United States Department of the Interior

Oscar L. Chapman, Secretary

Defense Minerals Administration

Report by Examination Team, Region II

DMA-316 F. J. Cardinal, Lost Trail Mine,
Okanogan Co., Washington

Neil Daly, Mining Engineer, U. S. Bureau of Mines

E. E. Klepper, U. S. Geological Survey

May 22, 1951

Lost Trust Mine
Stevens County, Washington

BM Docket 316

RECOMMENDATIONS

The Field Team recommends that the applicant's original proposal be modified to mine by open pit method 20,000 tons of rock, of which 16,000 will be milled in a 75-ton jig plant and that a loan of $10,000 be granted to carry out this modified proposal. The technical feasibility and details of the operation are analyzed elsewhere in this report.

APPLICANT

The applicant is F. J. Cardini, 308 Norfolk Building, Spokane, Washington.

LOCATION

The Lost-Trust mining property is in secs. 7 and 18, T. 39 N., R. 42 E. and secs. 12 and 13, T. 39 N., R. 41 E., Stevens County, Washington. The property is 22 miles east of Northport, Washington, which is on U. S. Highway 20 and the Spokane-Nelson branch of the Great Northern Railroad. The altitude at the property is about 5,500 feet.

Two miles of mountain road in good condition for the class connects the mine with the improved road at Lodgepole, Washington. The county road also serves the nearby Anderson mine of the Goldfield Consolidated Mines Company.

OWNERSHIP

The following unpatented mining claims in the vicinity of the Lost Trust mine are held by location by the applicant:

Lost Trust Extension No. 1
" " No. 2
" " No. 3
" " No. 4

The following unpatented mining claims are held by location and a patented timber and stone claim is owned by R. F. Cotter of Spokane, Washington (see claim map attached):

Great Northern No. 1
Do No. 2
Northport
Lone S
Patented stone and timber claim comprising
the S½, NE¼, SW¼, sec. 12, T. 39 N., R. 41 E.

The applicant has a lease with option to buy the property owned by R. F. Cotter. There are no liens or encumbrances against any of the claims.

HISTORY

The original claims on which the mine has been developed were located in 1900 1/. Intermittent small shipments of high-grade lead ore have been made throughout the years. The aggregate production has been variously reported at 30,000 tons 2/ and 100 3/ tons of ore. Rough measurements by the field force of workings in ore indicate that the production of ore has probably been greater than 100 tons but much less than 30,000 tons.

In October 1930 the applicant made a shipment from the mine of 93 tons of ore that yielded the following metals:

Lead	3,310 lb.
Zinc	[illegible] lb.
Silver	7.17 oz.

EQUIPMENT AND FACILITIES

Mining and milling equipment on the property consists of the following items:

1. 160 cubic foot portable compressor
2. Jackhammers
3. Shaker
4. Lagger

1/ Ruby, E. H., The Metal Mines of Washington: Wash. Geol. Survey, Bul. 23, p. 104, 1928.
2/ Jenkins, Olaf P., Lead Deposits of Pend Oreille and Stevens Counties, Wash: Wash. Dept. Conn. and Develop., Div. of Geol., Bul. 23, p. 93, 1926.
3/ Report by E. S. Campbell attached.

300 Ft. (approx.) of 2-inch pipe
100 Ft. (approx.) of rubber hose
1 8-inch x 10-inch jaw crusher
1 set 14-inch crushing rolls
1 McCormick Deering tractor with dozer blade. (This tractor not adequate for mining purposes--will be used for road maintenance, etc. only.)

The applicant plans to purchase the remainder of the milling equipment needed for the jig plant in Spokane, Washington. Most of this will be used equipment.

LABOR SUPPLY

The labor supply does not appear to be a critical factor in relation to the operation. It is anticipated that only six men will be employed at the mine and mill. Wages for miners and mill operators will be approximately $12.00 per shift.

POWER

Gasoline engines will be used to power the mill and the compressor at the mine. The nearest three-phase electric power line is at Spirit, about 10 miles south of the mine.

TRANSPORTATION

The mine is 40 miles from the Consolidated Mining and Smelting Co. smelter at Trail, British Columbia. It is estimated that concentrate can be trucked from the mill to the smelter at Trail for $5.00 per ton. The principal mining supply center for the area is Spokane, Washington, 120 miles south of the mine.

TECHNICAL FEASIBILITY

The Lead Trust mine explores two sub-parallel zones of fractured and in part brecciated dolomite of the Metaline limestone. These zones strike east-northeast, dip moderately to steeply northwest and are about 650 feet apart. Ore bodies within these zones consist of galena, limonite, coarsely crystalline dolomite and siderite but contain virtually no zinc. The geology of the mine has been described by G. D. Campbell of the Geological Survey, and a copy of his report is attached. The applicant proposes to mine by open pit method near-surface ore from the south zone. Therefore, the following discussion concerns only that zone.

The south zone has been explored by three adits, the lowest of which is now inaccessible, and a number of irregular interconnected winzes, raises, and stopes (see map attached). Examination of these workings suggests that the principal ore body was a south-dipping lens up to 50 feet long and 8 feet thick where drainage extension below the No. 2 level was a pipe several feet in diameter. This lens has been stoped to within 40 feet of the surface. A good zone of lead ore recently exposed at the surface by the applicant appears to be the outcrop of this lens. The fractured dolomite adjacent to the main ore lens-pipe has been permeated by stringers and small veinlets of galena. The principal ore body appears to be related to east-trending, south-dipping fractures, but no obvious control for this alignment. Lower grade mineralization has been recognized, and have the limits of the lower grade ore been determined. The mineralization is so erratic that it would be unnecessarily costly to attempt to block out a reserve in advance of mining. In this connection it should be pointed out that Campbell's estimate of reserve is for ore in sheets only and does not include the concept of low-grade disseminated ore.

The applicant proposes to mine by open-pit method this zone of low-grade ore which contained central portions of the high-grade body and to concentrate the ore in a 75 ton jig plant to be constructed on the property. In his application he cites a reserve of 98,000 tons of 3-35 Pb ore to a depth of 300 feet, one-third of which he considers to be measured and two-thirds inferred. The Field Team considers these estimates to be high and the proposal to open pit to a depth of 300 feet to be impracticable. Nevertheless, the Team believes that there is a real possibility to profitably mine a smaller quantity of ore from a shallower open pit (maximum depth 30'-35'). The reserve to be mined cannot be considered as measured, but part is indicated and the remainder inferred on a geologic basis. Sampling of surface and underground exposures in this block suggests that a grade of approximately 35 Pb can be attained by rejecting as waste about half of the rock mined from an open pit whose limits would be about as shown on the accompanying map.

The Field Team submits the following analysis of a small scale open-pit operation that appears to be feasible:

Surface area of pit 110' x 125'
Maximum depth - 50'; average depth 35'
Estimated total tonnage to be mined - 26,000, of which 13,000 tons are expected to average 2.5% Pb, 1,000 tons to average 7.0% Pb, and the remainder of 11,400 tons to be rejected as waste.

Pb content:

13,000 tons @ 2.5% Pb	650,000 lbs.
1,000 tons @ 7% Pb	140,000 lbs.
Total lead content of ore	790,000 lbs.
Recoverable Pb @ 75%	592,500 lbs.
Gross value of recovered Pb at prevailing smelter schedule $0.14A per lb.	$83,328.00

Estimated Costs:

Preparation for mining and milling:	
Labor on mill construction, road repair, etc.	$ 4,000.00
Mining (2-shift basis) in 26,000 tons @ $0.70 per ton.	25,760.00
Milling (including transportation) 2-shift basis: 14,000 tons @ $1.50 per ton	21,000.00
Trucking concentrate @ $1.00 per ton	1,170.00
Smelting: 494 tons of 60% Pb concentrate @ $10.20 per ton.	5,000.00
Royalty - 10% net smelter return	8,000.00
Taxes and interest	3,000.00
Depreciation of equipment and mill	3,500.00
Provision to repay loan	10,000.00
Contingencies	5,500.00
Total estimated cost	$76,330.00
Indicated net profit	7,030.00

The estimated income of the operation outlined above would be sufficient to repay the small government loan requested and to net the operator a $7,000 profit. Furthermore, the work would serve to explore a geologically favorable zone and might indicate a reserve of sufficient tonnage and grade beneath the pit floor to justify underground mining operations, which might take the form of glory-hole to the No. 2 tunnel level.

The applicant is prepared to commence operations as soon as a loan is granted. He states that he can have the jig plant and open pit prepared for operation within three months, at which time he will commence mining and milling operations. To mine and mill the block of ore outlined herein will require about twelve months. The total time anticipated to complete all phases of the proposed project is therefore about fifteen months.

AMOUNT OF REQUESTED FUNDS

An estimate of the cost of mining and milling equipment to be purchased, plus labor to install equipment and to get the project into production is as follows:

Mining

1	Wagon drill	$1150.00	
1	Air Compressor, 315 cu. ft.	4000.00	
300	Ft. 2-inch pipe,	150.00	
100	Ft. hose,	100.00	
	Contingencies, 10%	500.00	
			$5900.00

Milling

Lumber for building 20' x 70'	$1000.00	
Metal roof	250.00	
Pan-American jig, 2-42" x 42" cells	1900.00	
Sand drag	125.00	
100 hp. gasoline power plant	1900.00	
Belts, pulleys, shafts, etc.	400.00	
Water pump with gasoline engine	700.00	
900 Ft. 2-inch pipe	450.00	
Contingencies, 10%	600.00	
		$6925.00

Total Capital Expenditure $12825.00

The operator will put up the $2825.00 difference between the amount of the loan requested and the total capital expenditure as well as funds necessary to sustain the operation until smelter payments are received. Provision for depreciation and partial amortization has been provided for in the table of costs in the section on technical feasibility.

Mining Cost Recapitulation

Mining costs per shift - 150 tons

Rental on TD-6 tractor fully operated with dozer blade-(this tractor used for excav. & dozing ore to loading bin.	$ 65.00
2 Miners	30.00
Supplies (fuel, powder, etc.)	40.00
Total mining costs per day	$135.00

$\frac{135}{150}$ = $.90 per gross ton mined.

Milling costs per shift - 75 tons

3 mill men	$ 45.00
Truck (hauling ore to mill)	50.00
Supplies	17.50
Total mill cost per day	$112.50

$\frac{112.50}{75}$ = $1.50 per ton milled.

Total Direct Mining and Milling Costs

28,400 tons mined @ $.90/ton	$23,760.00
14,000 tons milled @ $1.50/ton	21,000.00
Trucking 494 tons concentrate to smelter @ $5.00/ton	2,470.00
Smelting 494 tons concentrate at $10.29/ton	5,080.00
Contingencies	6,000.00
Total direct costs	$63,130.00*

COMPETENCE OF APPLICANT

The Field Team believes that the applicant is competent to operate a small mine and gravity lead plant. During the past 15 years he has operated the Silver Trail and Admiral Consolidated mines and the Ark mill, all in Stevens County, Washington. He appears to be a man of integrity and sound judgment.

*For total cost, including indirect expenses, see table in section on Technical Feasibility.

The operator will pay up the $[illegible] difference between the amount of the loan requested and the total capital expenditure so will be funds necessary to complete the operation until revenue is produced. Provision for depreciation and profit [illegible] depletion has been provided for in the table of costs in the section on Economical Feasibility.

Mining Stock Reconstitution

Mining costs per shift - 10 hours

Rental on 20-ft trucker with dozer blade	$ 35.00
Stone operator	[illegible]
2 Miners	30.00
Supplies (fuel, powder, etc.)	[illegible]
Total mining costs per day	[illegible]

[illegible] = $.99 per gross ton mined.

Milling costs per shift - 20 hours

3 mill men	$ 45.00
Truck (hauling ore to mill)	[illegible]
Supplies	[illegible]
Total mill costs per day	[illegible]

[illegible] = $1.90 per ton milled.

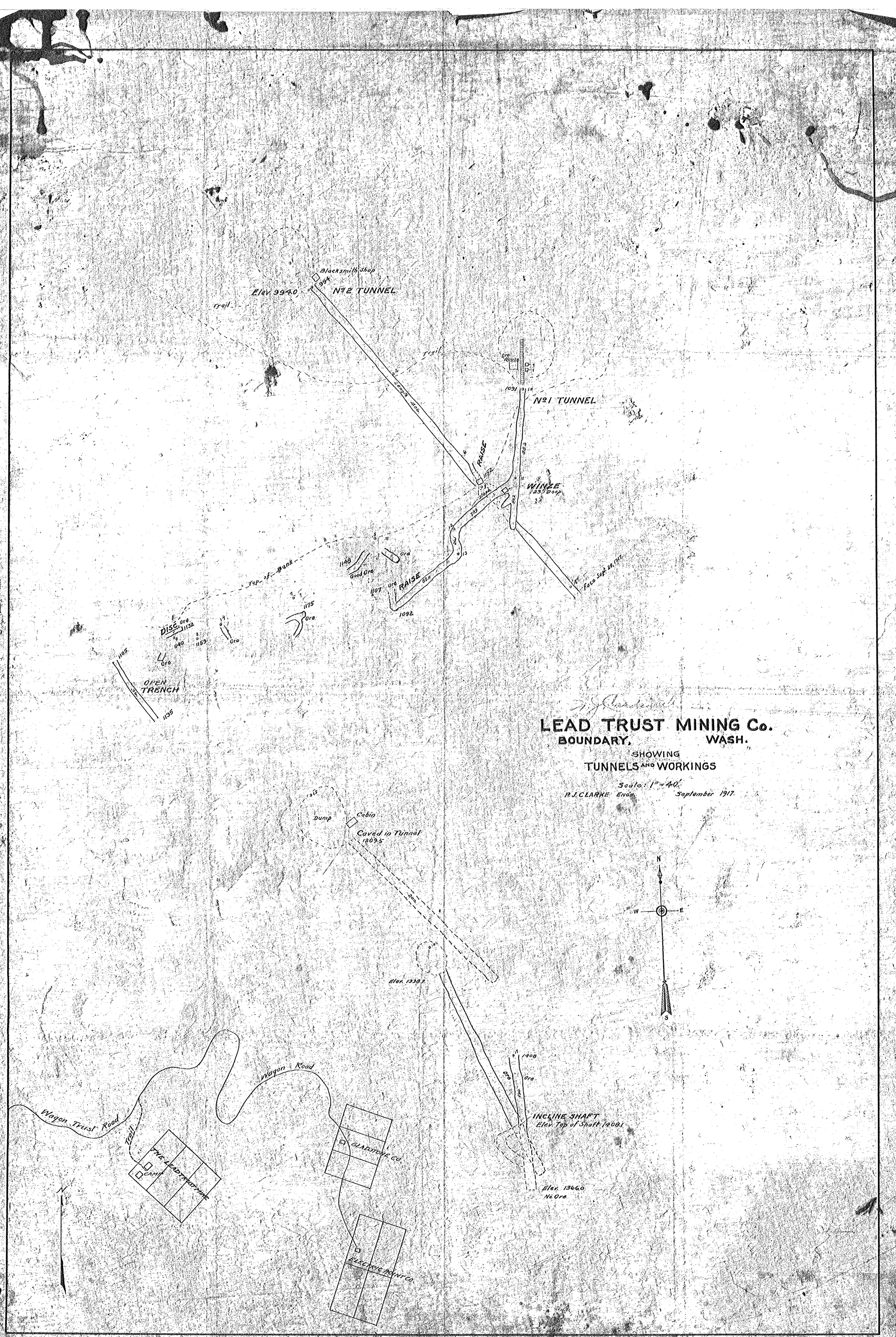
Total Direct Mining and Milling Costs

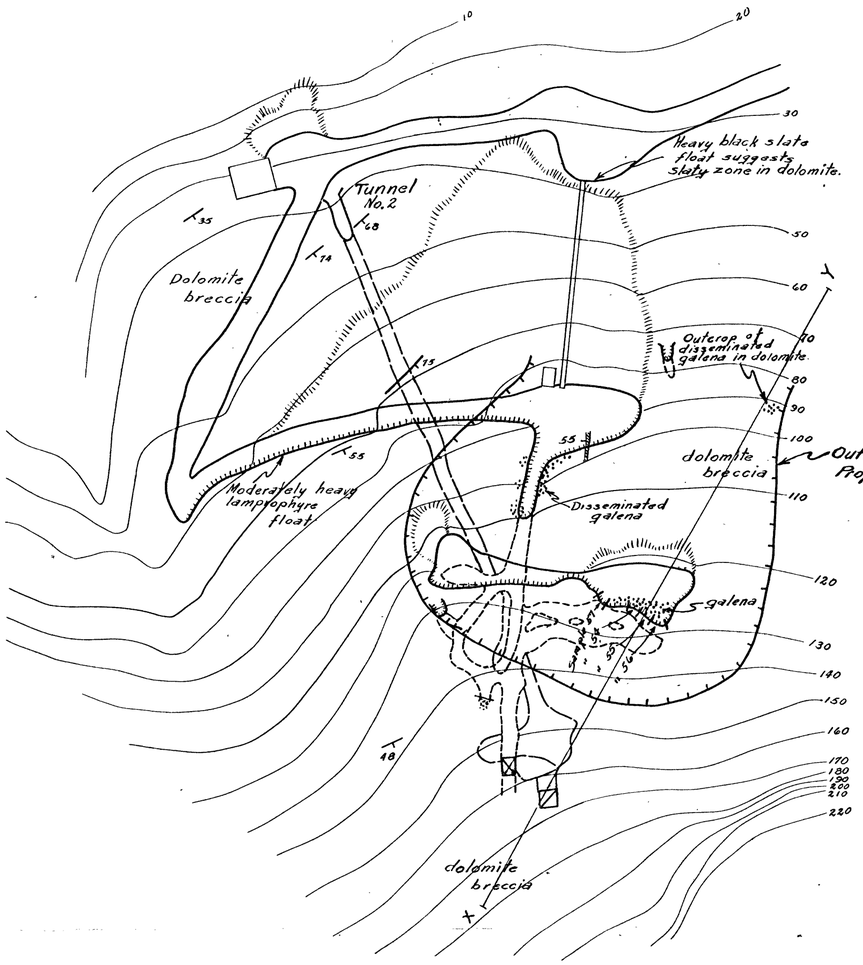
20,000 tons mined @ $.99/ton	$19,800.00
14,000 tons milled @ $1.90/ton	26,600.00
Trucking 18% tons concentrate to smelter @ $4.00/ton	2,470.00
Smelting 18% tons concentrate at $10.00/ton	6,000.00
Contingencies	[illegible]
Total direct costs	$[illegible]

CONFIDENCE OF APPLICANT

The Field Team believes that the applicant is competent to operate a small mine and gravity load plant. During the past 15 years he has operated the Silver Trail and Alpine Consolidated mines and the Ace mill, all in Stevens County, Washington. He appears to be a man of integrity and sound judgment.

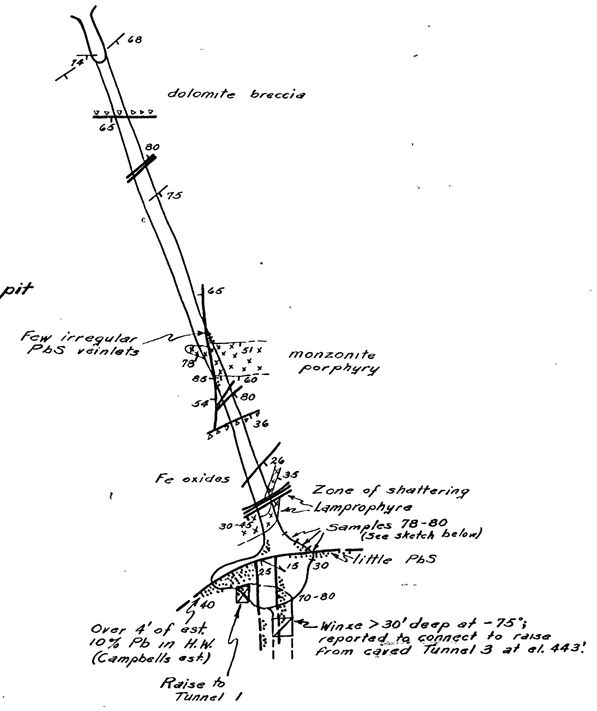
The total cost, including indirect expenses, see table in section on Economical Feasibility.


LEAD TRUST MINING Co.
BOUNDARY, WASH.
SHOWING
TUNNELS AND WORKINGS
Scale: 1" = 40'
R.J. CLARKE Engr.
September 1917.
N
W
E
S
Blacksmith Shop
994
Elev. 994.0
No 2 TUNNEL
Trail
Trail
Ore House
No 1 TUNNEL
Length 406.
RAISE
1152
Store
WINZE
123' Deep
Top of Bank
1140
Good Ore
Ore
RAISE
1107
Ore
1092
Face Sept 28, 1917.
DISC
Ore
1132
1140
1153
Ore
1115
Ore
1105
Ore
OPEN TRENCH
1135
Dump
Cabin
Caved in Tunnel
1209.5
Elev. 1338.7
1408
Ore
Ore
INCLINE SHAFT
Elev. Top of Shaft 1408.1
Elev. 1366.0
No Ore
Wagon Road
Wagon Trust Road
Trail
THE LEAD TRUST MINE
CAMP
GLADSTONE Co.
ELECTRIC POINT Co.
N



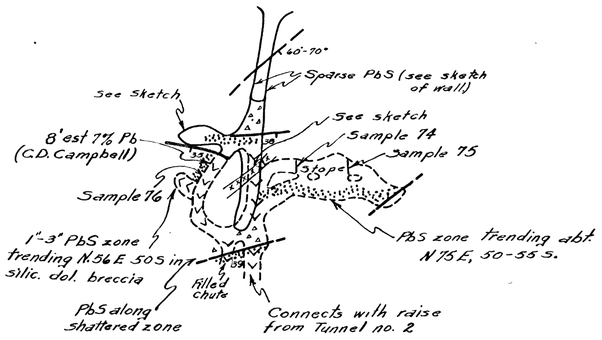
COMPOSITE SKETCH MAP

1" = 40'
C.I. = 10'
Datum assumed



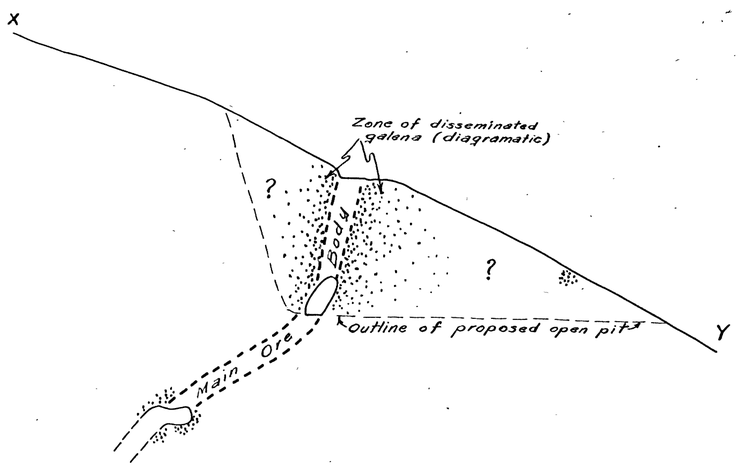
TUNNEL No. 2

1" = 40'



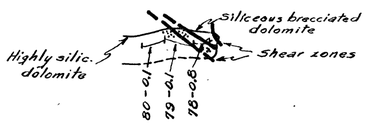
TUNNEL No. 1

1" = 40'



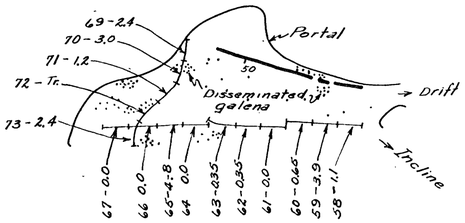
CROSS-SECTION X-Y

1" = 40'



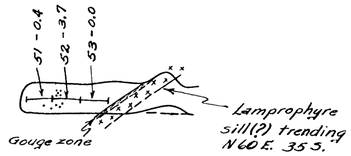
SKETCH of wall near breast of Tunnel 2

1" = 20'



SKETCH, east face portal Tunnel 1

1" = 20'



SKETCH, west face, south trending crosscut Tunnel 1

1" = 20'

ADVANCE or TRIAL COPY
Not Yet Approved For Official Release Subject to Revision and Revision. Your Comments Are Invited
U. S. GEOLOGICAL SURVEY

Geology modofied after C.D. Campbell by E.T. Ruppel, U.S.G.S.
Sampling by U.S. Bureau of Mines.

LEAD TRUST MINE

Stevens County Washington