation of some additional equipment, is indicated if the exploration work proves sufficient ore reserves.

SUMMARY: COST OF PROJECT

The Bureau's estimated cost of $376,000.00 is $49,380.40 higher than the applicants' and covers only the exploration stage. It does not provide for the development of any ore bodies discovered nor for the installation of any milling facilities. Thus, plans of the applicants should include means of obtaining the capital for such work by other means, perhaps a Defense Minerals Administration development loan. The additional capital required could total as much as $500,000.00 if deep development is included.

PROPOSED FINANCING

No details of methods of raising the applicants' share of the estimated cost of exploration are indicated in the application.

CONCLUSIONS

The proposals of the applicants are entirely feasible and logical. The applicants are not known to the Bureau office in Leadville but Robert Elder, who acts as their consultant, was formerly a Leadville attorney and mine operator.

RECOMMENDATIONS

These recommendations are based on the belief that the chances of finding substantial bodies of milling-grade lead-silver-zinc ores are possible under the proposed exploration plan, and that at present prices and costs this ore can be mined and milled at a small profit under the mining conditions likely to be encountered. The possibility of finding lenses of richer ore along with the low-grade material is likely in the exploration of an undeveloped ore horizon and this possibility provides the chance for more than a small profit on operations.

Because of the probable high cost of reaching and developing the ore horizons of the Leadville Blue limestone below the bottom of the Hellena shaft, this project is not included except for preliminary drill holes from the 500 foot level, if and when the shaft is in operation.

Because of the high cost of equipping and rehabilitating the Hellena shaft, it is recommended that the exploration be planned in two stages.

The first stage will consist of preliminary exploration by diamond drilling from the surface. Four thousand feet of drilling in angle holes from points along the west side of the Hellena vein would indicate the extent of mineralization in the undeveloped portion north of the Hellena shaft workings.

Four thousand five hundred feet of drilling in 10 vertical holes west of the Weston fault would outline, at least roughly, the extent and grade of the Blue limestone ore horizon tapped by the one churn drill

hole drilled by the Golden Rod Mining and Smelting Corporation which indicated lead-zinc mineralization. Four thousand five hundred feet was the amount suggested in the applicants' estimate and is double that suggested by the Bureau for the same purpose. The Bureau's estimate was to be supplemented by simultaneous underground development. With the latter deferred, the original estimate seems more logical.

An estimate of $75,000.00 for this work is made consisting of $63,750.00 for drilling 8,500 feet of hole at $7.50 per foot, and $11,250.00 for supervision, geological consultation, assaying, and general overhead.

Utilizing two drill crews, the surface work can be done in 7 months under favorable conditions. If a winter drilling campaign is instituted the difficulties and resulting costs will be greater.

The above program may not necessarily provide enough information on which to base an application for a Defense Minerals Administration development loan. However, if the information obtained from the first stage is favorable, it would probably justify the recommendation of the second stage and an exploration loan for the amount required to equip and rehabilitate the property and do enough further exploration underground to provide the basis for obtaining development capital, either from a Defense Minerals Administration loan or from other sources.

Recommendations for exploration of the deep lying Leadville Blue limestone in the down-faulted block below the Hellena shaft by 1,200-foot drill holes from surface is probably not justified because of the difficulty and expense of drilling such holes in the formations likely to be encountered and will be deferred until later.

No specific locations for diamond drill holes on surface are advisable on the basis of this brief preliminary examination. The sites should be determined and located on the ground after careful geological and engineering investigation.

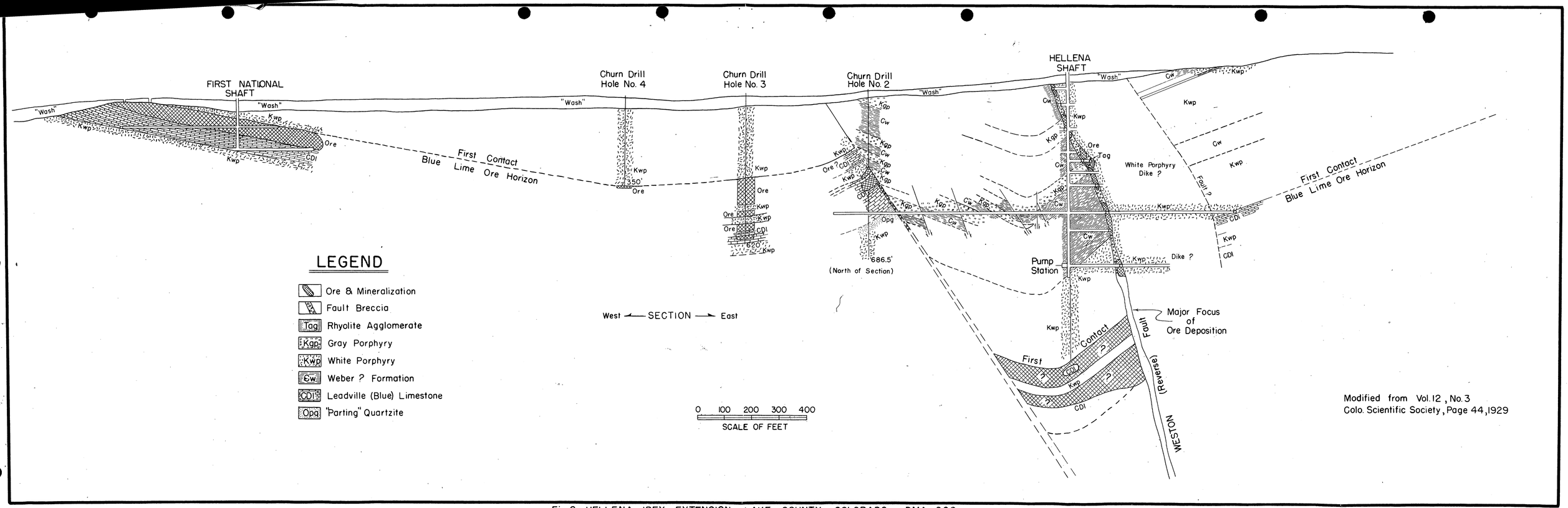


Fig. 2 - HELLENA IBEX EXTENSION, LAKE COUNTY COLORADO. DMA-860

500

FILE COPY
SURNAME:

Keating
MKeller

UNITED STATES
DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS EXPLORATION ADMINISTRATION
WASHINGTON 25, D. C.

JUL 31 1952

Mr. A. C. Furman
1424 K Street, N.W.
Washington, D.C.

Re: Docket No. DMEA-860 (Lead-Zinc)
Ibex Extension Mine, Colorado

Dear Mr. Furman:

A review of our files indicates that your application has been inactive for an extended period. In such cases it frequently develops that certain applications should be revised, withdrawn, or the file closed.

On March 1, 1952, the consideration of a contract was discussed with Mr. Moulds of the Lead-Zinc Division. Since that time this office has had no further advice from you.

Will you be kind enough to inform this office within the next thirty days as to what you plan regarding your request for an exploration loan. Otherwise it will be assumed that you are no longer interested and the file will be closed.

Sincerely yours,

C. O. Mittendorf (for) P.N. 7-31-52

Acting Administrator,
Defense Minerals Exploration
Administration

AGKeating/mb
July 29, 1952
cc to: Docket
Operating Committee
Adm. Reading File
Mr. Keller (2)
Mr. Keating
Mr. Bishop
Mr. McKnight
Chron
Region IV

4/1/52. 6 Copies of the Contract & Exhibit A (no maps) given to Greene Chandler Foreman who called at his office today to discuss his contract.

Copy of memo from J. Hofflund given to him marked Exh. A. Mgs. 1 & 2nd Rec. final paragraph

MF-200
(June 1951)
(Revised Feb. 1952)

Docket No. DMEA [illegible]
Commodity [illegible]

Extra Copy

UNITED STATES OF AMERICA
DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS EXPLORATION ADMINISTRATION

EXPLORATION PROJECT CONTRACT 1/

It is agreed this _____ day of _____, 195__, between the United States of America, acting through the Department of the Interior, Defense Minerals Exploration Administration, hereinafter called the "Government," and 2/ _____

[illegible]

[illegible]

[illegible]

[illegible]

hereinafter called the "Operator," as follows:

ARTICLE 1. Authority for contract. This agreement is entered into under the authority of the Defense Production Act of 1950, as amended, pursuant to DMEA Order 1 entitled "Regulations for Government Aid in Defense Exploration Projects."

ARTICLE 2. Operator's property rights. With respect to that certain land situated in the State of [illegible], County of [illegible], described as follows: _____

1/ If sufficient space is not provided in any blank, use an extra sheet of paper and refer to it in the blank.

2/ State name, address, and nature of organization if any.

3/ _____

_____

_____

_____

_____

the Operator represents and undertakes:4/

(a) That the Operator is the owner, in possession and entitled to possession, and that the property is subject only to the following claims, liens, or encumbrances, a list of which the subordination agreement of the holder is attached: _____

_____

_____

_____

(b) That the Operator is a lessee, in possession and entitled to possession, and the Owner's Consent to Lien is attached.

The Operator shall devote the land and all existing improvements, facilities, buildings, installations, and appurtenances, to the purposes of the exploration project without any allowance for the use, rental value, depreciation, depletion, or other cost of acquiring, owning, or holding possession thereof.

ARTICLE 3. Exploration project. The Operator, within _____ days from the date of this contract shall commence

_____

3/ Give legal description or enough to identify the property, particularly excluding any land or interest therein to which the Government's lien is not to attach or the production from which is not to be subject to the Government's percentage royalty.

4/ Strike out the provision not applicable.

on a project of exploration for[5] lead-zinc

in or upon the described land; and shall bring the project to completion within a period of thirteen (13) months from the date of this contract. The work to be performed is more fully described in Exhibit "A" attached hereto, which, with any maps or drawings thereto attached, are made a part of this contract. The Government will contribute to the cost of this work as hereafter provided.

ARTICLE 4. Performance of the work. (a) Operator's responsibility. The work shall be performed efficiently, expertly, in a workmanlike manner, in accordance with good mining standards and State regulations for health and safety and for workmens' compensation and employers' liability insurance, with suitable and adequate equipment, materials, and labor, to bring the project to completion within the time fixed. To the extent specified in Exhibit "A" , attached hereto, the work may be performed by independent contractor or contractors; and work not specified in Exhibit "A" for performance by independent contractor may nevertheless be so performed upon amendment of Exhibit "A", as agreed to by the parties, to state the work to be so performed and the estimated unit costs thereof, as provided hereafter.

(b) Independent contracts. Any independent contract for the performance of work shall be on a unit-price basis (such as per foot of drilling, per foot of drifting, per hour of bulldozer operations, per cubic yard of material moved), or on some basis that will indicate the amount due for work performed at any stage of the work to be performed

5/ Name of mineral or minerals.

under such independent contract. The Government shall not be nor be considered to be a party to any such independent contract, and the Government's right to terminate the exploration project contract under any of its provisions shall not in any manner be affected by reason of any such independent contract. If the reference in Exhibit "A" to any such independent contract states that the Government's approval thereof is required, the Government may refuse to participate in the cost thereof unless and until it has given its written approval of the independent contract.

(c) Government may inspect. The Government shall have the right to enter and observe and inspect the work at all reasonable times, and the Operator shall provide the Government with all available means for doing so. The Government may consult with and advise the Operator on all phases of the work.

ARTICLE 5. Estimated costs of the project. A statement of the estimated cost of the project is set forth in Exhibit "A", attached hereto. Except insofar as any item of requirement or the estimated cost thereof set forth in Exhibit "A" is there or elsewhere designated as an "allowable maximum," such items of requirement and of related cost are estimates only, and may be exceeded to the extent that the Government may from time to time approve for the most economic and beneficial performance of the work within the limitation of the total aggregate estimate of costs. The Government's approval of any such excess over the estimate for an item of requirement or related cost will be signified by its approval and payment of any invoice or voucher for payment which expressly calls attention to such excess. Items expressly designated in Exhibit "A" or

elsewhere as "allowable maximum," and the total aggregate estimated cost are limitations, and any excess therein will be for the sole account of the Operator in which the Government will not participate.

ARTICLE 6. Allowable costs of the project. (a) The costs of the project in which the Government will participate are limited to the following:

(1) Independent contracts. Payments to independent contractors under independent contracts listed in Exhibit "A". The estimated cost of any work to be performed under an independent contract is or shall be included in the estimate of costs in Exhibit "A" in terms of the estimated numbers of units of work to be performed, the estimated amount to be paid per unit, and the estimated total amount to be paid to the independent contractor, and such estimates shall be allowable maximums above which the Government will not contribute. Regardless of the provisions of any such independent contract, the Government will participate in the payments to the independent contractor only on account of work actually performed and that conforms with the provisions of the exploration project contract, and only to the extent that the Government deems the unit prices for the work under the independent contract to be reasonable and necessary. No such independent contract shall have the effect of increasing the estimated total cost of the exploration project contract nor the maximum amount which the Government will pay as provided in the exploration project contract.

(2) Labor, supervision, consultants. Labor, supervision and technical services (including engineering and geological consultants),

a schedule of which is included in the estimate of costs set forth in Exhibit "A". The requirements and related estimated costs for supervision and technical services are allowable maximums.

(3) Operating materials and supplies. Necessary materials and supplies including expendable items of equipment costing less than $50.00 each, and power, water, and fuel, a schedule of which is included in the estimate of costs in Exhibit "A".

(4) Operating equipment. Any operating equipment to be rented or purchased, or which is owned and will be furnished by the Operator, with the estimated rental, purchase price, or the allowable depreciation, as the case may be, a schedule of which is included in Exhibit "A". Any items listed for purchase or as owned and to be furnished by the Operator, and related purchase price and allowable depreciation, are allowable maximums.

(5) Rehabilitation and repairs. Any necessary rehabilitation or repairs of existing buildings, installations, fixtures, and movable operating equipment, now owned by the Operator and to be devoted to the purposes of the exploration contract, a schedule of which is included in the estimate of costs set forth in Exhibit "A". These items are allowable maximums.

(6) New buildings, improvements, installations. Any necessary buildings, fixed improvements, or installations to be purchased, installed, or constructed for the purposes of the exploration work, with the estimated cost of each, a schedule of which is included in the estimate of costs in Exhibit "A". All of these items are allowable maximums.

(7) Miscellaneous. Repairs to and maintenance of operating equipment (not including initial rehabilitation or repairs of the Operator's equipment), analytical work, accounting, workmens' compensation and employers' liability insurance and payroll and sales taxes.

(8) Unforeseen. Such other necessary, reasonable direct costs of performing the exploration work, within the limit of the total aggregate estimate of costs, whether or not included in any schedule of costs in Exhibit "A", as may be approved by the Government in the course of the work, as indicated by its approval and payment of invoices and vouchers.

(b) The Government's payments in all cases will be based on actual, necessary costs (including contract unit prices) incurred not in excess of any "allowable maximum," and not in excess of the fixed percentage of the total aggregate estimated cost. Costs will be considered to be incurred only as they are or become due and payable.

(c) No items of general overhead, corporate management, interest, taxes (other than payroll and sales taxes) or any other indirect costs, or work performed or costs incurred before the date of this contract, shall be allowed as costs of the project in which the Government will participate.

ARTICLE 7. Reports, accounts, audits. (a) Progress reports. The Operator shall provide the Government with monthly reports of work performed and costs (including contract unit prices) incurred under the contract, in quintuplicate (five copies), upon forms provided by the Government. These progress reports shall be certified by the Operator,

and shall constitute both the Operator's invoice of costs incurred on the project during the period covered by the report and his voucher for repayment by the Government, unless the Government requires the use of a standard voucher form with invoice attached. Progress reports shall include surface and/or underground engineering-geological maps or sketches showing the progress of the exploration, with assay-reports on samples taken concurrently with the advance in mineralized ground.

(b) Final report. Upon completion of the exploration work or termination of the contract the Operator shall provide the Government with an adequate geological and engineering report, in quintuplicate (five copies), including an estimate of ore reserves resulting from the exploration work.

(c) Compliance with requirements. If, in the opinion of the Government, any of the Operator's reports are insufficient or incomplete, the Government may procure the making or completion of such reports and attachments as an expense of the exploration work; and the Government may withhold approval and payment of any vouchers depending upon insufficient or incomplete reports.

(d) Accounts and audits. The Operator shall keep suitable records and accounts of operations, which the Government may inspect and audit at any time. The Government may at any time require an audit of the Operator's records and accounts by a certified public accountant, the cost thereof to be treated as a cost of the project. The Operator shall keep and preserve said records and accounts for at least 3 years after the completion of the project or the termination of this contract. Upon the completion of the project or termination of the contract the Operator shall render a final account as provided in Article 12.

ARTICLE 8. Payments by the Government. (a) The Government will pay fifty (50) per cent of the allowable costs incurred, as they accrue, in an aggregate total amount not in excess of $ 37,500.00, which is fifty (50) per cent of $ 75,000.00, the agreed, estimated total cost of the project in which the Government will participate; Provided, that until the Operator's final report and final accounting have been rendered to the Government, and any final auditing required by the Government has been made, and a final settlement of the contract has been made, the Government may withhold from the last voucher or vouchers such sums as it sees fit not in excess of ten (10) per cent of the maximum total which the Government might have been called upon to pay under the terms of the contract.

(b) The Government may make any payment or payments direct to independent contractors and to suppliers, for the account of the Operator, rather than to the Operator.

ARTICLE 9. Repayment by Operator. (a) If, at any time, the Government considers that a discovery or a development from which production may be made has resulted from the exploration work, the Government, at any time not later than six months after the Operator has rendered the required final report and final account, may so certify in writing to the Operator. The certification shall describe broadly or indicate the nature of the discovery or development. In the event of such certification, any minerals mined or produced from the land described in Article 2 within ten years from the date of this contract, including any mined or produced before the certification, shall be subject to a percentage royalty which

the Operator or his successor in interest shall pay to the Government, upon the net smelter returns, the net concentrator returns, or other net amounts realized from the sale or other disposition of any such production, in whatever form disposed of, including ore, concentrates, or metal, until the total amount contributed by the Government, without interest, is fully repaid, or said ten years have elapsed, whichever occurs first, as follows:

(1) One and one-half ($1\frac{1}{2}$) per cent of any such net amounts not in excess of eight dollars ($8.00) per tons

(2) One and one-half ($1\frac{1}{2}$) per cent of any such net amounts, plus one-half ($\frac{1}{2}$) per cent of such net amounts for each additional full fifty cents ($0.50) by which such net amounts exceed eight dollars ($8.00) per ton, but not in excess of five (5) per cent of such net amounts.

(For instance: the percentage royalty on a net amount of five dollars ($5.00) per ton, would be one and one-half ($1\frac{1}{2}$) per cent; on a net amount of ten dollars ($10.00) per ton, three and one-half ($3\frac{1}{2}$) percent.)

(b) As here used, "net smelter returns," "net concentrator returns," and "other net amounts realized from the sale or other disposition," mean gross revenue from sales; or if not sold, the market value of the material after it is mined in the form in which and the place where it is held. In the case of integrated operations in which the material is not disposed of as such, these terms mean what is or would be gross income from mining operations for percentage depletion purposes in income tax determination.

(c) To secure the payment of its percentage royalty, the Government shall have and is hereby granted a lien upon the land described in Article 2 and upon any production of minerals therefrom, until the royalty claim is extinguished by lapse of time or is fully paid.

(d) This article is not to be construed as imposing any obligation on the Operator or the Operator's successor in interest to engage in any mining or production operations.

ARTICLE 10. Assignment, transfer, or loss of Operator's interest. Without the written consent of the Government, the Operator shall not assign or otherwise transfer or hypothecate this contract or any rights thereunder. The Operator shall not make any voluntary nor permit any involuntary transfer or conveyance of the Operator's rights in the land described in Article 2, without making suitable provision for the preservation of the Government's right to a percentage royalty on production and lien for the payment thereof; Provided, that mere failure by the Operator to maintain the Operator's rights in the land, without any consideration running to the Operator other than relief from the cost of maintaining such rights (as by surrender of a leasehold, failure to perform assessment work, or failure to exercise an option), coupled with complete abandonment by the Operator of all interest in or operations on the land for a period of ten years from the date of this contract, shall not constitute such a transfer or conveyance. Should the Operator make or permit any transfer or conveyance in violation of this provision, the Operator shall be and remain liable for payment to the Government of the same amounts, at the same times, as would have been paid under the terms of the percentage royalty on production. If for any

reason the net smelter returns, net concentrator returns, or other net amounts realized from the sale or other disposition of such production are not available as a means of measuring the amount of the Operator's liability, the amount thereof shall be estimated as well as may be, and in the event of dispute as to such estimates, the determination thereof by the Administrator of Defense Minerals Exploration Administration or by his successor shall be final and binding upon the Operator.

ARTICLE 11. Title to and disposition of property. All facilities, buildings, fixtures, equipment, or other items costing more than $50.00 each, paid for or purchased with funds contributed jointly by the Operator and the Government, although title may be taken in the name of the Operator, shall belong to the Operator and the Government jointly, in proportion to their respective contributions, and upon the completion of the work or the termination of the contract shall be disposed of promptly by the Operator for the joint account of the Government and the Operator, either by return to the vendor, by sale to others, or purchase by the Operator at a price at least as high as could otherwise be obtained, as may appear to be for the best interest of the Government, unless the Government, in writing, waives its interest in any such item. If necessary to accomplish such disposition, the Operator shall dismantle, sever from the land, and remove any such item, the cost thereof to be for the joint account of the parties in proportion to their respective interests. If the Operator, within 90 days after the receipt of written notice from the Government, fails, neglects, or refuses to dispose of such property, the Government may itself enter upon the land, take possession of, and remove and dispose of any such property as above provided.

ARTICLE 12. Termination and completion. The Government may, at any time, by written notice to the Operator, terminate this contract: (a) If the Operator fails to provide his share of the money necessary to prosecute operations pursuant to the terms of the contracts; (b) if the Operator, in the opinion of the Government, fails to prosecute operations pursuant to the terms of the contract; or (c) if in the opinion of the Government, operations up to the time of the notice have not indicated the probability of making any worthwhile discovery and in the opinion of the Government further operations are not justified. Upon the completion of the project or any termination of the contract the Operator shall dispose of any remaining materials, supplies, facilities, buildings, fixtures, and equipment in which the Government has an interest, for the joint account of the Operator and the Government in the proportion of their respective interests; shall render to the Government a full and final accounting of his operations under the contract and his expenditures of money; and shall pay to the Government its prorata share of any money remaining.

ARTICLE 13. Changes and added provisions. _____

_____

_____

_____

_____

_____

_____

Executed in sextuplicate the day and year first above written.

THE UNITED STATES OF AMERICA

Greene Chandler Furman

Operator

By Acting Administrator, ~~Defense Minerals Exploration~~ Administration

By

I, , certify that I am the secretary of the corporation named as operator herein; that who signed this contract on behalf of the operator, was then of said corporation; that said contract was duly signed for and in behalf of said corporation by authority of its governing body, and is within the scope of its corporate powers.

[Corporate Seal]

16042

EXPLORATION PROJECT CONTRACT
GREENE CHANDLER FUNSAN
KELLENA-IBEX EXTENSION
DOCKET NO. DMEA-860

EXHIBIT "A"

Statement of the Work

The proposed exploration is for the purpose of testing for lead-zinc by diamond drilling from surface the shallow Leadville horizon west of the Weston Fault and the Kellena fissure northeast of the Kellena shaft.

The drilling is divided into three stages as follows:

Stage I

To drill eight holes not to exceed aggregate of 3500 feet at approximate location as shown on the attached map. If the results of this drilling are negative, the Government may end the project at this stage.

Stage II

If, in the estimation of the Government, the results of Stage I indicate that additional drilling is warranted, Stage II shall be approved and shall consist of a maximum of five holes aggregating 2500 feet. The location, direction and depth of the holes shall be determined to the satisfaction of the Government when approval of this stage is given.

Stage III

If, in the estimation of the Government, the results of Stage II indicate that additional drilling is warranted, Stage III shall be approved and shall consist of such footage to reach an aggregate of 8500 feet for the entire project. The number of holes to be drilled, the location, direction and depth shall be determined to the satisfaction of the Government when approval of this stage is given.

Estimate of Costs

Summary

Stage I

3500 feet of diamond drilling by contract at not to exceed $7.50/foot	$ 26,250.00
Manager-geologist at $500 per month for 5 months	2,500.00
Accountant (part time) at $50 per month for 5 months	250.00
Analysis of drill core and sludge	350.00
Surveying and mapping	250.00
Miscellaneous expenses (including transportation, drill core boxes, office space, etc.)	400.00
Total estimated cost - Stage I	$ 30,000.00

Stage II

2500 feet of diamond drilling by contract at not to exceed $7.50/foot	18,750.00
Manager-geologist at $500 per month for 2½ months	1,250.00
Accountant (part time) at $50 per month for 2½ months	125.00
Analysis of drill core and sludge	350.00
Miscellaneous expenses (including transportation, drill core boxes, office space, etc.)	200.00
Total estimated cost - Stage II	$ 20,675.00

Stage III

2500 feet of diamond drilling by contract at not to exceed $7.50/foot	18,750.00
Manager-geologist at $500 per month for 2½ months	1,250.00

Accountant (part time) at $50 per month for 2½ months	$ 125.00
Analysis of drill core and sludge	350.00
Miscellaneous expenses (including transportation, drill core boxes, office space, etc.)	200.00
Total estimated cost - Stage III	$ 20,675.00

Total Estimated Cost

Total Stage I	$ 30,000.00
Total Stage II	20,675.00
Total Stage III	20,675.00
Contingencies	3,650.00
Total Estimated Cost	$75,000.00

Details

(1) Independent contracts.

All diamond drilling to be by contract, approved by the Government. The contract rate shall not exceed $7.50 per foot of drilling and shall include all costs necessary to complete the drilling.

Stage I	$ 26,250.00	
Stage II	18,750.00	
Stage III	18,750.00	$ 63,750.00

(2) Labor, supervision, consultants.

All labor is to be included in the diamond drill contract.

A manager-geologist at not to exceed $500 per month who will do all geological work, supervising the project and prepare all reports required by the Government. This contract is contingent upon the Operator securing the services of a manager-geologist approved by the Government.

1 Manager-geologist @ $500/mo. for 10 months	$5,000.00	

A part time accountant at not to exceed $50 per month.

Part time accountant @ $50/mo. for 10 months	$ 500.00	$ 5,500.00

(3) Operating materials and supplies.

None

(4) Operating equipment.

To be purchased

None

To be furnished by Operator

None

To be rented

None

(5) Rehabilitation and repairs.

None

(6) New buildings, improvements, installations.

None

(7) Miscellaneous.

Analysis of drill core and sludge	$1,050.00	
Surveying and mapping	250.00	
Transportation, core boxes, office space, etc.	800.00	$ 2,100.00

(8) Unforeseen.

To provide for possible unforeseen costs not covered by the maximum cost items of this Exhibit, an allowance for

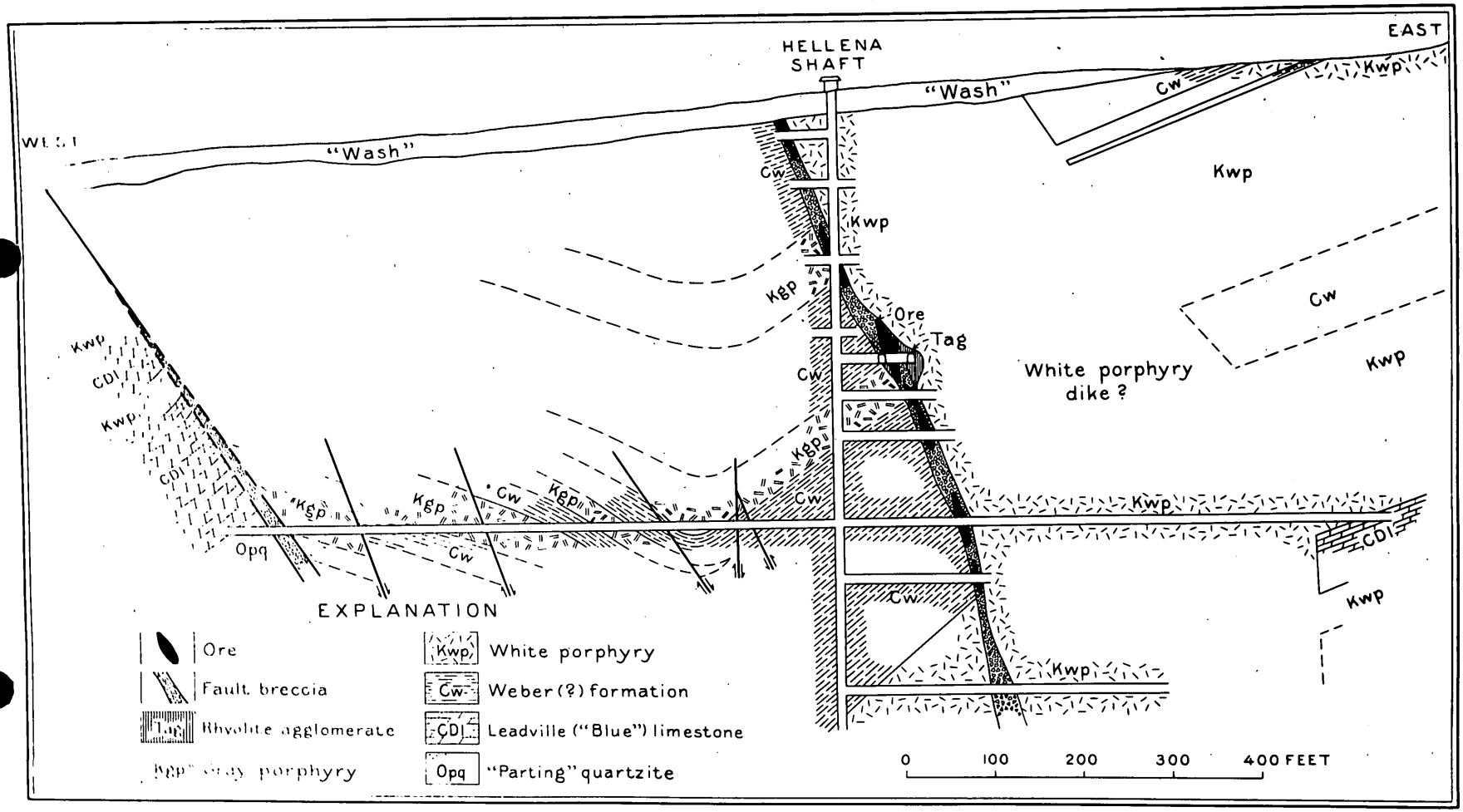
contingencies of $3,650.00 has been included in the total estimated cost for such additional expenses as are approved by the Government. $ 3,650.00

Total Cost of Project $75,000.00

APPENDIX I

Patented mining claims in the California Mining District, County of Lake, State of Colorado.

Amount of Claim Leased to Applicant	Name	U. S. Survey Number	Total Acreage
All	Hellena	4033 Am.	9.630
All	Black Cloud	903	10.330
All	Continental	902	9.157
All	Jane Eugene	3371	9.853
All	New Orleans	1448	4.383
All	Bloomington	1596	5.614
All	Bank	4724	6.116
All	Yale	3216	9.779
All	Josie	3605	1.096
All	Alameda	3604	3.346
All	(Eagle) (Emmerdale) (Hamelholm)	4708	6.479
All	Leopard	801	3.290
All	Mary E.	721	10.340
All	Maudy	870	3.760
All	Howard M. Holden	1137	5.600
11/12	Alma Mater	2565	3.500
2/5	Ohio	738	6.665
7/12	Mountain Lion	805	9.680
All	Friday	18203	3.157
All	First National	1934	9.360
All	Little Julia	1811	5.342
3/4	Jim Fisk	1812	4.920
All	Little Anna	4818	3.113
All	Conundrum	3242	3.000
611/900	Mammoth	1127	9.350
All	Slide	2619	8.170
All	C. N. Fraction	11501	1.164
All	Lady Allice	15908	1.164
1/4	Seek-no-Further	1225	9.000
1/16	Kauffman	9415	2.071
1/4	International	3501	5.990


HELLENA SHAFT
EAST
WEST
"Wash"
"Wash"
Cw
Kwp
Kwp
Cw
Kwp
Kgp
Ore
Tag
Cw
Kwp
White porphyry dike ?
Kwp
CDl
Kwp
CDl
Kgp
Kgp
Cw
Kgp
Cw
Kgp
Kwp
CDl
Opq
Cw
Kwp
Cw
Kwp
EXPLANATION
Ore
Fault breccia
Rhyolite agglomerate
Kgp gray porphyry
Kwp White porphyry
Cw Weber (?) formation
CDl Leadville ("Blue") limestone
Opq "Parting" quartzite
0 100 200 300 400 FEET

UNITED STATES
DEPARTMENT OF THE INTERIOR

140

DEFENSE MINERALS ADMINISTRATION
WASHINGTON 25, D. C.

March 24, 1952

Memorandum

To: Mr. Donald Moulds

From: J. L. Hofflund

Subject: Greene Chandler Furman - Exploration Project Contract - Docket No. DMEA-860

I am unable to give legal approval to the subject contract in the present state of the record, although there are attached hereto seven copies of the proposed contract, prepared on the new contract form, and which will be satisfactory from a legal standpoint if and when the following matters are cleared up:

1. The described property consists of a number of patented mining claims held under lease from Robert D. Elder and Margaret H. Elder. The Elders', apparently, are the owners of most of these claims, but as to some seven of the claims the Elders' apparently own only fractional interests, the other fractional interests in these claims having been leased to American Smelting and Refining Co. This office has no knowledge of how significant to the project the claims may be in which the applicant has only fractional interests. If the property consisted of one claim or a group of claims in which the applicant held as lessee only a leasehold in an undivided fractional interest, the applicant's interest in the property would not be sufficient to support an Exploration Project Contract. If the claims in which the applicant has only fractional interests are important to the project, I would say that the applicant should be required to secure either the full leasehold interest in them or a Subordination Agreement from the holder of the other leasehold interest.

2. The Subordination Agreements of Margaret H. Elder and Robert D. Elder which were submitted to this office with the rough draft of the contract, are not sufficient. The Subordination Agreements are dated September 29, 1951, and they refer explicitly to an Exploration Project Contract "to be executed on Form MF-200 (June 1951) on or before January 2, 1952." The subject contract is now placed on the new Form MF-200 revised February 1952, and the date of the contract will be long after January 2, 1952. It will therefore be necessary to have new agreements from the Elders, probably on the new Consent to Lien form. If a lease is also obtained on the missing fractional interests, it will also be necessary to have the Consent to Lien Agreements from the lessors of those fractional interests.

If you deem the claims in which the applicants hold only leasehold interests in fractional interests, to be quite insignificant, possibly this defect could be waived. It seems, however, that this is not an insignificant matter inasmuch as American Smelting and Refining Co. is the party that holds the leaseholds interests in the other undivided fractions.

J. L. Hoffmund
Chief Counsel

Attachment

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J. L. Hofflund

J. L. Hofflund
Chief Counsel

Attachment

FILE COPY
SURNAME:

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J. L. Hofflund

B.S
R&R

J. L. Hofflund
Chief Counsel

Attachment

JLHofflund/ema
Copy to: Mails & Files
J. L. Hofflund
Chron.

Defense Minerals Exploration Administration

Review of Application for Exploration Assistance

Docket No. DMA-860

To: Mr. C. O. Mittendorf

Commodity Lead-zinc

Total Amount $75,000

Govt. Participation 50%, $37,500

1. Name and Address of Applicant Mr. G. C. Furman, Realty Building 1424 K Street ~~Street~~, NW, Washington, D. C.

2. Location of Property Hellena-Ibex Mine, Leadville, Lake County, Colorado

3. Mineral or metal Lead-zinc Is it listed in Section 9 of MO-5?

If not, application will be rejected.

4. Geologic probability of discovery—based on data in application (question #16, 17, 18, 20 and 22)*

Mines or Survey reports, etc., do you rate chances:

a) Good Yes, see field reports

b) Poor

c) None

d) Don't know—needs field examination

e) Is there an alternative and favorable project? (If so, attach an explanation)

5. Is the applicant's right to the property clearly stated? (question 5, 6, 7)*

6. If applicant is a lessee, is a copy of the lease attached? Yes

Does the lease have sufficient time to run to cover a future productive period? Yes

*question numbers are those of MF-103

7. Are subordination agreements necessary? Yes

a) MF-201? _____

b) MF-202 Yes, it is attached

8. From the data presented, does the proposed project appear feasible from the point of view of:

a) Available manpower Yes

b) Equipment and supplies Yes
(question 14 plus general knowledge of availability)*

c) Accessibility (question 12)* Yes

d) Water (question 13)* Yes

e) Power (question 13)* Yes

Is a field check needed on any of these points? No

9. Does the experience of the applicant appear to be adequate to assure that he can properly conduct the proposed project? (question 4)* Applicant will employ a competent technical supervisor

Is a field check needed on this point? No

10. Exhibit A. (questions 21 and 22)*

a) Is the project adequately described? Yes, see supplemental field report

If not, are there sufficient data given so that you can describe the project? _____ If so, attach a draft.

b) Is there an adequate map or sketch of the proposed work? Yes

c) Is the proposed work "exploration" under the definition of Section 8, MO-5? Yes

If not, what part of it is? _____

Is this part a worth-while exploration project?_____

d) Are the cost estimates detailed? Yes

Can they be summarized, as on page 2 of Procedural Instruction 5-A, see p. 6 of field team supplemental report from the available data?_____ If so, attach a draft.

e) Are the cost estimates reasonable? Yes

f) Should more information be requested from applicant? No

g) Is a field examination necessary to complete Exhibit A? Already made

11. Exhibit B (question 23-d)*

a) Is it applicable? Not applicable in drilling program

b) If so, are sufficient data furnished?_____ If so, attach a draft.

c) Is a field check needed?_____

12. Exhibit C (question 23-e, f and g)*

a) Is it applicable? No - drilling to be contracted

b) Sufficient data?_____ If so, attach a draft.

c) Are rents and charges reasonable?_____

d) Is a field check needed?_____

13. Exhibit D (question 23-a, b)*

a) Are there sufficient data? Yes - labor is to be contracted and supervision items are adequately given on p. 6 of supplemental field team report.

b) Is the schedule adequate for the work proposed?_____

c) Is the schedule excessive for the work proposed? No

d) Are the proposed wages and salaries reasonable? Yes

e) Is a field check needed? Been made

14. Exhibit E (question 23-c)*

a) Is it applicable? No

b) Sufficient data?

c) Reasonable?

d) Field check needed?

15. In your judgment, can the proposed work be done in the proposed time? Yes

(All exploration must be completed within two years)

16. If field examination is not needed, attach your recommendation.

17. If field examination is needed, do you have any special instructions for the field team not indicated by your answers to the foregoing question?

Reviewed by: E. L. Newcomb
E. L. Newcomb GS 2-5-52

O. M. Bishop
O. M. Bishop, BM

Date 3-5-52

16. This application originally requested an exploration loan of $326,619. The proposal included installation of a complete surface plant at the Hellena shaft. Actual exploration was to consist of 2,400 ft. of drifting and 9,300 feet of diamond drilling underground, and 4,500 feet of diamond drilling from the surface. The proposed exploration had 2 general objections: (1) to explore the Leadville limestone in 2 fault blocks, a relatively shallow horizon west of the Hellena shaft and a deeply down-faulted horizon below the Hellena shaft, and (2) to explore the Hellena fissure vein north of the present workings.

The field team recommended that the program be carried out in 2 stages, because of the high cost of equipping and reopening the Hellena shaft. Stage 1, which consists of 8,500 feet of core drilling from the surface, would test the shallow Leadville horizon west of the Hellena shaft and the Hellena vein north of this shaft. If the results of this drilling were favorable, Stage 2 would be undertaken. Stage 2 would require the installation of equipment and considerable rehabilitation in the Hellena shaft in order that further exploration could be done by underground drilling and drifting.

Since the holes to be drilled under Stage 1 were not located on the field map and the costs under supervision, assaying, etc., were not itemized, the application was returned to the field.

A supplemental report recommends a surface drilling program involving 3 stages. This new program is essentially the same as Stage 1 in the first field report. Its objectives are to test the shallow Leadville horizon west of the Weston fault and the Hellena fissure northeast of the Hellena shaft.

Stage 1: (see map)

3-600 foot vertical holes
5-inclined holes totaling 1500 feet.

Stages 2 and 3:

Additional drilling to a maximum of 5,000 ft. based on results of Stage 1. This drilling may be needed in order to block out enough indicated ore to justify reopening the mine or to form the basis for a development loan.

The new exploration project, as presented by the field team, is recommended for approval.

E. L. Newcomb, GS

O. M. Bishop, BM

Defense Minerals Exploration Administration

Review of Application for Exploration Assistance

Docket No. DMA-860

To: Mr. C. O. Mittendorf

Commodity Lead-zinc

Total Amount $75,000

Govt. Participation 50%, $37,500

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3. Mineral or metal Lead-zinc Is it listed in Section 9 of MO-5?

If not, application will be rejected.

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a) Good Yes, see field reports

b) Poor

c) None

d) Don't know—needs field examination

e) Is there an alternative and favorable project? (If so, attach an explanation)

5. Is the applicant's right to the property clearly stated? (question 5, 6, 7)*

6. If applicant is a lessee, is a copy of the lease attached? Yes

Does the lease have sufficient time to run to cover a future productive period? Yes

*question numbers are those of MF-103

7. Are subordination agreements necessary? **Yes**

a) MF-201? _____

b) MF-202 **Yes, it is attached**

8. From the data presented, does the proposed project appear feasible from the point of view of:

a) Available manpower **Yes**

b) Equipment and supplies **Yes**
(question 14 plus general knowledge of availability)*

c) Accessibility (question 12)* **Yes**

d) Water (question 13)* **Yes**

e) Power (question 13)* **Yes**

Is a field check needed on any of these points? **No**

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c) Is the proposed work "exploration" under the definition of Section 8, MO-5? **Yes**

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Is this part a worth-while exploration project?_____

d) Are the cost estimates detailed? **Yes**

Can they be summarized, as on page 2 of Procedural Instruction 5-A, from the available data? **see p. 6 of field team supplemental report** If so, attach a draft.

e) Are the cost estimates reasonable? **Yes**

f) Should more information be requested from applicant? **No**

g) Is a field examination necessary to complete Exhibit A? **Already made**

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c) Are rents and charges reasonable?_____

d) Is a field check needed?_____

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b) Is the schedule adequate for the work proposed?_____

c) Is the schedule excessive for the work proposed? **No**

d) Are the proposed wages and salaries reasonable? **Yes**

e) Is a field check needed? **Been made**

14. Exhibit E (question 23-c)*

a) Is it applicable? No

b) Sufficient data?

c) Reasonable?

d) Field check needed?

15. In your judgment, can the proposed work be done in the proposed time? Yes

(All exploration must be completed within two years)

16. If field examination is not needed, attach your recommendation.

17. If field examination is needed, do you have any special instructions for the field team not indicated by your answers to the foregoing question?

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E. L. Newcomb GS 2-5-52

O. M. Bishop, BM
O M Bishop

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OFFICE OF THE ADMINISTRATOR

UNITED STATES
DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS ADMINISTRATION
WASHINGTON 25, D. C.

224 New Customhouse
Denver 2, Colorado

January 15, 1952

Memorandum

To: Secretary to the Operating Committee, Defense Minerals Exploration Administration

From: Field Team, Region IV

Subject: Docket DMA 860, Green Chandler Furman, Hellena-Ibex Extension Mine, Lake County, Colorado, Exploration Loan - $75,000 (Lead-Zinc)

Enclosed herewith are the original and two copies of a supplemental report on the subject docket which was requested by memorandum from Tom Lyon, Chairman, Coordinating Committee, to J. H. East, Jr., Executive Officer, Region IV, dated September 20, 1951.

Also enclosed are the brochure and one copy of the Field Team's original report which were returned to the field from Washington by Mr. Lyon's memorandum dated October 17, 1951.

We concur with the conclusions and recommendations of the examining team that the project be approved on the basis of the supplemental report, which recommends a maximum of 8500 feet of diamond drilling to be conducted in three stages, the approval of the second and third stages contingent on the results of the previous stage or stages.

Government participation will be 50 percent or $37,500.

JAN 21 8 07 AM '52
DEFENSE MINERALS ADMINISTRATION WASHINGTON, D. C.

J. H. East, Jr.

A. H. Koschmann

Enclosures

UNITED STATES
DEPARTMENT OF THE INTERIOR

DEFENSE MINERALS ADMINISTRATION
WASHINGTON 25, D. C.

200 New Customhouse
Denver 2, Colorado

Reviewed by
DMEA OPERATING COMMITTEE
1-25-52
(date) JHB

January 3, 1951

Memorandum

To: DMA Field Team, Region IV

From: A. H. Koschmann

Subject: DMA Docket 860, Hellena Ibex Extension Mine, Leadville, Colorado; Supplemental report (drilling)

Attached are 8 copies of a supplemental report and accompanying map by Ogden Tweto and M. H. Salsbury on subject docket in compliance with a request from Tom Lyon dated September 20, 1951, that specific locations of diamond drill holes to explore subject property be given.

It is recommended that the drilling program be set up in three stages. For Stage I, which is essentially of a probing or wildcat nature, 8 drill holes are located. Holes to be drilled in Stages II and III are contingent on results obtained in Stage I, and, obviously, locations of these holes cannot be located at this time. It is also recommended that the drilling be closely supervised by DMA field inspectors: (1) to assure efficient operation; (2) to approve location of holes of Stages II and III determined from results obtained in Stage I; and (3) to determine the stage at which the exploration work be terminated if it is not carried to completion.

I concur with these recommendations.

The brochure is enclosed.

A. H. Koschmann

A. H. Koschmann
Supervising Geologist
Colorado-Wyoming

Enclosures (9)

January 2, 1951

Memorandum

To: DMA Field Team, Region IV

From: Ogden Tweto, U. S. Geological Survey
M. H. Salsbury, U. S. Bureau of Mines

Subject: DMA Docket 860, Hellena Ibex Extension Mine, Leadville, Colorado; Supplemental report (drilling)

In the report on Docket 860, transmitted by the Field Team September 7, 1951, a program of diamond core drilling from the surface, totaling 8500 feet and estimated to cost $75,000, was recommended to explore the Hellena vein north of the shaft, and the Blue limestone several hundred feet west of the shaft. In a memorandum from Tom Lyon, Chairman, Coordinating Committee, to J. H. East, Jr., Executive Officer, Region IV, dated September 20, 1951, a request was made for specific locations of the holes to be drilled in this program.

In response to this request, we have prepared the accompanying map, divided the program into three stages, and, for Stage I, located eight drill holes as indicated on the map and inset table. Division of such an exploration program into stages is necessary because the advisability and location of most drilling after the first few holes is contingent on results obtained in these holes. The objectives of the drilling program are, first, to determine whether either the Hellena vein or the "replacement" target west of the Weston fault is commercially mineralized, and second, if one or both is mineralized, to establish whether tonnage

and grade are sufficient to warrant a development loan to reopen the Hellena mine.

The proposed program is divided into three stages: Stage I is essentially of a probing or wildcat nature, to hunt for concealed ore. It comprises the eight holes, totaling 3000 to 3500 feet, located on the map. If the results of this drilling are entirely negative, consideration could be given to ending the program at this stage. If the Stage I drilling is partly successful, but does not yield enough information to form a basis for drilling to block out ore, or if, in spite of negative results in Stage I, further drilling may be justified on geologic grounds, a few more holes may be necessary. These comprise Stage II. As shown below, a maximum of five holes, with a maximum total length of 2200 to 2500 feet, is adequate for this stage. If Stages I and II are both negative, the program should certainly be terminated at the end of Stage II (i.e. at a maximum of 6000 feet of drilling). If positive results are obtained from Stage I and/or Stage II, further drilling may be required to prove enough ore to warrant reopening the mine or to form the basis for a development loan. Such drilling comprises Stage III. Of the proposed maximum total of 8500 feet, a minimum of about 2500 feet would be left for Stage III. As Stage III is predicated on some positive holes in the earlier stages, this additional footage, together with the earlier positive holes, should be sufficient to determine whether there is enough ore present to warrant reopening the mine.

Thus, to summarize, a minimum of about 3500 feet, and a maximum of 8500 feet of drilling is proposed, and the actual total might be anything between 3500 and 8500 feet. As Stages II and III are contingent

on earlier drilling, the holes for these stages cannot be located at this time, and only the Stage I holes are discussed below.

In the area west of the Hellena shaft, the objective is the Blue limestone, which is upthrown on the west side of the Weston fault. As explained in the brochure, a churn drilling program was attempted in this area in 1927. Five holes were drilled, but only one reached the objective, the Blue limestone; this hole cut 26 feet of pyrite, with some lead and zinc, at the top of the Blue limestone, followed by 40 feet of moderately mineralized limestone. No record of assays of this material has been preserved, and there is even uncertainty as to the identity of the hole that showed this ore.

It is therefore necessary to re-drill the area to search for and partially outline the ore deposit. The first diamond drill hole should logically be located near the churn hole in which sulfides were found. According to one source of information (a map of the American Smelting and Refining Company), this was in hole 5; according to another (an old section in Bureau of Mines' file) it was in hole 3. The location given in the brochure does not fit either of these two locations. As hole 5 is near the Weston fault, and possibly in a narrow block between this and another fault 200 feet to the west (see map), the first proposed hole is placed 50 feet southwest of churn drill hole No. 5, to avoid the fault, and as a compromise between the locations of churn drill holes 3 and 5. The hole would be about 600 feet deep (400 feet to the Blue limestone, and 200 feet to go through the limestone). Two other vertical holes, Nos. 2 and 3, 150 feet southeast and northwest of hole No. 1, are also proposed for Stage I in this area. These would also be about 600 feet deep.

If none of these three holes disclose ore, or mineralized rock, further drilling may be unnecessary. At most, in this event, no more than two additional holes would seem justified in Stage II. Similarly, if only one of the Stage I holes yields positive results, one or two additional holes in Stage II may be needed. If two or more of the Stage I holes show ore, Stage II might be omitted, or combined with Stage III.

The second objective, in both the proposed drilling program and in the program of underground development proposed in the original application, is to explore the Hellena vein north of the present workings. Five inclined holes totaling about 1500 feet are proposed for Stage I for this objective. Two holes, at -45° and -65°, would be drilled from a site 100 feet north of the Hellena workings and would intersect the Hellena vein at approximate depths of 100 and 200 feet below the collar of the Hellena shaft. Two more holes with the same inclinations would be drilled from another site 150 feet farther north. A fifth and deeper hole, to intersect the vein about 340 feet lower than the Hellena collar, would be drilled from a site between the first two (see map). If none of these holes show ore in the vein, further drilling should be unnecessary. If all or nearly all show ore, Stage II can be omitted or combined with Stage III. If only one or two holes show ore, other holes (Stage II) may be needed, but obviously, their locations cannot be specified at this time. Stage II should require no more than two or three such additional holes, with a total maximum length of 1000 feet.

If and when a contract for diamond drilling is let, holes of relatively large bore should be specified, for several reasons: (1) All the holes will start in bouldery glacial drift; (2) The bedrock is almost

certain to be rather badly broken and consequently difficult to drill, as this area is in a fault block bounded by major faults; (3) If the Blue limestone is mineralized, it may be silicified or cavernous or both, requiring a hole of greater than minimum diameter at that depth for efficient drilling; (4) Difficulty was experienced in the earlier churn drilling, although this may reflect too-light equipment, a common fault of the churn drilling done in this district; (5) Some of the holes are moderately deep (600 feet), and the others, although shorter, are inclined, which in large part vitiates the advantage in length; (6) Past experience in drilling the altered and fractured rocks of the Leadville district has shown that high costs, poor recoveries, and lost holes are in large part attributable to attempting to drill holes of too-small bore. We therefore recommend that all holes be at least of BX size where they enter the bedrock, that they be held at this size as long as drilling conditions make practicable, or to at least half the distance to the objective, and that the hole size be planned no smaller than AX at the objective.

The original cost estimate on the entire drilling program is broken down to fit the more detailed plans outlined above. It will be noted that the estimated time for completion totals 10 months. This allows for preliminary reconnaissance by the operator, possible increased moving and setting up time under the revised program, and possible delays and expense occasioned by the fact that the entire program, if carried through, will lap over into the winter season.

The duties of manager and geologist have been combined, and it is essential that project operations be closely supervised by DMA field inspectors in order to assure the savings in management costs intended

and also to determine the stage at which the exploratory work should be terminated if it is not carried to completion.

The lease given by the owners provides for a monthly payment of $500 per month starting January 1, 1952. This, of course, is not a proper expense, so far as the government is concerned, and is not allowed for in the estimate. The lease should be re-examined to determine if any other clauses would be violated by the development program outlined.

STAGE I

Time Schedule - 5 months

3500 feet diamond drill hole at $7.50/ft.	$26,250	
Manager and geologist at $500 per month	2,500	
Accountant (part time) at $50 per month	250	
Analysis - drill core and sludge	350	
Surveying and mapping	250	
Miscellaneous expenses (including transportation, drill core boxes, office space, etc.)	400	
Total Stage I		$30,000

STAGE II

Time Schedule - $2\frac{1}{2}$ months

2500 feet diamond drill hole at $7.50/ft.	$18,750	
Manager and geologist at $500 per month	1,250	
Accountant (part time) at $50 per month	125	
Analysis - drill core and sludge	350	
Miscellaneous expenses (as shown in Stage I estimate)	200	
Total Stage II		20,675

STAGE III

Time Schedule - $2\frac{1}{2}$ months

2500 feet diamond drill hole at $7.50/ft.	$18,750	
Manager and geologist at $500 per month	1,250	
Accountant (part time) at $50 per month	125	
Analysis - drill core and sludge	350	
Miscellaneous expenses (as shown in Stage I estimate)	200	
Total Stage III		20,675
Contingencies		3,650
Total 3 Stages		$75,000

The recommendation in the "Summary, Conclusions, and Recommendations" of the original report is revised to read:

"Accordingly, it is recommended that an exploration loan of $37,500--50% of the estimated cost of $75,000--be granted for exploratory surface drilling, divided into 3 stages, the approval for the 2nd and 3rd stages being contingent on the results of the previous stage or stages, as outlined in this memorandum."

FILE COPY
SURNAME: 350

UNITED STATES
DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS ADMINISTRATION
WASHINGTON 25, D. C.

G E, C

Lyons (EJL)
McKnight
Bellinger
Bishop

OCT 17 1951

Re: DMA-860
Greene Chandler Furman
Hellena-Ibex Extension
Leadville District
Lake County, Colorado
Exploration loan, $326,619
Zinc, lead, copper

Mr. J. H. East, Jr.
Executive Officer, DMA Field Team
Region IV
224 New Customhouse
Denver 2, Colorado

Dear Mr. East:

As requested in your letter of October 4, 1951, we are returning the application of Greene Chandler Furman, together with the field team report on the Hellena-Ibex Extension property.

Very truly yours,

ce 10/18

Tom Lyon

Tom Lyon, Chairman
Coordinating Committee

Jewell B. Moore

for Bureau of Mines

Olaf N. Rove

for Geological Survey

EJLyons:emp
G 10-15-51
Copies to: Chief, Lead-Zinc Branch
E. T. McKnight 4204 GSA
O. M. Bishop
Directors r. files 4214 GSA
Br. r. files 4214 GSA
Administrators r. file
DMA docket files

3v-0

DEFENSE MINERALS ADMINISTRATION WASHINGTON, D.C.

UNITED STATES
DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS ADMINISTRATION
WASHINGTON 25, D. C.

OCT 8 11 13 AM '51

224 New Customhouse
Denver 2, Colorado

October 4, 1951

Memorandum

To: Tom Lyon, Chairman, Coordinating Committee
Defense Minerals Administration

From: Executive Officer, DMA Field Team, Region IV

Subject: DMA Docket 860, Green Chandler Furman, Hellena-Ibex Extension, Leadville District, Lake County, Colorado

Please return the brochure on the above application for an exploration loan, so that we may complete the information requested in your letter dated September 20, 1951.

J. H. East, Jr.

J. H. East, Jr.

OCT 1951 5

UNITED STATES
DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS ADMINISTRATION
WASHINGTON 25, D. C.

224 New Customhouse
Denver 2, Colorado

October 4, 1951

Memorandum

To: Tom Lyon, Chairman, Coordinating Committee
Defense Minerals Administration

From: Executive Officer, DMA Field Team, Region IV

Subject: DMA Docket 860, Green Chandler Furman, Hellena-Ibex Extension, Leadville District, Lake County, Colorado

Please return the brochure on the above application for an exploration loan, so that we may complete the information requested in your letter dated September 20, 1951.

J. H. East, Jr.

J. H. East, Jr.

JFS:ld

cc: DMA docket, chron.
Koschmann

FILE COPY
SURNAME: 350

UNITED STATES
DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS ADMINISTRATION
WASHINGTON 25, D. C.

Newcomb (ETM)
McKwalt
Brady
Chillingsby

Airmail

SEP 20 1951

Chairman, Greene Jeuller and Nugent

Re: DMA-860
Medlena-Ibex Extension Mine
Lake County, Colorado
Exploration loan, $75,000
Lead, zinc

A. E. C.

Mr. J. H. East, Jr.
Executive Officer, DMA Field Team
Region IV
224 New Customhouse
Denver 2, Colorado

Dear Mr. East:

In order to complete the processing of the subject docket we find that certain additional information is required beyond that which is given in the field team report. Under estimated costs, the $11,250 allowed for supervision, assaying, geological consultation and general expenses needs to be itemized. What is the estimated rate (so far as it can be given) and total cost on each of the included items? There is not a map, accompanying the field team report, indicating where drill holes will be located. We would like to know where the holes will be put down, how many, their inclination, and to what estimated depths.

The above information is required in preparing the details of the contract. We would appreciate your assistance in obtaining this information. Thank you for your consideration in this matter.

Very truly yours,

CC 9/20

Tom Lyon, Chairman
Coordinating Committee

Lowell B. Moon
For Bureau of Mines

J Hager
For Geological Survey

ELNewcomb:emp
G 9-17-51

Copies to: Chief, Lead-Zinc Br.
E. T. McKnight 4204 GSA
O. Bishop
Directors r. files 4214 GSA
Br. r. files 4214 GSA
Administrators r. files
DMA docket files

FILE COPY
SURNAME: 350

UNITED STATES
DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS ADMINISTRATION
WASHINGTON 25, D. C.

Newcomb (ETM)
McKnight
Bishop
Billings

Re: DMA-860

SEP 19 1951

Mr. Graeme Chandler Furman
1424 K Street, NW
Washington 5, D. C.

Dear Mr. Furman:

The Lead-Zinc Branch of the Defense Minerals Administration has reviewed your application for an exploration loan at the Hellena-Ibex Extension Mine, Lake County, Colorado.

In order to complete your application, you will need to submit "Landlord's Subordination Agreements". We are enclosing seven (7) copies of MF-202, the above mentioned form, six copies of which should be filled out and returned to me.

We wish to thank you for your consideration in this matter.

Very truly yours,

9-19

T. P. Billings, Chief
Lead-Zinc Branch

Enclosures 7

ELNewcomb:emp
G 9-17-51
Copies to: J. H. East, Jr.
Chief, Lead-Zinc Br.
E. T. McKnight 4204 GSA
O. Bishop
Directors r. files 4214 GSA
Br. r. files 4214 GSA
Administrators r. files
DMA docket files

UNITED STATES
DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS ADMINISTRATION
WASHINGTON 25, D. C.

224 New Customhouse
Denver, Colorado

Air Mail

September 7, 1951

Memorandum

To: Executive Secretary, Defense Minerals Administration

From: DMA Field Team, Region IV

Subject: Final Report, Docket No. 860, Green Chandler Furman, Hellena-Ibex Extension, Leadville District, Lake County, Colorado

Enclosed herewith are original and two copies of the report as indicated above.

We concur with the conclusions and recommendations of the examining team.

J. H. East, Jr.

A. H. Koschmann

Enclosures

SEP 11 8 33 AM '51
DEFENSE MINERALS ADMINISTRATION WASHINGTON, D. C.

SEP 11 1951

Defense Minerals Administration
Salaries and Expenses Defense
Production Act Department of
Interior 1420177 - 1952

FILE COPY
SURNAME

UNITED STATES
DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS ADMINISTRATION
WASHINGTON 25, D. C.

Johnson
McKnight
O'Leary
(For Mr.)

August 16, 1951

J. K. Rast, Jr.
Bureau of Mines, Region IV
224 New Customhouse Building
Denver 2, Colorado

Requested lease form DMA Docket 860 was airmailed August 8.

Gunnard Johnson

G. E. Johnson, Acting Chief
Lead-Zinc Branch

FWHanson:lm

cc: Mr. Mayo
Audits
Reports and Records
Note
McKnight
Moon
DMA Docket File

L

SPECIAL

Date: August 14, 1951
To: C. O. Mittendorf
time: 4:10

WASH DC BU MINES 310 GA PLS
DN 235 BUR MINES 8-14-51 1-10 PM Cable 400

C. O. MITTENDORF

PLEASE AIRMAIL COPY OF LEASE ON HELENA IBEX EXTESNSION GROUP, 33 43-$88443, SSS XXXXX LEADVILLE, COLORADO, DMA DOCKET 860, AS REQUESTED IN TELETYPE JULY 31, 9//1951. REPORTM HELD UP PENDING RECEIPT OF LEASE .

J. H. EAST ,4.

7
38 4
8. XXX END MSG ACK PLS BMH
MSG RECD OK BUT SOME OF IT IS PRETTY WELL GARBLED PERHAPS THEY CAN MAKE IT OUT CJ HOPE SO

Denver, Colo.

Green Chandler & Turner

AUG 15 1951

AUG 15 9 47 AM '51
BUREAU OF MINES
MAIL ROOM
WASHINGTON, D. C.

DI-17

TELETYPE MESSAGE

AUGUST 14, 1951

File

C. O. MITTENDORF, DIRECTOR
PRODUCTION EXPANSION DIVISION
DEFENSE MINERALS ADMINISTRATION
WASHINGTON 25, D. C.

PLEASE AIR MAIL COPY OF LEASE ON HELENA IBEX EXTENSION GROUP, LEADVILLE, LAKE COUNTY, COLORADO, DMA DOCKET 860, AS REQUESTED IN TELETYPE JULY 31, 1951. REPORT HELD UP PENDING RECEIPT OF LEASE.

J. H. EAST, JR.

AUG 21 1951

* Confirmation Copy

Form No. PBA 51

U. S. GOVERNMENT PRINTING OFFICE 16—46394-1

DEPARTMENT OF THE INTERIOR
Defense Minerals Administration
RECEIVED
AUG 2 1 1951

Defense Minerals Administration
Salaries and Expenses Defense
Production Act Department of

Interior 1408137 - 1952

August 16, 1952

Furman, Greene Chandler

J. E. Ennis, Jr.
Bureau of Mines, Region IV
224 New Customhouse Building
Denver 2, Colorado

Requested lease form DMA Docket 866 was airmailed August 8.

Gunnard Johnson

G. E. Johnson, Acting Chief
Land-Zinc Branch

JWJohnson'lm

cc: Mr. Hays
Audits
Reports and Records
Nate
McKnight
Mann
DMA Docket File

350

FILE COPY
SURNAME:

UNITED STATES
DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS ADMINISTRATION
WASHINGTON 25, D. C.

AUG 13 1951

Billings
O'Leary
(For Mote)
McKnight

a.e.c.

Airmail

Mr. J. H. East, Jr., Region IV
Bureau of Mines
224 New Customhouse Building
Denver 2, Colorado

Dear Mr. East:

Enclosed is a Mining Lease and Option which was handed to me today by Mr. Greene Chandler Furman with regard to DMA 860 - Ibex Extension Property, Lake County, Colorado.

I presume this will complete the information required for your field investigation of this property.

Very truly yours,

8/13
cc

Tom Lyon

Tom Lyon, Chairman
Coordinating Committee

Enclosure
8/9/51
Approved:

Merrill
For Bureau of Mines

J Lager
For Geological Survey

TPBillings:lm

ccL Reports and Records
Mote
McKnight
Moon
DMA Docket File

2

350

AUG 13 1951

Airmail

Mr. J. H. Rust, Jr., Region IV
Bureau of Mines
224 New Customhouse Building
Denver 2, Colorado

Dear Mr. Rust:

Enclosed is a Mining Lease and Option which was handed to me today by Mr. Greene Chandler Furman with regard to DMA 560 - Ibex Extension Property, Lake County, Colorado.

I presume this will complete the information required for your field investigation of this property.

Very truly yours,

Tom Lyon

Tom Lyon, Chairman
Coordinating Committee

Enclosure
8/9/51
Approved:

Merrill
For Bureau of Mines

2 Layer
For Geological Survey

TPBillings:lm

cc: Reports and Records
Mote
McKnight
Moon
DMA Docket File

FILE COPY
SURNAME:

UNITED STATES
DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS ADMINISTRATION
WASHINGTON 25, D. C.

Billings
McKnight
CLEAR
(For Mot)

August 2, 1951

DMA-869
Ibex Extension Property
Lake County, Colorado

a. EC

Mr. Greene Chandler Furman
1424 K Street NW
Washington 5, D. C.

Dear Mr. Furman:

In processing the Helena Ibex Extension Group at Leadville, Colorado, DMA-869, we find it necessary that you provide us with a copy of the lease relating to this project.

Your prompt attention to this matter will be appreciated in order that we may expedite final action.

Yours very truly,

T. P. Billings, Chief
Lease-Line Branch

TPBILLINGS:ks

cc: Reports & Records
Note
McKnight
Billings
Files

SPECIAL

CPO 10-101004-1

C.O. Mittendorf
7-31-51
11:20
Rec'd 8-2-51 T P Billings
Thomas, Helene Chandler
& George P. Nugent

DENVER BUR MINES 235 7-31-51 8-20 AM
C O MITTENDORF
PLEASE AIR MAIL COPY OF LEASE ON HELENA IBEX EXTENSION GROUP, LEADVILLE, LAKE COUNTY, COLORADO, DMA DOCKET 860. WE SUSPECT CERTAIN TERMS OF THE LEASE MAY CONFLICT WITH EXPLORATION PROPOSED BY ELDER.
PAUL T ALLSMAN, ALTERNATE, FOR J H EAST JR, EXECUTIVE OFFICER
ANOTHER ONE

P.E.D. does not have —
Refer to Supply Division

Denver, Colorado

AUG 1 1951

9

BUREAU OF MINES
MAIL ROOM
WASHINGTON, D. C.

JUL 31 1 00 PM '51

DEPARTMENT OF THE INTERIOR
Defense Minerals Administration
RECEIVED
JUL 31 1951

LANDON F. STROBEL
Executive Secretary

L1-17

UNITED STATES
DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS ADMINISTRATION
WASHINGTON 25, D. C.

August 2, 1951

DMA-860
Ibex Extension Property
Lake County, Colorado

Mr. Greene Chandler Furman
1424 K Street NW
Washington 5, D. C.

Dear Mr. Furman:

In processing the Helena Ibex Extension Group at Leadville, Colorado, DMA-860, we find it necessary that you provide us with a copy of the lease relating to this project.

Your prompt attention to this matter will be appreciated in order that we may expedite final action.

Yours very truly,

T. P. Billings, Chief
Lead-Zinc Branch

TPBILLINGS:ks

cc: Reports & Records
Mote
McKnight
Billings
Files

TELETYPE MESSAGE

TO: C. O. Mittendorf, Washington, D. C. July 31, 1951

PLEASE AIR MAIL COPY OF LEASE ON HELENA IBEX EXTENSION GROUP, LEADVILLE, LAKE COUNTY, COLORADO, DMA DOCKET 860. WE SUSPECT CERTAIN TERMS OF THE LEASE MAY CONFLICT WITH EXPLORATION PROPOSED BY ELDER.

PAUL T. ALLSMAN, ALTERNATE

FOR J. H. EAST, JR., EXECUTIVE OFFICER

PTA

Lease - sent to East 8/8 -

CONFIRMATION

AUG 9 1951

Form No. PBA 51

U. S. GOVERNMENT PRINTING OFFICE 16—46394-1

Traver

Colorado Branch

Date Rec'd
JUN 19 1951
BUREAU OF MINES
Denver, Colorado

DIST. ENGR.	WMT
SAT H	SWH
EXAMINATION	
DIST. CLERK	
PERSONNEL	
FILES	

224 New Customhouse
Denver, Colorado

June 18, 1951

Memorandum

To: A. H. Koschmann (with brochure)

P. T. Allsman

From: BMA Field Team, Region IV

Subject: DMA 860, Ibex Extension Property, Leadville, Colorado, applicant Greene Chandler Putnam

We are enclosing the brochure on DMA 860 and a letter from the Chairman of the Coordinating Committee. You will note on the second page of Mr. Lyon's letter that it is requested that Ogden Tweto review the application critically to determine if the project is suitable on a geologic basis and that if his decision is favorable, costs and methods should be investigated.

Mr. Koschmann will have Mr. Tweto review the application and Mr. Allsman will secure the necessary information so that Exhibits A, B, C, D and E can be prepared.

J. H. East, Jr.

J. H. East, Jr.

A. H. Koschmann

A. H. Koschmann

Attachments
JHE/cl
co-dma files
Allsman
Koschmann

Department of Commerce
NATIONAL TECHNICAL INFORMATION SERVICE
JUN 1 0 1971
Date Rec'd.
Customer Number

FILE COPY
SURNAME:

UNITED STATES
DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS ADMINISTRATION
WASHINGTON 25, D. C.

Lyons (E.T.M.)
McKinney
Harris

JUN 13 1951

Re: Docket DMA-860
Ibex Extension Property
Leadville, Colorado
Lead-zinc-copper
Exploration loan

Mr. J. H. East, Jr.
Executive Officer, DMA Field Team
Region IV
224 New Customhouse
Denver 2, Colorado

Dear Mr. East:

Attached is the application and supporting data submitted by Greene Chandler Furman of Washington, D. C. for a loan to explore the Ibex Extension property in Secs. 28 and 33, T. 9 S., R. 79 W., Lake County, Colorado.

The applicant's proposal, which has been modified several times includes the following:

Unwatering Hellena Shaft to 700 level
10 Diamond drill holes, averaging 450 ft. each, from the surface in the area from 800 ft. west of the Hellena Shaft to explore the upper contact of the "Blue" limestone.
2 Diamond drill holes, 200 ft. and 400 ft. each, upward from the breast of the crosscut west of the Helena shaft on the 500 level to explore the same contact as above.
3 Diamond drill holes, averaging 500 ft. each, below the 700 level to determine depth of and mineralization in the "Blue" limestone.
10 Diamond drill holes, averaging 700 ft. each, from the 500 level extended north (see below) at various intervals to determine depth of and explore the "Blue" limestone adjacent to the Hellena fault fissure.
Driving the drift on the 500 level 2400 ft. north to explore the Hellena fault fissure.

The total estimated cost of the above project, including purchase of new equipment, is $326,619.00. The applicant has signified his willingness to pay his share of the cost.

The Lead-Zinc Branch recommends that Ogden Tweto review the application critically to determine if the project is suitable on a geological basis. If his decision is favorable, costs and methods should be investigated. If it is decided that the project should be approved, any particulars necessary to complete the contract should be determined.

Very truly yours,

Tom Lyon
Chairman
Coordinating Committee

Lowell B. Moon
For Bureau of Mines

Olaf N. Rove
For Geological Survey

EJLyons:emp
G 6/12/51
Copies to: Chief, Lead-Zinc Br.
E. T. McKnight 4204 GSA
R. H. Mote
L. F. Strobel
Directorsr. file 4214 GSA
Br. r. file 4214 GSA
Files

FILE COPY
SURNAME:

Lyons (ETM)
E T McKnight
Mote
Strobel
Moon

UNITED STATES
DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS ADMINISTRATION
WASHINGTON 25, D. C.

JUN 13 1951

Re: Docket DMA-860

Mr. Greene Chandler Furman
1424 K Street, NW
Washington 5, D. C.

Dear Mr. Furman:

Your application, together with supporting data for a loan to explore the Ibex Extension property in Lake County, Colorado, has been referred to Mr. J. H. East, Jr., Executive Officer of the Field Team, 224 New Customhouse, Denver 2, Colorado for further information and advice.

Very truly yours,

Tom Lyon, Director
Supply Division

EJLyons:emp
G 6/12/51
Copies to: J. H. East, Jr. Region IV (2)
Chief, Lead-Zinc Br.
E. T. McKnight 4204 GSA
~~XxxRxxMxxx~~
R. H. Mote
L. F. Strobel
Directors r. file 4214 GSA
Br. r. file 4214 GSA
Files

FILE COPY
SURNAME:

Lyons (Ezra)
McKnight
Mote
Strobel
Moon

UNITED STATES
DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS ADMINISTRATION
WASHINGTON 25, D. C.

JUN 13 1951

Re: Docket DMA-860

Mr. Robert D. Elder
4233 32nd Road South
Arlington 6, Virginia

Dear Mr. Elder:

This will acknowledge receipt of your letter of June 6 with attached cost estimates for the exploration on the Ibex Extension property. The information has been referred to the Lead-Zinc Branch of the Defense Minerals Administration for their consideration.

Very truly yours,

Tom Lyon, Director
Supply Division

EJLyons:emp
G 6/12/51
Copies to: Chief, Lead-Zinc Br.
E. T. McKnight 4204 GSA
R. H. Mote
L. F. Strobel
Directors r. file 4214 GSA
Br. r. file 4214 GSA
Diles

FILE COPY
Surname:

Davis
Josephson
Moon

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF MINES
WASHINGTON 25, D. C.

June 11, 1951

Mr. Fred O. Schoeffer
30 Rockefeller Plaza
New York 20, New York

My dear Mr. Schoeffer:

Your letter of June 5, transmitting letter from Mr. O. L. Bancroft, concerning a geological report on the United States Fluorspar property, has been received.

We do not have a geological report prepared by Mr. C. H. Herrer, who presumably is engineer for U. S. Fluorspar Co. However, the application for loan filed by Mr. Bancroft was accompanied by a map prepared by Mr. Herrer and I am, therefore, wondering if this might be the document you desire.

Sincerely yours,

THOS. H. MILLER

Acting Director

HWDavis:cb

Copy to: G. W. Josephson
L. B. Moon
H. W. Davis
Files

Mr. Herres

ROBERT D. ELDER
STATE SENATOR
TWENTY-FIRST SENATORIAL DISTRICT
LEADVILLE, COLORADO

Senate Chamber
State of Colorado
Denver

COMMITTEES
MEMBER OF:
FISH, FORESTRY AND GAME
INTERSTATE CO-OPERATION
JUDICIARY
METAL MINING
PRIVILEGES AND ELECTIONS
RULES

Robert D. Elder
4233 32nd Road South
Arlington 6, Virginia
June 6, 1951

Mr. Tom Lyon
Lead-Zinc Branch
Defense Minerals Administration
Department of the Interior
Washington
D. C.

DMA-860

Re: Hellena-Ibex Extension
Leadville, Colorado

Dear Mr. Lyon:

In accordance with Mr. Furman's request and my phone conversation with you a few weeks ago, the attached cost estimate of exploration program is being mailed to you direct. It may be considered in lieu of the table previously designated "Estimate of production objectives" at pages 6 - 7 of letter R. D. Elder to G. C. Furman dated January 12, 1951, which you have in your file.

A line acknowledging your personal receipt of same will be appreciated -- the federal mail maze being what it is.

Sincerely yours,

Robert D. Elder

Robert D. Elder

Copy under separate cover

Check carefully this equipment inventory and submit your appraisal of present value.
Note replacements on new equipment requirements and probably costs.
Water is an important factor as much as 1500-2000 G/m.
Other costs of Diamond Drill entirely out of line in some proportion.

JUN 11 1951

DEPARTMENT OF THE INTERIOR
Defense Minerals Administration
RECEIVED
JUN 8 1951
LANDON F. STROBEL
Executive Secretary

COST ESTIMATE OF EXPLORATION PROGRAM

Surface construction at existing Hellena Shaft

One - 60-ft. headframe, with high-level skip pocket to compensate for the flat site in Iowa Gulch bed.	$ 4,800.00
Engine house and hoist room, with miners' dry room.	4,000.00
Blacksmith shop and store room.	1,200.00
Magazine for explosives.	450.00
Carbide shack.	90.00
Fluming creek for 500 feet to keep water our of fissure vein and min workings, cutting past pumping expense.	3,200.00
Three - Transformers to 440 and/or 2200 volts.	3,900.00

(N.B. - Public Service Power Line is only 50 feet from Hellena Shaft collar.

Transformer rack and meter hook-up by Public Service Co.	1,300.00
Reinforced concrete at shaft collar for support of pump.	600.00

Equipment for Hellena Shaft, including installation

Two - 6-ft. sheave wheels, mounted.	900.00
One - 125 h.p., 6600-lb. rope pull, single drum electric mine hoist, complete with motor, controller, grids, etc.	9,700.00
1500 ft. of 1" plowsteel hoisting rope.	1,950.00
Signal gong and wiring.	60.00
One - 20 cu. ft. self-dumping steel skip.	400.00
One - Electric deepwell turbine pump, 700 feet long between motor and bowls (Worthington or Layne-Bowler) installed complete with self-contained discharge column, direct-connected vertical electric pump set at surface, kingsbury bearings, oil lubrication, etc., for unwatering and continued drainage of Hellena Shaft to a point below 700 ft. level sills, as more fully treated in discussion infra.	18,400.00
One - Electric winch for lowering turbine pump column and shafting, complete with 300 ft. of special grade plowsteel cable, etc.	3,600.00
One- 1100 cu. ft. two-stage air compressor, complete with electric motor, etc., including air receiver and cooling water tanks with small circulating water pump. To provide necessary air capacity @ 100 lbs. pressure for simultaneous underground operation of one or more diamond drills, and at least one mucking machine, as well as one or two heavy drifter machine drills used in the exploration program.	9,800.00
Two -- DA 30 I-R drifter machines @ $1040 each, complete with power feed, steel centralizer, sliding cone, 36" shell, and late features.	2,080.00
One - R58 I-R rotator stoper.	735.00
One - J50 I-R jackhamer @ $365 each.	365.00
Four - 50 ft. lengths of 1" air hose @ $37.40 each.	149.60
Four - sets water hose, water tanks, and fittings.	860.00
2400 feet of 4" black pipe for compressed air line.	3,200.00
3000 feet of 2" black pipe for compressed air line. (may be used for diamond drills on surface as well as same and machine drills in mine.)	1,660.00
Valves and fittings, unions, T's, etc. for 4" and 2" pipe.	110.00
Stocks and dies for airline pipe.	60.00
One - Pneumatic steel sharpener with shanker and fittings for the several sizes of steel.	2,900.00
One - Oil forge for steel.	350.00
One - Coal-coke forge for picks, etc.	40.00

Supply of 1 1/8" round, 1" square, and 7/8" octagon machine drill steel.	$ 600.00
Columns and cross-bars for above drifter machines.	560.00
Miscellaneous tools and supplies for blacksmith shop.	250.00
Wrenches and miscellaneous tools for mine.	1,200.00
Twenty - 16 cu. ft. mine cars @ $160.00 each.	3,200.00
One - Mancha light storage battery locomotive for tramming in the extended 500 ft. level north.	4,900.00
One - pneumatic mucking machine.	4,750.00
10 tons of 12 lb. steel rails with splice bars, bolts, and spikes.	1,300.00
Est. cost of power, labor, etc., involved in initial unwatering of Hellena Shaft to 700 ft. level, using above equipment.	2,700.00
Est. cost of contracting the drilling of three diamond drill holes averaging 500 ft. deep below 700 ft. level.	4,500.00
Est. cost of extending the present breast of the 500 ft. level northward 2,400 feet along the Hellena reverse fault fissure vein, in exploration to determine the presence or absence of economic deposits in the fissure vein beyond those opened and mined by former operators in the Hellena claim portion of the vein, including only underground costs of labor, explosives, timber, and incidentals, but without power and surface overhead.	48,000.00
Est. cost of contracting the drilling of not less than ten (10) down-holes averaging 700 ft. deep below the extended 500 ft. level north, at selected intervals along said fissure vein, for the purpose of determining the precise depth of the Blue limestone stratum along fissure and the presence and character, or absence, of economic replacement deposits blanketing out into the Blue limestone from the Hellena reverse fault fissure vein.	21,000.00
Est. cost of contracting the drilling of two (2) diamond drill holes fanning upward at app. 45 degrees or flatter, westerly from the present breast of the 500 ft. level west crosscut from Hellena Shaft, for the purpose of exploring the Blue limestone and upper contact thereof, and determining the presence and character, or absence, of economic blanket deposits. Said holes would run to 200 and 400 feet respectively, at varying angles, and would supplement the information obtained from summer season drilling to the same Blue lime syncline from surface. Severe winter conditions prohibit surface drilling six months of the year.	1,500.00
Est. cost of contracting the drilling of ten (10) diamond drill holes averaging 450 ft. each, from surface set-ups in the area from 800 to 1800 ft. westerly from the Hellena Shaft, for the purpose of determining the presence and character, or absence, of economic replacement deposits in the higher Blue limestone syncline west of the Weston Fault. This aggregates 2700 ft. of such drill holes from surface.	8,100.00
Est. cost of power and pumping overhead for nineteen (19) months during effectuation of the aforesaid two-shift exploration program, at maximum of $2,200. per month.	41,800.00

Est. cost of labor overhead for same period of nineteen (19) months, comprising 1 mine foreman, 3 hoist engineers, 1 blacksmith, 2 top men, @ $2,400 per month, including Social Security, Workmen's Compensation insurance, etc. Does not include underground crews, which are covered under other estimates, largely under footage contracts.	45,600.00
Management, 24 month period.	14,400.00
Interpretation of drill cores and mapping of formations and mineral occurrences, by responsible independent geologists.	8,000.00
Mine surveying by U. S. Dep. Mineral Surveyor.	1,400.00
Accounting supervision (CPA), 24 month period.	1,200.00
Bookkeeping and clerical, 24 month period.	4,800.00
Est. marginal fund for emergencies and inflationary trends in costs and wages.	30,000.00
Total, costs of exploration program . . .	$ 326,619.00

Comment

In the exploration program above indicated, shaft sinking below the present depth of 766 feet is not included. Consequently, station pumps are unnecessary, obviating the expense of installing such pumps and the concomitants of 10-inch water column and armored electric cable in the shaft. To such a depth of 700 feet only, other methods of drainage have proven cheaper, safer, and more efficient.

For example, a deepwell turbine pump of 700 ft. length -- the same as required here -- has been continuously in operation since 1926 at one of the Union Pacific collieries near Rock Springs, Wyoming, and is still in constant use there as a sole drainage unit, without station pumps for standby. Many such pumps have been in continuous operation for over twenty years throughout the country, without once being raised for repairs.

It is suggested that the deepwell turbine pump be used to unwater to a point below the 700 ft. level sills, in one lift. Thereafter intermittent operation of the pump would hold the water below that level until completion of the diamond drilling slated from set-ups in the 700 ft. level. Upon completion, equipment would be removed from the 700 ft. level and the water thereafter held at any convenient point below the sills of the 500 ft. level, using the 700 ft. level and 570 ft. level for sump capacity only operating the turbine pump at times when no other he machinery is being used on the circuit. Peak load of p

demand is thus deeply cut and upwards of 30 to 40 per cent saved on electric power bills. Under very similar conditions the undersigned has used a double-throw switch, with the full approval of the Public Servce Co., to very great economic advantage.

Robert D. Elder

Robert D. Elder

June 6, 1951

Copy
Original
Replaced

Robert D. Elder
4233 32nd Road South
Arlington 6, Virginia
June 6, 1951

Mr. Tom Lyon
Lead-Zinc Branch
Defense Minerals Administration
Department of the Interior
Washington
D. C.

Re: Hellena-Ibex Extension
Leadville, Colorado

Dear Mr. Lyon:

In accordance with Mr. Furman's request and my phone conversation with you a few weeks ago, the attached cost estimate of exploration program is being mailed to you direct. It may be considered in lieu of the table previously designated "Estimate of production objectives" at pages 6 - 7 of letter R. D. Elder to G. C. Furman dated January 12, 1951, which you have in your file.

A line acknowledging your personal receipt of same will be appreciated -- the federal mail maze being what it is.

Sincerely yours,

Robert D. Elder

COST ESTIMATE OF EXPLORATION PROGRAM

Surface construction at existing Hellena Shaft

One - 60-ft. headframe, with high-level skip pocket to compensate for the flat site in Iowa Gulch bed.	$ 4,800.00
Engine house and hoist room, with miners' dry room.	4,000.00
Blacksmith shop and store room.	1,200.00
Magazine for explosives.	450.00
Carbide shack.	90.00
Fluming creek for 500 feet to keep water our of fissure vein and min workings, cutting past pumping expense.	3,200.00
Three - Transformers to 440 and/or 2200 volts.	3,900.00

(N.B. - Public Service Power Line is only 50 feet from Hellena Shaft collar.

Transformer rack and meter hook-up by Public Service Co.	1,300.00
Reinforced concrete at shaft collar for support of pump.	600.00

Equipment for Hellena Shaft, including installation

Two - 6-ft. sheave wheels, mounted.	900.00
One - 125 h.p., 6600-lb. rope pull, single drum electric mine hoist, complete with motor, controller, grids, etc.	9,700.00
1500 ft. of 1" plowsteel hoisting rope.	1,950.00
Signal gong and wiring.	60.00
One - 20 cu. ft. self-dumping steel skip.	400.00
One - Electric deepwell turbine pump, 700 feet long between motor and bowls (Worthington or Layne-Bowler) installed complete with self-contained discharge column, direct-connected vertical electric pump set at surface, kingsbury bearings, oil lubrication, etc., for unwatering and continued drainage of Hellena Shaft to a point below 700 ft. level sills, as more fully treated in discussion infra.	18,400.00
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One - J50 I-R jackhamer @ $365 each.	365.00
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Four - sets water hose, water tanks, and fittings.	860.00
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3000 feet of 2" black pipe for compressed air line. (may be used for diamond drills on surface as well as same and machine drills in mine.)	1,660.00
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Stocks and dies for airline pipe.	60.00
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One - Oil forge for steel.	350.00
One - Coal-coke forge for picks, etc.	40.00

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Management, 24 month period.	14,400.00
Interpretation of drill cores and mapping of formations and mineral occurrences, by responsible independent geologists.	8,000.00
Mine surveying by U. S. Dep. Mineral Surveyor.	1,400.00
Accounting supervision (CPA), 24 month period.	1,200.00
Bookkeeping and clerical, 24 month period.	4,800.00
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Total, costs of exploration program . . . $	326,619.00

Comment

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demand is thus deeply cut and upwards of 30 to 40 per cent saved on electric power bills. Under very similar conditions the undersigned has used a double-throw switch, with the full approval of the Public Servce Co., to very great economic advantage.

Robert D. Elder

June 6, 1951

Recd by H.W.D. 6-8-51
1:30 P.M.

Ans. 6-11-51 HWD.

THOS.

L.B. Mason

Mr. Davis

FRED OTTO SCHOEFFER
THIRTY ROCKEFELLER PLAZA
NEW YORK 20, N. Y.

June 6th, 1951

Chemical
Materials
Mgr. for alg. Director
Action
Comments
Your information

Mr. Thomas Miller, Acting Director
Defense Materials Administration
Interior Building
Washington 25, D.C.

Dear Mr. Miller-

Thank you very much for your courtesy extended to me over the telephone this morning. Under the same cover you are receiving the letter from Mr. Bancroft, authorizing you to send me the geological report on the United States Fluorspar property.

As Mr. Bancroft has said, I will greatly appreciate it if you could send me a copy of it at your very earliest convenience. Should no copy be available I will appreciate your letting me know immediately so that I can make arrangements to examine it wherever you suggest. Should it be possible for you to send the report to me, I herewith assure you that it willbe promptly returned.

Thank you again for your courtesy,

Very truly yours

Fred O. Schoeffer

Dec. 18, 1950
Eng. U.S. Fluorspar Co

BUREAU OF MINES
WASHINGTON, D. C.

1951 JUN 6 PM 4 20

RECEIVED
JUN 7 1951
BUREAU OF MINES
WASHINGTON 25, D. C.

CAMARDELLA, DE MAIO & HUGHES
ATTORNEYS AT LAW
158 REMSEN STREET
BROOKLYN 2, N. Y.

L. F. CAMARDELLA
JOHN HENRY DE MAIO
THOMAS J. HUGHES
LOUIS VICTOR DE MAIO

TELEPHONE MAIN 5-3240
CABLE "LEXCAMAR" NEWYORK

June 5th, 1951

Mr. Thomas Miller, Acting Director
Defense Materials Administration
Material Building
Washington 25, D. C.

Dear Mr. Miller:

This will authorize you to send the geological report prepared by Mr. C. M. Harrer on the United States Fluorspar property at Salida, Colorado, to Mr. Fred O. Schoeffer of 30 Rockefeller Plaza, Room 1515, New York City.

Your immediate cooperation will be deeply appreciated.

Very truly yours,

D. L. Bancroft
Treasurer and Secretary United States Fluorspar Maganese Incorporated.

LFC:JB

GREENE CHANDLER FURMAN
ATTORNEY AT LAW
1424 K STREET, N. W.
WASHINGTON 5, D. C.
REPUBLIC 7160

May 15, 1951.

Mr. Otto Herres
Chief Lead Zinc Branch
Defense Minerals Administration
United States Department of the Interior
Washington 25, D. C.

Subject: DMA- 860 ×

Dear Mr. Herres:

Following our conversation of about two weeks ago in which you referred us to Mr. Lyons of your office we interviewed Mr. Lyons. At that time Mr. Lyons requested further information of our plan of operations, particularly to know where the proposed drill holes would be sunk, the location of the existing levels of the Hellena shaft and some explanation of the sketch map we gave him.

Attached you will find a letter from Mr. Elder dated May 10, 1951, with enclosures, which we believe answers Mr Lyons Questions. Mr Nugent, who accompanied me on my last visit to your office is at present still in the west. Trusting you will call upon us for any further information we can render, We remain

Very truly yours,

G. C. Furman

FILE COPY
SURNAME:

UNITED STATES
DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS ADMINISTRATION
WASHINGTON 25, D. C.

APR 12 1951

From McKnight Herres Mote

In reply please refer to DMA-860

Mr. Greene Chandler Furman
1424 K Street, NW
Washington 5, D. C.

Dear Mr. Furman:

One of the purposes of the Defense Production Act of 1950 is the encouragement of exploration, development and mining of strategic minerals and metals. When an applicant has proven reserves of strategic materials, Federal aid in mining can be given through procurement contracts for such materials as are in short supply. On the strength of these contracts, the applicant can obtain private financing in most instances.

The program recently approved for encouragement of exploration of strategic materials calls for participation on the part of the applicant. For zinc, lead and copper deposits it will be necessary to match Government funds on an equal basis. Funds advanced by the Government will be considered a loan, to be repaid if the exploration is profitable, but to be canceled if unsuccessful. The details of the plan, explaining the projects that will be eligible for assistance, the terms and schedules of financing, repayment, and other pertinent information, are enclosed.

A review of your application (DMA-860) for financial aid in reopening and bringing into production the Ibex Extension property in Lake County, Colorado, indicates that part and possibly all of your proposal may be considered under this exploration program. Details concerning expenditures that will be considered chargeable to exploration aid will be subject to a final determination by negotiation.

Before we can proceed further with consideration of your application, which may or may not require a field examination, please indicate your willingness to provide your share of the funds needed to carry out the proposed exploration. Any modification of your original proposal that you may wish to make will be considered, but you should be specific concerning the work you wish to undertake.

Very truly yours,

Otto Herres

OTTO HERRES, Chief
Lead-Zinc Branch

EJLyons:emp G 3/30/51
Copies to: 2 copies to
J. H. East, Jr. Region IV
Chief, Lead-Zinc Br.
E. T. McKnight 4204 GSA
L. B. Moon

R. H. Mote
L. F. Strobel
C. O. Mittendorf
Files

FILE COPY
SURNAME:

Strobel

UNITED STATES
DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS ADMINISTRATION
WASHINGTON 25, D. C.

March 22, 1951

Mr. Greene Chandler Furman
1424 K Street, N. W.
Washington 5, D. C.

Subject: DMA-860

My dear Mr. Furman:

Receipt is acknowledged of your application and attachments of March 20, for a Government loan under the Defense Production Act of 1950.

The application was assigned docket number 860 and referred to Mr. Otto Herres, Chief, Lead-Zinc Branch, on March 22.

In any future correspondence relating to your application, kindly refer to DMA-860.

Sincerely yours,

LANDON F. STROBEL

Landon F. Strobel
Executive Secretary

Copy to: Strobel (2)
Files ✓
Mr. Herres
Mr. Lyon

GREENE CHANDLER FURMAN
ATTORNEY AT LAW
1424 K STREET, N. W.
WASHINGTON 5, D. C.
REPUBLIC 7160

dma 860

March 20, 1951

Dr. James Boyd, Administrator,
Defense Minerals Administration,
Department of the Interior,
Washington 25, D. C.

Subject: Obtaining a loan of $450,000. under the terms of "The Defense Production Act of 1950" for the purpose of reopening mines producing zinc, lead, copper, and other minerals in a consolidation of 186.209 acres of patented lode mining claims known as the Ibex Extension property, in Sections 28 and 33, Township 9 South, Range 79 West, in the California Mining District, Lake County, Colorado, 3 miles east of the City of Leadville. Upon this acreage there now exist, among other workings, three major operable mine shafts, to-wit: the Hellena shaft, 766 feet in depth; the First National shaft, 250 feet in depth; and the Fisk-Julia shaft, 660 feet in depth; all cribbed throughout and in good condition for mining work. Machinery and operating equipment of an estimated present value of $73,125. now remain available for use upon these properties, together with permanent development items of an estimated present value of in excess of $407,000., exclusive of other items not appropriate in the present plan of development.

References: (1) Department of the Interior, Information Service, Defense Minerals Administration, Release of 8:30 p.m., dated December 5, 1950.
(2) Professional Paper 148, U.S.B.S. 1928, and accompanying maps and plates. (Drs. Loughlin and Irving).
(3) Leadville Monograph of 1883, U.S.B.S. 1883, and accompanying maps and plates. (Prof. S.F. Emmons, Geologist-in-Charge).

See Clv. Dr. file

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Dr. James Boyd, Administrator, Defense Minerals Administration

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Dear Sir:

Mr. George A. Nugent, 1317 F Street, N.W., Washington, D. C. and I have from the owners in fee the written offer of a 20-year mining lease and option to purchase upon certain patented lode mining claims together with all appurtenances, which patented lode mining claims are more fully described in enclosure (1) attached hereto and by reference made a part hereof. The owners are Mr. Robert D. Elder and his wife, Margaret Hunter Elder, formerly of Leadville and Denver, Colorado, now residing at 4233 - 32nd Road, South Arlington 6, Virginia. From 1915 to 1943, Mr. Elder was a practicing attorney and nonferrous mining operator, also State Senator from the Leadville District, Colorado.

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Enclosed you will also find a copy of a letter dated January 12, 1951, from Mr. Robert D. Elder to Greene Chandler Furman, Esq., giving the history of the Ibex Extension property from 1927 - the date of the Nichols report - to the present time. While Mr. Elder is an owner of the property, his letter is readily verified, factually detailed, and entitled to respectful consideration because of his long identification with the Leadville District and many of its well-known operations. His father came to Leadville in 1878; Robert D. Elder was born there in 1889; he is a graduate of Princeton University and of Columbia University School of Law in 1914; from 1915 until 1943 he was a practicing attorney in Denver and a nonferrous mining operator upon many properties at Leadville, Alma, and other districts in Colorado; he represented the Leadville District as Representative and State Senator for many years. Mr. Elder states that there is now located on the Ibex Extension property mining and mill machinery and other operating equipment of the present estimated value of $73,125., and that the permanent development items on the Ibex Extension property, directly useful for present operations, have an estimated present value in excess of $407,000.

In his letter Mr. Elder outlines the work done by the Golden Rod Corporation at the Hellena shaft, together with their churn drilling operations on the western contact. The work of the Golden Rod was abandoned shortly after the market crash of 1929, but during their active work in 1928 and 1929 enough was accomplished to substantiate in a large measure the correctness of the obviously optimistic report of their engineer, Mr. O.A. Nichols, as well as the earlier reports by Dr. R.D. George, Colorado State Geologist, and F.J. McNair, E.M. While the deposits of zinc, lead-zinc, and lead ore remaining open in the upper levels along the vertical fissure vein at the Hellena offer a product which at present prices would afford a handsome margin of profit, even after the removal of $580,000. in crude lead-gold-silver shipments prior to 1915, no work whatever has been pushed along the fissure vein beyond a point about 150 feet each way north and south from the shaft, since the operators at that time could not obtain control of the adjoining claims along the fissure. It is clearly indicated by the reports, and emphasized by Mr. Elder, that greatest potential values are to be expected in the Blue limestone contact along the mineralizing zone of the great Hellena reverse fault fissure vein at a depth of about 1100 feet below the collar of the Hellena shaft. The American Smelting & Refining Co. is shown to be presently

Dr. James Boyd, Administrator, Defense Minerals Administration

engaged in completing an 1800-foot shaft to exploit similar geological conditions on the Blue limestone contact along the Garbutt fissure vein, in its consolidation of mining claims NNW of the Ibex Extension ground. Extensive deposits of copper were indicated by the diamond drilling of the Blue limestone contact near the site of the new Irene-Hawkeye shaft of the A.S.& R. Co. This makes it possible that copper, as well as lead and zinc values, may be in like manner found at depth along the Hellena fissure vein, although no ore with a copper tenor has so far been mined in the upper levels of the Hellena vertical fissure vein.

Small lessees of the A.S. & R. Co. have been working in the Sunday fissure vein far above the contact level for several years, with a reported production of crude zinc, lead-zinc, and lead aggregating over $260,000. per year in net smelter returns. As remarked by Dr. George, the Hellena fissure vein is even stronger than the Sunday. Mr. Elder indicates that it is practicable to reopen and mine the zinc, zinc-lead and lower grade lead ore deposits remaining in the upper levels from the Hellena shaft, while at the same time prosecuting the sinking of the shaft from its present depth of 766 feet to 1200 feet in order to command the contact deposits in the Blue limestone along the fissure. As above stated the Hellena vertical vein has not been opened beyond a point 150 feet north and 150 feet south of the Hellena shaft, because former operators prior to 1915 were unable to get control of the adjoining claims. Further development north and south in the vertical vein itself is regarded as even more desirable than at the Sunday, although small leasers cannot handle it because of the necessity of installing pumps for all work below 50 feet from the collar at the Hellena. Although the flow of water in the Hellena shaft can be handled with ease by small centrifugal or turbine pumps, this feature definitely places the Hellena shaft out of the small leasing category and requires a development fund that neither the present owners or local mine operators are able to command. Your attention is urgently invited to the accompanying reports and letters in support of our belief that vital interests of the Government's defense effort will be served by the proper reopening and development of the Ibex Extension property, commencing at the Hellena.

In 1937, when a substantial advance in lead and zinc prices seemed imminent, Mr. Elder personally unwatered, retimbered, and mined upwards of 6,000 tons of ore left above the 200-foot level of the old First National shaft. Metal prices promptly sagged below 6¢ per pound and stayed there. Mr. Elder milled the above 6,000 tons in the 100-ton gravity-flotation mill which he designed and constructed at the First National shaft in 1937-1938. After milling a like tonnage from the Hellena dumps and some 20,000 tons of dump ore from the St. Kevin, Little Winnie, and other properties, Mr. Elder shut down the First National and had the satisfaction of realizing that he had made a correct decision. Lead and zinc prices remained at such low levels for years that no motive whatever was provided for the expenditure of a dime in developing or mining these metals. The machinery and operating equipment for mine and mill in the present estimated value of $73,125.00 is shown to remain on the ground at the First National, 2400 feet west of the Hellena shaft, and is available for work in any part of the Ibex Extension consolidation. For reasons clearly stated in the reports it is regarded as more desirable to center the initial work at the Hellena shaft, regardless of the larger initial

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outlay of capital required.

In view of the facts that (1) there are known large deposits of strategic minerals accessible in this property, (2) the property is only 3 miles by trucking road to broad gauge railroad and a major lead-copper smelter of the A. S. & R. Co. at Leadville, (3) the Hellena, First National, and Fisk-Julia have direct transformer connections to a 6600 volt power line within 100 feet of each shaft, (4) there is in existence at the First National Shaft a complete 100-ton gravity-flotation mill, 2400 feet west of the Hellena Shaft and 400 feet SW of the Fisk-Julia shaft, (5) the property has an ample water supply for indefinitely expanded operations, (6) the labor supply has always been adequate to meet widely varying needs throughout the years since 1879, in one of the outstandingly permanent and best known nonferrous mining districts in the United States -- in view of these facts, this application would appear to meet all the requirements set forth on page 3 of the Defense Minerals Administration release of December 5, 1950.

We shall be able to furnish competent administrative and technical services. It is now estimated that the outside cost of unwatering the Hellena shaft, sinking same to the Blue limestone contact ore horizon, and bringing the mine to substantial production from existing orebodies remaining in presently opened parts of the fissure vein, will be $346,770.00. In view of constantly rising costs we believe that the full sum of $450,000.00 should be requested in applying for a loan for this purpose. A substantial "carrying" production from the upper levels in the Hellena vertical fissure vein is regarded as reasonably certain within eight months after the loan is available and initial surface construction is commenced at the Hellena shaft; but ample margin of safety should be available to insure successful attainment of such "carrying" production and development of the deep east contact along the fissure. This last is regarded as of paramount importance, as the several reports emphasize. The owner has, in fact, expressed himself as unwilling to enter into a lease arrangement which does not offer substantial assurance that actual work will be commenced in a reasonable time with its major objective the proper development of the east Blue limestone contact along the mineralizing channel of the Hellena reverse fault fissure vein.

Thanking you in advance for your prompt consideration of this application, and assuring you that we shall be happy to supply such further information as may be required, we remain,

Very truly yours,

Greene Chandler Farman

Greene Chandler Furman
Attorney at Law
1424 K St., N.W.
Washington, D.C.

March 20, 1951

Dr. James Boyd, Administrator,
Defense Minerals Administration,
Department of the Interior,
Washington 25, D. C.

Subject: Obtaining a loan of $450,000. under the terms of "The Defense Production Act of 1950" for the purpose of reopening mines producing zinc, lead, copper, and other minerals in a consolidation of 186.209 acres of patented lode mining claims known as the Ibex Extension property, in Sections 28 and 33, Township 9 South, Range 79 West, in the California Mining District, Lake County, Colorado, 3 miles east of the City of Leadville. Upon this acreage there now exist, among other workings, three major operable mine shafts, to-wit: the Hellena shaft, 766 feet in depth; the First National shaft, 250 feet in depth; and the Fisk-Julia shaft, 660 feet in depth; all cribbed throughout and in good condition for mining work. Machinery and operating equipment of an estimated present value of $73,125. now remain available for use upon these properties, together with permanent development items of an estimated present value of in excess of $407,000., exclusive of other items not appropriate in the present plan of development.

References: (1) Department of the Interior, Information Service, Defense Minerals Administration, Release of 8:30 p.m., dated December 5, 1950.
(2) Professional Paper 148, U.S.G.S. 1928, and accompanying maps and plates. (Drs. Loughlin and Irving).
(3) Leadville Monograph of 1883, U.S.G.S. 1883, and accompanying maps and plates. (Prof. S.F. Emmons, Geologist-in-Charge).

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Thanking you in advance for your prompt consideration of this application, and assuring you that we shall be happy to supply such further information as may be required, we remain,

Very truly yours,

INC. #1

LIST OF PATENTED MINING CLAIMS UPON WHICH LOAN IS REQUESTED

U.S. Sur.No.	Acres
4033 Am. Hellena	9.630
903 Black Cloud	10.330
902 Continental	9.157
3371 Jane Eugene	9.853
1448 New Orleans	4.383
1596 Bloomington	5.614
4724 Bank	6.116
3216 Yale	9.779
3605 Josie	1.096
3604 Almeda	3.346
4728 Eagle)	
" Emerdale)	
" Haselholm)	6.479
801 Leopard	3.290
721 Mary E.	10.340
870 Maudy	3.760
1137 Howard M. Holden	5.600
2565 11/12 only in Alma Mater (remainder is leased by other 1/12 owner to American Smelting & Refining Co. as lessee)	3.500
738 2/5 only in Ohio (remainder is leased by other 3/5 owner to A. S. & R. Co.	6.665
805 7/12 only in Mountain Lion (rem.5/12 leased to A.S.& R. Co. by other owner)	9.630
10023 Friday	3.157

U.S.Sur.No.	Acres
1934 First National	9.360
1811 Little Julia	5.342
1812 3/4 only in Jim Fisk (rem.¼ leased to A.S.& R.Co. by the other ¼ owner)	4.920
4818 Little Anna	3.113
3242 Conundrum	3.000
1127 611/900 only in Mammoth (rem. 289/900 may be secured from other owner of that interest)	9.350
2619 Slide	8.170
11501 C. M. Fraction	2.954
15908 Lady Alice	1.164
1225 1/4 only in Seek-No-Further	9.000
9415 1/16 only in Kaufman	2.071
3501 1/4 only in International	5.990
Total acreage:	186.209

Checked:

/s/ Robert W. Elder

Robert W. Elder

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Total acreage:	186.209

Checked:

/s/ Robert D. Elder

Robert D. Elder

From
Robert D. Elder
4233 32nd Road South
Arlington 6, Virginia
May 10, 1951

To
Greene Chandler Furman, Esq.,
Attorney at Law
Realty Bldg.
1424 K Street, N. W.
Washington, D. C.

Re: Hellena-Ibex Extension
Leadville, Colorado
DMA - 860

Dear Mr. Furman:

Pursuant to your current inquiry there is appended hereto a photographic reproduction of the East-West section of the Hellena Shaft prepared in 1929 by the U. S. Geological Survey (Dr. Charles F. Behre), which is published at page 44, Volume 12, Colorado Scientific Society Proceedings, the same being on file with the U. S. G. S. at Washington, D. C. Dr. Behre, accompanied by the late Dr. G. F. Loughlin, examined the underground workings at the Hellena in 1929, while drained and under brief pre-depression operation by Golden Rod Mining & Smelting Corp. as previously described.

Enclosures

A. The East-West Behre section, above referred to, shows the ten levels from the Hellena Shaft and some of the major geological features discussed in the several reports you have in your dossier. As you will have observed, this Behre section is the basis of the eastern portion of the E-W section of the Blue limestone syncline between the Hellena and First National Shafts, represented by the sketch which you have. The First National Shaft is 2400 feet west of the Hellena Shaft.

B. Also enclosed is a surveyed plan map, scale 30 ft. to 1 in., showing part of the workings at the 147, 198, and 225-ft. levels from the First National Shaft in their relation to the deeper Fiske-Julia Shaft.

C. Also enclosed is a SW-NE section through the First National and Fiske-Julia Shafts, to scale 1 in. to 100 ft.

In answer to your present specific inquiries:

Location of proposed diamond drill holes.

(1) It has been recommended that there be one vertical down hole from a set-up in the 700-ft. level, Hellena, at a point not more than fifty (50) feet east of the shaft. This hole should not be drilled nearer to the fissure vein than the point just indicated.

for the reason that the Hellena vein may reverse to a west dip before reaching the Blue limestone contact and thus intercept and interfere with the continuity of the drill hole, or deflect it. Such reversal of dip has occurred at the Garbutt fissure vein. It is also to be noted that the Sunday fissure vein, on its southward strike, changes from a west dip in the Sunday claim to almost vertical dip in Green Mountain and slight east dip in Ontario; and the Sunday vein may either be the same vein as the Hellena vein or a branch of it, temporarily assuming an east dip in Black Cloud and Hellena claims.

The 700-ft. level, Hellena, is the deepest level shown on the Behre section. The total depth of the Hellena Shaft is 766 ft. A drill hole from the shaft sump would be excessively inconvenient and is not recommended. The pump station west of the shaft at the 700-ft. level is 50 feet long and is not shown on the Behre section.

(2) One vertical diamond drill hole from a set-up in the 700-ft. level, Hellena, at a point approximately five hundred (500) feet north of the crosscut from the shaft, is recommended. The 700-ft. level drift has not yet been driven any distance along the fissure vein in either north or south direction from the 700-ft. crosscut shown on the Behre section, and consequently this north drift must be driven before this particular drill hole can be drilled. When this north drift has been driven, it is recommended that a 50 to 100-ft. crosscut be extended due west of the fissure vein drift and the necessary raise cut therein to facilitate handling the drill rods and cores in drilling below to Blue limestone contact. As later shown, only the 500-ft. level may be driven this far north, and if so the diamond drilling may be prosecuted from the 500-ft. level instead of the 700-ft. level, assuming equipment for drilling holes of an additional 200-ft. depth is utilized for the purpose. If this course is adopted, the shaft need be unwatered only to the 500-ft. level in the first instance until the results of the drill holes become available.

(3) It is recommended that the third drill hole, or portion of footage thereof, be held in reserve.

The 500-ft. level, Hellena

This is the longest East-West level shown on the Behre section. The enlarged pump station at 500 is on west side of the shaft but is not indicated on the Behre section. The 500-ft. level west crosscut bypasses the pump station and penetrates the Weston Fault and passes beyond into the Parting quartzite and underside of the Blue limestone stratum west of the Fault, against which it is tilted up in the aforesaid syncline. This 500-ft. level west crosscut should be driven at least 300 feet further west to approach more nearly the contact ore zone in the upper portion of the Blue limestone, which is here dipping down westerly into the syncline above and in advance of this level. The level will thus undercut and gradually approach nearer the massive contact ore measures penetrated from surface by the Golden Rod churn drill hole in 1927, previously referred to. These west contact ore measures may then be developed by raises from the 500-ft. level west crosscut and stoped in due course.

However, it should not be overlooked that the west Blue limestone contact ore, while demonstrated to be massive in deposition, has never been shown so far to be comparable in tenor to the very much higher grade values shipped in a consistent tonnage from the Hellena vertical fissure vein and consequently expected to persist in massive replacements of like tenor in the east Blue limestone along the strike of the Hellena reverse fault fissure vein. But, having the 500-ft.-level unwatered, it is now believed that the west contact may be and should be quickly and conveniently developed concurrent with prosecution of the indicated work in the Hellena fissure vein and in the east contact.

As long as present metal prices prevail, this west contact ore should return a substantial margin of profit; but when prices fall to former levels, this west contact ore may not return a desirable margin and shipment thereof may necessarily have to be discontinued until prices recover.

On the other hand, the east contact and fissure vein ores

of the Hellena, Black Cloud, Continental, and other properties of this group, once opened and kept in due course of development by an experienced and conservative management, should yield a handsome margin of profit throughout periods of low price levels as well. This is why decisive priority is recommended for the eastern part of this development.

Six levels or two levels

An estimate of $48,000 has been made to cover the cost of 2,400 feet of new drift along the Hellena vertical fissure vein for the purpose of opening and mining virgin oreshoots therein. (p.7 of Elder letter, 12 Jan. 1951) It was there suggested that this work might be divided between twelve present breasts in six different levels, both north and south. Reference was thus made to the 100, 200, 300, 400, 500, and 700-ft. levels, north and south along the fissure vein. If prosecuted simultaneously, this would entail twelve (12) distinct machine crews in twelve (12) operating breasts, and require large air compressor capacity even if other work of higher priority were postponed.

It may well be found to be of more practical advantage , in the initial stages, to confine this drift extension work to the north and south breasts of the 300 and 500-ft. levels in the fissure, using only one heavy drifter machine in each of these two levels -- drilling and blasting at north breast on day shift and at south breast on night shift using the same machine, and mucking out on alternate shifts. Greater progress and footage may thus be secured per shift, at less cost and with less interference with other work. Each of these two drifts may thus be extended six hundred (600) feet north and six hundred (600) feet south, in such manner verifying the existence and developing for stoping the oreshoots along twelve hundred (1200) feet of the fissure vein. Of course, this procedure would not open immediately 400 feet of new stoping ground on six different levels; but the more extended development of the fissure on two levels only has its practical aspect under the circumstances, even though greater tonnage may

be available through adopting the six-level twelve-breast program of drift extension in the fissure vein.

The precise program to be followed depends on many interrelated circumstances. It should be emphasized that nothing suggested by the undersigned is intended to dictate to or limit in any way the judgment of the competent technical management which it is assumed the lessee will utilize in carrying on work in these properties.

Yours very truly,

Robert D. Elder

Robert D. Elder

In re: D.M.A. 860
Ibex Extension Property
Lake County Colorado.

MINING LEASE AND OPTION

THIS LEASE AND OPTION entered into as of this 15th day of December, A. D. Nineteen Hundred Fifty (1950), regardless of the actual time of signing and acknowledgment, between MARGARET H. ELDER and ROBERT D. ELDER, lessors and optionors, hereinafter called the lessors, and GREENE CHANDLER FURMAN, hereinafter called the lessee,

W I T N E S S E T H :

That the lessors, in consideration of the royalties and rentals herein reserved and the covenants herein to be performed by the lessee, and of One Dollar ($1.00) paid to the lessors by the lessee, receipt of which is hereby acknowledged, do by these presents lease, demise, and let unto the lessee the following described premises and patented mining claims in the California Mining District, County of Lake, State of Colorado, to-wit:

Amount of Undivided Interest	Name	U.S. Survey Number	Total Acreage
All	Hellena	4033 Am.	9.630
All	Black Cloud	903	10.330
All	Continental	902	9.157
All	Jane Eugene	3371	9.853
All	New Orleans	1448	4.383
All	Bloomington	1596	5.614
All	Bank	4724	6.116
All	Yale	3216	9.779
All	Josie	3605	1.096
All	Almeda	3604	3.346
All	Eagle Ennerdale Hazelholm	4728	6.479
All	Leopard	801	3.290
All	Mary E.	721	10.340
All	Maudy	870	3.760
All	Howard M. Holden	1137	5.600
11/12	Alma Mater	2565	3.500

2/5	Ohio	738	6.665
7/12	Mountain Lion	805	9.680
All	Friday	18023	3.157
All	First National	1934	9.360
All	Little Julia	1811	5.342
3/4	Jim Fisk	1812	4.920
All	Little Anna	4818	3.113
All	Conundrum	3242	3.000
611/900	Mammoth	1127	9.350
All	Slide	2619	8.170
All	C. M. Fraction	11501	2.954
All	Lady Alice	15908	1.164
1/4	Seek-No-Further	1225	9.000
1/16	Kauffman	9415	2.071
1/4	International	3501	5.990
		Total acreage	186.209

being patented lode mining claims together with all improvements thereon;

TO HAVE AND TO HOLD said premises for the term of thirty (30) years from and after January 1, 1951, unless sooner terminated in the manner hereinafter provided, subject to the following terms and conditions, to-wit:

1. Performance of mining work or shifts of mining labor shall not be required of lessee as a condition for holding the mining lease and the option to purchase.

From and after the first day of January, Nineteen Hundred Fifty Two (1952) payment of advance rental in the monthly amount of Five Hundred Dollars ($500.00) shall be paid by lessee to lessors on or before the twentieth day of each calendar month of the lease term as a condition for holding this mining lease and option to [illegible]hase, and lessee covenants and agrees to make each such advance [illegible] promptly at the time stipulated to Robert D. Elder,

Agent, or such other person as may from time to time be designated in writing by such Agent or by lessors, so long as said mining lease and option to purchase shall remain in effect.

2. All such advance rental payments shall be credited upon (or deducted from) the ore royalties earned and paid to lessors by lessee under the lease.

3. Lessee covenants and agrees to pay and shall pay to Robert D. Elder, Agent, or such other person as may from time to time be designated in writing by such Agent or by lessors, all royalties hereinafter set forth computed on the lessors' interest and ownership in the claim from which such ore is shipped, on all ores extracted and sold from any and all of such claims, as follows:

<u>Ore royalties</u>

7.0% of the net returns on ore	to and including a net return of $10 per ton;
9.5% " " " " " "	over $10, to and including a net return of $15 per ton;
12.0% " " " " " "	over $15, to and including a net return of $20 per ton;
17.0% " " " " " "	over $20, to and including a net return of $30 per ton;
22.0% " " " " " "	over $30, to and including a net return of $50 per ton;
27.0% " " " " " "	over $50, to and including a net return of $100 per ton;
32.0% " " " " " "	over a net return of $100 per ton.

Net returns whall be determined by deducting actual competitive transportation costs from net smelter returns on all ore or concentrates sold to a smelter or to a United States Mint. The above royalties shall also be paid on Government premium metal payments so far as may be lawful. If the lessee creates any dumps, the lessee shall determine the weights and values of any ores therein according to the facts and pay royalties thereon if and when marketed during the lessee's tenure.

4. Together with the mining lease, lessee shall have two separate and distinct options to purchase the demised premises, conditioned respectively as follows:

(a) The lessors hereby grant to the lessee the exclusive right and option, at lessee's election, to purchase the above

described property at any time before January 1, Nineteen Hundred Fifty Four (1954) for the sum of Six Hundred Thousand Dollars ($600,000.00), provided the mining lease has remained and is in full force and effect and good standing up to the date last mentioned, it being further agreed that from said sum shall be deducted the amount of all advance rental payments paid by lessee to lessors subsequent to January 1, 1952, and all ore royalties paid by lessee to lessors over and above the amount of such advance rental payments since January 1, 1952.

(b) In default with respect to the aforesaid option payment under (a), the lessors hereby grant to the lessee the exclusive right and option, at lessee's election, to purchase the above described property at any time before January 1, Nineteen Hundred Sixty (1960) for the sum of One Million Six Hundred Thousand Dollars ($1,600,000.00), provided the mining lease has remained and is in full force and effect and good standing up to the date last mentioned, it being further agreed that from said sum shall be deducted the amount of all advance rental payments paid by lessee to lessors subs quent to January 1, 1952, and all ore royalties paid by lessee to lessors over and above the amount of such advance rental payments since January 1, 1952.

In the case of either of the aforesaid options to purchase, the payment of the stipulated amount of purchase price, on or before the respective option date designated, shall be deemed to fulfill the option contract on the part of lessee, shall require the delivery to lessee of mining deeds conveying the lessors' interests in the demised premises, and shall terminate all rights, obligations, and liabilities of the parties under the mining lease. Any such option to purchase shall be exercised by lessee only during continuance in good standing, full force and effect of the mining lease, and not otherwise.

5. All work and operations under the mining lease shall be carried on in a thorough and workmanlike manner, in accordance with

the accepted standards of the industry, and lessee shall at all times keep all drifts, shafts, tunnels and other workings, except stopes where good mining practice makes the filling of such stopes proper, used by the lessee in any part of the demised premises thoroughly drained and clear of loose rock or rubbish, unless prevented by extraordinary casualty. The lessee shall not store waste rock or rubbish in any workings on the demised premises, except stopes where good mining practice makes the filling of such stopes proper, whether such workings are used by the lessee or not.

6. The lessee shall keep serially numbered records of all assays made of samples taken from underground workings, dumps and cores or sludge on the demised premises, and the location from which said samples were taken, so that said location may be accurately ascertained on the maps provided for by this lease, and these assay records shall be kept open and accessible to the lessors and their agents for the purpose of inspection, copying and taking notes at all times during thirty years after the date first above mentioned, whether the mining lease is in force and effect or not.

7. The lessee shall keep all ores broken and mined in the premises hereby leased separate and distinct from all ores by lessee broken or mined in any other property, and shall keep the same under distinctive markings and in separate storage equipment, and shall ship the same in serially numbered lots separate and distinct from all other ores, and the lessee shall notify the lessors or their agents when and where said ore is shipped and said notification shall show the net weight of said shipment, and the location from which said ore was extracted from the demised premises, so that said location may be accurately and readily ascertained on the maps provided for by the lease.

8. Products shall be marketed at the best terms obtainable from any responsible and competent smelter, actually engaged in the business of treating such ores, with due regard to differences in freight rates; that is, the lessors shall be entitled to royalties

hereunder determined on the basis of whichever competitive rate yields the greater net return. All ores shall be and remain the property of the lessors until full settlement has been made for the royalty due therefrom, but said ores may be sold in the name of the lessee, with duplicate settlement sheets furnished to the lessors.

9. The lessee shall make and keep accurate surveyed maps of all mining operations in the demised premises, showing thereon all workings, excavations and the location of all ore bodies which may be discovered, and shall make and keep accurate maps of all diamond drill holes bored on the demised premises, showing thereon the location and angles of all said holes, and the location and dimensions of all formations and ore bodies which may be encountered by drilling operations. All maps provided for by this lease, whether of mining or drilling operations, shall be posted to within three months of any current date, and a blue print of the same showing conditions existing as of the first day of January of each year and beginning with the year 1952, shall be furnished to the lessors on or before the 15th day of February of each year of the life of this lease. Lessors, at their own expense, shall have the right to have copies or blue prints made of any or all maps, sketches, or records utilized by lessee in connection with the operation of the demis d premises, both during and after lessee's tenure under such lease.

10. The lessee shall make and keep systematic records of all the data ascertained from pumping operations in the area in which the demis d premises are located, and such data shall at all times be available to lessors and their agents.

Lessee's maps and records of all mining operations upon the demised property shall be available for lessors' inspection upon request, at any time during and after lessee's tenure under said lease. The lessors and their agents may enter said demised premis s at any and all times for the purpose of inspecting,

surveying, and/or sampling the same, and lessee shall facilitate such work of lessors in every reasonable way; but the lessors shall enter upon said leased premises so as not to hinder unreasonably t the operations of lessee and at lessors' own risk except with respect to culpable negligence on the part of lessee or lessee's employees.

11. Lessee shall pay all general and special property taxes assessed against the demised premises and improvements and machinery thereon during the term of this lease, beginning with the first day of January, Nineteen Hundred Fifty-Two (1952) and including all such taxes due and payable during said year; but the lessors shall be charged with their proportion of production taxes based on the royalties hereinabove reserved.

12. Lessee shall comply with the Workmen's Compensation Laws of Colorado, and with Social Security, Unemployment Insurance, and all other State and Federal laws relating to lessee's operations, and shall save lessors harmless from any claim for damages or liability by reason thereof.

13. Lessee shall keep the demised premises free and clear of labor and material liens and encumbrances, and shall keep posted in a conspicuous place thereon written or printed notices that the premises are leased to and operated by the lessee and that the ownership and interest of lessors shall not be subject to liens by reason of lessee's operations.

14. Lessee shall pay all advance rental payments herein provided for at least monthly, on or before the twentieth day of each calendar month for said current calender month. Lessee shall pay all royalties herein provided for at least monthly, on or before the twentieth of each calendar month for the preceding calendar month. If the lessee shall fail to make any such payment of rental or royalty, or shall fail to perform any other term or condition on lessee's part to be performed, the lessors may give lessee notice in writing specifying such failure, and lessee shall have ten (10) days thereafter within which to make payment, or as to any other

term or condition on lessee's part to be performed, sixty (60) days thereafter within which to remedy such default, and upon failure or refusal by lessee to make such payment or remedy any such default, all lessee's rights hereunder shall terminate at the expiration of the periods named in this paragraph. Waiver of any default shall not constitute a waiver of any subsequent default.

15. Lessee may surrender this lease upon sixty (60) days' prior written notice to lessors, and upon such surrender at the end of such sixty days notice all rights, liabilities and obligations of the parties not already accrued shall terminate.

16. Upon the termination or surrender or forfeiture of this lease, as herein provided, the lessee shall without further notice or demand deliver the demised premises to the lessors in good order and condition, with any and all main and working drifts, shafts, tunnels, and other workings, except stopes where good mining practice makes the filling of such stopes proper, thereon and therein, which the lessee has constructed or used in his own operations, thoroughly drained and clear of loose rock and rubbish and in condition for immediate continued operation.

17. Lessors make no representation or warranty as to the sufficiency or marketability of the title to the properties hereby demised, or to any interest or claim in such consolidated group of mining claims, but lease only such interest as they have therein.

17. Written notice to lessors may be given by registered United States mail sent to Robert D. Elder, 310 West 8th Street, Leadville, Colorado, until changed by notice in writing.

Written notice to lessee may be given by registered United States mail sent to Greene Chandler Furman, Highland Apartments, Connecticut Avenue and California, N. W., Washington, D. C., until changed by notice in writing.

18. The lessee shall not assign this lease in whole or in part without the written consent of lessors first had and obtained.

19. These presents shall inure to the benefit of and be

binding upon the parties hereto, their respective successors, heirs, and assigns.

IN WITNESS WHEREOF the lessors and lessee have executed this instrument as of the day and year first above written.

_____(SEAL)
Margaret H. Elder

_____(SEAL)
Robert D. Elder

Lessors.

_____(SEAL)
Greene Chandler Furman

Lessee.

STATE OF VIRGINIA)
) SS
COUNTY OF ARLINGTON)

The foregoing instrument was acknowledged before me this _____ day of _____ A. D. 1951, by Margaret H. Elder and Robert D. Elder.

Witness my hand and official seal
My commission expires

_____
Notary Public

UNITED STATES OF AMERICA)
) SS
DISTRICT OF COLUMBIA)

The foregoing instrument was acknowledged before me this _____ day of _____ A. D. 1951, by Greene Chandler Furman.

Witness my hand and official seal
My commission expires

_____
Notary Public

* * *EIGHT PAGES ONLY* * *

Blue limestone contact ore horizon in Irene, U. S. Sur. 668. Since the surface collar elevation of this Irene Shaft is 11,625 feet above sea level -- as opposed to 10,980 ft. elev. at the collar of the Hellena Shaft -- the Irene Shaft depth to the Blue lime contact exceeds 2,000 ft. As an operational shaft for production the Irene Shaft is to be equipped with facilities for two 10-ton skips hoisting in balance. The Irene Shaft is 300 ft. north of the north end line of the aforesaid King Solomon #769.

Sublessees of the A. S. & R. Co. since 1945 have been mining and shipping 900 tons per month of crude ore to the A. S. & R. Co. smelter at Leadville, with production now rapidly expanding. This ore is coming from the vertical vein at Sunday, U. S. Sur. No. 1266, through the Garibaldi adit level at an elevation of 11,200 ft. in the area of high relief northwest of the Hellena group. The collar of the Sunday Shaft is at an elevation of 11,925 feet above sea level, but now connected with and drained by the Garibaldi Tunnel. The Sunday claim adjoins two claims owned in part by R. D. Elder, Bald Mountain, U. S. Sur. 722 and Green Mountain, U. S. Sur. 1190, and the Sunday vertical vein has been followed by drift into the Green Mountain claim on its strike, continuing on its strike into Black Cloud #903 and Hellena #4033 Am. of the Ibex Extension group. The strong Hellena vertical vein parallels the course of the Sunday vein to the east.

Mining operations continue at the 108-acre property of the Ibex Mining Co. The five-mile Yak Tunnel, which cuts Ibex No. 4 Shaft 1280 ft. below surface, has been purchased and is being operated by the Resurrection Mining Co., jointly stock-owned by Newmont Mining Corporation (J. P. Morgan) of New York City, the Hecla Mining Co. of Wallace, Idaho, and the United States Smelting, Refining & Mining Co. with headquarters in Salt Lake City and Boston, Mass. The Resurrection Co. milled 155,000 tons of ore in its Yak portal mill in 1950, as compared to 130,000 tons in 194

Yours very truly,

/s/ Robert D. Elder
Robert D. Elder

From
Robert D. Elder
4233 32nd Road South
Arlington 6, Virginia
January 12, 1951

To
Greene Chandler Furman, Esq.
Attorney at Law
Realty Bldg.
1424 K Street, N. W.
Washington, D. C.

Dear Mr. Furman :

In response to your request, the following information amplifies my communication of January 5, 1951, and brings up to date the material supplied by prior engineers' reports.

The market price of lead and zinc is now about five times the price prevailing during former periods of ore production from the Hellena Shaft, all before 1913. Gold is about 75% higher. Silver has almost doubled in price. Labor, timber, equipment, and other costs of mining, on the other hand, have roughly tripled since 1913; and have doubled since 1926, when F. J. McNair made his estimate of $200,000 required to place the Hellena mine on a profitable production basis. The following figures necessarily reflect, to a certain extent, this radical change in conditions.

As of this date, the following designated items of mine and mill machinery, equipment, improvements, and mine development are available at the Hellena, First National, and Fisk-Julia Shafts for the use of lessee in reopening and operating the respective workings as circumstances may require. Unless otherwise stated, all such items are in good and serviceable condition for use over an extended period of time, and their use is restricted by lessor only to work upon some part of these demised premises.

Now installed at First National Shaft	Replacement Value
1-combination enginehouse and blacksmith shop, substantially built in 1937 and in excellent repair at present date	$ 4,200.00
1-560 cu. ft. Ingersoll-Rand two-stage air compressor, purchased new, used less than two years and in excellent condition	4,000.00
1-75 h.p. Westinghouse electric motor for short belt drive of above air compressor; excellent condition	950.00
1-8' by 4' air receiver	90.00
1-I-R- pneumatic steel sharpener with shanker and all fittings; purchased new, used less than 2 years; in excellent condition	1,150.00
1-oil forge for drilling steel; exc. cond.	300.00
1-coal-coke forge for picks, etc.; exc. cond.	25.00

1- 35 h.p. electric mine hoist with motor, controller, and grids; serviceable, but too light for work below 400 ft. At least 100 h.p. and 6600 rope pull (lbs.) would be required for Hellena Shaft.	$ 1,250.00
1- Geared hand winch for lowering 5,400 lb. deep well turbine pump with water column and shafting.	75.00
1- Worthington electric deep well type turbine pump, 12 bowls, with 225 ft. of 6" exterior water column, drive shafting, etc., together with 30 h.p. vertical direct-connected electric motor, starter, etc.; purchased new, used less than 2 yrs.; excellent condition. Capacity, 600 gals. per min. @ 50 ft. head; 300 gals. per min. @ 225 ft. head: "head" here in sense of actual depth in shaft.	4,150.00
1- 450' of electric power transmission line and transformer rack. (3 heavy duty mine transformers of Public Service Co. have been left on this rack.)	860.00
1- Interior type lighting transformer.	120.00
1- Explosives magazine.	270.00
1- Carbide shack near shaft head.	40.00
1- 30 ft. high headframe, 12 " oregon, now in place over shaft.	1,300.00
1- 60 cu.ft. skip pocket, in headframe.	90.00
1- 5' sheave wheel, in place.	250.00
1- 4' sheave wheel, in place.	190.00
1- 500 ft. of 7/8" plowsteel hoisting rope, now on spool of hoist drum.	850.00
1- 20 cu.ft. Vulcan self-drumping steel skip.	470.00
1- 260' of 4" black pipe for compressed air.	480.00
1- 300' of 4" black pipe for ancillary pumping column in shaft.	525.00
1- 20 h.p. I-R Cameron electric centrifugal sinker pu,p with vertical electric motor, splashproof design; purchased new; requires minor repairs.	1,450.00
1- 60-ton capacity coarse ore bin for mill head ore with hopper bottom; takes discharge from either mine cars or motor trucks.	720.00
1- 7' X 2' grizzly screen, 1" mesh, in place ahead of jaw crusher.	60.00
1- 15" X 20" Telsmith-Wheeling high-speed jaw crusher, v-belt drive; purchased new, used less than 2 years; excellent condition.	3.300.00
1- New manganese steel renewable jaw plates (2) for above crusher; never used.	190.00
1- 25 h.p. Westinghouse electric motor with v-belt drive for above crusher; exc. cond. but v-belting has been stolen.	360.00
1- Belt conveyor compartment, 120 ft. long, with complete frame, floor, and manway for all conveyor pulleys, idlers, etc. (N.B. 230 ft. long of 18" extra heavy conveyor belting with drive motor and all pulleys and idlers has been stolen.) Figures here are for compartment only.)	1.350.00
1- Fine ore bin of mill, 16' X 20' , app. 200 ton capacity, flat bottom, heavy timber construction, including two 7' X 16' concrete piers.	3,900.00
1- Plunger feeder; fair condition but motor and v-belt stolen.	40.00
1- 18" belt conveyor feeder to ball mill with 32' of 18" extra heavy conveyor belting. (Drive motor and v-belt have been stolen.)	460.00
1- Ball mill scoop housing and relief discharge platform for Dorr classifier.	530.00

1- Dorr Classifier, 20' X 4' , installed complete with direct connected motor intact; purchased new, used less than two years, excellent condition.	$ 4,300.00
1- 6' X 4' American Ball Mill, with combination scoop-drum feeder, relined just before shutdown; purchased new, used less than two years, excellent condition.	6,400.00
1- 48" X 2' spiral return screen, now on ball mill discharge, complete; purchased new, used less than two years; excellent condition.	420.00
1- 75 h.p. Fairbanks-Morse electric motor with heavy v-belt drive, now in place at ball mill; purchased new, used less than two years; in excellent condition.	1,450.00
1- Deister-Plato concentrating table, purchased new, used less than two years, with 1½ h.p. motor.	800.00
1- Willley conc. table, with 1½ h.p. elec. motor.	700.00
1- 2" Kimball-Krogh Sand Pump with direct-connected 5 h.p. electric motor.	1,060.00
1- 10 cell Climax-Weinig sub-A all-steel flotation machine with five 5 h.p. vertical electric motors with v-belt drive to each two cells, complete with all grids, impellers, valves, launders, etc.; purchased new, used less than two years; exc. condition.	3,900.00
1- 3 cell Climax-Weinig sub-A all-steel cleaner machine, with one 7½ h.p. vertical electric motor with v-belt drive to all three cells, complete with all grids, impellers, valves, launders, etc. purchased new, used less than two years; exc. condition.	1,450.00
1- Pulp weighing scale, portable; pur. new; exc. cond.	40.00
2- 5' X 4' galvanized steel water tanks.	90.00
1- Main mill building proper, including ball mill concrete piers, concrete concentrate bins, extra-heavy concrete floors, piers for flot. machines and concentrating tables; substantial timber construction roofed with heavy gauge corrugated iron, galvanized, and sheathed with heavy gauge painted corrugated iron. (This building was constructed in the fall of 1937 and the above machinery and equipment installed during the winter of 1937-1938.)	26,000.00
1- Tailings launders, 8" X 8" , 4400 ft. in length, with trestles; fair condition.	900.00
1- 2400 linear feet of 2" compressed air pipe (black).	1,200.00
1- 12 tons of 12 lb. mine rail, with splice-bars, bolts, and spikes.	940.00
Total, above improvements, buildings, machinery, and equipment at First National Shaft, Iowa Gulch, 2400 ft. west of Hellena Shaft.	$ 73,125.00

Hellena Shaft

No buildings, machinery, or equipment remain at the Hellena Shaft, except 80' X 28' of cement floor and machinery piers. The Knowles duplex steam pump at the 500-foot level station and the Snow compound steam pump at the 700 ft. level station were blasted and removed by the Golden Rod Co. in 1928 to make room for modern electric pumps. One 125 h.p. Gould electric centrifugal pump was then installed, at the 500 ft. level only; and this pump was removed with all pipe, etc., by the Golden Rod Co. when it shutdown the mine after the Wall Street crash in 1929. Development items are listed as follows:

Development items	Replacement value
Hellena	
1- Mine shaft at Hellena, 766 ft. deep, solidly cribbed throughout to 4' X 8' in the clear, partitioned and equipped with oregon guides for cage or skip in each compartment -- to 700 ft. in south compartment, to 500 ft. in the north. South compartment is still equipped with ladders and landings for air and water pipe and manway; but all pipe and rail were removed from the Hellena workings in 1929, the time of latest shutdown. Water stands at app. 50 ft. below collar. Shaft is in excellent condition for resumption of work and can be used as is, although concreting the collar may be desirable for a long time operation. Replacement value of shaft only at present labor, timber, and other costs.	$ 180,000.00
1- Cross-cuts from Hellena Shaft to vertical fissure vein at 50, 100, 300, 350, 400, 500, and 570 ft. levels, aggregating over 700 linear feet. (The 200-ft. level opens directly into the vertical vein.)	21,000.00
1- Drifts north and south along vertical vein from the above crosscuts at the several levels, app. 250 ft. north and south from crosscut at each level, aggregating app. 3200 linear feet of drift. A few of these drifts were found to be partially obstructed in 1929. No change in the general conditions is to be anticipated at this time.	64,000.00
1- West crosscut at 500 ft. level, driven 900 ft. through west limb of Weston Fault in 1929, reaching under side of the tilted parting quartzite stratum. Bulkheaded on shutdown in 1929, and probably in good condition except immediately at Fault zone, where some retimbering may be necessary.	18,000.00
3- Large shaft and pump stations at 400, 500 and 700 ft. levels.	1,800.00
1- 250 ft. shaft on Black Cloud 1- 200 ft. shaft on Continental 1- Tunnel 400 ft. long on New Orleans 1- Tunnel portal of the 1800-ft. workings of Ontario Tunnel on NW corner of Black Cloud N.B. These and numerous similar openings on other claims of the Group have no practical relation to present or future operations.	00.00
First National	
1- Mine shaft at First National, 245 ft. deep, 2400 ft. west of Hellena Shaft and 40 ft. lower in elevation at collar. R. D. Elder retimbered the collar for 60 ft. down in 1937 and installed oregon guides for skip hoisting from 200 ft. to surface in the east compartment; also installed one 4" compressed air pipe and 4" water pipe for auxiliary sinker pump, together with the Worthington turbine pump above referred to. All this equipment remains in the shaft, which is solidly cribbed throughout and should still be in excellent condition. The stations are negligible, since the shaft only made 40 gals. per min. at 225 ft. Shaft only, at present labor, timber, and other costs.	49,000.00
1- 2,300 linear feet of crosscuts and drifts at 168, 195, and 225 ft. levels of First National Shaft.	46,000.00

1-E+L4/

Fisk-Julia

1- Mine shaft 660 feet deep near SW endlines of Jim Fisk and Little Julia claims, a few feet NE of First National NE corner. This Fisk-Julia Shaft is 4' X 8' in the clear and solidly cribbed throughout and is shown by careful soundings to be open clear to the bottom. Since the water level stands at 105 ft. below the collar, this should preserve the timbering in excellent condition indefinitely. The immediate collar and upper 120 ft. might be retimbered to avoid interruption during an operation of many years' duration. In any event it is regarded as cheaper and better to retimber this upper 120 ft. of the Fisk-Julia Shaft, already 660 ft. deep, than to sink the First National 245-ft. shaft another 100-ft. lift to 440 ft. in order to command the Blue limestone contact ore horizon at a depth corresponding to the existing 486.30 ft. level of the Fisk-Julia Shaft. Collar of the Fisk-Julia Shaft is 55 ft. higher then collar of First National shaft, 300 ft. SW of Fisk-Julia Shaft. The 195 ft. level of First National extends to within 140 ft. of Fisk-Julia Shaft and if driven NE would intersect the latter shaft app. 248 ft. below the collar. A duplicate of the Worthington turbine pump now at the First National could then be lowered with its bowls and suction below the 486 ft. level of the Fisk-Julia Shaft, pumping only to the 195 ft. level from First National, through which the water would pass to be picked up and relayed to surface by the existing turbine pump now installed in First National Shaft. This convenient expedient would elimate any marginal uncertainty inseparable from the use of electric station pumps, and effect substantial savings in cutting extra labor attendance and admit of confining actual pumping to less than 90 minutes per 24 hours in these two shafts. Fiske-Julia Shaft only, at present labor, timber, and other costs of sinking totalling $132,000.00, less present cost of retimbering upper 120 ft. (i. e. $3,500.00) $ 128,500.00

Total of above development items $ 407,000.00

The foregoing figures by no means comprise all the relevant expenditures made by prior operators and by the owner of the ground. Nor do they bear any relation to any receipts or profits from former ore shipments. They comprise only that portion of such former development expenditures which, at the much lower costs then prevailing, contribute in the most significant way toward the objective of present importanct -- which is the early production of lead and zinc for the defense effort. From this substantial beginning of essential development, we pass to an estimate of the additional expenditures required to get these mines into efficient production on the basis of present costs, as nearly as the same may be determined under the circumstances.

COST ESTIMATE OF PRODUCTION OBJECTIVES

Surface construction at existing Hellena Shaft

Headframe, 60-ft. high, with high-level skip pocket for the flat site in Gulch bed.	$ 4,800.00
Engine house and hoist room, with miners' dry room.	4,000.00
Blacksmith shop and store room.	1,200.00
Magazine for explosives.	450.00
Carbide shack.	90.00
Fluming creek for 500 ft. to keep water out of fissure vein and mine workings, cutting past pumping expense.	3,200.00
3- Transformers to 440 and/or 2200 volts.	3,900.00
(N. B. Public Service Co. power line is only 50 ft. from Hellena Shaft collar.)	

Equipment for Hellena Shaft, including installation

2- 6-ft. sheave wheels, mounted.	900.00
1- 125 h.p., 6600-lb. rope pull, single-drum electric mine hoist, complete with motor, controller, grids, etc.	9,700.00
1500 ft. of 1" plowsteel hoisting rope.	1,950.00
Signal gong and wiring.	60.00
1- 20 cu. ft. self-drumping steel skip.	400.00
1- 1100 cu. ft. two-stage air compressor, complete with electric motor, etc., including air receiver and circulating water tanks with small pump.	8,900.00
6- heavy drifting machine drills, complete with water tanks, air and water hoses, columns, cross-bars, etc.	8,600.00
4- heavy jackhammer type machine drills for sinking, complete with fittings.	2,800.00
4- light drifter machine drills, complete with water tanks, air and water hoses, columns, cross-bars, etc.	3,600.00
4- Rotator stoper machine drills for 1" square chucks, complete with water tanks, air and water hoses, etc.	5,400.00
2,400 ft. of 4" black pipe for compressed air line.	3,200.00
3,000 ft. of 2" black pipe for " " " .	1,660.00
Valves and fittings, unions, etc. for 4" and 2" pipe.	140.00
Stocks and dies for pipe.	60.00
1- electric deepwell type turbine pump, complete with direct-connected vertical electric motor, kingsbury bearings, etc., for unwatering shaft from 50 ft. to below 500 ft. level sills.	9,700.00
1- Electric winch for lowering pump column and shafting, complete with special steel cable.	3,600.00
1- Electric centrifugal station pump for 500 ft. level, complete with motor, foundation bolts, suction, etc.	7,800.00
1- Electric centrifugal sinker pump for unwatering between 500 and 700 ft. levels, pumping to 500 ft. level station pump; sinker pump complete with splash-proof motor, standard sinking suction, etc.	1,400.00
1- Electric centrifugal station pump for 700 ft. level, complete with motor, bolts, suction, etc., for pumping direct to surface through 10 inch water column.	8,400.00
730 ft. of 10" flanged steel high-pressure water column.	3,800.00
Flanges, bolts, valves, gaskets, for 10" pipe.	370.00
400 ft. of 4" black pipe for relaying sump water from 1100 ft. to 700 ft. station.	700.00
Supply of 1 1/8" round, 1" square, and 7/8" octagon machine steel.	400.00
1- Pneumatic steel sharpener with shanker and fittings.	1,900.00
1- Oil forge for steel.	300.00
Coal-coke forge for picks, etc.	40.00
Miscellaneous tools and supplies for blacksmith shop.	250.00
Wrenches and miscellaneous tools for mine.	1,200.00

20- 16 cu. ft. mine cars.	$ 3,200.00
10 tons of 12 lb. steel rails with splice bars, bolts, and spikes.	1,300.00
Est. cost of power, labor, etc. involved in unwatering Hellena Shaft to 700 ft. level, using above equipment.	4,500.00
Est. cost of three diamond drill holes averaging 500 ft. deep below 700 ft. level, by contractors.	3,000.00
Est. cost of power, labor, timber, explosives, and sundries in sinking 350 feet below 766 ft.	80,000.00
Est. cost of driving 500 ft. level crosscut another 300 ft. further west, together with necessary raises and stoping facilities for operating for production in the higher west Blue limestone ore horizon.	8,000.00
1- light storage battery locomotive for tramming cars on the extended 500 ft. level west.	3,900.00
Est. cost of cleaning up and preparing the frifts at the several levels along the vertical fissure vein for production of crude lead-gold-silver and zinc ores as well as complex lead-zinc-gold-silver milling ores.	4,000.00
Est. cost of extending the present breasts of six of the existing drifts another 200 ft. north and 200 ft. south along the vertical vein at each level, for the purpose of opening and mining virgin orechutes therein; total, 2,400 linear feet of new drift.	48,000.00
Est. cost of providing intermediate crushing machinery, with thickening and filter equipment for both lead and zinc concentrates, stepping up capacity of First National Mill to 300 tons per day, in readiness for operation on ore from Hellena Shaft, 2400 ft. away. This est. includes cost of replacing stolen or deteriorated equipment, wiring, pipe, etc., at First National Mill and arranging additional space for equipment aforesaid.	26,000.00
Est. marginal fund for initial period of production, inflationary trends in material costs and wages, and for emergencies.	60,000.00
Total costs into production stage:	$ 346,770.00

The most recent operations at Hellena Shaft

O. A. Nichols was the reputable and trusted engineer of the Golden Rod Mining & Smelting Corporation who was sent to Leadville, Colorado, to make a report in 1927 on the Hellena-Ibex Extension consolidation and other mines in Colorado. Golden Rod was throughout the 1920s the second largest producer of zinc in the Tristate field of Oklahoma, Missouri, and Kansas, with operations in all three states. Their success was in no small part due to the skill and experience of Mr. Nichols in many phases of their business. His particular report in 1927 was obviously designed to acquaint the men on this Tristate Board of Directors with the geology and mining conditions at Leadville, Colorado, where they had never before operated.

Some months after presentation and consideration of Mr. Nichols' 1927 report, the Golden Rod Board of Directors authorized

their officers to execute the Ibex Extension lease and Mr. H. H. Wallower, E. M. of Cornell University in 1917, was assigned in charge of the ensuing Golden Rod work upon two separate mining operations at Leadville and one at Red Cliff, Colo.

A complete churn drilling rig and crew was brought to Leadville from Cardin, Oklahoma, in July, 1927, and proceeded to drill at five set-ups between 850 and 1500 feet west of the Hellena Shaft. Churn drills are standard practice in the Tristate Field, but were not found to be very efficient under the very different conditions obtaining in the porphyry-limestone contacts at Leadville. At the Hellena, four of the holes ran into difficulties before reaching the upper west Blue limestone contact. After losing stems, bits, and hundreds of feet of cable, each of these four holes had to be abandoned without demonstrating significant results. One hole succeeded in penetrating the White porphyry to the Blue Limestone from a surface set-up 1200 feet west of the Hellena Shaft and app. 15 feet south of the south endline of the Yale claim, where it encountered the Blue limestone contact 386 ft. from surface. From here the hole penetrated twenty-six feet of heavy lead-zinc-iron mineralization in the top of the Blue limestone and continued to bring up lead-zinc-iron cuttings for an additional forty odd feet before registering unaltered Blue limestone below. The detailed assays of the footage cuttings have not been available to other than the company officials.

Soon thereafter, in 1928, Mr. Wallower proceeded to drain the Hellena Shaft to the 700 ft. level, using an electric deepwell type turbine pump. With the consent of the owner, the steam station pumps in the 500 and 700 ft. stations were blasted and brought to surface in fragments, to make room for efficient modern electric centrifugal station pumps. A single 125 h.p. Goulds electric centrifugal pump was installed in the 500 ft. level station. No pump was ever placed at the 700 ft. level during this operation, and almost entire attention was devoted to work toward the higher west contact. Beyond the removal of the Snow compound

steam station pump from the 700 ft. level station, no further preparation or action was taken toward the sinking of the Hellena Shaft to the east Blue limestone contact before the Wall Street crash of 1929, when the Hellena and other Golden Rod operations in Colorado were shut down.

Before this final shutdown, however, Mr. Wallower was able to drive the 500 ft. level to a point 900 ft. west of the Hellena Shaft, penetrating the west limb of the Weston Fault at about 800 feet west of the shaft and then at 900 ft. encountering thelower part of the uptilted Parting quartzite before discontinuing the work at the mine. This position of the Parting quartzite, which is a uniform twenty-foot stratum underlying the Blue limestone, confirmed the opinion of C. J. Moore, E. M., that the Blue limestone and underlying formations west of the Weston Fault are raised against the Fault to the east, forming a syncline basin with its western edge a short distance beyond the First National shaft, which is itself just 2400 ft. West of the Hellena Shaft. The circumstances in 1929 did not permit further prosecution of drift or raise toward the overlying mineralized mass of the Blue limestone demonstrated by the drill hole above mentioned. The pump was pulled and the work stopped. The headframe and buildings were at once dismantled and salvaged and the Hellena Shaft has never since 1929 been drained to any depth whatever. For the ensuing ten years lead and zinc remained at the cellar point of depression prices. The ephemeral rise of metal prices in 1937 betrayed a number of mine operators into premature expenditures which crippled them for work during the second World War.

In passing, it should be noted that very little was done by Golden Rod in the vertical vein at the Hellena, from which $580,000.00 in past production prior to 1913 had been taken within 250 feet of the shaft. In 1928-29 none of the drifts were ever cleaned out and opened for work at any of the faces, and no new ore was ever broken or mined in any part of the vertical vein. For a short time two miners were employed in doing some retimbering

at a point in the 200 ft. level where the vein had previously been stoped to great width; and in the course of their work about 500 tons of milling grade ore was scooped up, hoisted to surface, and dumped. R. D. Elder milled it in 1938, together with about 4,000 tons of other lead-gold-silver ores which had been cast upon the Hellena dumps over thirty years before, intermingled with waste. This milling was done at the First National mill which was designed and built by said R. D. Elder, the undersigned, in the fall and winter of 1937-1938.

In the spring of 1939 I broke with machine drills 6,000 tons of lead-gold-silver-iron ore in a stope under the flint capping reached from the 195 ft. level of the First National Shaft, where the same orebody continues on dipping below the level along the gentle ENE dip of the Blue limestone contact. Except for a few test crude shipments to smelter, all this 6,000 tons was milled and shipped as concentrates from the First National mill. The following smelter settlement was upon a crude test shipment broken and shipped without sorting, and serves to illustrate the character of the lowgrade masses of ore here opened along the Blue limestone contact.

	Au (oz)	Ag(oz)	Pb%	Cu	%	%	%	%	%
Nov 2, 1938	0.115	7.7	8.55	0.0	SiO_2	Fe	Mn	Zn	S
					16.1	16.4	5.0	10.7	S

(A.V. Plant, Leadville, A. S. & R. Co.)

It is interesting to compare the above smelter settlement with those resulting from a hit-and-run foray by a small wartime leaser in 1917, breaking some of this same ore in the First National by single-jack hand holes in the hard mass of the ore. From June to October, 1917, the old First National Shaft, idle for 30 years back, was unwatered to 225 ft. and briefly operated by O. A. Norstrom as lessee with two men employed below, resulting in the following carload lot smelter settlements and control assays for such First National crude ore, which are on file at the Leadville A. V. smelter of the American Smelting & Refining Co., and original copies of which I have in my own possession.

	Au (oz)	Ag (oz)	Pb%	SiO_2%	Fe & Mn	Zn%	S
June 25, 1917	0.226	14.40	9.10	15.65	19.70	12.70	S
July 30, 1917	0.135	10.45	6.6	14.5	21.5-5.3	9.7	S
Sept. 17, 1917	0.185	10.10	5.35	11.65	23.10-5.80	6.7	S
Sept. 22, 1917	0.11	5.62	3.42	9.8	24.75-6.1	8.2	S
Oct. 31, 1917	0.145	6.95	6.00	10.20	24.2-5.1	11.1	S

(A.V.Plant, American Smelting & Refining Co., Leadville)
(First National Mine, O. A. Norstrom, Lessee, 1917)

Even in 1917 the above material was shipped at a price of 6¢ a pound for Lead, which happens to be the same price paid for Lead in my above machine-broken lot in 1938. And notice the zinc, which is worth money also.

Perhaps to Norstrom as well as myself, it is a matter for some surprise that all of the above control assays now represent a handsome margin of profit at the prevailing prices of 17¢ per pound for Lead and 17½¢ per pound for Zinc -- and for crude ore, not just mill dirt. And its existence as a thick blanket orebody dipping down into the shallow Blue limestone syncline west of the Weston Fault is still more to the point.

Present prices of lead, silver, gold, and also zinc, have created a situation in which the entire mass of the blanket of ore on this shallow western contact should be reopened at slightly more depth and set moving into the world market.

But all this material on the west contact is much lower in grade than the poorest of the ores which have set the tenor in the Hellena -- both for the vertical vein and for the deeper east contact for which it is the recognized source of mineralization.

The conditions east of the Weston Fault and/or at the Hellena Shaft virtually preclude a small or half-hearted operation there, which would in any event be subject to the same overhead as one of large tonnage and expanding margin of profit. The East and West Blue lime contacts, in my judgment, should be developed together in conjunction with work in the Hellena vertical vein, as components of one inter-related production plan, in the interest of securing early and rapidly increasing tonnage of the metals essential for the armed forces.

The 100-ton gravity-flotation mill now at the First National has proven convenient and saving in mill labor. It was substantially constructed upon solid concrete footings and thick cement flooring in 1938 and equipped with new machinery of the latest design throughout. It may be reaily stepped up to 300 tons per diem capacity by simple addition of intermediate crushing equipment and more flotation cells for a selective separation of the lead-gold-silver product from the zinc. The great custom smelter of the American Smelting & Refining Co. 4½ miles from this mill, by a good trucking road of easy gradient, affords a ready market and makes prompt settlement on every lot of crude ore or concentrates shipped to it.

Adjoining operations in 1950 -- 1951

The American Smelting & Refining Co. is itself operating under twenty-year leases a group of claims immediately adjoining the Hellena-Ibex Extension group on the north. It has drilled a series of diamond drill holes showing the average datum level of the Blue limestone contact to be 9,960 feet above sea level in this same Ibex Extension fault block. This places the Blue limestone contact at 1,030 ft. below the collar of the Hellena Shaft. The drill cores from these holes have also proved up heavy deposition of copper as well as lead-zinc-gold-silver in this Blue limestone contact. Walter Winchell dwelt upon this strike in a 1950 radio broadcast, although so far as the undersigned is aware the core assays remain confidential among officials of the A. S. & R. Co. In the King Solomon claim, U. S. Sur. No. 769, owned in part by Elder, the smelting company as lessee reported this mineralization to be twenty feet thick on the Blue limestone contact at said datum level, together with the geological formations traversed by the drill holes therein. This it was required to do under the terms of its lease from the undersigned, but was under no obligation to report the assay values.

Since October, 1950, the A. S. & R. Co. has been engaged in completing a large new three-compartment shaft through this

REPORT OF A. O. NICHOLS, E. M.

IBEX EXTENSION PROPERTY, LEADVILLE, COLORADO

The property under consideration is known as the "Ibex Extension" and consists of a group of contiguous patented mining claims, aggregating 333.6 acres in area, located about three miles in a direct line East-Southeast of the City of Leadville, Colorado.

The proposition to the Golden Rod Mining & Smelting Corporation is to lease this group of properties for a period of twenty years on a sliding royalty basis with no further consideration except reasonable working and development requirements. The royalty varies from 10 per cent on direct shipping ore having a settlement value (that is, assay value less Smelter charges, losses and penalties, and freight to Smelter) of $10.00 per ton and less, to 50% on ore having a settlement value of over $500.00 per ton; and on concentrates, from 5% on concentrates yielding $12.00 per ton at the mine to 20% on concentrates selling for more than $50.00 per ton. Depending on metal prices, the rate of royalty will vary from 15% to 20% on concentrates derived from average grade milling ore and from 25% to 30% on average direct shipping ore. The royalty is equivalent to about one-third of operating profits on average ore before royalty deduction. The ratio of royalty to operating profits per ton on average grade ores is virtually the same as in the Picher, Oklahoma, field with 15% royalty, 7% zinc blende recovery, and $50.00 per ton market. The actual net profit, however, per ton of average mine ore is six to eight times greater in the Leadville District.

The important productive area of the Leadville District extends about four miles east and three miles south from the City of Leadville. Nearly all of the production has come from five or six square miles included within the above roughly rectangular area. Up to January 1, 1926, the value of the metals mined in this area was $547,000,000.00. Certain comparatively small areas have been extraordinarily productive. Less than 100 acres of the Ibex group of claims one mile north and east of the center of the Ibex

Extension properties has yielded more than $110,000,000.00 to date. This must closely approach the world's record in metal mining for values recovered from so small an area.

Some of the claims of the Ibex Extension group lie within a very short distance of this very rich area.

Attention is here directed to the fact that the foregoing values would have been much greater under metallurgical processes developed in very recent years. During all the active period of the Leadville Camp until very recently not only was the large amount of zinc contained in the mixed sulphide ores entirely lost in the smelting process, but its presence imposed a smelter penalty on the value of the recovered metals.

The predominating ore of the Leadville Area is a rather complex mixture of the sulphides of lead, zinc, iron and copper (the latter, as a rule, in unimportant quantities) with which usually are associated from one to two-tenths of an ounce gold and six to ten ounces of silver per mine-run ton. The proportions of the valuable constituents -- lead, zinc, silver, and gold -- vary in different parts of the same orebody, but under practical mining conditions the grade of milling ore approaches a fair degree of uniformity. Milling ore from the Greenback Mine, now in operation may be considered as of average grade for the contact orebodies of the District. The average assay values are: Metallic lead, 8%; Metallic zinc, 12.5%; gold, 0.15 oz. per ton; Silver 8.0 oz. per ton; Total assay value with lead at 8¢ per pound, zinc at 7¢, gold at $19.50 per oz. and Silver at 54¢ per oz. = $37.54. The iron sulphide has no value in itself under present conditions.

Above the natural ground water level the original sulphides have largely been altered to carbonates with which we also find gold and silver values. During the early history of the Leadville Camp, the production was, therefore, largely in the form of carbonates. The oxidized zone in certain areas, particularly the Ibex, contains numerous veins which carry, mainly, gold and silver values. Some of the ore chutes along these veins have proved remarkably rich. Less than 100 tons of ore from a small chute at the Ibex Mine last year yielded $300,000.00 in gold.

The orebodies of the Leadville District are of several types, but in general they may be classed as contact deposits which are the result of replacement of soluble sedimentary rocks by ore bearing solutions; veins, which result from the precipitation of ore within and along fissures and faults; and stockworks, resulting from the partial or complete filling in of numerous comparatively small cavities of brecciated rocks. It follows that the contact, or replacement orebodies, occur almost entirely within the readily soluble massive limestone beds, the veins within all formations traversed by fractures extending to depth, and stockworks, as a rule, within brecciated insoluble quartzites and porphyries. In all instances, fractures extending through the sedimentaries and into the underlying igneous rocks have served as the channels through which ore bearing solutions from great depths have ascended to loci favorable for deposition.

The contact deposits have supplied much the greater part of the ore mined in the Leadville area. These deposits occurred at four horizons wherein igneous intrusions and subsequent fracturing of the formations provided the necessary conditions for the introduction and dispersion of ascending thermal orebearing solutions. The first contact from the surface is that between the blue limestone and the overlying intrusive porphyry, the latter formation serving as a barrier and confining the circulation to the porous and soluble limestone. The second contact from the surface is between intrusive porphyry and the parting quartzite which lies between the blue and white limestone. The third contact is between porphyry and white limestone and the fourth between porphyry and the basal quartzite lying between the white limestone and the granite.

Because of the porous, soluble character of the blue limestone, this horizon presented the most favorable conditions for ore deposition. Next in importance comes the white limestone horizon and then the parting and basal quartzite contacts, the last two horizons, however, though they

have yielded considerable ore in the aggregate, being relatively of minor importance.

Of the two limestone contacts, that of the blue limestone has yielded much the larger and richer deposits. The orebodies at this horizon have proved to be truly massive. Many of them have been entirely stoped out over a width of from 200 to 1,000 feet, a length of one-fourth of a mile to a mile, and to a height of more than 100 feet. Probably more than 80% of the leadville production has come from this horizon. However, the white limestone contact has yielded many large and valuable orebodies.

It seems desirable at this point to examine briefly the sequence of geologic events in the Leadville District, in order that we may clearly recognize the relationship existing between certain structural features and the known orebodies, and by deduction infer the presence or absence of valuable deposits in undeveloped areas. Eminent geologists who have devoted years of study to the district are in accord on all essential facts having a bearing on the genesis of these orebodies.

The Leadville area lies on the western flank of a colossal mountain mass known as the Mosquito Range, several of the peaks of which, grouped within a radius of a few miles, exceed 14,000 feet in height. The Mosquito Range is among the youngest of the great mountain masses of Colorado. The Front Range to the east, of which Pike's Peak and Long's Peak are outstanding members, and the Saguache Range to the west of Leadville, culminating in the great piles of Mount Massive and Mount Elbert, were towering mountain island masses during all the countless ages in which 10,000 to 12,000 feet of sedimentary rocks were being deposited on the bottom of the intervening sea, and which, in a later geologic period (the Cretaceous), were to be raised above the waters, and finally and contemporaneously with the general elevation of the Rocky Mountain region, crumpled in part into mountain ranges of which the Mosquito Range, with its flanking Leadville area, is the

most massive and important.

The stupendous lateral stresses, due primarily to earth shrinkage, which raised these two miles of vertical thickness of sedimentaries above the sea and at the same time elevated the general mass of the Rocky Mountain region, produced, in these more or less local areas of maximum movement within the underlying archean rocks, such intense heat that these rocks were rendered plastic and forced upward through fractures in the sedimentaries -- fractures caused by the same crushing lateral stresses which melted the underlying igneous rocks. Rising through these fractures the plastic material in great quantities was forced by tremendous pressures for long distances along the bedding planes of the lower members of the sedimentary series. These intrusive masses are frequently several hundred feet in thickness and not uncommonly more than a thousand. The sedimentary strata were, of course, separated and the land surface raised approximately the same distance locally, except where this process was modified by the breaking away of masses of the sedimentaries and their incorporation partly or completely within the intrusives. The strains to which the sedimentaries were subjected by these intrusions naturally resulted in the formation of numerous local faults and fractures.

The foregoing attempts to present a consecutive picture in brief of the first intrusive period -- that of the white porphyry, so-called. This blow off of steam, so to speak, temporarily relieved the regional strain and a period of comparative quiescence followed, during which the molten intrusives lost much of their heat and assumed a crystalline structure . There followed at intervals other periods of stress with further fracturing and faulting, not only of the sedimentaries, but also of the earlier intruded porphyries, with inflow at each period of large quantities of molten material. These later intrusions were of gray porphyry.

All of these igneous porphyritic intrusions occurred soon after nine o'clock, in a geological sense, after the emergence of the sedimentary

land mass above the sea and before the surface of the land had reached any considerable elevation. According to Emmons the intrusions may have occurred somewhat before. Irresistible but slowly acting forces, which were long afterwards to reach their culmination in the completion of the Mosquito Range and other mountain masses, held the region in a vise; but the evidence of the momentous alterations which had occurred in the lower members of the sedimentary formations was largely obscured at the surface by the many thousands of feet of overlying strata.

We are now at the beginning of the period of mineralization. Let us clearly visualize the conditions under which these tens of millions of tons of ore were brought into the rocks.

Intense earth stresses have crushed and extensively fractured the massive sedimentary formations. This crushing and fracturing also extends deep into the archaean rocks. Continued pressure and movement melt the igneous rocks and force them upward where they spread out for long distances and in great masses along contact and stratification planes of the lower few hundred feet of the sedimentaries. Then there is temporary relief from strain, with slow cooling of the intrusive masses, to be followed by another period of strain essentially similar in its manifestation to the first. This sequence of geologic phases -- of strain, fracturing, intrusion, quiescence -- occurred several times, until the horizons wherein the ore was soon to be deposited became a massive matrix of intrusives, enclosing the lower distorted and broken sedimentary beds together with their great and small detached fragments.

Following the last intrusive period, a number of the great overthrust faults both within and without this immediate district must have had their beginning, thus bringing relief from stress and heat to the long tortured rocks of the Leadville area.

Now followed the period of ore deposition. A circulatory system was established. Waters from whatever source, which found their way to great

depths, were highly heated and, commingling with included pore waters of the igneous rocks, leached these rocks of their minute, disseminated particles of metallic compounds and rose through numerous fractures into the overlying contorted sedimentary and intrusive porphyry beds where, with some lowering of temperature, they deposited their burdens, usually in the form of the sulphides, either by reaction with the soluble limestones or by the filling of cavities. The intrusive porphyries themselves were also probably the source of some part of the ores.

A close to the period of ore deposition was finally brought about, either by the impoverishment of the sources of the minerals, or by the exhaustion of readily soluble materials along the paths followed by the solutions, or by the complete filling of cavities, or by a lowering of temperature, or by change in scope and character of the circulation, or by one or several of these causes at one time or another.

Now again, after this period of comparative quiet, giant forces renew the process of plateau and mountain building. The entire Rocky Mountain mass moves slowly and irresistibly upward. The sedimentaries and underlying igneous crust are crumpled into massive mountain chains. Mass is thrust above mass along great fault zones. The Mosquito Range towers above the Leadville area many thousands of feet higher than we find it today. Extensive movements have occurred in the rocks of the mineralized section. Many early fractures without displacement, which formerly served merely as channels for orebearing solutions, have been formed into great faults. Pre-mineral normal faults have become reverse faults; reverse faults have become normal. Entirely new fractures and faults have been formed. Many of the orebodies have been sheared and their parts separated -- in some instances by hundreds of feet.

The topography of the land is now extremely bold and rugged. Erosion is rapid, in a geological sense. The materials which are to form the Great Plains are being scoured from the mountains. Grain by grain,

through a long period of geological time, several thousand feet of rocks are removed and carried down the streams. The uppermost of the ore horizons in the Leadville area are beginning to appear in places at the surface. The glacial epochs follow, scoring out amphitheatres and gulches, covering parts of the region deeply under morainal drift and obscuring many of its structural features. The lower sedimentary beds still remaining in one portion or another of the Leadville area are:

Weber grits	940 feet
Weber shales	300 "
Leadville or "blue" limestone	200 "
Parting quartzite	10 — 70 "
White limestone	120 "
Lower quartzite	50 - 180 "

And above and below and within these beds are great masses of intrusive porphyries.

Erosion continues. Possibly the great forces which elevated this region are still at work. If so, the process is so slow that it presents no discernible result within the short period of human observation.

We may now examine the Ibex Extension property. It consists of 46 patented claims aggregating 333 acres and located within the southeastern limits of the proven area. It is said to comprise the largest group of claims ever assembled under one ownership in this district.

The essential facts relating to these lands could hardly be set out more concisely and accurately than has been done by Dr, R. D. George, State Geologist of Colorado, who made an extended examination of them.

Dr. George says: (in his Report of Sept., 1926)

"An examination of the Ibex Extension lands with respect to these conditions will show a remarkable combination of the essentials of ore-making.

(From Report of Dr. R. D. George)

"1. Three-fourths of the land lies in a block bounded by the Weston Fault on the west, the Ball Mountain Fault on the east, the Colorado Prince Fault on the north, and the Iowa Fault on the south. The remaining one-fourth is just outside of the block but borders the faults. That lying outside of the block to the west of the Weston Fault is very attractive.

These unusual conditions are accentuated by the junction of the Union Fault with the Weston Fault within a few yards of the strong Hellena vein, and the junction of the Mosquito Fault with the Ball Mt. Fault a short distance to the southeast.

The junctions and intersections of faults — especially major faults -- afford the most favorable conditions for ore deposition. Affecting this property are the following:

The Junction of the Weston and Iowa Faults.

The Junction of the Ball Mt. and Iowa Faults.

The Junction of the Ball Mt. and Mosquito Faults.

The Junction and probably the Intersection of the Union and Weston Faults. What is called the east branch of the Weston Fault may be a continuation of the Union Fault beyond the Weston.

2. Within the block bounded by the Weston, the Ball.Mt., and the Iowa Faults are all the sedimentary formations with which contact deposits are formed in the Leadville area — namely, the Blue limestone, the Parting quartzite, the White limestone, and the Lower quartzite — and the porphyries to make the contacts.

3. Another feature of importance is the presence of numerous mineralized fissures roughly paralleling the Weston and Ball Mt. Faults.

On many of the claims, both within and outside the fault block, the existence of strong mineralized fissures has been proved, but development was not carried far enough to demonstrate their value.

(From Report of Dr. R. D. George)

The Ibex Mining Co., whose mines adjoin this property on the north and northwest, has opened over 70 veins, a goodly number of which did not reach the surface. Loughlin, who has made a recent study of "Guides to ore in the Leadville District", recommends an exploration of the country south of the Modoc and east of the Garbutt.

This area adjoins the Ibex Extension on the north.

The Sunday and Hellena veins are quite as strong as those of the Ibex. To the immediate east of the Sunday is a large block of Ibex Extension claims. The Hellena belongs to the Ibex Extension and is central to a large area of unexplored Ibex Extension ground right along the Weston and Union Faults. The geological conditions appear much better than in the area recommended by Loughlin and the mineralization is the same. Loughlin's studies covered only a part of the Leadville District and did not reach the Hellena area.

The richest vein workings of the Ibex were found where the veins passed from the siliceous rocks into the limestone. The Hellena workings are approaching this condition.

Within a claim length of the north end of the Ibex Extension acreage is the great Ibex property which has produced over $110,000,000.00 in metals and is still one of the most active groups in the district.

The Sunday lode which produced approximately $1,500,000.00 in metals lies in the angle between the Bald Mountain and the Enterprise claims of the Ibex Extension.

To the southwest are the Long & Derry and other great producers.

The workings and production of the Clear Grit, the Hellena, the Black Cloud, the Ontario, the Green Mountain group and the Sunday, show that there is a wide, strongly fissured zone having a general north-south trend roughly parallel to the northward extension of the Union and Weston Faults and trending across the Bank, Hellena, Black Cloud, Continental, Bloomington, Leopard, Bald Mountain, and other claims of the Ibex Extension.

(From Report of Dr. R. D. George)

South of the Iowa Gulch Fault and between and adjacent to claims of the Ibex Extension are the Ella Beeler, Little Alice, and other fissure workings in the same trend from the Ibex southward along the general line of the Weston and Union Faults.

The many openings of the Ibex Extension and other claims between the Weston-Union and Ball Mt. Faults prove the presence of many mineralized fissures trending in a N-S direction in this great fault block, and make possible the occurrence of stockworks and non-contact blanket deposits.

The Blue limestone and the White porphyry are in contact under all the Ibex Extension claims between the Weston and Ball Mt. Faults north of the Iowa Fault, and under all claims west of the Weston Fault.

This means that contact deposits between the Blue limestone and White porphyry are possible in four-fifths of the Ibex Extension acreage.

There is reason to believe that west of the Weston Fault the Blue limestone is <u>both</u> overlain and underlain by White Porphyry.

Between the Weston and Ball Mt. Faults the White porphyry is in contact with the White limestone and the Parting quartzite throughout the area, and in contact with the Lower quartzite in a large part of the area.

Thus all the various ore-forming contacts known in the Leadville area are possible under the Ibex Extension acreage. Not only were all the rock formations present, but in addition the structural relations were present -- faults, fault junctions, and intersections, and fissures afforded channels for the rise and circulation of the mineralizing solutions during the period of ore-making.

The faults and fissures of the Leadville area are classed as:

1. PREMINERAL, and
2. POST-MINERAL FAULTS.

The Premineral faults and fissures are those which existed before the formation of the ores or minerals, and were the channels through which

the waters carried the ores to the place where they were deposited.

The Post-mineral faults and fissures are those which were formed after the ores were deposited and so played no part in their making.

Of the pre-mineral faults those known as thrust or reverse faults are regarded by some geologists as the most important ore-making channels. Of the reverse faults within the Leadville mining district, the Weston, south of Iowa Gulch, is the greatest. It is also probable that, though only the southern end of the Weston is now a reverse fault, other sections were once reverse. The Weston Fault, both north and south of Iowa Gulch, is in Ibex Extension territory.

The northern boundary of this great fault block is another of the reverse faults of the eastern Leadville area -- the Colorado Prince Fault.

That there were many channels of ore-bearing solutions in this area is abundantly proved by the many mineralized fissures, such as the Hellena, the Ontario, the Sunday, the Little Alice, and many others.

The presence of contact orebodies has not been proved in this area simply because not a single shaft has reached even the first -- uppermost -- contact.

But the ores of the fissures and veins came from depths far greater than the contacts. Is it reasonable to assume that they have not entered and deposited ores along these contacts on their journey toward the surface? It is not.

At the position of the Hellena Shaft, the Blue lime-White porphyry contact (east of the Weston Fault) lies at a depth of about 1,100 feet. The Hellena Shaft -- 766 feet -- in ore all the way and proved by drill another 150 feet, has 335 feet to go to the contact.

West of the Weston Fault this contact lies higher than the bottom of the Hellena Shaft, and can be reached by driving west across the Fault only a few hundred feet. This was never done because it was impossible to

(From Report of Dr. R. D. George)

get control of the ground. But now that Ibex Extension owns the claims across the Fault west of the Hellena Shaft, this would naturally be one of the first pieces of exploration.

The Blue limestone outcrops at an elevation of 11,450 feet at the north end of the fault block, 8,000 feet north of the Hellena Shaft. Assuming a fairly uniform dip of the Blue limestone from that point to the Blue limestone contact at about 1,100 feet below the collar of the Hellena Shaft, the greatest depth to the Blue lime contact between these two points would be about 1,400 feet, near the north end of the Leopard claim. This is still shallow mining.

The White limestone-White porphyry contact in the Hellena Shaft should be reached at 1,450 feet below the collar of the shaft.

The Hellena workings on a vein deposit produced $580,000.00 worth of lead when the lead price averaged less than one-half of the present price and when zinc had no value, but was a detriment.

Changed conditions which greatly improve the outlook for this area are:

Higher prices of lead.

Real values in zinc instead of penalties.

Selective flotation, making possible the production of clean zinc and clean lead concentrates.

Improved metallurgical processes."

Dr. George concludes his report as follows:

"It is shown in this report that the structural and other geological conditions in the Ibex Extension ground are exceptionally favorable so far as mining experience in the Leadville area has proved. Every type of ore deposit found in the District may reasonably be looked for in these claims, and there is no other relatively undeveloped area

(Conclusion of Report of Dr. R. D. George)

of equal promise known to me.

I confidently recommend it."

/end of Dr. George's report/

The principal development on the Ibex Extension property was on the Hellena fissure vein within the Hellena claim, although the vein extends through several claims. Mr. Fred J. McNair, a mining engineer of long experience in the Leadville District had charge of operations at the Hellena Shaft while much of the last work was being done, including the sinking of the Hellena Shaft to the 766 ft. level. Mr. McNair recently made a report on the property from which I quote, as follows:

EQUIPMENT

"The Hellena Shaft is furnished with a direct line of the Colorado Power Co., which supplies electric power for hoisting and for the operation of air compressors and electric pumps.

The Shaft is fitted with guides for cage or skip to the 700 ft. level. It contains an 8 inch water column to the 700 ft. level pump station, a 5 inch water column to the 500 ft. level, a 4 inch steam line to the 700 ft. level pump station, a 3 inch compressed air line to the 700 ft. level, and two steam and water lines, two inch and four inch respectively, from the 500 ft. level to the bottom of the shaft at 766 feet.

Installed in the shaft station at the 700 ft. level is a Snow Compound station pump (steam) of 600 gals. capacity. At the 500 ft. shaft station is a Knowles Duplex station pump (steam) of 500 gals. capacity. Heavy grease has been left as a protection to the metal, and these pumps should still be capable of extended service. At the present cost of coal, however, electric turbine or centrifugal pumps are recommended as more efficient and economical.

At no time in its history was there an inflow of more than 350 gals. to be handled in the Hellena Shaft. The average, from the 700 ft. level

was about 300 gals per minute.

In the boiler house are four tubular boilers, two 80 horse power high pressure and two 60 h.p. No other machinery remains at the Hellena. /These and buildings are now of little value. N./

DEVELOPMENT

The initial operating shaft of the consolidation, above referred to, is on the Hellena Lode Claim, 100 feet south of the northeast side-line of the claim, 230 feet from the southeast end line, and 1270 feet from the northwest end line. Said Hellena Shaft is now 766 feet in depth, double compartment and cribbed throughout. It is located in the bed of Iowa Gulch, upon the lowest surface point of the Weston Fault fissure.

In and along the fault fissure is a strong vertical fissure vein carrying lenses, chambers, and chutes of galena, zinc blende, and pyrite, with substantial silver and gold values. This vein averages over 19 feet in width with an average easterly dip of 75 degrees. The Hellena Shaft starts in the outcrop and coincides vertically with the vein to a depth of about 200 feet, from which point the vein bears off at a more pronounced dip to the east. The shaft is vertical throughout. Levels were driven from the shaft at depths of 40,100, 200, 300, 350, 400, 500, and 570 feet below the collar.

At each level the vertical fissure vein was cut and large quantities of lead-gold-silver ore shipped therefrom.

In addition to the 766 feet in depth attained by the Hellena Shaft, there are many linear feet of cross-cuts, drifts, and raises at different levels from this shaft, although none of this lateral development extends more than 250 feet from the shaft, and most of it is along the vertical vein up to a distance of less than 130 feet from the shaft. The Blue lime contacts were never opened from this shaft for two reasons:

1. The operator sinking the shaft to 766 feet was entirely unable to purchase or secure leases on the ground covering the upper contact to the west and above the 700 ft. level of the Hellena Shaft, and,

2. The financial deficiencies of said operator, hereinafter described, effectually prevented it from sinking the shaft the requisite distance to open the lower of "Ibex" contact just below.

There are numbers of other development openings on the consolidation, such as the Black Cloud Shaft, 210 feet deep, two shafts on the Continental claim over 100 feet each, with numerous tunnels and adit openings in the area of high relief, such as the New Orleans Tunnel, 350 feet long, and many openings on the Emma, Leopard, Alleghany No. 2, and other claims. In view of the great depth, comparatively speaking, of the regular Blue lime contact ore measures in this section of Leadville, all such openings, with the exception of the Hellena Shaft, are properly to be regarded as superficial. Although interesting as demonstrating the presence of values in fissures in the porphyry far above the Blue lime horizon, they are not commercial developments at such elevation above the lime contact, and will not be noticed further herein.

In other words, the horizontal contact between the Blue limestone and porphyry is by far the major source of the $500,000,000.00 odd production of Leadville to date, and work done in vertical fissure vein deposits above the lime-porphyry contact represents only an insignificant fraction of the values present on the Blue lime and quartzite horizons, particularly where the lime strata have been penetrated from below by productive vertical fissures extending upward to the surface, with major fault junctions and intrusions of porphyry dikes, as at the Hellena.

SMELTING GRADE OREBODIES IN VERTICAL FISSURE

Metal values of approximately $580,000.00 have been shipped from the Hellena Shaft. This was practically all crude ore, bought direct by

the Leadville smelter without concentration, as well as by the Ohio & Colorado S. & R. Co. at Salida, Colo. The following assays are smelter controls on carload lots of crude ore given effect in smelter settlement sheets of the Hellena Mine, and are on file at the office of the American Smelting & Refining Co. at Leadville, Colo., and the O. & C. office at Salida. These control assays accurately represent the average run of lot shipments of crude ore from the vertical fissure after 1906, the low grade shipments being included with those of higher grade:

ORE SETTLEMENTS O. & C. S. & R. CO.

	GOLD (oz.)	SILVER (oz.)	LEAD %	ZINC %
Aug. 28, 1906	.17	9.3	29.1	5.3
Aug. 14, 1906	.265	6.8	16.3	11.6
Sep. 6, 1906	.145	9.9	30.3	8.5
Sep. 18, 1906	.23	9.5	27.8	9.9
Oct. 24, 1906	.215	7.7	20.5	10.0
Dec. 17, 1906	.15	6.7	18.9	9.1
Jan. 1, 1907	.105	9.06	30.5	7.1
Nov. 1, 1911	.135	12.0	39.07	6.2
Nov. 10, 1911	.075	12.7	44.5	5.2
Dec. 15, 1911	.115	10.9	34.85	5.0
Apr. 25, 1912	.085	10.95	33.35	8.6
Apr. 25, 1912	,092	14.0	53.2	4.0
Jun. 12, 1912	.155	10.3	34.15	9.5
Jun. 19, 1912	.185	7.65	22.8	10.1
Jun. 19, 1912	.11	8.6	28.4	10.2
AVERAGE	.148	9.73	30.91	7.96

/Carload lot shipments to Arkansas Valley Plant of A. S. & R. Co. are placed together on next sheet for convenient comparison/

(Report of F. J. McNair, E. M.)

ORE SETTLEMENTS American Smelting & Refining Co.

	GOLD (oz.)	SILVER (oz.)	LEAD %	ZINC %
Aug. 10, 1906	.315	6.65	17.0	11.4
Aug. 24, 1906	.06	10.6	29.8	
Jan. 31, 1907	.07	15.4	47.25	
Mar. 5, 1907	.13	10.05	31.3	9.0
Mar. 9, 1907	.13	11.65	30.2	12.0
May 3, 1907	.175	9.7	21.65	12.4
May 8 , 1907	.165	10.12	20.65	15.2
May 20, 1907	.195	9.05	18.75	15.7
July 30, 1907	.175	9.15	30.65	10.35
Aug. 12, 1907	.19	8.55	22.75	11.0
Sep. 4, 1907	.19	8.05	25.1	9.7
Oct. 14, 1907	.40	7.8	23.35	9.6
Dec. 3, 1907	.25	9.0	27.25	9.5
Aug. 12, 1908	.105	7.85	22.75	6.2
AVERAGE	.182	9.54	26.31	11.0

The undersigned is reliably informed that the earlier operators at the Hellena took out a considerable tonnage running between 50 and 70% Pb. The foregoing list of assays, however, represents figures of which I have absolute personal knowledge and can certify as correct.

This was a lead, silver, and gold product. It was extracted entirely from the vertical fissure vein lying along the porphyry dike which traverses the Weston Fault fissure, and from within 150 feet of the crosscuts from the shaft. Beyond this point the vein is wholly undepleted.

In addition to the lead-silver-gold orebodies in the Hellena, there are a like series of large lenticular bodies of zinc blende ore,

assaying from 12 to 32 per cent Zn, opened by the present workings along the vertical fissure vein from the Hellena Shaft, now commercially valuable. Only one small trial lot was ever shipped from any of these zinc bodies for the reason, no longer existing today, that such zinc ores (sulphide) were unmarketable at that time.

Throughout the entire linear development of the vertical fissure at the Hellena, streaks of galena from several inches to over a foot in thickness are standing exposed in the breasts of the drifts and raises, in the zones on each side of larger chutes and bodies. Toward the close of the last operation of the Hellena Shaft, I am reliably informed, a gold quartz vein four inches and more thick was struck in the 570 ft. level along the footwall of the galena zone, apparently emerging from below at this point, and assaying 3 oz., 7 oz., 28 oz., and 33 oz. in gold. These high grade gold values so far up in the porphyry, and the strong showing of lead-silver-gold-copper values, increasing with depth in the lower workings and the bottom of the Hellena Shaft, and which have come under my own personal observation, forcibly indicate the enrichment of the contact ore horizon just below the shaft, in the manner of the Little Jonny Mine of the Ibex Mining Co.

CONCENTRATING ORES OPENED

The present extent of development of the Hellena vertical fissure throughout the eight levels from which ore was shipped, disclosed and partially blocks out considerable bodies of lead-zinc and iron ores carrying gold and silver, too low grade to be shipped to the smelter at then existing prices. These masses of low grade ores would furnish a profitable product through the utilization of a standard mill concentration process at the mine.

(Report of F. J. McNair, E. M.)

THE MAJOR FAULT JUNCTION AT THE HELLENA

The Hellena Shaft is about two hundred feet north of the junction point of the Weston and Union Fault fissures, two of the seven major fault fissures of the Leadville District. At the point where this Weston-Union Fault juncture meets the Blue lime contact at depth, about 300 feet below the present bottom of the Hellena Shaft, one of the greatest enriched ore deposits of the Leadville District awaits extraction. This is my mature conclusion, and that of other mining engineers and mine managers of outstanding experience at Leadville.

During twenty-five years it has been my privilege to examine nearly all of the productive mines of the Leadville District. The heavy showing of lead, silver, and other values which I have seen thickly disseminated in the porphyry at the bottom of the Hellena Shaft, over two hundred and fifty feet from and entirely independent of the vertical fissure, is prima facie proof of the intensified conditions of ore deposition on the Blue lime, a few hundred feet below that point, and in the porphyry adjacent to the Blue lime. The further intensification of this condition, disclosed by a diamond drill hole put down 150 feet below the bottom of the Hellena Shaft from a set-up in the sump, is still more to the point.

The larger and richer ore deposits of the Leadville District have almost invariably been opened in the underlying Blue lime contact horizon under just such coincident conditions: tremendous vulcanism from great depths, fracturing and penetrating the Blue lime ore measures and bursting through fissures toward the surface, as at the Hellena.

It should be noted here that less than mile and a half northward from the Hellena Shaft, and along the same Weston Fault fissure, covers the noted ore deposits of the Little Jonny, Golden Eagle, Sunday, Fanny Rawlings, St. Louis, Comstock, Robert Burns, Highland Chief, Nonie, Garbutt, and Ballard mines, totalling a production of over $180,000,000.00. Along

the faulted area adjacent to the Ball Mountain Fault, a parallel fault about 2,000 feet eastward from the Weston Fault, are found the rich orebodies of the New Monarch, Silent Friend, Little Ella, Fortune, Valley and Forest Rose, Sedalia, Dolly B., Diamond, and Resurrection properties, totalling in their production to date over $40,000,000.00.

CONCLUSIONS

THE VERTICAL VEIN

The vertical vein at the Hellena, without reference to blanket deposits on the Blue lime contact horizon along its strike, will produce large quantities of milling grade ores, with the addition of smelting grade orebodies as the fissure is further developed. A concentration mill for these bodies of lower grade ore, installed near the collar of the Hellena Shaft, would aid materially in placing the mine on a paying basis.

THE UPPER (OR WEST) CONTACT

None of the levels and drifts from the Hellena Shaft have ever been extended beyond a point 250 feet from the shaft, and most of them are along the fissure within a radius of half this distance. The extraction of ores was confined exclusively to the vertical vein, with no opportunity to explore the contacts, owing to inability to secure the ground covering same to the west during the former operations at the Hellena. These properties are now held under the Hellena-Ibex Extension consolidation.

The Hellena Shaft now commands at an above its 700 ft. level the ore bearing Blue lime contact on the west side of the Weston Fault fissure. This Blue lime contact rises gradually to the west to its surface exposure at the First National Mine and the Long & Derry Mine, the latter

celebrated as an early day producer from this Blue lime contact of a heavy tonnage of some of the finest silver-lead ores ever mined in the Leadville District. In the bed of Iowa Gulch at the First National Mine, a shallow shaft produced several hundred thousand dollars from minor vertical crevices, in the nature of gash veins, in the remaining scored-off thickness of Blue lime. The White porphyry overlies the Blue lime stratum on its downward dip between the First National and the Hellena, and the orebodies thereon are unimparired by erosion. No shaft has ever been sunk deep enough in the intervening area to reach the orebodies on this contact.

A few hundred feet of lateral drifting from the Hellena Shaft will open for extraction the orebodies of this upper or western Blue lime contact for thousands of feet west.

Two independent surveys made by myself to determine the depth of the Blue lime contact west of the western branch of the Weston Fault at the Hellena gave results agreeing within a few feet and showed the contact to be at a maximum depth of about 425 feet from the surface at this point.

THE LOWER (OR EAST) CONTACT

Experience of Ibex operators has demonstrated that the Blue lime ore horizon on the lower throw east of the Weston Fault, and the porphyry immediately above it, constitute one of the richest gold bearing zones in American mining history.

The great depth (comparatively speaking from the Leadville contact viewpoint) of this east formation caused miners to turn aside from what is now known as the Leadville Gold Belt to shallower contacts. For nearly twenty years after the entire area was covered with patented claims, nothing was done in this sector but superficial surface prospecting in the porphyry, from 800 to 2100 feet above the Blue lime ore

horizon, by individuals whose limited capital did not permit the sinking necessary to reach the ore deposits at depth. Then John F. Campion organized the Ibex Mining Co., a close corporation composed of Denver bankers and engineers, and sunk a shaft at the Little Jonny, demonstrating the lime-porphyry ore horizon of this sector of Leadville to be the richest of all. It was here that Campion opened up the ensuing production of $110,000,000.00 for the Ibex Mining Co., which controls less than 108 acres, only partially developed and still shipping steadily at the present day.

The Hellena Shaft commands a lower and more practicable access to the orebodies at the lime-porphyry contacts along the Weston Fault fissure than any other point in the District, from its strategic position in the bed of Iowa Gulch. In the area of high relief immediately between the Ibex Mining Co. ground and the Hellena Shaft, the Blue lime contact is at a depth approaching 2,000 feet below the surface, owing to the intervening precipitous elevation of Breece Hill and Ball Mountain.

The Hellena Shaft will command the entire "Ibex" Blue lime contact on its gradual upward trend to the Little Jonny to the north, just as it does the upward trend of the Long & Derry contact to the West. It is the most practical base of operations for the progressive development and extraction of the orebodies of these contacts.

FORMER OPERATION OF THE HELLENA

For the reason that the ore of the Hellena vertical fissure outcropped at the surface in Iowa Gulch, the property early became the scene of profitable exploitation by a series of small leasing concerns, mining superficially above the 300 ft. level. The bulk of the production to date was taken out prior to 1900 and from above this level. The proceeds were successively dissipated among the different lessees

the management and complete the sinking of the shaft to the Blue lime. Under my supervision the Hellena Shaft was sunk to its present depth, 766 feet. Unfortunately, however, the company continued with this work with an available fund in bank of only a few thousand dollars at a time, without accumulating the capital reported by me and known to be necessary to attain the objective. From the very first the funds were obtained piecemeal, month by month, and were never even adequate to meet the current monthly expense. The monthly labor payrolls were continually in arrears for as long as three months after pay day. There was never sufficient cash or credit available to secure proper pumping equipment, and thousands of dollars were wasted in electric power bills as a result of the makeshift of pumping with compressed air, using steam pumps wholly unfitted for this practice, unjustifiable at the best. The company had no credit to buy coal.

After repeated failures on the part of the Midland Mining Co. to meet their payrolls when due and pay their bills for mining supplies, I resigned as manager in October, 1909. The company struggled along in the same fashion for a time under managers sent out from the East; but the continuous financial difficulties of the company soon resulted in its entire collapse, without sinking the shaft a single foot below 766 feet. The water thereupon was permitted to rise again in the Hellena Shaft.

Sinking conditions in this shaft are not unusual or difficult. The inflow of water is not large and can be handled with ease by small modern electric pumps. The shaft is in favorable material for continued sinking; there is no bad ground around it. But nothing which in the slightest degree resembles common sense business policy has ever characterized the operation of the property from the beginning of the early day gophering in the galena fissure by small local "tributers" or "leasors". No effort was ever made systematically to block out the orebodies in the vertical fissure. These were hastily gophered of their highest

grade portions as reached. The Hellena has, in fact, been the most execrably mismanaged mine that has come under my observation in the Leadville District, or elsewhere, during over twenty-five years of active service as a mining engineer and United States Mineral Surveyor. No adequate report on the basis of "Tonnage blocked out" can do justice to the Hellena and adjacent properties, handled as they have been.

This ground is of great value and of enormous potential value, in the category of the greatest Leadville producers.

COST ESTIMATE

A Fund of $200,000. is required for equipment of the Hellena Shaft with an efficient modern plant of mine and mill machinery, for the sinking of the shaft to a depth of 1200 feet (from 766) to command the Blue lime contacts on each side of the Weston Fault, and for the proper and systematic development and blocking out of the ore reserves in the vertical fissure and in the horizontal contacts on each side of the fissure. A considerable tonnage of lead and zinc ore could be produced within the first few months after unwatering the Hellena Shaft, which would consume only a few weeks with proper pumping facilities. But the same overhead expense would exist concurrent with minor or partial operation as with major and extended operation from the shaft. The former is manifestly false business policy. It is recommended, therefore, that the operator proceed to secure the requisite fund above specified, to insure the conduct of operations at a capacity of maximum efficiency and highest percentage of profit on the ore product shipped.

This is one of the largest consolidations of mining ground in the history of the Leadville District. All of it is over the Blue lime contact horizons in the most favorable geological position to be conceived of in our experience. Correspondingly large returns therefrom are, in my mature opinion, inevitable under proper management and financial arrangements; for every condition points irresistibly to many years of production on a scale only limited

(Conclusion of Report of F. J. McNair, E. M.)

to the shaft capacity developed. "

(Signed, Fred J. McNair, Mining Engineer)

(Report of A. O. Nichols, E. M., continues)

The Leadville camp is taking on new life due to the fact that zinc in the ores now means added profits instead of stifling penalties. Mr. Herbert H. Wallower and the writer recently inspected some of the operating mines at Leadville. By data kindly furnished by the Greenback and Colorado Iron & Lead Company managements, Mr. Wallower has made the following calculations. These figures are interesting and important because they represent not theoretical probability but actual accomplishment, and this under more unfavorable conditions, particularly as to the volume of water handled, than usually obtains in the Leadville mines.

CALCULATIONS

Case 1.

Milling ore Example taken from average of milling ore from Greenback Shaft, Deep Mines Co., milled by Colorado Iron and Lead Company plant at Leadville, Colo.

Assay milling ore. Pb 8% Zn 12.5% Ag 8 oz. Au .15 oz.

Mill concentrates 40% Pb (Containing Ag Au 8% Zn

50% Zn

(a) One ton ore contains 20% of 40% lead concentrate less mill loss (80%) or 20% of 50%. It requires 6.25 tons ore for one ton lead concentrates.

(b) One ton ore contains 25% of 50% Zn concentrate less mill loss (80%0 or 20% pf 50%. It requires 5.0 tons ore for one ton Zn concentrate.

100 tons rock produce	16 tons 40% Pb Conc.
	20 tons 50% Zn "
	800 oz. Silver.
	15 oz. Gold.

Lead --	16 tons 40% Conc.	6.4 tons Pb Metallic.	
	Less smelting loss 10%	.64	
	Smelter Recovery	5.76 tons Pb Metallic.	
	5.76 tons metal @ $160.00		$ 921.60
	Less cost smelting	$8.00 per ton	
	Transportation	1.00 " "	
	16 tons @	$9.00 " "	144.00
Net Lead value per 100 tons rock			$ 777.60

Zinc -- 20 tons 50% conc.

Zinc --	20 tons 50% conc.	10 tons metallic Zn.	
	Smelting loss 15%	1.5 " " "	
	Smelter recovery	8.5 " " "	
	8.4 tons metal @ .07 per lb.		$ 1,190.00
	Less smelting cost	$22.50 per ton.	
	Freight	5.00 " "	
	Flotation & Grade penalty.	10.00 " "	
	20 tons @	$37.50	750.00
Net Zinc value per 100 tons rock			$ 440.00
Total values:			
	Silver	800 oz. @ .45 per oz.	$ 360.00
	Gold	15 oz. @ 12.00	160.00
	Lead		777.60
	Zinc		440.00
			$ 1,757.40
Less 20% Royalty			351.52
Total value per 100 tons rock			$ 1,406.08

COST:

Milling cost	100 tons @ $2.50	$ 250.00
Mining cost	100 tons @ $5.00	500.00
	Total cost	$ 750.00
Total value		$ 1,406.08
Less costs		750.00
Net profit per 100 tons rock		$ 656.08
Profit per ton		$ 6.56

Case 2:

Direct smelting ore. Example take from average of ore shipments from Hellena Shaft.

Assay 30% Pb 8% Zn 9.5 oz. Ag 0.16 oz. Au		
One ton rock produces 600 lbs. Pb @ .08	$48.00	
Less smelting loss	4.80	
	$43.20	
		$ 43.20
9.5 oz. Ag @ .54		5.13
.16 oz. Au @ 19.50		3.12
Total values		$ 51.45
Less smelting cost	$5.00 per ton	
Freight	1.00	
	$6.00 " "	
		6.00
Net values		$ 45.45
Less 25% Royalty		11.25
		$ 34.20
Less mining cost per ton		6.00
Net profit		$ 28.20

For each 100 tons milling ore there will be produced
10 tons shipping ore.

100 tons milling ore		$ 656.00
10 tons shipping ore		$ 282.00
Total		$ 938.00
Daily production 300 tons milling ore	$1,968.00	
30 tons shipping ore	846.00	
Daily profit	$2,814.00 "	

(A. O. N ichols resumes:)

The men from whose reports I have quoted are qualified to speak from long experience in the Leadville District. It will be seen that they are in agreement on all essential facts. During my recent examination of the Leadville area and the Ibex Extension property, I found no available fact at variance with the premises set out or the deductions drawn therefrom as disclosed by these reports. I am in complete accord with the essential conclusions which these engineers have reached respecting the Ibex Extension property.

I believe that the reader who has closely followed these pages to this point, with the aid of the accompanying maps, will have reached one conclusion, viz.: that the contact zones of the Ibex Extension lands possess enormous potentialities. In my own case, I find myself much inclined to discard the mantle of doubt which should properly clothe the mental processes of the Engineer, and to consider these great contact orebodies as existing in their normal positions beyond any question. Indeed I do not know even a remote reason why this should not certainly be the case.

My conclusions follow easily. The considerable quantities of milling and shipping ore which still remain in the Hellena workings and undeveloped portions of the vertical vein should not, because of their ready availability, control the scope of development plans, but should be considered as reserves which will enable a flotation plant to get into earlier capacity operation after the contact orebodies are reached.

I recommend that an appropriation of $5,000.00 per month for the first year be set aside for the definite purpose of completing the Hellena Shaft to the Blue lime contact, driving a drift therefrom to the Blue lime contact west of the Weston Fault, and for initial work on an additional shaft after the contact orebodies are penetrated. This amount of money would provide necessary equipment and housing and leave a margin for some work in the Hellena vein itself.

It is estimated that $250,000.00 distributed over about two and one-half years will be required to properly develop and equip the mine, construct a first unit of the milling and flotation plant and bring it to capacity production of 300 tons per day.

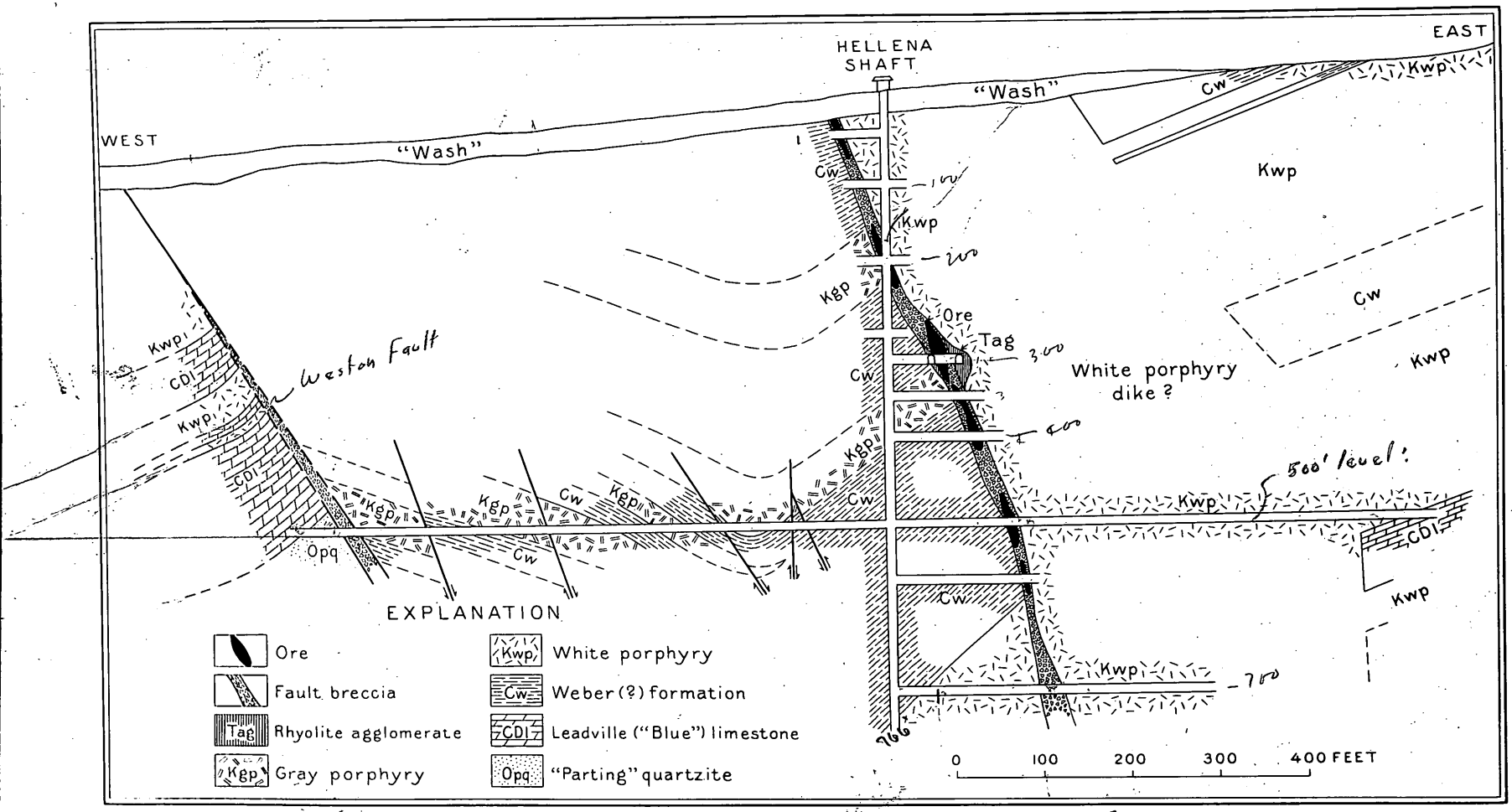
It does not seem necessary for me to go into detail as to development and construction plans. It is sufficient to say that no unusual problems present themselves. Mining methods have long been so, and milling practices as applied to complex sulphide ores in recent years largely have become stablized along definite lines.

The amount of money required to prove the value of the Ibex Extension property isa pittance compared to probable returns. Whatever doubt exists will be removed by the first year's outlay. Mining opportunities of such abundant promise rarely present themselves.

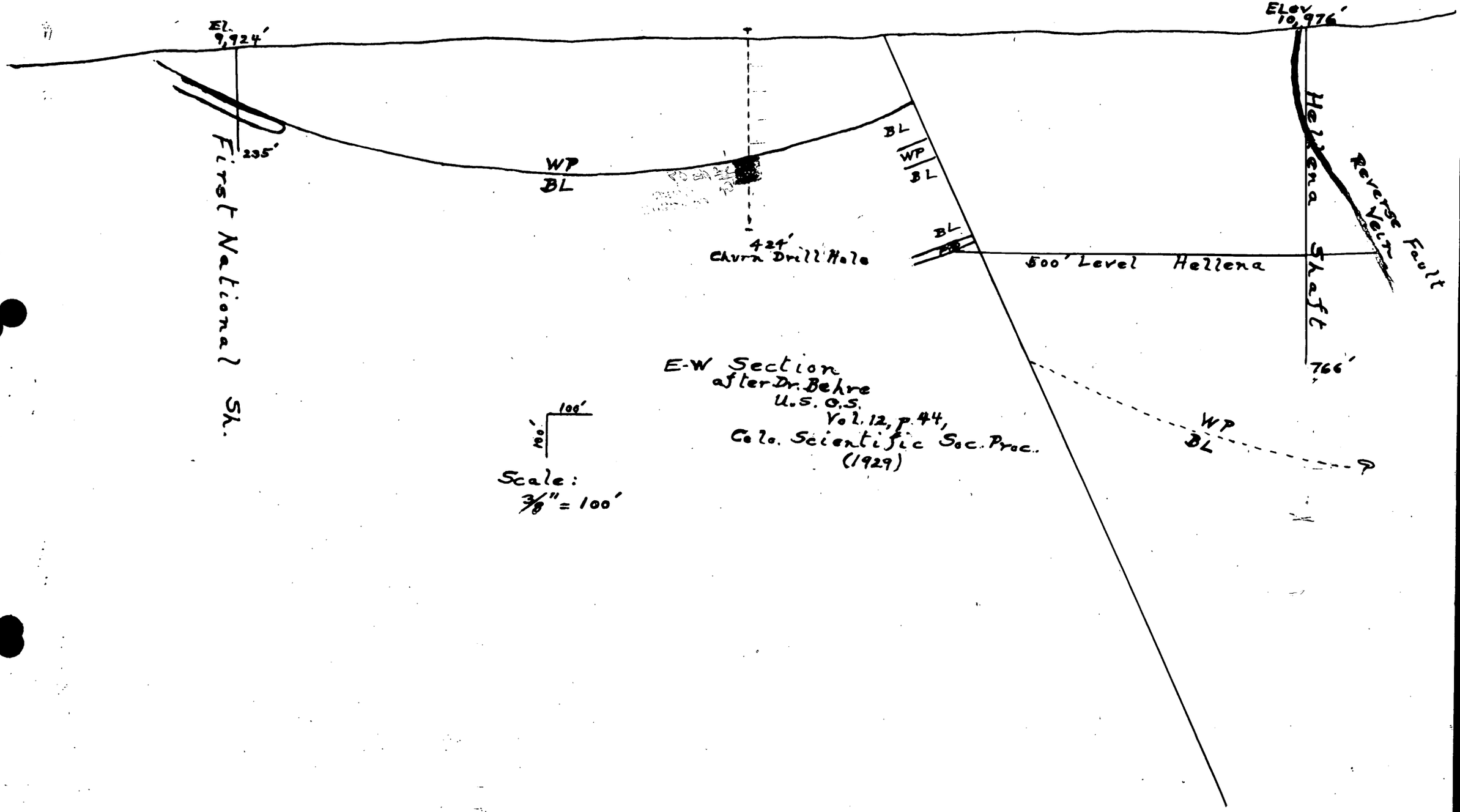
Respectfully,

A. O. Nichols

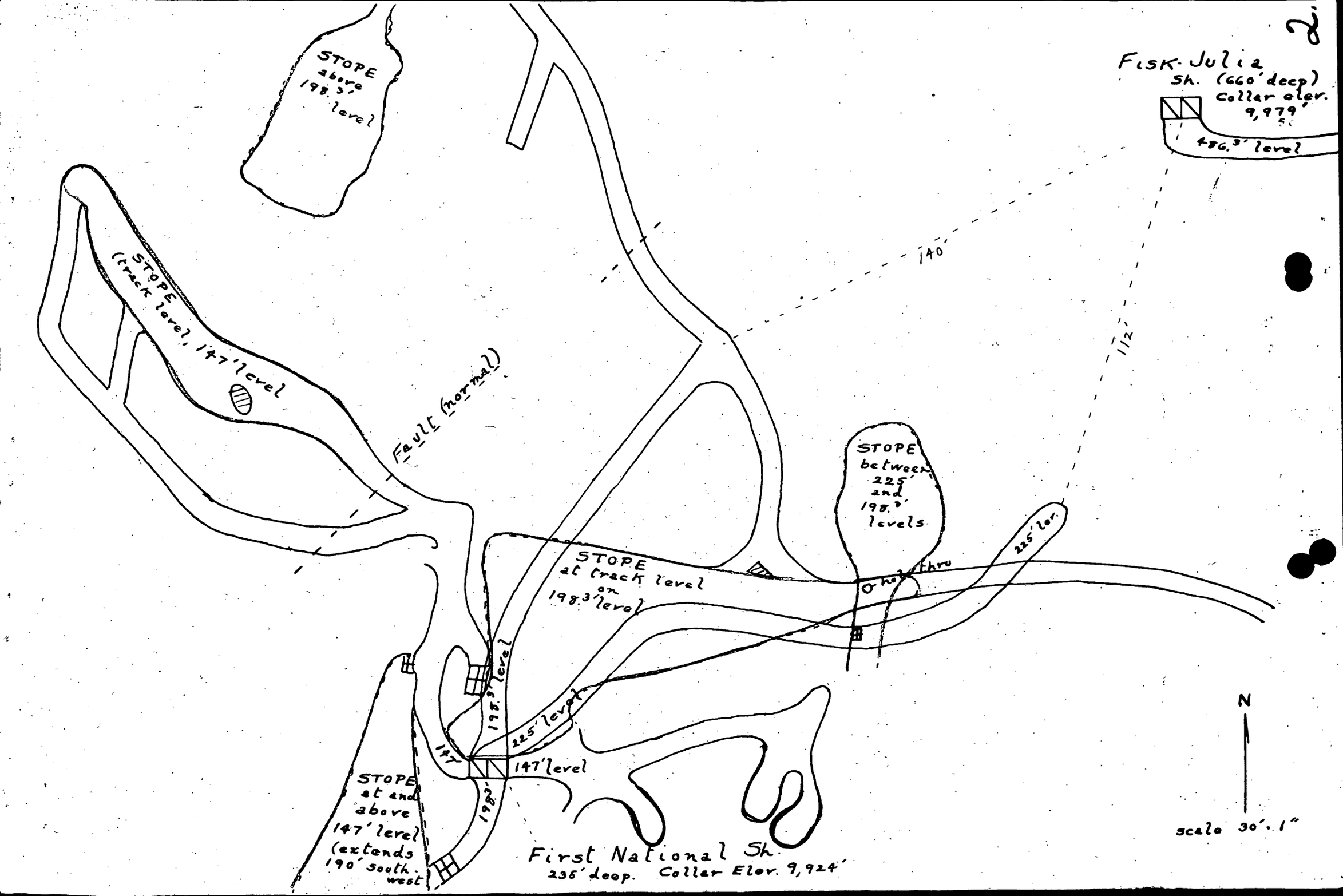
Joplin, Mo.
January, 1927.

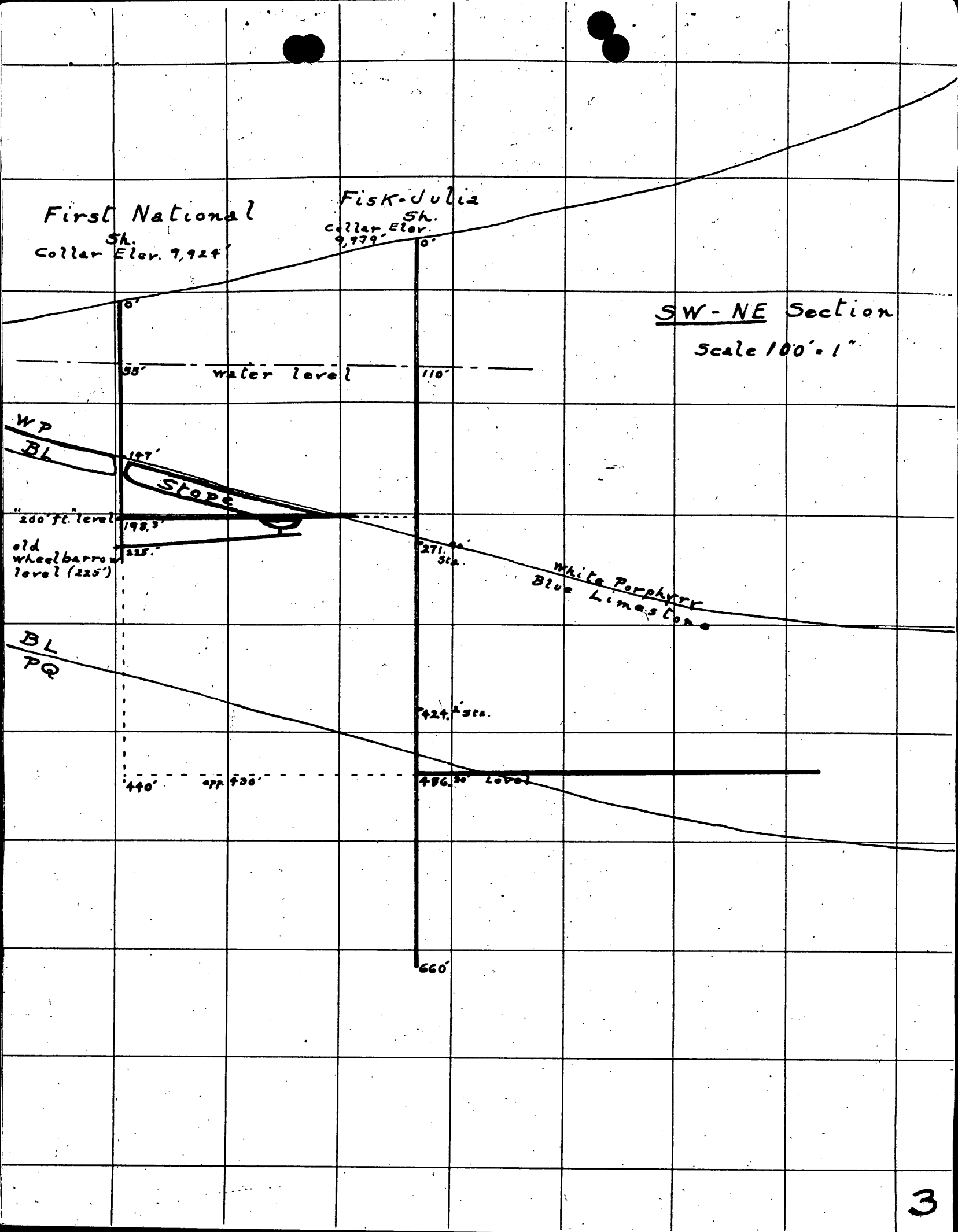


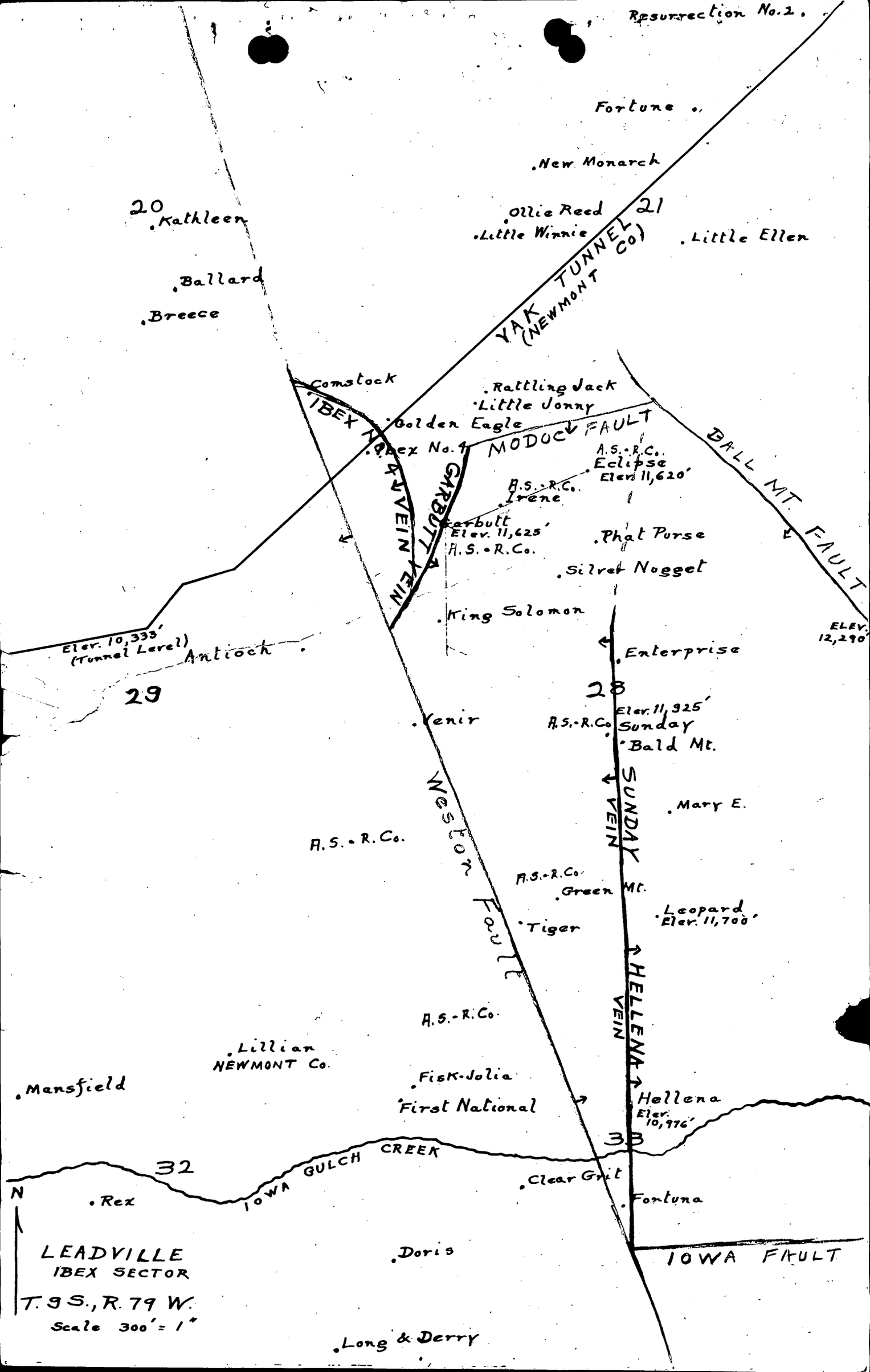
Copy of: East-West section of Hellena Shaft prepared in 1929 by the U.S. Geological Survey (Dr Charles F Behrendt) Published pg 44 Vol 12 Colorado Scientific Society Proceedings same being on file with U.S.G.S Washington, D.C.



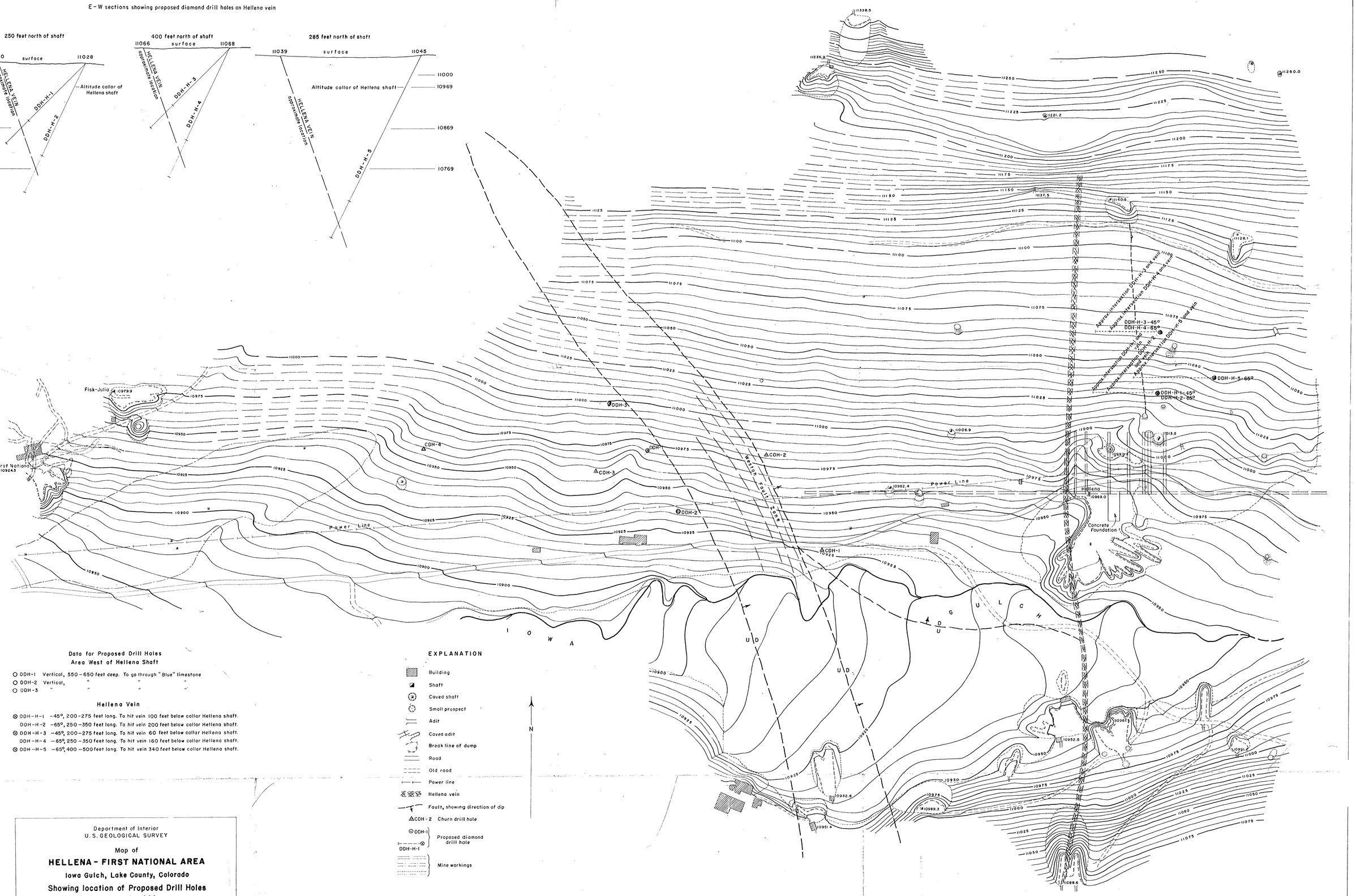
E-W Section
after Dr. Behre
U.S.O.S.
Vol. 12, p. 44,
Colo. Scientific Soc. Proc.
(1929)


8
Fisk-Julia
Sh. (660' deep)
Collar elev.
9,979'
486.3' level
STOPE
above
198.3'
level
STOPE
(track level, 147' level
Fault (normal)
140'
112'
STOPE
between
225'
and
198.3'
levels
225' lev.
STOPE
at track level
on
198.3' level
198.3' level
225' level
147'
147' level
STOPE
at and
above
147' level
(extends
190' south-
west
198.3'
First National Sh.
235' deep. Collar Elev. 9,924'
N
scale 30'=1"


First National
Sh.
Collar Elev. 9,924'
Fisk-Julia
Sh.
Collar Elev.
9,979'
0'
0'
SW-NE Section
Scale 100' = 1"
55'
water level
110'
WP
BL
147'
Stope
"200' ft. level"
198.3'
old
wheelbarrow
level (225')
225'
271.
Sta.
White Porphyry
Blue Limestone
BL
PQ
424.2' Sta.
440'
app 430'
486.30' Level
660'


Resurrection No. 2.
Fortune
New Monarch
20
Kathleen
Ollie Reed
21
Little Winnie
Little Ellen
Ballard
Breece
YAK TUNNEL (NEWMONT CO)
Comstock
Rattling Jack
Little Jonny
IBEX
Golden Eagle
Ibex No. 4
MODOC FAULT
BALL MT. FAULT
A.S.-R.Co.
Eclipse
Elev. 11,620'
A.S.-R.Co.
Irene
GARBUTT VEIN
Garbutt
Elev. 11,625'
A.S.-R.Co.
Phat Purse
Silver Nugget
King Solomon
ELEV. 12,290'
Elev. 10,333'
(Tunnel Level)
Antioch
Enterprise
29
28
Elev. 11,925'
Venir
A.S.-R.Co.
Sunday
Bald Mt.
SUNDAY VEIN
Mary E.
Western Fault
A.S.-R.Co.
A.S.-R.Co.
Green Mt.
Leopard
Elev. 11,700'
Tiger
HELLENA VEIN
A.S.-R.Co.
Lillian
NEWMONT Co.
Fisk-Jolia
Mansfield
First National
Hellena
Elev. 10,976'
33
32
IOWA GULCH CREEK
Clear Grit
N
Rex
Fortuna
LEADVILLE
IBEX SECTOR
T. 9 S., R. 79 W.
Scale 300' = 1"
Doris
IOWA FAULT
Long & Derry

E-W sections showing proposed diamond drill holes on Hellena vein



Data for Proposed Drill Holes
Area West of Hellena Shaft

- ○ DDH-1 Vertical, 550-650 feet deep. To go through "Blue" limestone
- ○ DDH-2 Vertical, " " "
- ○ DDH-3 " " " "

Hellena Vein

- ⊗ DDH-H-1 -45°, 200-275 feet long. To hit vein 100 feet below collar Hellena shaft.
- DDH-H-2 -65°, 250-350 feet long. To hit vein 200 feet below collar Hellena shaft.
- ⊗ DDH-H-3 -45°, 200-275 feet long. To hit vein 60 feet below collar Hellena shaft.
- DDH-H-4 -65°, 250-350 feet long. To hit vein 160 feet below collar Hellena shaft.
- ⊗ DDH-H-5 -65°, 400-500 feet long. To hit vein 340 feet below collar Hellena shaft.

EXPLANATION

- Building
- Shaft
- Caved shaft
- Small prospect
- Adit
- Caved adit
- Break line of dump
- Road
- Old road
- Power line
- Hellena vein
- Fault, showing direction of dip
- CDH-2 Churn drill hole
- DDH-1 / DDH-H-1 Proposed diamond drill hole
- Mine workings

Department of Interior
U.S. GEOLOGICAL SURVEY

Map of

HELLENA - FIRST NATIONAL AREA

Iowa Gulch, Lake County, Colorado

Showing location of Proposed Drill Holes

DMA Docket 860

SCALE

0 50 100 200 300 FT.

Contour Interval: 5'

Plane table map by H.T. Schassberger and M.R. Brock — October, 1951

Maßbelege in Seppenwartz Bpst.