J. H. East, Jr. Region IV

DMA

REGIONAL DIRECTOR'S OFFICE
REGION IV
OCT 1 1951
BUREAU OF MINES
DENVER, COLORADO

SEP 25 1951

Re: DMA-1472X
E. L. Snell, Criterion Mining Co.
Criterion Mine, Park County, Colo.
Exploration loan $12,000
(Estimated by field team)
Lead, zinc

Memorandum

To: Reports and Records Unit
Administrative Management Div.

From: Chief, Lead-Zinc Branch

Subject: Recommendation for denial of application submitted by E. L. Snell, on behalf of the Criterion Mining Company for exploration loan.

The property involved has been examined and reported on by the field team.

The applicant proposed to rehabilitate No. 1 adit and surface workings, explore replacement zones along fissures to the northeast of the present workings, and explore for bedded replacement deposits in limestones exposed in the present drifts. Although the applicant did not estimate the cost, the examining team believes that the total cost would be $12,000.

The Criterion mine is located in the Alma Mining District, Park County, Colorado. The mine is developed on a northeast-striking fissure, which dips about 60° to the northwest. No. 1 level is in the Manitou limestone and No. 2 in the Sawatch quartzite. Although the lower levels are not accessible, it is probable that the vein is present in the Sawatch quartzite or pre-Cambrian rocks in the lowest or No. 6 level.

The deposits are fissure fillings or limestone replacements in the Manitou limestone.

In the lower levels the vein deposits have produced mainly gold and silver. A small amount of oxidized lead and zinc ores have been produced from Nos. 1 and 2 levels.

There are no measured ore reserves. The examining team, after investigating and assaying the deposit, estimated that there are present at the maximum about 500 tons of inferred ore which would average about 5% Pb and 7% Zn. Most of this is oxidized ore which could not be treated in the custom mills of the region.

entered

JHE
Wish

mailed

Because of the small potential reserves, the relatively low grade of the ore, and the difficulty of concentrating such an ore, the Field Team recommends that the application be denied. The Lead-Zinc Branch concurs with this recommendation.

Returned herewith are:

3 copies Form DF-103 with attached letter to J. H. East, Jr.
1 copy of "Review of Application" for exploration assistance
2 copies of letter to applicant from Tom Lyon
2 " " " " " N. Luhr from C. W. Snell
1 copy of Field Team report.

R. P. Billings, Chief
Lead-Zinc Branch

Approved:

Tom Lyon
Director, Supply Division

EJLyons:emp
G 9-20-51

Copies to: J. H. East, Jr Region IV (2)
Chief, Lead-Zinc Branch
E. T. McKnight 4204 GSA
O. Bishop
Directors r. files 4214 GSA
Br. r. files 4214 GSA
Administrators r. file
DMA docket files

REGIONAL DIRECTOR'S
OFFICE
REGION IV
SEP 28 1951
BUREAU OF MINES
DENVER, COLORADO

Re: DMA-1472

SEP 25 1951

Mr. E. L. Snell
Criterion Mining Company
Fairplay, Colorado

Dear Mr. Snell:

The Defense Minerals Administration has again reviewed your application for a loan to explore your property in the Alma District, Park County, Colorado.

A report submitted by the Field Team after examination of your property indicates that there is little possibility of finding a sufficient tonnage of ore of minable grade to warrant further exploration. In view of this, we are unable to justify an expenditure of public funds for the work you propose. I regret, therefore, that your application must be denied.

We wish to thank you for bringing this property to our attention.

Very truly yours,

Tom Lyon

Tom Lyon, Director
Supply Division

EJLyons:emp
G 9-20-51
Copies to: J. H. East, Jr. Region IV (2)
Chief, Lead-Zinc branch
E. T. McKnight 4204 GSA
O. Bishop
Directors r. files 4214 GSA
Br. r. files 4214 GSA
Administrators r. file
DMA docket files

Recorded

Mining Division
Region IV

September 14, 1951

Memorandum

To: DMA Field Team, Region IV

From: Chief, Mining Division, Region IV

Subject: Final Report, Project TMA-[illegible], Criterion Mining Company, Alma Mining District, Park County, Colorado

Less than 500 tons of ore, averaging approximately five percent lead and seven percent zinc can be inferred from geologic evidence. The bulk of the possible ore is in the form of carbonates, sulphates, and oxides of lead and zinc, and cannot be treated in the custom mills of the region.

Because of the small tonnage of inferred ore, and the difficulty in concentrating mixed oxidized ores, the examining team recommended that the application for an exploration loan estimated to cost $12,000 be denied.

We concur with the findings of the examining team.

Paul T. Allison

JFS:oj
cc: DMA Subject and Chronological

[illegible] Customhouse
Denver 2, Colorado

September 14, 1951

Memorandum

To: Executive Secretary, Defense Minerals Administration

From: DMA Field Team, Region IV

Subject: Final Report, DMA Docket 1472-X, Criterion Mining Company, Zinc-Lead Mine, Alma District, Park County, Utah

Enclosed herewith are the original and two copies of the report on the subject docket.

We concur with the conclusions and recommendations of the examining team that the exploration loan of $12,000 be denied.

The brochure is enclosed.

Paul T. Allman, Alternate

A. N. Lossheman

WHM:oj
cc: DMA Subject and Chronological

6-303
(March 1947)

cc: P. T. Allsman
W. M. Traver, Jr.

UNITED STATES DEPARTMENT OF THE INTERIOR
BUREAU OF MINES
Salt Lake City, Utah

Mining Division
Date Rec'd AUG 16 1951
No. 15

BUREAU OF MINES
DENVER, Colorado

Report to Mr. C. M. Harrer

Chemical Laboratory Report

Date received Aug. 10, 1951

Date reported Aug. 15, 1951

Serial No.	DESCRIPTION	Lot No.	Au	Ag	Pb	Zn	Oxide Pb	Oxide Zn					
	DMA-1472X, Criterion Mining Co. Sec. 3, T. 9 S., R. 78 W., Park County, Colorado												
97618	Drift	H-520	0.045	0.6	1.5	2.55	0.8	2.4					
19	Side of drift	21	0.01	0.8	3.15	5.25	2.55	5.05					
97620	Drift face	22	0.07	1.5	7.15	17.3	5.8	16.6					
21	Drift	23	0.06	1.3	2.9	11.75	1.1	10.5					
22	"	24	0.03	0.7	2.55	5.5	1.25	4.75					
23	"	25	0.12	1.6	26.5	0.35	22.6	0.05					

U. S. GOVERNMENT PRINTING OFFICE 16—33553-3

Signed H. E. Peterson

224 New Customhouse
Denver, Colorado

June 28, 1951

Memorandum

To: A. H. Koschmann (with brochure)

W. M. Traver, Jr.

(Through Chief, Mining Division)

From: DMA Field Team, Region IV

Subject: DMA Docket 1472X, Criterion Mining Company, Fairplay, Colorado

Herewith is the application and review of the above docket. Please make the necessary examination and report. If the exploration is being recommended for approval, also include the necessary information to complete the contract.

P. T. Allsman, Alternate

A. H. Koschmann

Attachments
PTA/cl
co-dma files, Koschmann

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

224 New Customhouse
Denver 2, Colorado

September 14, 1951

Memorandum

To: Executive Secretary, Defense Minerals Administration

From: DMA Field Team, Region IV

Subject: Final Report, DMA Docket 1472-X, Criterion Mining Company, Zinc-Lead Mine, Alma District, Park County, Utah

Enclosed herewith are the original and two copies of the report on the subject docket.

We concur with the conclusions and recommendations of the examining team that the exploration loan of $12,000 be denied.

The brochure is enclosed.

Paul T. Allaman, Alternate

A. H. Koschmann

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF MINES

Mining Division
Region IV

224 NEW CUSTOMHOUSE
DENVER 2, COLORADO

September 14, 1951

Memorandum

To: DMA Field Team, Region IV

From: Chief, Mining Division, Region IV

Subject: Final Report, Docket DMA-1472-X, Criterion Mining Company, Alma Mining District, Park County, Colorado

Less than 500 tons of ore, averaging approximately five percent lead and seven percent zinc can be inferred from geologic evidence. The bulk of the possible ore is in the form of carbonates, sulphates, and oxides of lead and zinc, and cannot be treated in the custom mills of the region.

Because of the small tonnage of inferred ore, and the difficulty in concentrating mixed oxidized ores, the examining team recommended that the application for an exploration loan estimated to cost $12,000 be denied.

We concur with the findings of the examining team.

Paul T. Allsman

Paul T. Allsman

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF MINES
DENVER, COLORADO

Region IV

Building 20
Denver Federal Center
Denver 14, Colorado

September 4, 1951

Mining Division
Date Rec'd.
SEP 5 1951
BUREAU OF MINES
Denver, Colorado

Memorandum

To: Chief, Mining Division, Region IV

From: W. M. Traver, Jr.

Subject: DMA-1472X, Criterion Mining Company, Park County, Colorado.

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

Due to the complex ore, necessity for hand sorting, difficult winter operation conditions, and small reserves, the examining team conclude the application should be denied. I concur with their recommendations.

In addition, I believe the application could be disapproved on the basis alone that, except for the small reserve of 18 tons of indicated and 100 tons of inferred oxidized lead ore estimated where sample H525 was taken, the other reserves represent ore that, so far as I know, is unmarketable.

Obviously, ore as highly oxidized as that indicated by the other samples would not be acceptable at the Resurrection Mining Company's custom mill at Leadville, and it is too low-grade for shipment to Coffeeville, Kansas, as zinc ore. It is a certainty the oxidized zinc ores could not be upgraded at the mine to meet specifications for such class product and show a profit.

W. M. Traver, Jr.

W. M. Traver, Jr.

enclosures

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

Defense Minerals Administration
200 New Customhouse
Denver 2, Colorado

September 10, 1951

Memorandum

To: DMA Field Team, Region IV

From: A. H. Koschmann

Subject: DMA Docket 1472X, Criterion Mine, Criterion Mining Company, Alma Mining District, Park County, Colorado

Attached are 8 copies of the geologic report by Truman H. Kuhn, U. S. Geological Survey, covering the Criterion Mine, Alma Mining District, Colorado

Mr. Kuhn points out that geologic conditions are unfavorable to make significant ore discoveries, that the ore will be low grade and oxidized in character, which cannot be treated in local mills. He, therefore, recommends that the loan be denied.

I concur with this recommendation.

A. H. Koschmann
A. H. Koschmann
Supervising Geologist
Colorado-Wyoming

Attachments (8)

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

DEFENSE MINERALS ADMINISTRATION

REPORT OF EXAMINATION BY FIELD TEAM
REGION IV

DMA-1472X, Criterion Mining Company

Alma Mining District

Park County, Colo.

C. M. Harrer, Mining Engineer
Bureau of Mines

Truman H. Kahn, Geologist
U. S. Geological Survey

August 31, 1951

CRITERION MINING COMPANY
ALMA MINING DISTRICT
PARK COUNTY, COLO.

Summary, Conclusions, and Recommendations

By C. M. Harrer
Mining Engineer
Bureau of Mines

and

Truman H. Kuhn
Geologist
U. S. Geological Survey

CRITERION MINING COMPANY
ALMA MINING DISTRICT
PARK COUNTY, COLO.

SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

By C. M. Harrer and Truman H. Kuhn

The Criterion Mining Company has applied for an exploration loan for an unstated amount to explore for lead and zinc. The examining team estimates $12,000.00 will be required to perform the work requested.

A vein which probably extends from the pre-Cambrian rocks and Sawatch quartzite exposed in the number six level to the Manitou limestone in number one level has been developed on the Criterion property. Vein deposits in the lower levels have produced mainly gold and silver, and a small amount of oxidized lead and zinc ore has been produced from the vein on the number two and number one levels. Associated with the vein on the upper levels are two small oxidized lead and zinc replacement bodies.

In general, the deposits in the Alma district are small and scattered as compared with the larger blanket deposits at Leadville.

Less than 500 tons of ore averaging approximately five per cent lead and seven per cent zinc can be inferred from geologic evidence. The ore consists predominantly of carbonates, sulphates, and oxides of lead and zinc with minor amounts of galena and sphalerite.

Because of the difficulty of treating the complex oxide and sulphide ores and the small inferred reserves estimated in

unimportant limestone replacement bodies, it is recommended that this application for an exploration loan be denied.

Geology

CRITERION MINE

CRITERION MINING COMPANY

ALMA MINING DISTRICT

PARK COUNTY, COLORADO

DMA DOCKET 1472X

Geology and Ore Reserves

Truman H. Kuhn, Geologist
U. S. Geological Survey

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CRITERION MINE
CRITERION MINING COMPANY
ALMA MINING DISTRICT
PARK COUNTY, COLORADO

INTRODUCTION

The Cleaner claim (U. S. Survey No. 182), owned by the Criterion Mining Company, and the Criterion claim (U. S. Survey No. 950) and the Caroline claim (U. S. Survey No. 2359), leased by the Criterion Mining Company, are located in section 3, T. 9 S., R. 78 W., on the Buckskin Gulch side of Mt. Bross in the Alma Mining District, near Alma, Park County, Colorado. E. L. Snell, a partner and acting for the company, has applied for an exploration loan of approximately $12,000.00 (DMA Docket 1472X) to explore these claims for lead and zinc.

The property was examined on July 22, 1951, accompanied by E. L. Snell, and again on August 3, 1951, accompanied by C. M. Harrer and D. L. Roberts, engineers for the U. S. Bureau of Mines.

Geology of the general area has been discussed by Quentin D. Singewald and B. S. Butler in ORE DEPOSITS IN THE VICINITY OF THE LONDON FAULT OF COLORADO, U. S. Geological Survey Bulletin 911, 1941, and summarized by John W. Vanderwilt in MINERAL RESOURCES OF COLORADO, State of Colorado Mineral Resources Board, 1947.

GENERAL GEOLOGY

In the Alma area the oldest rocks are pre-Cambrian gneiss, schist, granite, pegmatite, and granite gneiss. Unconformably overlying the

pre-Cambrian rocks are:

1. Cambrian Sawatch quartzite, including the Peerless shale member
2. Ordovician Manitou limestone
3. Devonian Parting quartzite
4. Devonian Dyer limestone
5. Mississippian Leadville limestone
6. Pennsylvanian Weber (?) formation.

All the limestones are dolomitic.

Abundant Tertiary (?) igneous rocks, close to quartz monzonite porphyry in composition, occur principally as sills in the sedimentary rocks and as dikes in the pre-Cambrian rocks.

The ore deposits of the Alma area may be classified in order of past output as:

1. Gold veins related to the footwall zone of the London fault
2. Silver-lead bedded replacement bodies and replacement veins in limestone
3. Gold veins and replacement veins in the Sawatch quartzite
4. Miscellaneous types, mainly in pre-Cambrian rocks.

Most of the ore from the silver-lead bedded replacement deposits and replacement veins occurs in the upper part of the Leadville limestone, but none of the pre-Pennsylvanian limestone is wholly barren. The deposits are small and scattered as compared with the larger "blankets" at Leadville.

Gold deposits in the Sawatch quartzite consist of oxidized ores. In places, a massive sulphide vein, lean in gold, has been mined for lead and zinc.

Small veins occur in the crystalline rocks, but the larger mines have been in the sedimentary formations.

CRITERION MINE

A northeasterly striking vein has been prospected on No. 2 level of the Criterion Mine in the Sawatch quartzite and has been followed upward through the Peerless member into the Manitou limestone on No. 1 level. The average dip of the vein is approximately 60° to the northwest. The same vein probably occurs in the Sawatch quartzite and the pre-Cambrian rock in the lowest or No. 6 level.

The Criterion vein in the upper levels is a relatively strong structure, with up to 2 feet of altered and weathered material. Vein matter consists of quartz, limonite, barite, pyrite, galena, sphalerite, and carbonates, sulphates, and oxides of lead and zinc. The offset along the vein was not determined; however, the amount could not be more than a few feet.

A very weakly mineralized fault was seen on the surface cutting the Parting quartzite. This could be the upward extension of the Criterion vein.

Vein deposits in the lower levels have produced mainly gold and silver which occurred with quartz and limonite in oxidized and weathered deposits in the Sawatch quartzite. A small amount of oxidized lead and zinc ores have been produced from the vein on the No. 1 and No. 2 levels.

Three samples cut across the vein assayed:

Sample No.	Width ft.	Level	Total Lead %	Total Zinc %	Oxide Lead %	Oxide Zinc %	Gold oz.	Silver oz.
H522	2.4	No. 1	7.15	17.3	5.8	16.6	0.07	1.5
H523	1.2	No. 2	2.9	11.75	1.1	10.5	0.06	1.3
H524	1.5	No. 2	2.55	5.5	1.25	4.75	0.03	0.7

Associated with the vein are several small replacement bodies. On No. 1 level a 4-foot bed, approximately in the middle of the Manitou limestone has been replaced northward from the vein for about 6 feet. Two samples cut across this bed assayed:

Sample No.	Width ft.	Level	Total Lead %	Total Zinc %	Oxide Lead %	Oxide Zinc %	Gold oz.	Silver oz.
H520	3.7	No. 1	1.5	2.55	0.8	2.4	0.045	0.6
H521	4.5	No. 1	3.15	5.25	2.55	5.05	0.01	0.8

On No. 2 level the Peerless member, near its contact with the Sawatch quartzite, has been replaced at least several feet from the vein proper. A samples from across this zone assayed:

Sample No.	Width ft.	Level	Total Lead %	Total Zinc %	Oxide Lead %	Oxide Zinc %	Gold oz.	Silver oz.
H525	3.0	No. 2	26.5	0.35	22.6	0.05	0.12	1.6

ORE RESERVES

No ore is blocked out and all estimated tonnages are inferred from indirect geologic evidence.

Lead-Zinc Vein Deposits

Although a few small bodies have been mined from the vein on No. 1 and No. 2 levels, the tonnage has been very small. The total future

lead-zinc production from the 1 to 2 foot vein could not be expected to exceed a few hundred tons of ore averaging approximately 5 per cent lead and 13 per cent zinc. Approximately 3 per cent lead and 12 per cent zinc is in the form of oxidized minerals, and the other 2 per cent of lead and 1 per cent of zinc is in the form of galena and sphalerite.

Lead-Zinc Limestone Replacement Deposits

On No. 1 level, one bed, averaging 4 feet in thickness, is mineralized 6 feet northward from the vein. The applicant proposes to follow downward the contact between the bed and the vein. Judging from the assays taken and from the history of the Criterion mine, an ore body, if found, could not be expected to exceed a few hundred tons of ore averaging approximately 3 per cent total lead and 4 per cent total zinc.

On No. 2 level, there are a few tons of high grade lead oxide ore near the Sawatch-Peerless contact in the vicinity of sample H525. The extent of this ore zone is limited, and the maximum expectable ore would not exceed 50 tons, the average grade of which would be considerably below the grade indicated by the one sample.

Gold-Silver Deposits

Since the loan application is for lead and zinc exploration, the possible gold-silver reserves in the Sawatch quartzite in the lower levels have not been considered for this report.

Summary

The maximum amount of inferred lead-zinc ore from the Criterion mine would not exceed 500 tons of material averaging approximately

5 per cent lead and 7 per cent zinc, most of which occurs as oxidized ores.

CONCLUSIONS AND RECOMMENDATIONS

The lead-zinc reserves in the Criterion mine are negligible, and not more than 500 tons of ore, averaging approximately 5 per cent lead and 7 per cent zinc, can be inferred from geologic evidence. The bulk of the possible ore is in the form of carbonates, sulphates, and oxides of lead and zinc and cannot be treated in the custom mills of the region. The ore must be shipped without concentrating either as zinc ore or as lead ore.

Because of the small expectable reserves, the relatively low grade of the ore, and the difficulty in concentrating oxide ore of the mixed type, it is recommended that the application for a development loan be denied.

CRITERION MINING COMPANY
ALMA MINING DISTRICT
PARK COUNTY, COLO.

Engineering Report

Engineering

By C. M. Harrer
Mining Engineer
Bureau of Mines

CRITERION MINING COMPANY
ALMA MINING DISTRICT
PARK COUNTY, COLO.

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Location, topography, and physical features	1
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Description of the deposit	3
Minable ore reserves	3
Present status	5
Proposed exploration plan and costs	5
Conclusions	8
Recommendations	9

ILLUSTRATIONS

Figure	Follows Page
1. Index Map, Criterion Mining Co., Alma Mining District, Park County, Colo.	1
2. Level and assay map, Criterion mine, Alma Mining District, Park County, Colo.	*

*See illustration following "Geology Report".

CRITERION MINING COMPANY
ALMA MINING DISTRICT
PARK COUNTY, COLO.

ENGINEERING REPORT

By

C. M. Harrer

INTRODUCTION

Criterion Mining Company, of Fairplay, Colorado, identified under Defense Minerals Administration Docket 1472 X, proposes to explore certain lead-zinc exposures in the upper levels of the Criterion mine. To accomplish this, an exploration loan, estimated by the examining engineer as $12,000.00, on a 50 per cent participation basis under the Defense Production Act of 1950 has been applied for.

An examination of the company's property on August 3, 1951, by members of the U.S. Bureau of Mines and the U.S. Geological Survey is the basis of this report.

LOCATION, TOPOGRAPHY, AND PHYSICAL FEATURES

Criterion Mining Company property is in sec. 3, T.9S., R.78W., of the 6th P.M., Alma Mining District, Park County, Colorado, 3.7 miles northwest of Alma and on the northeast side of Buckskin Gulch (fig. 1). A well maintained county road leads from Alma to the properties which are between 11,000 and 12,000 feet altitude. The terrain is steep and rugged and well wooded in part. Water is available from mine drainage, a small lake at the foot of the properties, and from Buckskin Creek.

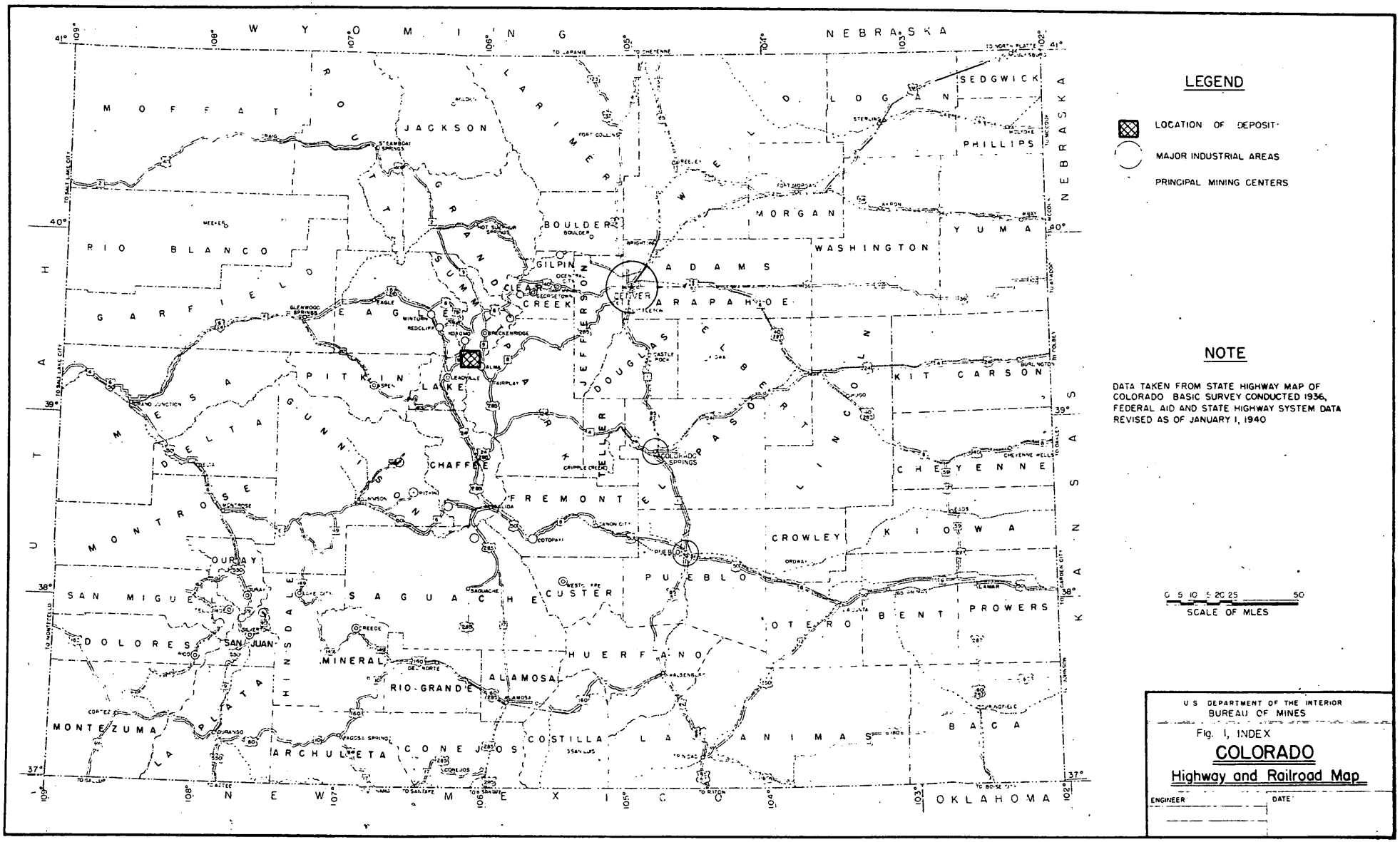


Fig. 1 - CRITERION MINING CO. ALMA MINING DISTRICT, PARK CO. COLO. DMA-1472 X

Cool summers and rigorous winters with considerable snow fall are the rule. Existing climatic conditions will not permit continuous operation for more than seven months of the year. Ready access is possible to a number of supply centers from Alma by truck and railroad combinations.

HISTORY AND PRODUCTION

The mining claims under consideration were located in 1872 by W. J. H. Miller, of Alma, Colorado. During 1882 to 1887, 450 tons of ore were reported shipped to the Grant smelter as "sand carbonates". There is no record of values other than that they returned $11.50 to $22.00 per ton. Extensive mine excavations and early reports infer a large production of gold ore. There is no complete and authentic record of this gold production.

Production statistics of the U.S. Bureau of Mines indicate that 24 tons of gold ore were produced during the period 1902 to 1903, assaying 0.7 ounces gold and 1.5 ounces silver per ton.

Sixty-one tons of lead-zinc ore from the vicinity of number one adit level, shipped to the U.S. Zinc Company, at Blende, Colorado, in 1924, assayed 0.1 ounce gold and 2.5 ounces silver per ton, 10.0 per cent lead and 20.7 per cent zinc.

During the years 1924 to 1950, a total of 116 tons of ore was reported with a recovery assay of 0.19 ounce gold and 2.7 ounces silver per ton, 11.4 per cent lead, 17.6 per cent zinc, and 0.08 per cent copper.

OWNERSHIP AND EXTENT

The Criterion Mining Company, of Fairplay, Colorado, a partnership between J. M. Youngson, of 315 Union Avenue,

Bakersfield, California, and E. L. Snell of Fairplay, Colorado, controls the following mining claims by ownership and lease:

The Cleaner Lode, patent number 182, is owned by J. M. Youngson.

The Criterion Lode, Patent number 950, and the Caroline Lode, patent number 2359, are controlled by a lease assignment.

At the present time Mr. Youngson expects to secure a direct lease from the C. C. Browning estate of Denver, present owners, to insure clear title.

The claims have a combined area of fifteen acres.

DESCRIPTION OF THE DEPOSIT

Several small and irregular bodies of highly oxidized lead-zinc ore occur in the limestone host rock as replacements along its bedding and fissures, and have been developed in part by small open stopes. Excavations in the area under consideration for exploration testify to the small size of individual replacement zones containing zinc-lead ore of interest to operators and leasers.

Past development of the property, now mainly inaccessible, was for gold and silver rather than the base metals lead and zinc.

MINABLE ORE RESERVES

Six character samples, H-520 to H-525 inclusive, taken on the first and second adit levels are the basis of reserve estimates and their locations are shown and analyses listed in a table on figure two.

Two potential sources of lead-zinc ore are exposed on each level as fissure and bedded replacements of limestone by lead and zinc minerals now highly oxidized.

The Number One Adit Level:

There are no measurable ore reserves. Indicated ore reserves for the fissure replacement in the vicinity of sample H-522 are estimated at 67 tons, assaying 0.07 ounce gold and 1.5 ounces silver per ton, 7 per cent lead and 17 per cent zinc. The bedded replacement in the vicinity of samples H-520 and H-521 is estimated to contain 40 tons of indicated ore assaying 0.03 ounce gold and 0.7 ounce silver per ton, 2.3 per cent lead and 3.9 per cent zinc.

Inferred ore reserves based purely on geologic inference and the possiblity of repetition of favorable replacement zones are estimated at 100 tons, assaying 0.05 ounce gold and 1.2 ounces silver per ton, 5 per cent lead and 12 per cent zinc.

The Number Two Adit Level:

There are no measurable ore reserves.

Indicated ore reserves for the fissure replacement located by samples H-523 and H-524 are estimated at 50 tons, assaying 0.04 ounce gold and 1.0 ounce silver per ton, 2.7 per cent lead and 8.6 per cent zinc. The bedded replacement deposit at sample H-525 is estimated to contain 18 tons of indicated ore, assaying 0.12 ounce gold and 1.6 ounces silver per ton, 26.5 per cent lead and 0.35 percent zinc.

Inferred reserves are estimated at 100 tons assaying 0.08 ounce gold and 1.0 ounce silver per ton, 14.6 per cent lead and 4.5 per cent zinc.

Total reserves for the accessible parts of the number one and number two adit levels are estimated at 375 tons of predominantly oxide ore, assaying 0.06 ounce gold and 1.0 ounce silver per ton, 8 per cent lead and 9 per cent zinc.

PRESENT STATUS

The property is idle at present. The number one adit level is readily accessible for 140 feet and difficultly accessible through caving ground for an additional 50 feet. It would require considerable rehabilitation before mining operations could be started.

The number two adit level, 64 feet below, is accessible for 190 feet. Small stopes show no evidence of caving.

The access road to the number one adit level is very steep and rough and in need of considerable repair.

PROPOSED EXPLORATION PLAN AND COSTS

The Criterion Mining Company proposes to explore replacement exposures in limestone for potential lead-zinc ores in the vicinity of the first and second levels of the Criterion mine as follows:

1. Rehabilitate the number one adit level and surface plant.
2. Explore replacement zones along fissures, northeasterly, with about 50 feet of drift and 30 feet of raise.
3. Explore the limestone bedded replacements exposed in

the drift walls with about 75 feet of drift, as conditions dictate.

It is estimated by the examining engineer that this project would cost $12,000.00 and require four months for completion.

The company lists equipment on hand and requirements for rehabilitation only. Several large items are noted as purchases. It is believed that the shortness of the program would not justify this, and rental is recommended. Equipment on hand as reported by the applicant, cost data, and an estimate of the total cost of exploration follows:

Equipment Now Available at the Criterion Mine

1. Gardner-Denver drifter, #93
2. 3½ inch drill column and arm
3. Two sets 1-1/8 inch lug Leyner steel for Timken bits
4. Gardner-Denver Jackhammer steel for Timken bits
5. Two sets 7/8 inch hex. Jackhammer steel for Timken bits
6. One set 1 inch hex. stoper steel for Timken bits
7. 1,000 feet of 2 inch airline, installed
8. Two 1 ton mine cars, 18 inch gauge
9. One 600 foot aerial tramway
10. One 60 ton ore bin at lower terminal
11. Imperial I.R. type 10 compressor, size 14 x 12 x 7½; two stage
12. 75 H.P. motor for compressor. No power available.
13. International gas engine to operate compressor
14. Miscellaneous small tools

All equipment items are reported in good condition except (9) the aerial tramway is not complete and is inoperative, (11) the compressor requires extensive repairs, (12) its motor drive is unusable as power is not connected in, and (13) the gas engine substitute drive is considered as unsatisfactory.

Estimated Cost of Equipment Required at the Criterion Mine

*1 - Steper (rental, 4 mo. @ $66.75/mo)	$ 267.00
1 - Slusher (2nd hand, or rental, approx.)	400.00
Timken bits @ 50 ¢ each	50.00
*1 - 315 cu. ft. Compressor (rental 4 mo. @ $507.00)	2,028.00
Mining and small tools	60.00
Fuel	500.00
300 feet mine track, bolts, spikes, etc.	250.00
3 - 50 foot air hoses, complete	190.00
2 - 50 foot water hoses, complete	66.00
3,000 feet - 1 inch lumber	165.00
3,000 feet - 2 inch lumber	330.00
6 x 6 timbers	70.00
200 pounds nails	30.00
150 - 4" x 6" x 30" ties @ 20¢	30.00
17 - rolls roofing paper	68.00
1 - stove	65.00
Mine timbers	100.00
Total Estimated Cost of Equipment	$4,669.00

*Purchase of these items would increase the total estimate cost of equipment at least $5,000.00.

Estimated Labor Costs to Rehabilitate Number One Adit Level

To rehabilitate mine plant and workings	$ 900.00
Road repairs and camp construction	500.00
Installing Compressor and housing it	500.00
Total	$1,900.00

Estimated Cost of Exploration

125 feet of drifting @ $30.00 per foot	$3,750.00
30 feet of raise @ $25.00 per foot	750.00
Total	$4,500.00

Total Estimated Cost of Exploration Program

Equipment	$ 4,669.00
Rehabilitation	1,900.00
Exploration	4,500.00
	11,069.00
Contingencies	931.00
Total cost	$12,000.00

The applicant made no estimate of cost of the proposed exploration and the above estimates were made by the examining engineer.

CONCLUSIONS

The original galena and sphalerite ore has been altered to include the recognizable products of oxidation, limonite, cerrussite, plumbojarosite, smithsonite, and hydro-zincite, to form a predominantly oxide ore difficult to concentrate or turn to a maximum profit.

The ore will require hand sorting and would be shipped to the Resurrection Mining Company's mill for treatment or to

the American Smelting and Refining Company smelters at Leadville, Colorado, or Amarillo, Texas.

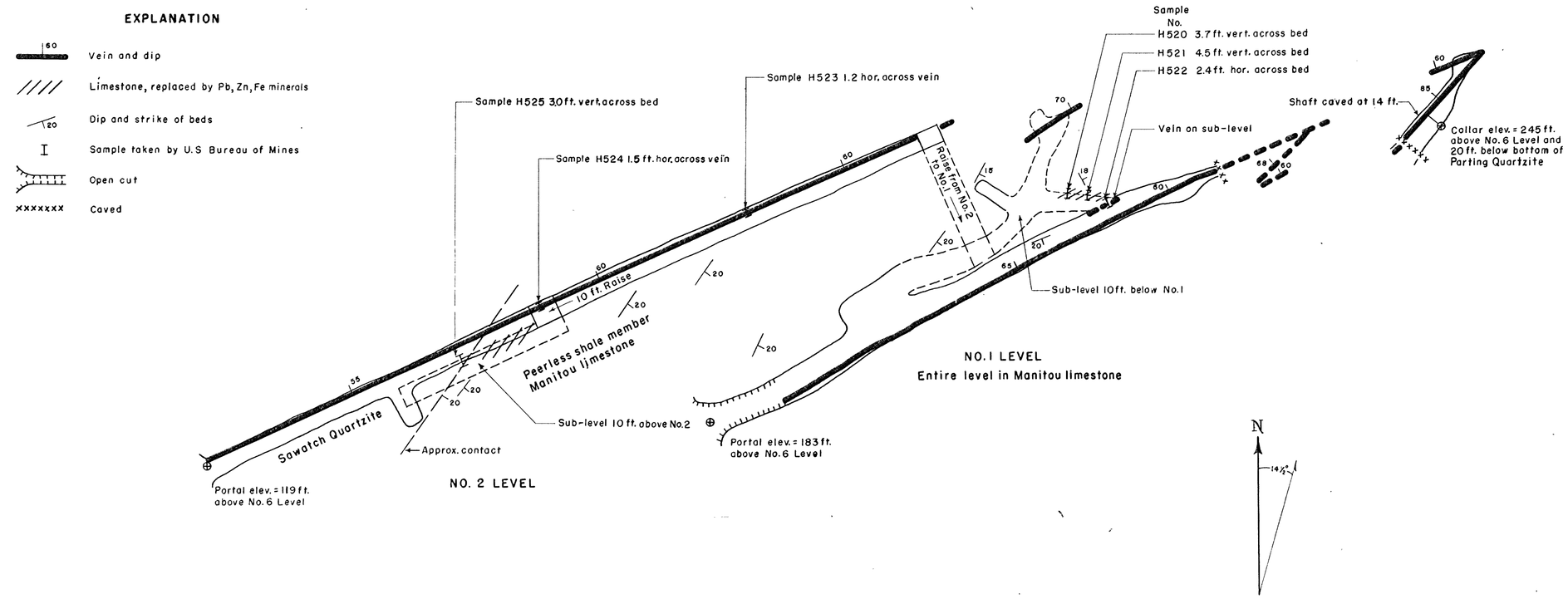
Rough terrain and heavy winter snows make mining operations for more than seven months a year doubtful.

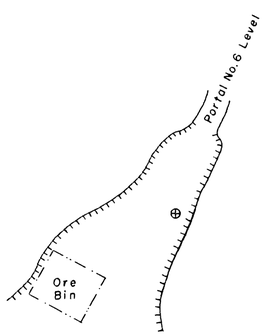
Lead-zinc concetrations as replacement ore bodies in limestone appear small and erratic and offer little encouragement to any but small and intermittent leasing or "split check" operations.

There are insufficient ore reserves predictable to make this a promising venture.

RECOMMENDATIONS

It is recommended that the application of the Criterion Mining Company for an exploration loan of $12,000.00 under the Defense Production Act of 1950 be denied.





U. S. BUREAU of MINES ASSAYS

Sample No.	Width	Level	Total Lead %	Total Zinc %	Oxide Lead %	Oxide Zinc %	Gold oz.	Silver oz.
H520	3.7 ft vert. across bed	No. 1	1.5	2.55	0.8	2.4	0.045	0.6
H521	4.5 ft. vert. across bed	No. 1	3.15	5.25	2.55	5.05	0.01	0.8
H522	2.4 ft. hor. across vein	No. 1	7.15	17.3	5.8	16.6	0.07	1.5
H523	1.2 ft. hor. across vein	No. 2	2.9	11.75	1.1	10.5	0.06	1.3
H524	1.5 ft. hor. across vein	No. 2	2.55	5.5	1.25	4.75	0.03	0.7
H525	3.0 ft. vert. across bed	No. 2	26.6	0.35	22.6	0.05	0.12	1.6

Department of Interior
U.S. GEOLOGICAL SURVEY

CRITERION MINE

CRITERION MINING COMPANY

Alma Mining District
Park County, Colorado

Brunton and Tape Survey

August 10, 1951 — Truman H. Kuhn

SCALE 20 10 0 20 40 FT.

DMA DOCKET 1472X — Fig. 2