224 New Customhouse
Denver 2, Colorado

February 6, 1957

Memorandum

To: Secretary, Operating Committee, DMEA

From: DMEA Field Team, Region III

Subject: Joint Supplemental Report of Examination, Docket DMEA 4461 (Lead-Zinc-Copper) Tech-Ser Mining Company (Caledonian Mine) San Juan County, Colorado

Enclosed are the original and three copies of the subject report by C. M. Harrer and F. B. Moore, which is in response to the memoranda of review enclosed with your letter of December 20, 1956. We suggest this report be incorporated with the original joint Report of Examination.

The examiners reaffirm the recommendation of denial to the work initially proposed, in which the Field Team concurs.

An alternate work proposal, however, is suggested in the report which is agreeable to the Field Team, should the examiners original recommendation be reversed.

DMEA Field Team, Region III

Original signed by
W. M. TRAVER

By W. M. Traver
Executive Officer

Enclosures

WMT:eh

cc: Harshman)
Mining Division)
Shaw (2))
Docket 4461)
Chron.)
w/Copy of subject report

Reviewed by
DMEA OPERATING COMMITTEE

(date)

EXTRA COPY DMEA RECEIVED		
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DMEA
DEPARTMENT OF THE INTERIOR
FEB 5 1957
REGION III
DENVER, COLORADO

TRANSMITTED
FEB 6 1957

Building 20
Denver Federal Center
Denver 2, Colorado

REGION III

February 4, 1957

Memorandum

To: Executive Officer, DMEA Field Team, Region III

From: John F. Shaw
E. N. Herzhman

Subject: Docket DMEA 4461 (Lead-Zinc-Copper) Tenh-dar Mining Company, (Caledonian mine) San Juan County, Colo.
Joint Supplemental Report of Examination.

Enclosed are original and eight copies of subject report by C. M. Harrer and F. B. Moore.

This report supplements a Joint Engineering and Geologic report submitted by the same men to the Executive Officer, DMEA Field Team, Region III, on November 16, 1956, in which they recommended denial of an application for DMEA assistance in exploring the Caledonian mine for lead, zinc and copper.

In response to the joint report the Commodity Review Board suggested that the exploration program might be warranted. The enclosed report is in answer to that suggestion.

The examiners reaffirm their original recommendation for denial, but have submitted an exploration program and its estimated cost, that could be considered in the event their original recommendation is reversed.

A. M. Moselman for
John F. Shaw
Supervising Mining Engineer

E. N. Herzhman
E. N. Herzhman
Member Field Team

JFS:jg
Enclosures

cc: 8
Herzhman
DMEA 4461
Chron.

Reviewed by
DMEA OPERATING COMMITTEE

(date)

FOR UNITED STATES GOVERNMENT USE ONLY

UNITED STATES
DEPARTMENT OF THE INTERIOR
FRED A. SEATON, SECRETARY

TRANSMITTED

FEB 6 1957

DEFENSE MINERALS EXPLORATION ADMINISTRATION

REPORT OF EXAMINATION BY EXAMINING TEAM
REGION III

DMEA 4461

CALEDONIAN MINE

Tenn-Ser Mining Company

San Juan County, Colorado

Lead-Zinc-Copper

Joint Supplemental Report of Examination

By

F. E. Moore
Geologist
Geological Survey

C. M. Harrer
Mining Engineer
Bureau of Mines

January, 1957

Reviewed by
DMEA OPERATING COMMITTEE

DMEA 4461

CALEDONIAN MINE
TECH-SEE MINING COMPANY
SAN JUAN COUNTY, COLORADO

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2.	Claim and exploration map, Caledonian mine, San Juan County, Colorado	10

SUPPLEMENTAL REPORT OF EXAMINATION

DMEA 4461

CALEDONIAN MINE
Tech-Ser Mining Company
San Juan County, Colorado

INTRODUCTION AND SUMMARY

On November 16, 1956, a Joint Engineering and Geologic Report on the Caledonian mine by F. B. Moore, Geological Survey, and C. M. Harrer, Bureau of Mines, was submitted to the Executive Officer, DMEA Field Team, Region III. The report recommended denial of the application by Tech-Ser Mining Company to explore for lead, zinc, and copper at the above property. Subsequent memoranda from members of the Commodity Review Board have suggested that the property may warrant exploration. The field examiners, admitting that it is a borderline case, wish to stand on the original recommendation.

The geologic report, submitted by the company with the application, is overly optimistic. The 510 feet of "ore" in 680 feet of drift shown on Plate II, N. 75 W. Vertical Section of the Lower Main Tunnel level is simply a guess. The areas outside the stopes have not been sampled. The examining team gave the company the benefit of the doubt and called such areas protore. The various estimates of $17.85 to $21.50 a ton net smelter returns are theoretically possible. If the examining team remembers correctly, settlement sheets shown by the company showed net smelter returns of about $7.50 a ton for this ore. Unfortunately, the team did not copy these figures. However, 1,933 tons of ore shipped in 1952 from the Caledonian vein brought an average net return of $6.48 per ton. (Report by Scott Hansen, Bureau of Mines) The

market value of the Caledonian ore at 1952 prices is $34.80; the current value is $38.38. This, of course, is figuring 100 percent recovery and making no allowance for dilution in mining. The Kittiana mine, which is probably part of the same vein system, produced 23,709 tons of ore between 1906 and 1918. This ore had a gross market value of $164,484 or about $7 a ton. The ore shoots, from the Kittiana through the Caledonian workings, get progressively smaller toward the west. Barring a favorable control by a ring fault to the west, ore bodies in that direction will probably be smaller than those already exposed. Again, the examining team gave the company the benefit of the doubt by stating that ore bodies of equal size to already-discovered ones might be found. In a quick review of the literature on the San Juan region, the examining team found no statement indicating that ore bodies are found at the intersections of the ring faults with the radial faults.

The Livingstone vein, as pointed out on page 9 of the Joint Engineering and Geologic Report, is a narrow fissure weakly mineralized. The company's plans for exploration along this fissure were drawn without the company's geologist ever having seen it. At the suggestion of the examining team, the portal was visited and found to be accessible. The Livingstone adit followed the fissure for nearly 500 feet; the last 40 feet, however, does not follow the fissure. At the end of the adit, a 45-foot crosscut is driven in a direction opposite to that in which the fissure left the adit. Whoever drove the adit apparently did not think the fissure worth following farther and started looking for a new one. As it is nearly 1,600 feet from the end of

the Livingstone adit to a projected intersection with the Caledonian vein, an intersection of the two veins was not considered a target by the examining team.

Realizing that this was a marginal case, the examining team made an attempt to get a "yardstick" on DMEA policy in regard to possible economic returns. Mr. F. E. Johnson, deputy administrator, who was in Denver at the time the Caledonian report was being written, was asked about the DMEA policy. Johnson stated that, in the case of lead-zinc-copper applications, which involve a certain amount of development, there should be a reasonable chance for the Government to get a 50-percent return on its money. The recommendations were made on that basis. Using the company's own figures for expected smelter returns, the Government could expect a 37-percent return if ore were discovered equal to the examining team's reserve figures. Using the company's figures for expected profit and figuring the value of the ore at current prices and 90-percent recovery, the company would lose 83 cents a ton.

If economic considerations are not important, a program could be followed as given below.

The best place to explore is underneath the large (easternmost) ore shoot. The company has not asked for assistance in this area and asked that this ground not be subordinated. In a telephone conversation with R. A. Hildebrand, president of Tech-Ser Mining Company, on January 14, 1957, Hildebrand agreed to subordinate this ground for purposes of exploration. The second best place to explore is by drifting east on the Caledonian vein toward the Kittinna mine.

The company apparently owns only about 200 feet of ground in this direction. The third best place is along the Caledonian vein to the west as proposed by the company. Minimum distance for such a drift would need to be 600 feet as the "ore shoots" appear to be about 400 feet apart along the vein. The nearest mappable ring fault is an estimated 1,800 feet to the west--the exact location with respect to the mine is not known. The Livingstone fissure is not considered a mappable ring fault although the structure may be related to ring faults.

POSSIBLE EXPLORATION

Stage I

Phase 1

Drive a 100-foot crosscut trending N. 21° E. from a point near No. 1 raise on the Lower Main Tunnel level. Cut a drill station, hereafter called No. 1, at the end of the crosscut. This will require widening the crosscut to about 10 feet at the 100-foot point. From the above drill station, drill three holes to cut the Caledonian vein at a depth of 100 feet below the Lower Main Tunnel level at distances of 100 feet apart. A fourth hole, also to cut the Caledonian vein at a depth of 100 feet and 100 feet from the easternmost hole already drilled, to be drilled from station No. 2 (fig. 1). A tabulation of distances and direction of holes is given below. If ore is found in the above holes, four more holes can be drilled under Stage II to cut the vein at a depth of 200 feet below the Tunnel level.

Phase 2

Drift westerly along the Caledonian vein a distance of 1,200 feet as proposed by the company (fig. 2). In this distance, any possible intersections with the Livingstone, Tremmore, and Cosident veins should be reached. If favorable intersections are found, exploration of such intersections can be continued under Stage II.

Stage II

Phase 1

Continue the No. 1 drilling-station crosscut an additional 100 feet N. 21° E. and cut a drill station (No. 3) at the face. From drill station No. 3, drill three holes to cut the Caledonian vein 200 feet below the Lower Main Tunnel level. These holes will also cut the vein at distances of 100 feet apart. From drill station No.2, drill one hole to cut the vein at a depth of 200 feet below the Tunnel level, and 100 feet east of the easternmost hole at the 200-foot depth.

Phase 2

Drift, crosscut, and/or raise a maximum distance of 200 feet to explore favorable intersections in the western part of the new Caledonian drift. Costs for the above exploration are given in a separate section.

Tabulation of Drill Holes

Hole No.	Drilled from	Direction	Inclination	Estimated Distance (feet)
1	Sta. 1	S. 82° W.	-38°	200
2	Sta. 1	S. 31° W.	-51°	160
3	Sta. 1	S. 21° E.	-38°	200
4	Sta. 2	N. 16° W.	-45°	170
5	Sta. 3	S. 53° W.	-52°	315
6	Sta. 3	S. 15° W.	-53°	315
7	Sta. 3	S. 14° E.	-45°	350
8	Sta. 2	N. 6° E.	-62°	290
			Total —	2,000

The reason for drilling from the north side of the vein is to take advantage of the dip of the vein and to eliminate small angles between the drill holes and the vein. It is believed that angles under 25° make geologic interpretation very difficult. Also a saving of about 470 feet of drill hole will be effected which is equivalent in cost to 90 feet of crosscut.

ESTIMATED COSTS OF POSSIBLE EXPLORATION

The following are estimated unit costs and the costs of a "possible" exploration program. These costs can be used for any other exploration program which may occur to the DMEA reviewers.

Core drilling should be based finally on three bids by the applicant.

In the absence of bids, drilling costs are estimated as follows:

Diamond drilling contract cost, including air	$7.00 per foot
Engineering and geological services	1.00 per foot
Coreboxes	.20 per foot
Contingencies	.10 per foot
Total cost per foot, without analyses.	$8.30

Sampling and assaying ore zone is estimated at $60.00 per hole, sampled in 5-foot intervals.

Cost per drill station is estimated at $100.00

Estimated unit costs for advancing the lower Caledonian level which is now in 1,430 feet from its portal. This unit cost will be basis for all exploration drifting and/or crosscutting.

	Item Cost/Ft.	Total Unit Cost/Ft.
(1) Independent Contractor:		
None		
(2) Labor and Supervision:		
Labor		
2 miners on labor contract at $12.00 a foot	$12.00	
1 trammer at $15.00 a day	3.00	
Supervision		
1 supervisor at $450/mo., 1/3 time pro rata	$ 1.50	
Technical Services		
Engineering and geological at $0.50 a foot	$ 0.50	
		$17.00
(3) Operating Materials and Supplies:		
Timber - none		
Explosives - 1 case powder for 5 ft. round	($11.00)	
25 blasting caps per round	($ 0.51)	
200 ft. of fuse per round	($ 2.60)	
	$14.11	$2.82

	Item Cost/Ft.	Total Unit Cost/Ft.
Pipe -		
3-inch air line at $0.80 per foot	$ 0.80	
1-inch water line at $0.22 per foot	$ 0.22	
Ventilation pipe at $1.00 a foot	$ 1.00	
Track - New 20 lb. track at $0.15 a lb.	$ 2.00	
Ties, spikes, bolts, fishplates	$ 0.50	
Drill steel and Liddicoat bits bits at $0.215 each	$ 2.75	
Fuel oil, lubricants, gasoline, etc at $4.60 a pound	$ 0.92	$11.61

(4) Operating Equipment:

Rental - None

Purchase - None

Depreciation -

1 Cleveland N-10 pneumatic rock drill and jacking	$800.00
1 12-B Rimco Mucking machine	$3,900.00
1 600 cfm I. R., Gyro-flow air compressor	$12,000.00
1 ventilation fan	$ 800.00
6 mine cars, 2-ton rocker bottom, Card Co.	$ 2,500.00
1 2-ton Atlas of 1 1/2 ton Mancha locomotive-electric.	$ 6,000.00
1 Jeep station wagon	$ 1,000.00
	$27,400.00

Depreciation allowance per month estimated as 1/60 of cost. $27,400 x 1/60 = $456.67

Advance per month estimated at 100 feet $ 4.57 — $ 4.57

(5) Initial Rehabilitation and Repairs:

None. Being done by operator at his own expense.

(6) Non Mine, Incidentals, etc:

None. Being done by operator at his own expense.

	Item Cost/Ft.	Total Unit Cost/Ft.
(7) Miscellaneous:		
Repairs in Equipment Estimated at $1.00 a foot	$ 1.00	
Sampling and Analyses Estimated at one analysis for lead, zinc, copper, gold and silver per 10 ft.	$ 1.00	
Payroll Taxes Payroll compensation and insurance taxes, etc; 5 percent of $17.00	$ 0.85	
Accounting at $50.00/month	$ 0.50	$ 3.35
(8) Contingencies: Allow 5 percent for occasional timbering, bad conditions and possible increase in costs. (5% of $34.93 = $1.75 per foot.	$ 1.75	
Total cost of drifting per foot without analyses		$36.68

Cost of the possible exploration program is estimated as follows:

		Cost
Stage I		
Phase 1.	Drive 100 feet of crosscut on a N. 21° E., bearing to establish core drill station No. 1 at $36.68 per foot.	$ 3,668.00
	Enlarge crosscut for drill station No. 1	$ 100.00
	Core drill holes 1,2, and 3, minimum size AX; 560 feet at $8.30 per foot; from core drill station No. 1	$ 4,648.00
	Core drill hole No. 4, minimum size AX; from core drill station No. 2; 170 feet at $8.30 per foot.	$ 1,411.00
	Enlarge crosscut for core drill station No. 2	$ 100.00
Phase 2.	Drift westerly along the Caledonian vein for 1,200 feet at $36.68 per foot	$44,016.00
	Cost of Stage I without assays	$53,943.00

Stage II

		Cost
Phase 1.	Extend the No. core drill station crosscut an additional 100 feet on the N. 21° E., bearing to establish core drill station No. 3; 100 ft. of crosscut at $34.46 per foot	$ 3,446.00
	Enlarge crosscut for drill station No. 3	$ 100.00
	Core drill holes 5, 6, and 7, minimum size AX; 980 feet at $8.30 per foot from core drill station No. 3.	$ 8,134.00
	Core drill hole No. 8 from core drill station No. 2; 290 feet at $8.30 per foot.	$ 2,407.00
Phase 2.	Drift, crosscut and/or raise a maximum of 200 feet to explore favorable intersections in the western part of the new Caledonian drift, at $36.68 per foot.	$ 7,336.00
	Cost of Stage II without assays	$21,445.00
	Cost of Stages I and II, without assays	$75,588.00

Cost of Sampling and Assaying:

		Cost
Stage I:	6 - 5-foot sections per core drill hole, assayed for lead, zinc, copper, gold and silver at $8.00 per section; 4 holes at $48.00	$ 192.00
	A maximum of 1,200 feet of drift sampled at 10-foot intervals; 120 samples at $8.00 (only ore shoots or well mineralized zones should actually be sampled.)	$ 960.00
Stage II:	6 - 5-foot sections per core drill hole, assayed for lead, zinc, copper, gold and silver at $8.00 per section; 4 holes at $48.00	$ 192.00
	A maximum of 200 feet of drift or raise sampled at 10-foot intervals; 20 samples at $8.00 (only ore shoots or well mineralized zones should actually be sampled).	$ 160.00
	Total cost of sampling and assays	$ 1,504.00
Total cost of possible exploration program		$77,092.00

Memorandum February 18, 1957

To: W. M. Griswold, Defense Minerals Exploration Administration

From: W. P. Williams, U. S. Geological Survey

Subject: Review of Supplemental Report of Examination, DMEA 4461, Tech-Ser Mining Company, Caledonian Mine, San Juan County, Colorado, (lead-zinc-copper).

In a review of the examining team's first Report of Examination, in which denial of the application was recommended, I listed what seemed to be favorable aspects of the property and concluded that DMEA participation in exploration on the property was justifiable.

In their supplemental report the field examiners repeat their recommendation for denial but they offer cost estimates in the event a DMEA contract is awarded the applicant.

The field examiners' main reasons for again recommending denial appear to be that the ore is marginal in grade, that any newly discovered ore bodies are not likely to be as large as the deposits now known in the mine, and that any ore bodies present will become progressively smaller as exploration drifting proceeded westward. According to the examiners' estimates the Government would not regain participating expenditures through royalties from ore sales.

The examining team have reviewed their data on the application and appear to have obtained new information about the proposed project. In reviewing the entire problem, it seems well to defer to the more detailed and precise evaluation of the property that field examination has afforded the examining team. Under these conditions I agree with the findings of the examining team and their recommendations for denial of the application.

W. P. Williams

cc: O. M. Bishop, 3617
Director's reading, 4212
Branch reading, 4212
DMEA (4)
Docket file
Chron. file
WPWilliams:pbb
G: 2/18/57

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DATE	INITIALS	CODE
February 18, 1957		

Memorandum

To: W. A. Griswold, Defense Minerals Exploration Administration

From: W. P. Williams, U. S. Geological Survey

Subject: Review of Supplemental Report of Examination, DMEA 4461, Tech-Ser Mining Company, Caledonian Mine, San Juan County, Colorado, (lead-zinc-copper).

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W. P. Williams

cc: O. M. Bishop, 3617
Director's reading, 4212
Branch reading, 4212
DMEA (4)
Docket file
Chron. file
WPWilliams:pbb
Q: 2/18/57

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

RECEIVED 1957
DATE | INITIALS | CODE

February 27, 1957

Re: DMEA 4461; Lead-Zinc-Copper; $131,320
Tech-Ser Mining Company
Caledonian Mine
San Juan County, Colorado

Memorandum

To: W. R. Griswold, DMEA

From: O. M. Bishop, Branch of Base Metals

Subject: Review of field team Supplemental Report dated February 6, 1957, received February 18, 1957.

The field team and examiners reaffirm their earlier position in this supplemental report and recommend denial of the application. This position is taken and maintained on the grounds that although there is considerable evidence that exploration may lead to discovery of mineralized rock, there is little or no evidence that such material will be commercial and therefore there appears to be no valid reason to undertake the exploration. Net smelter returns in the past have been small. The examiners report 1,933 tons shipped in 1952 brought a net return of but $6.48 per ton although 100 percent of the content at New York prices would total $34.80.

In that same year the American Zinc, Lead, and Smelting Company produced 3,214 tons which yielded 21 ounces gold, 4284 ounces silver, 12 tons of copper, 112 tons of lead and 94 tons of zinc. Such material is clearly submarginal under conditions prevailing in the San Juan area of Colorado.

The examining team also point out that in their opinion the exploration outlined is a third choice site and should only be undertaken if economics are discounted. I concur with the field examiners and field team in recommending denial of the application.

O. M. Bishop

Copy to: Division of Minerals
Mr. Kiilsgaard
Mr. Lamb
Files

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

224 New Customhouse
Denver 2, Colorado

December 27, 1956

Memorandum

To: E. N. Harshman (w/enclosure)
J. F. Shaw (2) (w/enclosure)

From: DMEA Field Team, Region III

Subject: Docket DMEA 4461 (lead-zinc-copper) Tech-Ser Mining Company (Caledonian Mine) San Juan County, Colorado

Enclosed is a copy of a letter from the Chairman of the Operating Committee, dated December 20, 1956, together with memoranda of review of the joint Report of Examination on the subject docket by O. M. Bishop and W. P. Williams.

Will you please review the letter and the memoranda of review and submit your comments to this office.

Should you agree that some exploration is warranted, please submit a supplemental Report of Examination, including your estimate of costs.

DMEA Field Team, Region III

Original signed by
W. M. TRAVER

By W. M. Traver
Executive Officer

Enclosures

EMC:ytl

cc: Sec. Op. Comm. (2)
Docket 4461
Chron.

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY
WASHINGTON 25, D. C.

IN REPLY REFER TO:

RECEIVED DEC 17 1956 D.M.E.A.

December 7, 1956

Memorandum

To: W. R. Griswold, Defense Minerals Exploration Administration

From: W. P. Williams, U. S. Geological Survey

Subject: Review of field examination report, DMEA 4461, Tech-Ser Mining Company, Caledonian Mine, San Juan County, Colorado, (lead-zinc-copper).

The examining team recommends denial of the subject application for the principal reasons that, 1) past production records indicate that high-grade ore cannot be expected in the area, and known ore in the mine is of marginal grade, and 2) it is doubtful if the proposed drifting will uncover ore bodies of greater significance than those already exposed.

After reviewing the available information on the area containing the applicant's property the application was reviewed and discussed with Mr. Wilbur S. Burbank, U.S.G.S., who has conducted extensive field studies on the geology and ore deposits of the San Juan region. Upon weighing the merits and disadvantages of the proposed project there seems to be some favorable aspects about the property which might be considered.

To begin with, the known ore at a grade of 2 ounces of silver per ton, 5 percent lead, 6 percent zinc, and 0.75 percent copper would have a gross value of nearly $40 per ton at present prices, which would not be considered marginal by many mine operators. If an ore body of 20,000 tons, the size of the bodies now known in the mine, could be found by the proposed project, such an ore body would have a gross value of about $800,000, or about 560,000 if 70 percent recovery is assumed.

In reviewing the geologic probability of discovering new ore reserves the following considerations might be mentioned. The applicant's property lies within an arcuate belt of ore deposits that bounds the Silverton caldera on the east. Within the arcuate belt ore deposits are found in fissures that radiate outward from the caldera and in or near fissures that are parallel to the walls of the caldera.

Apart from places where the fissures outcrop there are, at present, no specific geologic criteria by which favorable areas may be precisely delineated from unfavorable areas within the Burns latite complex--the ore host. In particular, then, it is not possible to predict

at this time whether the proposed drifting would pass into more favorable or less favorable ground. Some generalizations probably can be made. Because the peripheral fissures and mineralization are probably related to the emplacement of the Silverton caldera it may be expected that the Caledonian fissure will parallel as the proposed drift is driven westerly toward the caldera. Other mineral deposits in the vicinity show that at many places large ore shoots are found on one side or the other of the fissures that are parallel to the caldera walls. As a result, it may be expected that favorable ground would be encountered near the place where the Caledonian fissure intercepts the Livingstone vein.

All things considered, and admittedly without benefit of field examination, it is my impression that exploration work with RMEA participation is justified on the applicant's property. Justification is based on the following principal points:

1) The property is located within a belt of significant mineral deposits.

2) The Caledonian mine now possesses ore shoots of 20,000 tons size.

3) The known deposits in the mine are probably of economic grade.

4) The prospect of finding ore bodies of the size of known deposits appears good.

5) The prospect of finding substantially larger ore bodies as the proposed drift is driven toward the caldera and the Livingstone crossfracture seems good.

The applicant's proposal to drive the shorter, Caledonian drift first as Stage I at a cost of $56,250 appears to be a reasonable approach to the work.

The examining team's reasons for recommending denial of the application are well taken; but the weight of favorable geologic evidence seems greater to me, and I, therefore, recommend that consideration be given to approval of a RMEA contract that would provide at least for the applicant's proposed first stage.

WPWilliams:jeh
12/7/56
cc: Director's reading 4212
Branch reading 4212
RMEA (3)
O.M.Bishop 3617
Docket file
Chrono. file

W. P. Williams

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

RECEIVED DEC 4 1956 D.M.E.A.

December 4, 1956

Re: DMEA 4461; ~~Pb-Zn-Ag~~
Tech-Ser Mining Co.
Caledonian Mine
Eureka Mining District
San Juan County, Colorado

Memorandum

To: W. R. Griswold, DMEA

From: O. M. Bishop, Branch of Base Metals

Subject: Field team recommendation of November 20, 1956 (received November 28, 1956) on application.

The Caledonian Mine, located about 8 miles northeast of Silverton, Colorado has had limited production for a number of years, from veins of marginal quality.

The field examiners, Harrer (USBM) and Moore (USGS) after reviewing maps, analyses and previous reports and visiting the mine estimate reserves of 7,500 tons of indicated ore and 12,500 tons of inferred ore which will average 2 ounces of silver per ton, 5 percent lead, 6 percent zinc and 0.75 percent copper in ore shoots that average about 5 feet in thickness. The examiners are of the opinion that ore of similar grade and thickness might be developed by additional exploration drifting, but inasmuch as all past mining and exploration in the area has yielded marginal ore, they see no valid reason for the undertaking of additional exploration.

The Caledonia vein is developed through 4 crosscut adits over a vertical extent of 465 feet and over a strike length in excess of 600 feet. The vein ranges from 2 to 12 feet in width, and has poorly defined walls. The mineral content, like other San Juan veins, is complex being a mixture of sphalerite, galena, chalcopyrite, pyrite and quartz. A stope some 170 feet long and 115 feet high was mined to widths of over 12 feet from the Lower Main or 11,000-foot level and some stoping has been done ~~on~~ from the 11,465-foot level. It seems reasonable to assume that the stopes were developed on

the better parts of the exposed ore shoot. On the basis of shipments of the 4,000 tons of ore shipped 1948-52, the mine run of ore does not appear to equal 5 percent lead, 6 percent zinc and 0.75 percent copper. Such ore is not commercial with the high costs that pertain in the San Juans unless a gold-silver content in excess of that indicated by assays exists. The Livingstone vein is accessible over about 500 feet of strike length, but is very weakly mineralized and is mostly less than 1 foot in width. The Occident and Tremmore veins are inaccessible.

In conclusion it would appear that the field examiners conclude that although mineralization exists, a further development is not apt to prove commercial ore bodies because the veins are both narrow and lean in mineralization.

The proposed extension of the 11,000-foot drift for 1,200 feet at $46.90 per foot and of the Livingstone drift for 1,600 feet to its projected intersection with the Caledonian vein would be sound exploration only if there are logical reasons to believe that discoveries would be commercial in nature. All the evidence, however, points to the probability that discoveries, if made, would be marginal or submarginal.

I recommend denial, concurring with both field examiners and the Field Team.

O. M. Bishop

O. M. Bishop

Copy to: Division of Minerals
Mr. Kiilsgaard
Mr. Lamb
Mr. Bishop
Files

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

224 New Customhouse
Denver 2, Colorado

November 20, 1956

ALB
Betty

Memorandum

To: Secretary to the Operating Committee

From: DMEA Field Team, Region III

Subject: Joint Report of Examination Docket DMEA 4461 (lead-zinc-copper) Tech-Ser Mining Company (Caledonian Mine) San Juan County, Colorado

Enclosed are the original and three copies of a joint Report of Examination by Frank B. Moore, U.S.G.S. and C. M. Harrer, U.S.B.M, approved by their respective supervisors, E. N. Harshman, Member Region III Field Team, and John F. Shaw, Supervising Mining Engineer.

The Applicant has proposed a far too optimistic program at a cost of $131,320.00 to explore by 2800 feet of drifting and crosscutting. The examiners found no geologic evidence to indicate that drifting west on the Caledonian vein would result in the discovery of larger or higher-grade ore bodies than those already exposed which are small. They recommend denial of the application.

The field team concurs in this recommendation.

DMEA Field Team, Region III

Original signed by
W. M. TRAVER

By W. M. Traver
Executive Officer

Enclosures

WMT:ytl
cc
Sec. Op. Comm. (4)
Docket 4461
Harshman
Shaw
Mining Division
Chron.

Reviewed by
DMEA
11/26/56

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF MINES

Building 20
Denver Federal Center
Denver 2, Colorado
November 16, 1956

DMEA
DEPARTMENT OF THE INTERIOR
NOV 20 1956
REGION III
DENVER, COLORADO

TRANSMITTED
NOV 20 1956

Memorandum

To: Executive Officer, DMEA Field Team, Region III

From: E. N. Harshman
John F. Shaw

Subject: Joint Engineering and Geologic Report, Docket DMEA 4461, (Lead-Zinc-Copper) Tech-Ser Mining Co., Caledonian Mine, San Juan County, Colorado

We submit the original and 8 copies of a Joint Engineering and Geologic Report on the subject property, examined by Frank B. Moore, Geologist, Geological Survey, and C. N. Harrer, Mining Engineer, Bureau of Mines. The report is based on a field examination made October 3, 1956, to determine feasibility of granting aid in exploring the Caledonian mine near Silverton, San Juan County, Colorado, for lead-zinc-copper ores.

The operator proposed an exploration program consisting of driving 2,800 feet of drifts and crosscuts at an estimated cost of $131,320.00.

The examining team found geologic conditions at the Caledonian mine to be similar to those at other productive mines in the Silverton district, and that an estimated 50,000 tons of marginal-grade ores was exposed in the mine workings, but that higher-grade ore could not reasonably be expected to occur in this particular area.

Consequently, it was recommended that the application be denied.

E. N. Harshman
Member Field Team

John F. Shaw
Supervising Mining Engineer

Reviewed by
DMEA OPEN FILE COMMITTEE

cc 8
EHHarshman
DMEA 4461
Chron.

FOR UNITED STATES GOVERNMENT USE ONLY

UNITED STATES
DEPARTMENT OF THE INTERIOR
FRED A. SEATON, SECRETARY

TRANSMITTED

NOV 20 1956

DEFENSE MINERALS EXPLORATION ADMINISTRATION

JOINT REPORT OF EXAMINATION BY EXAMINING TEAM

REGION III

DMEA 4461

TEVA-BER MINING CO.

CALIFORNIAN MINE

SAN JUAN COUNTY, COLORADO

Reviewed by
DMEA OPERATING COMMITTEE

(date)

Lead-Zinc-Copper

JOINT ENGINEERING AND GEOLOGIC REPORT

By

Frank B. Moore, Geologist
Geological Survey

C. M. Barter, Mining Engineer
Bureau of Mines

November 15, 1956

BMSA 4461
TECH-SER MINING COMPANY
CALEDONIAN MINE
SAN JUAN COUNTY, COLORADO

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DMEA 4461
TECH-SER MINING CO.
CALEDONIAN MINE
SAN JUAN COUNTY, COLORADO

INTRODUCTION AND SUMMARY

Tech-Ser Mining Co., P. O. Box 517, Silverton, Colo., a Colorado corporation, has applied for Defense Minerals Exploration Administration assistance to explore the Caledonian mine further for lead, zinc and copper.

The mine is near the head of Minnie Gulch, in the Rio Grande National Forest and the Eureka Mining District, at an altitude of about 11,000 feet.

The property comprises 14 lode claims and 5 mill sites covering about 170 acres.

Tech-Ser Mining Company proposes to explore its property by extending the lower Caledonian drift (alt. 11,000 feet) 1,200 feet northwesterly, and extending the Livingstone drift (alt. 10,500 feet) 1,600 feet northeasterly to their intersections with the Caledonian vein. Total cost of the project is estimated at $131,380.00.

A field examination of the property was made October 3, 1956.

The mine is in an area underlain by rocks of the Silverton volcanic series. The vein occupies a radial fault related to a sunken block 8 to 10 miles in diameter. Both the rock type and the structural pattern are similar to those of many productive mines in the Silverton district.

Reserves exposed in present drifts, which total a little over 1,200 feet in length, are estimated at 20,000 tons of marginal-grade lead-zinc-copper ore. Under favorable conditions, an amount of ore equal in size and grade might be discovered by 1,200 feet of additional drifting. Past records indicate that high-grade ore can not be expected in this area.

Several unknown factors, if unfavorable, could greatly reduce the amount of potential reserves.

It is recommended that the application for RFC assistance be denied.

ACKNOWLEDGMENTS

The following references in the files of the Bureau of Mines, Region III, were consulted for information on the property:

Bateman, Willard (1942) Report on the Caledonian Mine, Minnie Gulch, Silverton, Colo.

Wilfley, C. R. (1943) War Minerals Report, The Caledonian Mine, San Juan County, Colo.

Young, W. E., and Thurber, H. K. (1949), Summary report of strategic minerals examination.

Young, W. E., and Thurber, H. K. (1949), Caledonian Lead-Zinc-Copper Mine, San Juan County, Colo. - Supplement to W. E. Young - 20

Bacon, E. W., Jr., (1953), The Caledonian and Kittanna Lead-Zinc-Copper Mines, Eureka Mining District, San Juan County, Colo.

R. A. Hildebrand, president and J. E. Bishin, superintendent of Tech-Ser Mining Co., conducted the examining team over the property and furnished all available information on the property.

LOCATION, TOPOGRAPHY AND PHYSICAL FEATURES

The Caledonian mine is in the rugged alpine San Juan Mountains at about 11,000 feet altitude. The property (fig. 1) is in secs. 28, 29, 32 and 33, T. 42 N., R. 6 W., New Mexico principal meridian, in the Eureka Mining District of San Juan County, Colo. The mine is on the south slope of Minnie Gulch and can be reached from Silverton by following Colorado State Highway 110 northeasterly for 7 miles to Minnie Gulch, and then over a Government constructed access road easterly for 2.5 miles.

The access road is steep and rough. The mine can be operated during most winters, except for short periods when very severe weather and snowslides make it inaccessible.

Silverton, the county seat of San Juan County, is the nearest town and is a source of supplies and labor. Water is available the year round from the mine and from Minnie Gulch Creek. Electric power is not available on the property, and mine equipment is actuated by diesel and compressed-air power. The nearest ore concentrating facility is at the Pride of the West mill at Howardsville, 3 miles southwest of the mine. Ore and concentrates from the region are trucked to Ridgeway, 3½ miles north of Silverton, and shipped therefrom on the Denver, Rio Grande and Western Railroad.

HISTORY AND PRODUCTION

The property was originally known as the Beaton group. Early-day operators and lessees were R. C. Beaton, John Leith, Carl H. Peterson, Willard Bascom. Later the American Zinc, Lead and Smelting Co., the Peerless San Juan Mining Co., and finally the present operator, Caledonian Mining and Milling Co., controlled the property and mine.

The mine was worked intermittently until 1921, again in 1928-30 and in 1937. Nothing was done from 1937 until 1942 when work was resumed, and during the period 1942-45, several hundred tons of ore were reportedly produced. The first recorded production from stoping was in 1948. During the period 1948-52, the property had a verified production of 5,566 dry tons of ore. Information on the various shipments and their assays are compiled as Annex I of this report.

The present lessees, Tech-Ser Mining Co., are engaged in mining on the upper level, and are opening up the caved portal of the lower tunnel preparatory to mining.

OWNERSHIP AND ACCESS

The claims comprising the Caledonian mine (fig. 2) are owned by Harry G. Knapp, Kenneth E. Knapp, Martin B. Williams and Frank A. Williams, Jr., all of Rifle, Colorado. They granted a 5-year lease on the property to Tech-Ser Mining Co., on November 1, 1955, with an option to extend the lease for an additional 5-year period.

The applicant lists the following claims, comprising about 170 acres, which it holds under lease from the owners. Although some of the ungatented claims listed differ from those mentioned in the lease, all are covered in a clause naming the claims under lease, "together with all other contiguous claims, patented or ungatented, now or hereafter owned or located by lessors during the term of the lease".

Claims under lease to Tech-Ser Mining Company

Name	Type	Size (feet)	Patent Survey No.	Kind
Artesia	Lode	300 x 1500	872	Patented
Livingstone	do	300 x 1500	876-A	Do.
Occident	do	300 x 1500	875-A	Do.
Tremmore	do	300 x 1500	874-A	Do.
Tantallon	do	300 x 1500	873-A	Do.
Standard	do	300 x 1500	19086	Do.
Dundee	do	300 x 1500	19090	Do.
Artesia	Mill site	481.7 x (643.3) (381.0)	872-B	Do.
Livingstone M.S.	do	895 x 738.3	876-B	Do.
Occident M.S.	do	335.5 x 653	875-B	Do.
Tremmore M.S.	do	311.1 x 700	874-B	Do.
Tantallon M.S.	do	311.1 x 700	873-B	Do.

Name	Type	Size (feet)	Patent Survey No.	Kind
Nellie-B	Lode	600 x 1500	--	Unpatented lode location
Nellie-1B	do	600 x 1500	--	Do.
Nellie-2B	do	600 x 1500	--	Do.
Nellie-3B	do	600 x 1500	--	Do.
Livingstone-2B	do	600 x 1500	--	Do.
Livingstone-3B	do	600 x 1500	--	Do.
Tuptelion 2B	do	600 x 1500	--	Do.

The applicant requests that any ore mined from the developed block of ground east of the upper level Caledonian crosscut be excluded from any exploration contract royalty schedule.

PRESENT STATUS

Exploration and development

The Caledonian vein has been opened up through four crosscuts (figs. 2 and 3) at altitudes of 11,000, 11,235, 11,255 and 11,465 feet. The lower crosscut (alt. 11,000 ft.) was driven 615 feet to the Caledonian vein. It is reported that so much water was encountered in the vein that a lateral was started 80 feet back from the end of the crosscut and driven westerly and northwesterly around the water source to reach the vein. From here, the Caledonian vein was drifted on northwesterly for 625 feet. A raise, started 125 feet back from the end of the drift, connects the lower and upper levels. The upper level and the raise are accessible. The portal of the lower tunnel was blocked by a cave-in at the time of the examination. The applicant is now engaged in reopening this portal. Access to the lower level was attained through the upper level and the raise; thus the lower level and all stopes and raises therefrom were accessible. On the upper level, the Caledonian vein was cut 480 feet in from the portal of the tunnel and was then drifted on 435 feet southeasterly and 135 feet north-

westerly. The northwest drift was extended 165 feet northerly along a cross fissure. The Upper East tunnel (alt. 11,855 ft.) and the Wiese tunnel (alt. 11,465 ft.) were caved and inaccessible. Tech-Ser Mining Co., is now engaged in mining on the upper level and expects to open stopes on the lower level shortly.

Mining, milling and other facilities

The mine was last operated during 1951-52, and is in good condition except for the caved lower tunnel portal. The upper and lower levels are equipped with track and air lines. Ample water is available for mining activities. The surface plant includes several buildings which house the shop and change room, compressor and ore bin. The company is erecting a Butler building to accommodate employees during winter if isolated by snowstorms or slides. Equipment on the property includes:

6 - rocker dump mine cars
2 - end dump mine cars
1 - 600 c.f.m. I.R. Turboflow air compressor
1 - airleg drifter
2 - stopers
3 - air hoists (tuggers)
1 - slusher
1 - Kimco 12B mucking machine
Ample tools and supplies for mining.

The nearest ore concentrator is the Pride of the West differential-flotation mill of 100-ton per day capacity at Somerdeville, about 3 miles distant. Ore from the area is also trucked 33 miles to Ridgeway, Colo., and shipped by rail to mills and smelters that offer the better prices.

GEOLOGY

The Caledonian mine is in an area underlain by Tertiary extrusive rocks of the Silverton Volcanic Series. The mine workings are in the Burns latite, a formation known to be a favorable host rock for vein deposits. The formations above and below the latite, pyroxene andesite and Eureka rhyolite respectively are probably somewhat less favorable host rocks.

A large sunken block, 8 to 10 miles in diameter, lies just to the northeast of Silverton. This block is surrounded by a series of marginal faults. A second series of faults radiates outward from the sunken block like the spokes of a wheel. Most of the deposits in the Silverton district are in radial faults. The Caledonian vein is believed to have formed in one of the radial faults on the east side of the sunken block.

The Caledonian vein (on the Tantallon claim) has been explored by four crosscut tunnels at elevations between 11,000 and 11,466 feet (fig. 4). The two upper tunnels are caved but apparently drifting along the vein from these adits totalled less than 300 feet. The two lower tunnels, at elevations of 11,000 and 11,235 feet, are called the Lower Main Tunnel and the Upper Tunnel respectively. In each, the vein has been explored for a distance of a little over 600 feet. About half a mile east of the Caledonian mine, work in the Kittimac mine has exposed a vein which is believed to be the southeasterly extension of the Caledonian vein.

The Caledonian vein strikes from N. 60° W. to N. 75° W. and dips from 70° NE to 80° SW; a strike of N. 75° W. and a dip of 80° NE to vertical is typical. In general, the vein is 2 to 6 feet wide but it widens to 10 or 12 feet in places. A well defined foot or hanging wall is rarely seen and the vein material grades into unaltered wall rock.

Vein minerals are sphalerite, galena, chalcopyrite, pyrite and quartz.

Nearly all the ore produced from the mine has come from one stope on the Caledonian vein near the east end of the drift on the Lower Main Tunnel level. The stope is 170 feet long and 115 feet high and has been mined for a width of over 12 feet. A small amount of stoping has also been done on the Caledonian vein from the Upper Tunnel level. The ore shoots appear to be controlled by a change in strike to N. 60° W. and possibly by a flattening of the dip to the northeast.

The mine has an estimated 7,500 tons of indicated ore and 12,500 tons of inferred ore in the Caledonian vein in the ground opened by the present workings (fig. 4). This ore is marginal in grade and will average about 2 ounces silver per ton, 5 percent lead, 6 percent zinc, and 0.75 percent copper. In addition, it is estimated that a possible 30,000 tons of protore averaging 1 to 3 percent combined sulfides is present. The reserve tonnages for the ore represent a reasonable projection of stoped and sampled areas in the workings and are figured for a 5-foot width. The mine has not been adequately sampled and the grade of the ore is based on past production figures of the company. The tonnage and grade of the protore is an estimate made from a study of the level and stope maps and an underground inspection ("eye ball assay") of the vein material. There are no assay data available from the protore areas.

The reserve figures estimated by the company are ridiculously over-optimistic. The blocks of indicated and inferred ore on the Caledonian vein are extended much farther than sensible mining practice would allow. Much of the ore inferred in the present workings probably should be indicated protore; it is accessible but too low in grade to interest the operators in sampling. The "possible tons" figures are based on

the assumption that the unexplored veins (Occident, Tremmere, and Livingstone) and the unexplored portion of the Caledonian vein are 100 percent mineralized. The Occident vein is an unknown quantity as is the Tremmere, but neither are believed to have produced much ore; both are inaccessible. A drift on the Livingstone vein is accessible, a fact not known by the company's president-geological engineer at the time of the examination. This vein has been drifted on for about 350 feet and is mostly a 2- to 3-inch weakly mineralized fracture; in a few places it reaches 1 foot in width. There has been no stoping on the Livingstone vein.

The intersection of the Caledonian and Livingstone veins, and other possible intersections, cannot be considered targets as it is rather doubtful that the Livingstone, Occident, and Tremmere veins are strong enough to extend to the Caledonian vein. Therefore, the "target" consists of 1,200 feet of drifting to the west along the Caledonian vein. The new drift would be in latite similar to the wall rock in the present workings. It is doubtful if this drifting will uncover ore bodies of greater significance than those already exposed. Past records indicate that high-grade ore cannot be expected in this area and, as the new drift will trend away from known ore bodies which also become smaller from east to west, possible new ore bodies will probably be smaller than those currently exposed.

As shown on the geologic map in the Silverton quadrangle folio, a north-northeast trending fault, related to the series of marginal faults, displaces the Burns latite in the vicinity of the Caledonian mine. The position of this fault relative to the mine workings has not been determined. If this fault is later than the Caledonian vein

and cuts the vein in the area of the proposed westward drift, displacements are such that the Caledonian vein would be lost across the fault.

SAMPLING

The Caledonian mine was examined by engineers of the Bureau of Mines in 1943[1] and 1949[2]. These examinations were made at the request of the owners or lessees. Twenty-five samples were taken by Bureau of Mines engineers during 1943 and 1949. Twenty-three were chip samples taken across the vein at accessible points and two were muckpile grab samples.

According to G. R. Wilfley, the Caledonian mine was sampled by the Reconstruction Finance Corporation during 1942 for information on which to evaluate a loan application. A total of 24 samples were taken of the vein. Fifteen samples across the vein on the upper tunnel level averaged 0.03 ounce gold and 3.01 ounces silver a ton, 4.13 percent lead, 5.49 percent zinc and 1.46 percent copper over an average vein width of 3.5 feet; nine samples taken of the vein in the lower tunnel and stope averaged 0.03 ounce gold and 2.49 ounces silver a ton, 3.97 percent lead and 5.9 percent zinc over an average vein width of 7.3 feet. Mr. Wilfley estimated 9,000 tons of indicated ore on the upper tunnel level and 28,000 tons on the lower level. On this basis, using the results of Reconstruction Finance Corporation sampling, he estimated the average grade of ore as 0.03 ounce gold and 2.62 ounces silver a ton, 4.01 percent lead, 5.8 percent zinc and 1.02 percent copper over a vein width of 6.5 feet.

1/ Wilfley, G. R., former mining engineer, Denver Field Office, Sept. 24, 1956 (War Mineral Report)

2/ Young, W. E., and Thurber, K. K., mining engineers, Region IV, Mining Division

The weighted average of the 25 samples taken by the Bureau of Mines engineers during 1943 and 1949 is 0.013 ounce gold and 2.92 ounces silver a ton, 4.81 percent lead, 7.15 percent zinc and 1.86 percent copper.

During the examination on October 3, 1956, three additional samples (M-846, 847 and 848) were taken in the lower tunnel level and one (M-849) was taken in the upper tunnel level. These samples assayed as follows:

Sample No.	Width (feet)	Percent Lead	Zinc	Copper
M-846	3.25	9.6	10.7	2.15
M-847	6.0	2.8	4.0	0.75
M-848	3.7	0.05	0.8	0.15
M-849	3.8	0.8	2.3	0.35

More representative of the ore is the average metal content of the 1,896.2 dry tons of ore produced by the American Zinc, Lead and Smelting Co., during November 1952. The weighted average of settlement sheet assays is 0.008 ounce gold and 1.68 ounces silver a ton, 4.81 percent lead, 5.05 percent zinc and 0.56 percent copper.

All available sample locations and assay results are shown on figure 3.

ORE RESERVES

An unpublished report[3/], in the files of the Bureau of Mines, estimates reserves of 5,000 tons of indicated ore and 14,000 tons of inferred ore having an average content of 0.008 ounce gold and 1.65 ounces silver a ton, 4.0 percent lead, 5 percent zinc and 0.56 percent copper.

3/ Hazen, Scott W. (1953): The Caledonian and Kittimac Lead-Zinc-Copper Mines, Eureka Mining District, San Juan County, Colo.

The writer's estimate total reserves of marginal grade ore as 7,500 tons of indicated ore and 12,500 tons of inferred ore. This will average about 2 ounces of silver per ton, 5 percent lead, 6 percent zinc and 0.75 percent copper. In addition, it is estimated that a possible 50,000 tons of protore averaging 1 to 3 percent combined sulfides is present.

PROPOSED EXPLORATION AND COSTS

Tech-Ser Mining Co., proposes to explore its property with a two-stage program of drifting at an overall cost of $131,350.00. Stage I would consist of advancing the lower Caledonian drift (alt. 11,000 ft.) 1,200 feet northwesterly along the Caledonian vein. The drift would be 6 by 7 feet in cross-section. This stage is estimated to cost $56,280.00 or $46.90 a foot. Stage II would consist of advancing the Livingstone drift (alt. 10,500 ft.) 1,600 feet northeasterly along the Livingstone vein to the intersection with the Caledonian vein. This stage is estimated to cost $75,040.00 or $46.90 per foot. Each stage would be completed within one year.

CONCLUSIONS AND RECOMMENDATIONS

The proposed 1,200 feet of drifting to the west will be in an unexplored area, away from the known ore deposits in Minnie Gulch. The Kittimac mine is about 2,500 feet east of the Caledonian and the one large ore shoot in the Caledonian is in the easternmost workings. However, the Caledonian vein structure is strong in the western workings. Except for possible displacement of the vein by the north-northeastward trending fault, there is no evidence to indicate any change in the geologic conditions to the west; the rock type should be the same and, lacking

surface maps, there is no reason to predict or deny a possible favorable change in the strike of the vein. As the chance for favorable vein intersections seems remote, the target would be exposing 1,800 feet of vein. It should be noted, however, that the field team was shown no evidence, such as surface maps, that the vein extends this far west.

It is believed that the applicants proposal for Stage II drifting along the Livingstone vein has very little chance of discovering significant deposits of ore. There is no geologic evidence to indicate that drifting along the Caledonian vein to the west will result in the discovery of larger or higher-grade ore bodies than those already exposed; that is, 20,000 tons containing 2 ounces silver per ton, 5 percent lead, 6 percent zinc, and 0.75 percent copper, and an additional 50,000 tons of protore containing 1 to 3 percent combined sulfides. The chances of making such a discovery are dependent upon the continuation of the vein for an adequate distance, the absence of an off-setting cross fault, and the presence of favorable changes in strike (and dip) of the vein.

Because of the above unknown factors and the marginal grade of the ore, it is recommended that the application be denied.

ANNEX I

Known production from the Caledonian mine, 1948

Lot No.	Dry Tons	Ounces a ton Gold	Ounces a ton Silver	Percent Copper	Percent Lead	Percent Zinc	Remarks
789	59.1	0.008	2.80	0.65	4.63	4.9	Old stope above lower level. Ore sorted from diluted stope rock mined full vein width of 18 feet. Ore shipped to May-flower custom mill of Shenandoah-Dives Mining Company
805	54.8	0.007	1.58	0.42	2.81	3.43	
810	89.6	0.01	1.325	0.42	2.8	3.4	
818	132.5	0.01	1.35	0.85	2.45	3.05	
835	148.6	0.01	1.15	0.50	2.5	3.5	
851	154.8	0.01	1.00	0.35	2.05	2.85	
853	100.9	0.01	1.55	0.40	2.4	3.75	
862	115.6	0.01	1.81	0.60	3.85	4.0	
804	54.4	0.008	2.20	0.75	2.78	4.05	New stope above lower level. Ore mined from high grade, footwall part of vein, 6-foot wide. Ore shipped to May-flower custom mill of Shenandoah-Dives Mining Company
817	79.8	0.003	2.80	0.65	2.5	3.95	
825	48.3	0.005	2.10	0.80	2.7	4.15	
880	91.8	0.005	2.05	0.95	3.45	5.85	
902	161.7	0.005	1.96	0.75	4.5	7.30	
1	90.34	—	1.5	—	5.5	3.7	Sorted dump ore from upper east tunnel. Shipped to Mayflower custom mill, Shenandoah-Dives Mining Co.
2	43.17	0.008	1.48	0.10	3.9	5.1	
3	164.1	0.035	0.92	0.30	1.55	1.5	
			1949				
683	44.3725	—	2.10	0.74	4.73	7.70	
			1950				
			No production				
			1951				
891	76.605	—	2.495	.75	5.7	8.3	Sorted ore shipped by E. G. and E. E. Knapp to Shenandoah-Dives Co. Ore from lower tunnel level stope.
900	17.867	—	2.66	.84	5.3	7.5	
976	37.48	—	1.88	.73	4.2	5.5	
969	89.09	—	2.11	.77	5.8	7.3	
993	187.36	—	2.45	.89	5.7	7.6	

Known production from the Caledonian mine (Cont'd).

1952

Lot No.	Dry Tons	Ounces a ton Gold	Ounces a ton Silver	Percent Copper	Percent Lead	Percent Zinc	Remarks
1005	27.783	--	1.90	.71	4.80	6.80	Shipped by E.O. and E. E. Kemp to the Shenandoah-Dives Mining Co. Ore from stope above lower tunnel level.
1000	101.750	--	2.08	.64	4.45	6.10	
995	60.475	--	2.33	.69	4.85	5.70	
992	60.185	--	1.65	.60	4.05	5.50	
1	395.7	0.008	1.47	0.52	2.9	3.6	Produced by American Zinc, Lead and Smelting Co. in November 1952. The company estimated that there were 500 tons remaining in stopes as of November 20, 1952.
2	247.06	0.009	1.6	0.55	4.25	5.0	
3	517.76	0.009	1.875	0.66	5.4	6.4	
4	333.808	0.007	1.5	0.53	3.5	4.35	
5	399.676	0.007	1.85	0.575	4.1	5.35	

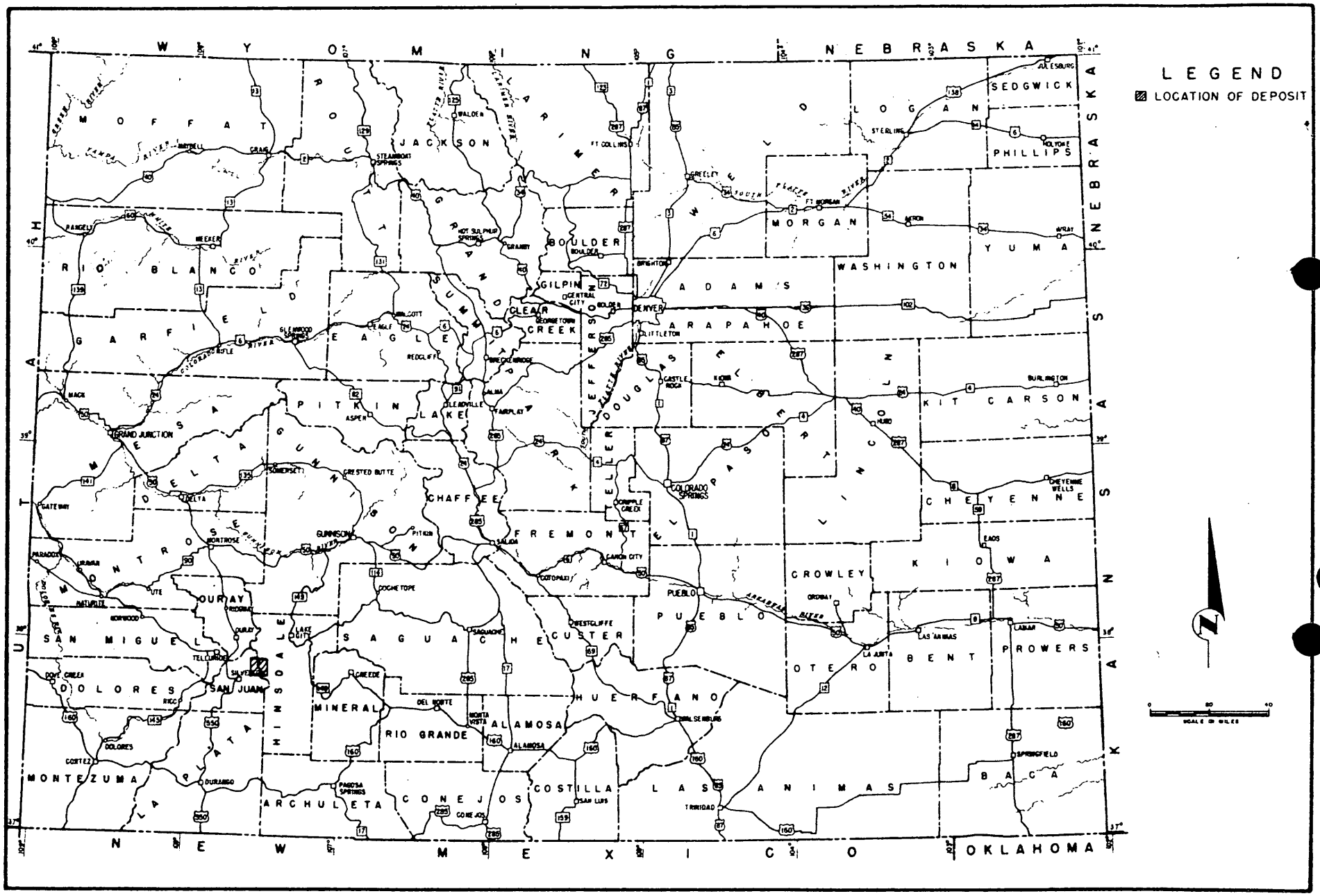


FIGURE 1 - LOCATION MAP, TECH-SER MINING COMPANY, CALEDONIAN MINE, SAN JUAN COUNTY, COLO. DMEA 4461

RECEIVED
NOV 23 1956
D.T.I.C.

DMEA
DEPARTMENT OF THE INTERIOR
OCT 10 1956
REGION III
DENVER, COLORADO

October 9, 1956

Memorandum

To: W. M. Traver, Executive Officer, DMEA Field Team, Reg. III

From: Superintendent, Denver Experiment Station, Reg. III

Subject: Docket DMEA 4461 (lead-zinc-copper) Tech-Ser Mining Company (Caledonian Mine) San Juan County, Colorado

The application for Tech-Ser Mining Company, Docket DMEA 4461, was received in this office on October 8, 1956.

A field examination will be made and suitable report prepared by an engineer from the Denver office.

W. H. KING

W. H. King

cc: W. M. Traver (2)
E. N. Harshman
J. F. Shaw
Sec. Op. Com. (2)

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

September 24, 1956

Re: DMEA 4461; Pb-Zn-Cu;
$131,320
Tech-Ser Mining Co.,
Silverton, Colo.
Caledonian Mine
San Juan County, Colo.

Memorandum

To: W. R. Griswold, DMEA

From: O. M. Bishop, Branch of Base Metals

Subject: Review of application dated September 7, and received September 12, 1956

The applicant proposes a 2-stage drifting program to explore downward extensions of known ore shoots. Stage I consists of 1,200 feet of drifting from the face of the Lower Main tunnel at 11,000-foot elevation. Stage II which is predicated on success in Stage I provides for 1,600 feet of drifting from the face of the Livingston drift 500 feet below the work of Stage I. Each drift explores a separate vein system and each explores the intersection of the two systems.

Although past production appears to have been some 2,000 tons of mixed lead-zinc-silver-copper ore with a net smelter value of about $21 per ton, there is about 16,000 tons of developed and some 48,000 tons of indicated ore in relatively narrow veins and there appears to be a reasonable expectation that similar ore can be found in depth on the two vein systems to be explored

I recommend that the application be referred to the Field Team for review and field examination if such be needed.

O. M. Bishop

O. M. Bishop

Copy to: Division of Minerals
Mr. Kiilsgaard
Mr. Lamb
Mr. Bishop
Files

R
SE

IN REPLY REFER TO:

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY
WASHINGTON 25, D. C.

RECEIVED
SEP 18 1956

September 18, 1956

Memorandum

To: W. R. Griswold, Defense Minerals Exploration Administration

From: W. P. Williams, U. S. Geological Survey

Subject: Review of application, DMEA 4461, Tech-Ser Mining Company, Caledonian Mine, San Juan County, Colorado, (lead, zinc, copper).

The applicant proposes to explore for lead, zinc, copper, and silver deposits in the old Caledonian mine. The exploration work would consist of a total of 2,800 feet of drifting to be done in two stages. The proposed work would explore for extensions of two known vein systems on two different mine levels.

Past production from the Caledonian mine does not appear to have been large. The applicant estimates 16,606 tons of indicated and 47,830 tons of inferred reserves exist on the property. There is no mining going on at present although the applicant states some mine development and retimbering is being done.

The property should be evaluated in the field. It may be that the proposed project consisting entirely of blind drifting along the two veins, hoping that ore will show up 'with the next round', is not suitable as a DMEA project at this time.

I recommend that the application be referred to the Field Team for examination and report.

WPWilliams:iml
G-9/18/56

W. P. Williams

cc: Director's reading, 4212
Branch reading, 4212
DMEA (3)
Docket file
O. M. Bishop, 3617

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

RECEIVED
SEP 12 1956

224 New Customhouse
Denver 2, Colorado

September 10, 1956

Memorandum

To: Secretary to the Operating Committee, DMEA

From: DMEA Field Team, Region III

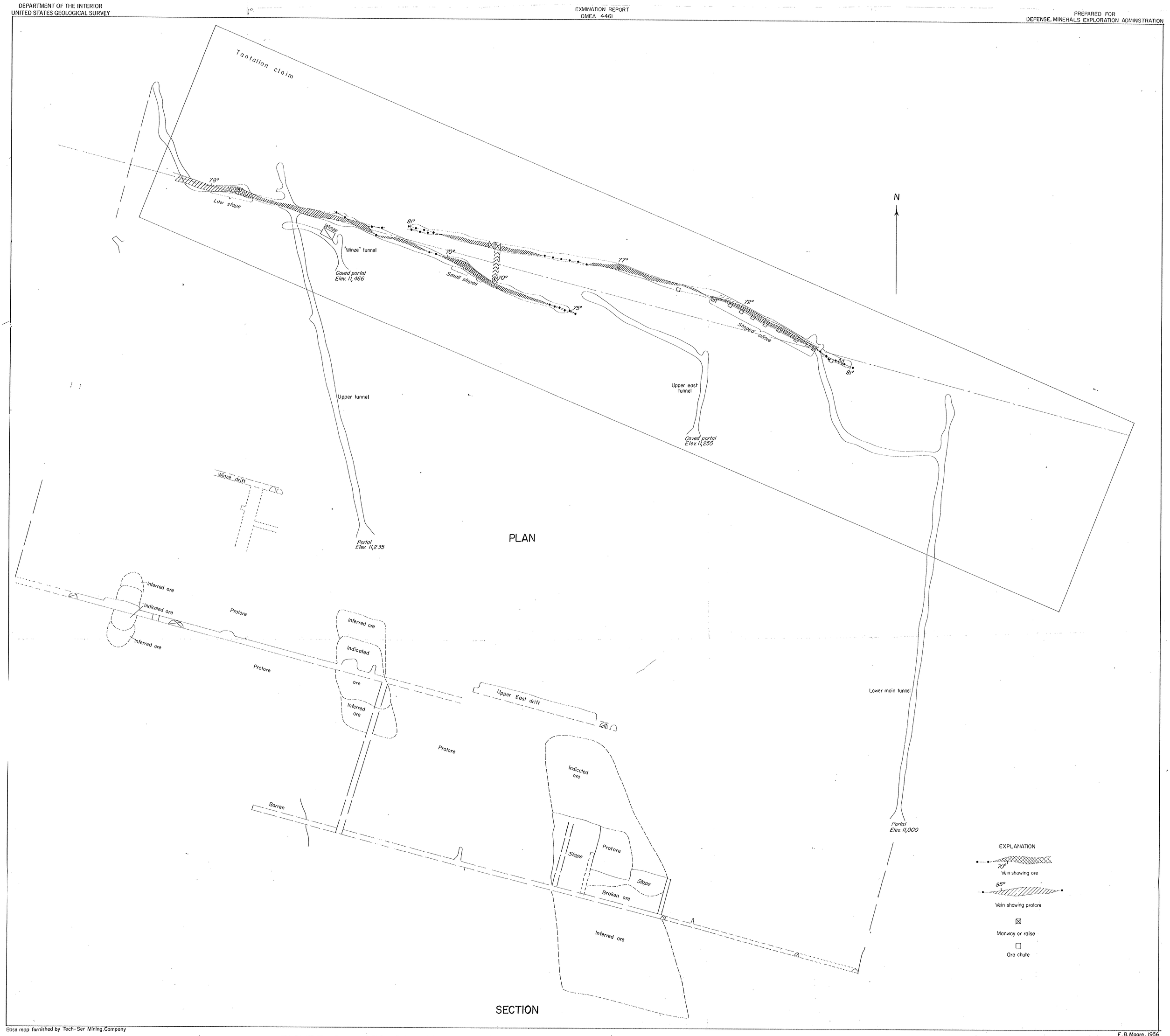
Subject: Application for DMEA Aid (Lead-Zinc-Copper), Tech-Ser Mining Company (Caledonian mine), San Juan County, Colorado.

Enclosed are three copies of the subject application, in the amount of $131,320.00. One copy of the application is being retained in our files.

DMEA Field Team, Region III

By W. M. Traver
W. M. Traver
Executive Officer

Enclosures

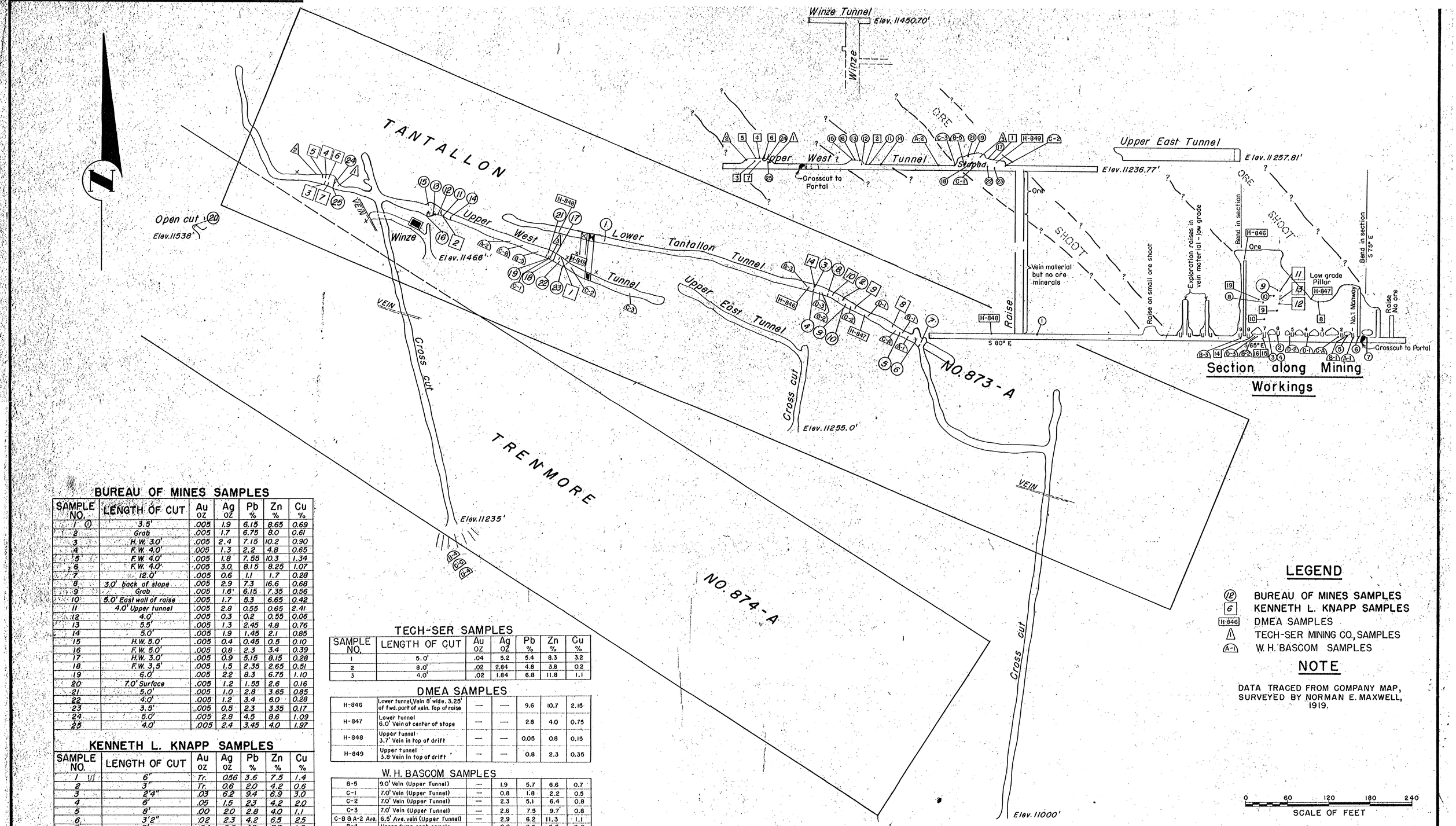


Base map furnished by Tech-Ser Mining Company

F. B. Moore, 1956

FIGURE 4 —. GEOLOGIC MAP AND SECTION OF THE CALEDONIAN MINE, SAN JUAN COUNTY, COLORADO.

50 0 150 Feet



BUREAU OF MINES SAMPLES

SAMPLE NO.	LENGTH OF CUT	Au oz	Ag oz	Pb %	Zn %	Cu %
1 (1)	3.5'	.005	1.9	6.15	8.65	0.69
2	Grab	.005	1.7	6.75	8.0	0.61
3	H.W. 3.0'	.005	2.4	7.15	10.2	0.90
4	F.W. 4.0'	.005	1.3	2.2	4.8	0.65
5	F.W. 4.0'	.005	1.8	7.55	10.3	1.34
6	F.W. 4.0'	.005	3.0	8.15	8.25	1.07
7	12.0'	.005	0.6	1.1	1.7	0.28
8	3.0' back of stope	.005	2.9	7.3	16.6	0.68
9	Grab	.005	1.6'	6.15	7.35	0.56
10	5.0' East wall of raise	.005	1.7	5.3	6.65	0.42
11	4.0' Upper tunnel	.005	2.8	0.55	0.65	2.41
12	4.0'	.005	0.3	0.2	0.55	0.06
13	5.5'	.005	1.3	2.45	4.8	0.76
14	5.0'	.005	1.9	1.45	2.1	0.85
15	H.W. 5.0'	.005	0.4	0.45	0.5	0.10
16	F.W. 5.0'	.005	0.8	2.3	3.4	0.39
17	H.W. 3.0'	.005	0.9	5.15	8.15	0.28
18	F.W. 3.5'	.005	1.5	2.35	2.65	0.51
19	6.0'	.005	2.2	8.3	6.75	1.10
20	7.0' Surface	.005	1.2	1.55	2.6	0.16
21	5.0'	.005	1.0	2.8	3.65	0.85
22	4.0'	.005	1.2	3.4	6.0	0.28
23	3.5'	.005	0.5	2.3	3.35	0.17
24	5.0'	.005	2.8	4.5	8.6	1.09
25	4.0'	.005	2.4	3.45	4.0	1.97

KENNETH L. KNAPP SAMPLES

SAMPLE NO.	LENGTH OF CUT	Au oz	Ag oz	Pb %	Zn %	Cu %
1 (1)	6'	Tr.	0.56	3.6	7.5	1.4
2	3'	Tr.	0.8	2.0	4.2	0.6
3	2'4"	.03	6.2	9.4	6.9	3.0
4	6'	.05	1.5	2.3	4.2	2.0
5	8'	.00	2.0	2.8	4.0	1.1
6	3'2"	.02	2.3	4.2	6.5	2.5
7	3'	.04	2.6	4.3	7.3	1.5
8	7'	.00	2.3	6.8	7.9	0.8
9	5'8"	.00	1.9	3.8	5.3	0.9
10	3'	Tr.	1.44	3.8	7.6	1.0
11	Grab	.01	2.6	8.9	16.0	1.1
12	Grab	.01	2.1	6.8	8.7	0.7
13	Grab	.01	2.1	7.0	10.1	0.71
14	4'5"	.01	1.8	2.9	5.2	0.75
15	Car Grab	.02	3.3	3.8	5.9	0.9
16		.013	2.22	4.81	7.15	1.26

TECH-SER SAMPLES

SAMPLE NO.	LENGTH OF CUT	Au oz	Ag oz	Pb %	Zn %	Cu %
1	5.0'	.04	5.2	5.4	8.3	3.2
2	8.0'	.02	2.84	4.8	3.8	0.2
3	4.0'	.02	1.84	6.8	11.8	1.1

DMEA SAMPLES

H-846	Lower tunnel, Vein 8' wide. 3.25' of fwd. part of vein. Top of raise	—	—	9.6	10.7	2.15
H-847	Lower tunnel 6.0' Vein at center of stope	—	—	2.8	4.0	0.75
H-848	Upper tunnel - 3.7' Vein in top of drift	—	—	0.05	0.8	0.15
H-849	Upper tunnel 3.8 Vein in top of drift	—	—	0.8	2.3	0.35

W. H. BASCOM SAMPLES

B-5	9.0' Vein (Upper Tunnel)	—	1.9	5.7	6.6	0.7
C-1	7.0' Vein (Upper Tunnel)	—	0.8	1.8	2.2	0.5
C-2	7.0' Vein (Upper Tunnel)	—	2.3	5.1	6.4	0.8
C-3	7.0' Vein (Upper Tunnel)	—	2.6	7.5	9.7	0.8
C-B & A-2 Ave.	6.5' Ave. vein (Upper Tunnel)	—	2.9	6.2	11.3	1.1
B-4	Upper dump grab sample	—	2.8	2.5	6.5	2.0
C-C & D-4 Ave.	Upper dump grab sample	—	2.4	3.3	5.8	1.5
A-1	6.0' Vein (Lower Tunnel)	—	3.8	3.1	5.3	0.3
B-1	5.5' Vein (Lower Tunnel)	—	2.6	1.6	4.1	0.6
B-2	5.3' Vein (Lower Tunnel)	—	4.4	8.2	9.8	1.6
B-3	4.5' Vein (Lower Tunnel)	—	2.2	1.9	4.4	1.1
C-A	6.0' Vein (Lower Tunnel)	—	3.6	3.1	5.3	0.3
D-1	6.0' Vein (Lower Tunnel)	—	0.8	2.8	5.2	0.5
D-2	8.0' Vein (Lower Tunnel)	—	2.3	5.1	6.4	0.5
D-3	8.0' Vein (Lower Tunnel)	—	2.6	7.5	9.7	0.8
	Ave. of mill bin fines	—	3.8	4.9	6.6	N.A.

LEGEND

- (12) BUREAU OF MINES SAMPLES
- 6 KENNETH L. KNAPP SAMPLES
- H-846 DMEA SAMPLES
- △ TECH-SER MINING CO. SAMPLES
- A-1 W. H. BASCOM SAMPLES

NOTE

DATA TRACED FROM COMPANY MAP, SURVEYED BY NORMAN E. MAXWELL, 1919.

0 60 120 180 240
SCALE OF FEET

FIGURE 3 - SAMPLING MAP, TECH-SER MINING COMPANY, CALEDONIAN MINE, SAN JUAN COUNTY, COLO. DMEA 4461

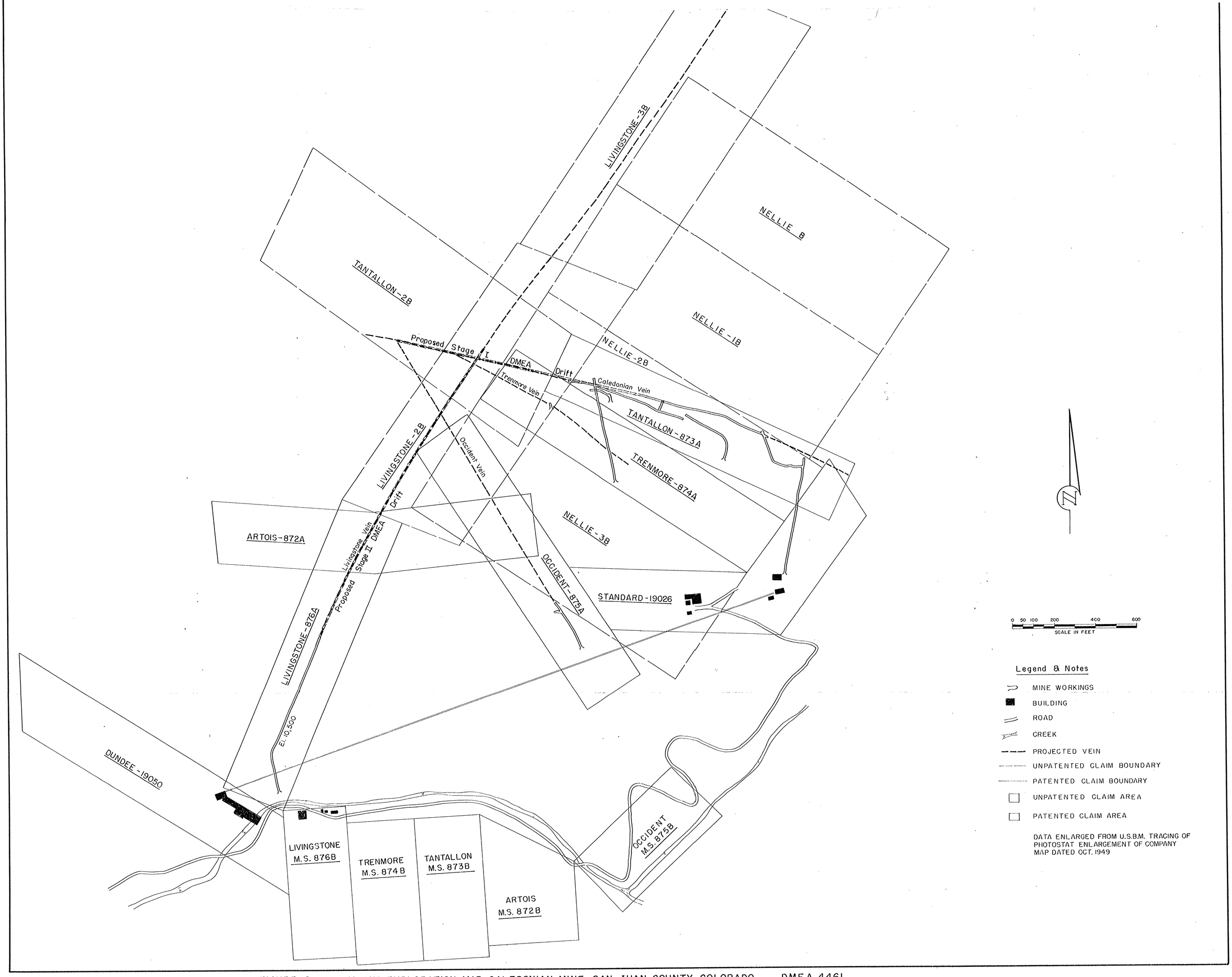


FIGURE 2 - CLAIM AND EXPLORATION MAP, CALEDONIAN MINE, SAN JUAN COUNTY, COLORADO. DMEA 4461

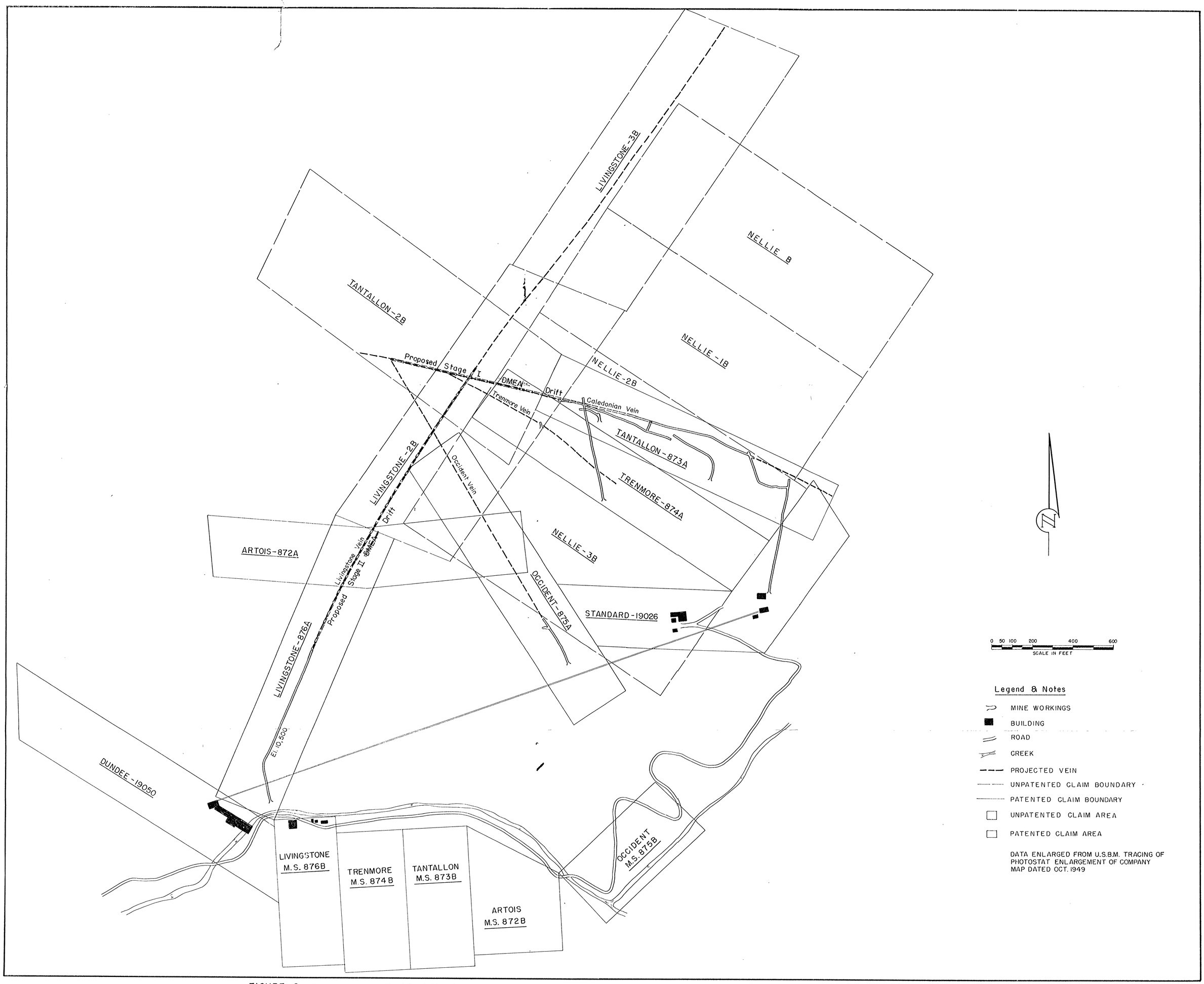


FIGURE 2 - CLAIM AND EXPLORATION MAP, CALEDONIAN MINE, SAN JUAN COUNTY, COLORADO. DMEA 4461

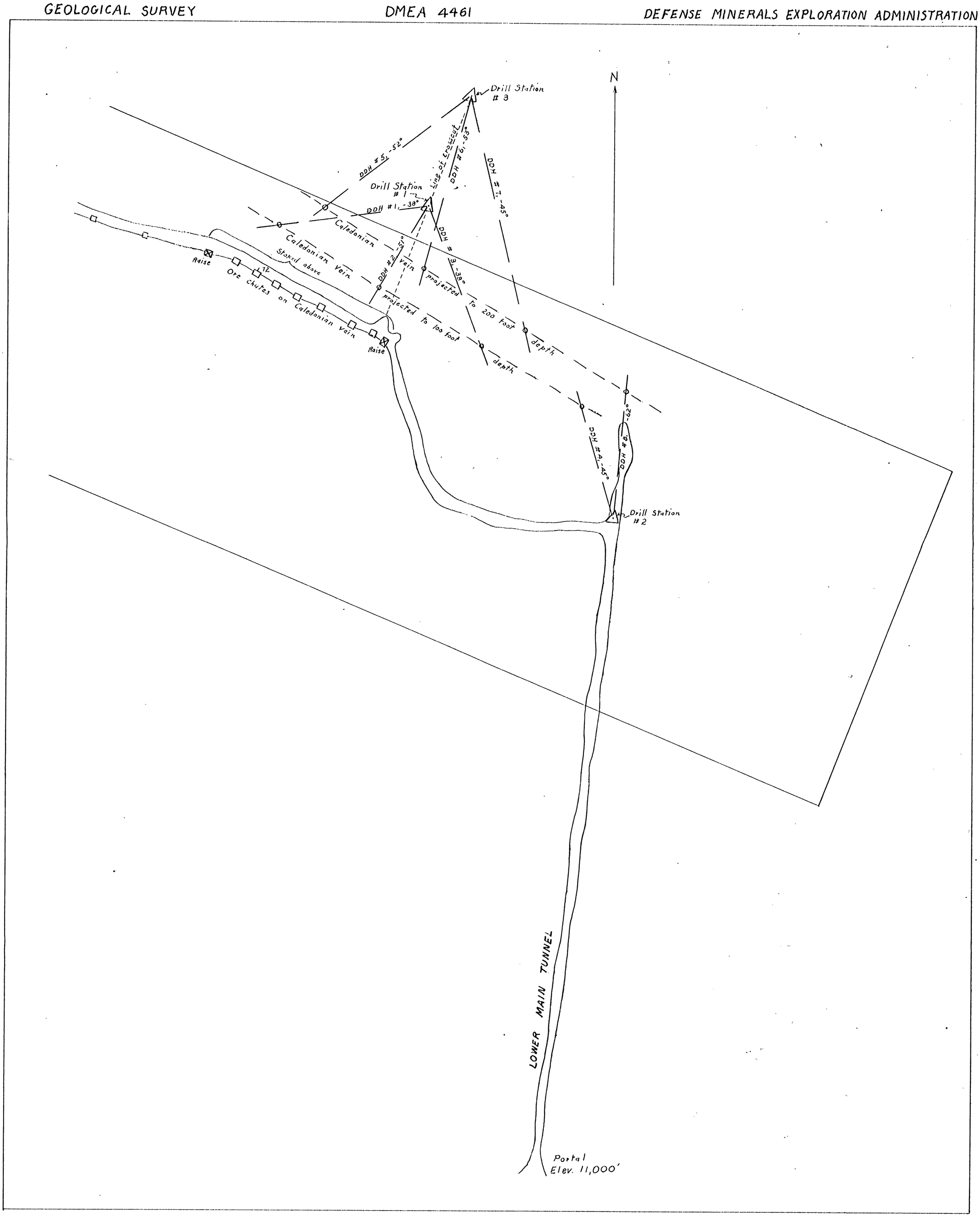


FIGURE 1.- PLAN SHOWING LOCATION OF EXPLORATORY DRILL HOLES, CALEDONIAN MINE, SAN JUAN COUNTY, COLORADO

50 0 50 100 150 FEET