FORM C.O. 77-2

UNITED STATES SMELTING REFINING AND MINING COMPANY

3103-B

NINTH FLOOR NEWHOUSE BUILDING
P. O. BOX 1980 SALT LAKE CITY 10, UTAH

Salt Lake City, Utah, AUGUST 6, 1962

Purchased From F. W. EISEIE — Liberty Gem

Pay F. W. EISEIE, BOX 565, HAILEY, IDAHO

Shipping Point: HAILEY, IDAHO

Lot No. 1 Product CRUDE Mine LIBERTY 50% GEM Gold License No.

Sampled by TOCEIE Received 7-19-62 Sampled 7-21-62 Assayed 8-2-62

Metal Quotations—Gold 34.9125 Silver 1.0475 Copper, N. Y. Lead, N. Y. Zinc, E. St. L.

ASSAYS	GOLD OZS. PER TON	SILVER OZS. PER TON	COPPER %	LEAD %	INSOLUBLE %	IRON %	ZINC %	SULPHUR %	LIME %	Arsenic %	NON-SULPHIDE LEAD %	NON-SULPHIDE ZINC %
U. S. S. R. & M. Co.				2.10								
Umpire												
Less ~~[illegible]~~				1.50								
Settlement	.15	103.45	.20	.60	87.6	2.10	.60	tr	.80	.15		

CAR NOS.	NET WEIGHT
Truck	
Total Weight	
Wet Weight	12000
Moisture 0.44%	53
Dry Weight	11947

METAL VALUES		
Gold 100 % @ 31.8183	4	77
Silver 95 % @ 1.0475	102	95
Copper		
Lead		
Zinc		
Total Metal Value	107	72
Less Treatment Charge	25	00

TREATMENT CHARGES	DEBIT	CREDIT
Based on % Lead		
Variation from % Lead		
Labor		
Insoluble		
Zinc, excess over %		
Sul., excess over %		
As., excess over %		
Iron		
Lime		
Net Treatment Charge		

Payment for 5.9735 Dry Tons @ 82 72 Per Ton 494 13

	Per Ton	Wet Tons @	Per Ton	DEDUCTIONS
Freight (Value under				
Handling Charge				15 00
Assay Charge				
Umpire Charge				
Watching Charge				
Hauling 6.000 Wet Tons @ $14.00 Per Ton				84 00
Pay Hauling to: Robert E. Hoaston, 231 East E Street, Jerome, Idaho				
Royalty:				

Total Deductions 99 00

Amount Withheld Pending Receipt of Silver Affidavit

Net Payment 395 13

Rexhubert K.

AMERICAN SMELTING & REFINING REFINING CO.
EAST HELENA PLANT LANT
EAST HELENA, MONTANA NTANA

Form No. 1

Shipper: LIBERTY GEM SILVER MINES, INC. 101 A Rs
Mine:
Class: Shipping Point: HAILEY, IDAHO
Smelter Lot. No. Mine Lot No:

Assays	Gold Oz. Per Ton	Silver Oz. Per Ton
A.S.& R.Co.	0.040	30.2
Shipper		
Umpire		
Settlement		

on	Silver Oz. Per Ton	Wet Lead %	Copper %	Zinc %	Arsenic %	Antimony %	Bismuth %
	30.2	36.8	0.10	11.0	1.40	0.49	

ONE TON SAMPLE SETTLEMENT.

Assay Deduction
1.5

H_2O	Wet Weight	Dry Weight	Dry Tons	Wet Tons
		2,000		
	2,000	1,000		

Assay Deduction	Percent Pay	METAL	Pay Quotation	Quotation Deduction
	100	Gold	31.81825	
	95	Silver	1.289	.01
1.5	90	Lead	.15	.0225
		Copper		

Date of A

Date of Arrival: NOVEMBER 13, 1964

Settlement Assay		Total Content	Assay Ded.		Percent Pay	
4.00	Gold	.04			100.00	
3,020.00	Silver	30.20			95.00	
3,680.00	Lead	736.00	150.00		90.00	
10.00	Copper	2.00				

	Pay Content	Pay Quotation	Quot. Ded.	Net to Shipper
	.04	31,818.25		1.27
	28.69	1,289.00	10.00	36.69
	635.40	150.00	22.50	81.01
	.00			

SPECIAL CHARGE $10.00

LABOR ADJUSTMENTS CHARGES

EAST HELENA RATE	CONTRACT RATE	DIFFERENCE	CHARGES

Dry Tons X Total Contract Deductions				
Sampling				
Lbs. of Pb (Pay Content)				
Lbs. of Cu. (Pay Content)				
Tons of Pb & Cu X Bullion Frt. Act.				
Tons of Pb & Cu X Bullion Frt. Cont.				
Sub-Total				118.97S
Wet tons X Frt. Rate	tions	ST 6	1,000.00S	10.00
Sub-Total				10.00
Advances	ct.	PR		
Hauling	ont.			
Umpires		ST 5		
		ST 5		
Net Proceeds				108.97*

FEDERAL RESOURCES CORPORATION
BELLEVUE MILL
P. O. Box 158 Hailey, Idaho

Purchased from:
Liberty Gem Silver Mines Inc
% Earl Copley
P.O. Box 913
Jerome, Idaho

Bellevue Mill Lot No. 64-11-5 Date 11-17-64

Shipper's Lot No. 3 Product Mine Liberty Gem
Open Stope @ KC-Dr. [illegible]

Metal Market: Gold Silver 1.989 Lead .15 Zinc, E.St.L. .145

ASSAYS	Gold Ozs. Per Ton	Silver Ozs. Per Ton	Lead %	Zinc %				Insol. %	Non-Sulphide % Lead	Non-Sulphide % Zinc	
Bellevue Mill		13.35	14.30	16.05					.30	.15	
Shipper											
Ump.											
Less Non-Sulphide		.30	.30	.15							
Settlement		13.05	14.00	15.90							

LOAD NOS.	NET WEIGHT	METAL VALUES PER TON		
1	18430	Gold % @	$	
		Silver 13.05 % @ x 1.989 x 70%	11	77
		Lead 14.00 % @ x 70x70 (150.00-3.75%) = 117.46	73	02
		Zinc 15.90 % @ x 90 per unit	14	31

Net Weight	18430	Total Metal Value	$ 49	10
Moisture % 1.7	770	Less Treatment	5	00
Dry Weight	18710	Net Per Ton	$ 44	10

Payment for 9.105 Dry Tons @ $ 44.10 Per Ton $ 401.53

	Deductions	
	$	
No Royalty		

Total Deductions	$ 401	53
NET PAYMENT	$ 401	53

FEDERAL RESOURCES CORPORATION
BELLEVUE MILL
P. O. Box 158 Hailey, Idaho

Purchased from: Liberty Gem Silver Mines, Inc.
P.O. Box 913
c/o Pauline Bowery
Jerome, Idaho

Bellevue Mill Lot No. 65-9-1 Date 9-30-64

Shipper's Lot No. 1 Product _____ Mine Liberty Gem Silver 101 ARS.

Metal Market: Gold 35.05 Silver 1.29 Lead .14 Zinc, E. St. L. _____

ASSAYS	Gold Ozs. Per Ton	Silver Ozs. Per Ton	Lead %	Zinc %				Insol. %	Non-Sulphide % Lead	Non-Sulphide % Zinc	
Bellevue Mill											
Shipper											
Ump.											
Less Non-Sulphide											
Settlement	.08	9.00	5.95	.70							

LOAD NOS.	NET WEIGHT	METAL VALUES PER TON		
7	3 75.10	Gold .08 % @ x 35.05 x 70% =	$ 1	78
		Silver 9.00 % @ x 1.29 x 70% =	8	14
		Lead 5.95 % @ x 70 x (.14 - .03 x .7 x 210.24) x 70%	8	95
		Less 70%		

Net Weight	3 75.10	Total Metal Value	$ 18	87
Moisture % 11.8	3 40	Less Treatment	5	00
Dry Weight	3 35.70	Net Per Ton	$ 13	87

Payment for 14.33 Dry Tons @ $ 13.87 Per Ton $ 199.75

	Deductions	
Property:	$	
Guy A. Matthews		
P.O. Box 1418		
E. Jefferson		
Boise, Idaho	19	87

Total Deductions	$ 19	87
NET PAYMENT	$ 178	88

F.H 45—2-62—5M.
Standard.

The Anaconda Company, Anaconda Sampler

RECEIVED FROM F. W. Eisele
ADDRESS Box 565
Hailey, Idaho
MINE Liberty Gem Mine - Ore

ANACONDA, MONTANA,
August 13, 1962
SMELTER LOT B-700 (July a/c)

CAR NUMBER	WEIGHTS			ASSAYS			TREATMENT CHARGE	PRICE PER TON	VALUE	Draft No.
	Pounds Gross	Per Cent Water	Pounds Dry	Per Cent Copper	Ounces Silver	Ounces Gold	Dollars	Dollars	Dollars	
1 Truck	17,250	1.34	17,019	.15	60.00	.022		54.93	467.43	
Sampling Charge									5.00	
									462.43	
Robert Holston, Haul									150.00	
									312.43	

SILICA 86.4
ALUMINA 3.9
IRON 2.4
CaO 0.7

COPY

PAYMENT FOR METALS				
Copper		@	Less 3½c	
Silver	100%	@89.959¢	~~Less 8c~~	53.98
Gold	100%	@$31.81825		0.70
Silica				0.25
Date of Quotations		7/18/62		

TREATMENT

BASE
Add—12c for each 1% Iron
Add—10% of sum of metal payments in excess of $15.00
Deduct—2.5c for each 1% Silica in excess of Alumina
NET TREATMENT - - - - - - -

An extra charge of $5.00 made for sampling all lots under ten tons.

Rates subject to change without notice.

Extensions and footings corect.

The Anaconda Co., Anaconda Sampler

By J. H. McCrea
METALLURGIST

Posted
Noted
mlb

UNITED STATES
DEPARTMENT OF THE INTERIOR
OFFICE OF MINERALS EXPLORATION
GEOLOGICAL SURVEY
So. 157 Howard Street
Spokane, Washington 99204
October 27, 1965

MEMORANDUM

To: Chief, Office of Minerals Exploration

From: Field Officer, Region I

Sec. 33
T. 2 N
R. 17 E

Subject: Application Examination
OME-6464 (Silver)
Liberty Gem Silver Mines, Inc.
Liberty Gem Mine
Blaine County, Idaho

INTRODUCTION

Liberty Gem Silver Mines, Inc., applied for OME aid to explore for silver ore at the Liberty Gem mine in the Mineral Hill Mining District, Blaine County, Idaho. The applicant proposed to explore five veins by diamond drilling from the surface and the 100 level; crosscutting, drifting and long hole drilling on the 100 and 200 levels and existing workings on the 200 level; and drifting and long hole drilling on the 200 level. The applicant estimated that the total cost of his proposed work would be $105,975.00 to which the Government's contribution would be 75 percent or $79,481.25.

The property and all accessible workings were examined on August 25, 1965, in company with Lowell S. Hilpert, regional geologist of the Geological Survey, Paul S. Bovey, president of the applicant company, and R. W. Osterstock, the applicant's consulting geologist. About 6 hours were spent on the property and, that evening the proposed work was further discussed with Hilpert and Osterstock.

It is concluded that the chance of making a significant discovery of silver ore on this property is less than fair and it is recommended that the application be denied.

PROPERTY, LOCATION, AND ACCESSIBILITY

The property comprises nine ungatented claims recorded in the office of the Blaine County Recorder, Hailey, Idaho, as follows:

Claim	Book	Page
Liberty No. 1	130	352
No. 2	130	353
No. 3	130	354
No. 8	157	289
No. 9	157	295
No. 10	157	296
Badger No. 1	130	355
No. 2	130	356
No. 3	157	350

Photostatic copies of the location notices, included with the application, contain inconsistent statements that may or may not be of importance. Quartz Location Notice filed October 15, 1951, referring to claims bounding Liberty No. 1, states in part: "Bound on East and South end of this mining claim is the West and North side line of Liberty No. 8 mining claim. The adjoining claims are . . . on East and South Liberty No. 8 . . ." However, Notice of Quartz Location filed August 6, 1955, referring to claims bounding Liberty No. 8 states in part: "The North West end line of this claim joins the South-East end line of Liberty No. 3." Thus, one location places Liberty No. 1 and No. 8 end-to-end while the other so places Liberty No. 3 and No. 8. The latter relationship of Liberty No. 3 and No. 8 coincides with a statement in Quartz Location Notice relative to Liberty No. 3, filed October 15, 1951. Notice of Quartz Location filed August 20, 1955, referring to Liberty No. 9, states in part: "The North-West end line of this mining claim join the South-East end line of Liberty No. 1 mining claims." A possible explanation might be that in 1951 the northwest end line of Liberty No. 8 overlapped the southeast end lines of Nos. 1 and 3, and that in 1955 Liberty No. 8 was relocated and Liberty No. 9 was added. The inconsistency was not noticed until this report was being written and therefore has not been called to the applicant's attention. The claims are situated in the Mineral Hill Mining District in parts of secs. 32 and 33, T. 2 N., R. 17 E., and sec. 4, T. 1 N., R. 17 E. B.M. They may be reached easily throughout the year by following a graveled county road from Hailey for about 8.5 miles southwesterly along Croy Creek.

GEOLOGY

A brief description of the Liberty Gem mine and geology is given by:

> Killingaard, Thor H., 1950, The geology and ore deposits of the Triumph-Parker mine mineral belt in: Detailed geology of certain areas in the Mineral Hill and Warm Springs districts, Idaho Bur. of Mines Pamphlet No. 90, p. 61-62.

Rocks in the area are limestone, shale, and argillite of the Wood River Formation of Pennsylvanian age that have been intruded by granitic rocks probably related to the Idaho batholith. On the applicant's property the attitude of the sedimentary beds is difficult to determine as is the relationship of the granite to the beds, without much more detailed mapping than has been done or could be done in the time available to the examiner.

The applicant's Exhibit H indicates the presence of 5 veins, 4 of which strike northwesterly and dip to the southwest. Of the five veins only the Liberty and the New veins were identified in the mine and only the Fields Mutual vein was identified on the surface.

In the side of a wide shallow trench or a road cut--it was difficult to be sure which--above the incline shaft and about 130 feet northwest of the shaft collar there was a small exposure of what appeared to be a quartz vein striking about N. 50° E. and dipping an indeterminate amount to the southeast. This is the wrong direction of dip to be the Betty Lou vein which is said to have been intersected by the incline shaft and followed by drifting on the 77-foot level. No other vein that could be identified as the Betty Lou could be shown on the surface.

The northerly side of the road between the incline shaft hoist house and the powder magazine tunnel is a cut bank several feet high. Although this area was carefully checked, no evidence of either the Liberty vein or the Mirror vein could be found. According to Osterstock, there was no vein exposed in the powder magazine tunnel, so this was not entered.

The Fields Mutual vein was exposed in the southerly side of an open cut south of the collapsed shed, as indicated in Exhibit H. The cut side was weathered and featureless, but a hole about 2 feet across and 2 feet deep at the bottom of the side of the cut revealed a dark grey to black claylike mass that was said to be the vein. A grab sample of this material assayed 0.01 ounce gold and 0.4 ounce silver per ton, trace lead and nil zinc. A Black & Deason assay certificate with the application reports 0.02 ounce gold and 62.0 ounces silver per ton, and 77.0 percent wet lead for a sample described as "surface

sample fields mutual vein." The applicant indicated that this sample came from the same pit as mine. If so, I suspect it was a galena rich nodule dug out of the pit, although this cannot be substantiated.

In an area bounded on the south by the road north of the 47-foot shaft and hoist house, on the west approximately by the northwest extension of that road, and extending northerly about 100 feet and easterly about 80 feet was a large open cut, for the most part filled with water. In the south and west part of open cut the sides were about 8 feet from surface to water level and the depth of the water was estimated to be about 6 feet at the least. No evidence of the Betty Lou vein could be seen from the sides of the open cut nor on the surface to the north. Viewed from the north side of the open cut a band of dark material on the south face resembled that sampled as the Fields Mutual vein, but this exposure could not be approached for sampling.

Only 1 of 4 shafts on the property was accessible; the Ernie shaft, said to be 230 feet deep, was caved at the collar, and both the Betty Lou incline and the 47-foot shaft were flooded. Two levels from the main shaft were open and both were visited. On the 100 level a drift has been driven on a northwesterly bearing along the Liberty vein but is caved tight shut about 100 feet north and 35 feet south of survey station 2-A-2 (applicant's Exhibit G). How far the level extends beyond the caved faces is not known.

The Liberty vein is a strong shear zone in shaley limestone along which apparently small podlike to lenslike ore shoots have formed. Whether they tend to fill voids in the shear zone or to replace particular beds could not be determined, but probably they mostly fill voids, with some replacement. From the cave at the south face to about 35 feet north of station 2-A-2 the shear zone strikes N. 30° W. and dips about 35° SW. The shear then swings to a strike of about N. 27° W. for a distance of about 17 feet and is there cut off by a fault. Throughout this distance the sides and back of the drift are tightly lagged so that any mineralization in this part of the shear zone could not be seen. The lack of chutes suggests that mineralization was low grade or lacking.

The fault strikes N. 35° E. and dips about 40° NW. A chute about at the fault and another in the crosscut that turns off the Liberty drift about where the vein bends, lead to an open stope about 5 feet by 12 feet in plan and averaging about 10 feet high. The ground was heavy and this plus a lack of stulls or other timber in the stope made it uninviting to enter for sampling. Caved rock in the chute showed that the vein contains considerable galena and sphalerite between walls of dense black and somewhat shattered limestone or limey shale with some quartz and granitic material. Assays of 7 samples and 1 ore shipment from this vein indicate that these metals comprise more than 30 percent of the dollar value.

The crosscut just mentioned was followed in a slightly winding westerly direction to within 30 feet of the end. The 101-A raise started within a few feet of a granite-sediment contact along which sparse sulfide mineralization had been noted. At a height of about 20 feet the raise had entered an ore shoot that has been partially stoped to a height of about 40 feet above the level. The vein widens from an inch or so to more than 3 feet and contains galena and lesser amounts of sphalerite in a gangue of crushed quartz, granite(?), and limestone. Settlement sheets accompanying the application indicate that at least 14.83 tons were shipped and that gold-silver combined was worth only $15.35 per ton compared to lead worth $20.40 per ton and zinc worth $2.94 per ton.

A short distance beyond the 101-A raise the crosscut swings to the southwest, continuing on that course for about 70 feet. The structure here is quite complex. From 101-A raise westerly the wall rock is granite for about 14 feet. A down-faulted block of sediments comprise the wall rock for the next 30 feet; granite then makes up the walls for 20 feet until a fourth fault again drops the sedimentary rocks. This fault is the so-called New vein shown on Exhibit E.

A grab sample of the New vein taken here by the examiner assayed trace gold and 0.3 ounce silver per ton, trace lead, and trace zinc over a width of 3 feet. Osterstock has spent considerable time studying the faults in this area and has satisfied himself that the vein in the 101-A raise is the same as the New vein. In the short time available I was unable to study the complex situation sufficiently to follow his reasoning entirely.

On the 67 level a raise is being driven on the Liberty vein from a chute about 15 feet south of the shaft. The raise was inspected to the top at about 50 feet. The vein is 3 to 6 feet wide of crushed and sheared wall rock with small lenticular masses of galena and small amounts of sphalerite. A grab sample taken by the examiner across the vein at a height of 40 feet up the raise assayed 0.04 ounce gold and 0.3 ounce silver per ton, trace lead and 0.8 percent zinc. The irregular occurrence of the obviously higher grade pods and lenses made taking of a fair sample without salting or "starving" out all values most difficult.

Several assay reports and settlement sheets accompany the application. In some cases only the gold and silver values are given and in some cases the vein represented could not be identified by the applicant. The following sample assays that could be identified as to source indicate the character of the ore from two veins and from the mine as a whole. Values are based on $35.00 gold, $1.29 silver, $0.15 lead, and $0.14 zinc.

	Ounces/Ton		Percent	
Liberty vein:	Au	Ag	Pb	Zn
Av. of 7 sample assays	0.03	15.25	8.71	11.94
Value per ton	$1.05	$19.67	$26.13	$33.43
9.103 LDT shipped	NA	13.03	14.00	15.90
Value per ton	--	$16.83	$42.00	$44.52
Av. value all sources	$1.05+	$18.25	$34.06	$38.97
101-A Raise (New vein?)				
0.5 LDT shipped	0.04	30.20	36.80	11.00
14.33 LDT shipped	0.08	9.02	5.73	0.70
Av. of 14.83 LDT shipped	0.08	9.73	6.80	1.03
Value	$2.80	$12.55	$20.40	$2.94
OME grab from stockpile	0.30	11.90	12.90	Tr
Value	$10.50	$15.35	$38.70	Nil
OME grab from 100 level	Tr	0.3	Tr	Tr
Value	Nil	$0.39	Nil	Nil
Av. value all sources	$4.43	$9.40	$19.70	$0.98
Vein or location unknown				
Av. of 5 sample assays	0.07	51.46	58.87	2.47
Value	$2.45	$66.38	$176.61	$6.92

Five other sample assays and one settlement sheet from the Anaconda Sampler showed silver ranging in grade from 60 to 334.4 ounces per ton but were not run for lead-zinc One other settlement sheet from U.S.S.R. & M. Smelter, Salt Lake City, Utah, dated August 6, 1962, indicates that a shipment of 3.9735 L.D.T. contained 0.15 ounce gold and 103.45 ounces silver per ton, 0.60 percent lead, 0 60 percent zinc and 0.20 percent copper, but the source of this ore could not be determined; it might have come from the Liberty 100 level, it might have come from either of the two open cuts previously described, it might have come from the 47-foot shaft, or it might have come from the incline shaft.

With the exception of the 5.9735 tons shipped in August 1962, and the CME sample from the New vein, 100 level, which contained insignificant values, assays of all samples and shipments that were run for both precious and base metals indicate that the combined values in base metals exceed the combined values in precious metals by 3.78 times in the Liberty vein, by 1.51 times in the 101-A Raise-New vein, and by 2.66 times in the unknown locations. The average of values from all known and unknown sources in the mine indicates that the base metal values exceed those of precious metals by 2.6 times.

CONCLUSIONS AND RECOMMENDATIONS

It is concluded that fairly small lenses of silver-bearing lead-zinc ore occur along the Liberty vein and the New vein as exposed in the 101-A raise. It is possible that similar lenslike bodies were found on the Betty Lou vein in the incline shaft and near the Betty Lou-Fields Mutual intersection in the water-filled open cut north of the 47-foot shaft house, although this could not be confirmed. It is also concluded that the chance of making a significant discovery of silver ore on this property is less than fair. Finally, it is concluded that in any ore body that might be found the value of the base metals will make up appreciably more than half the total value.

Therefore, it is recommended that this application be denied.

D. R. MacLaren

Distribution:
CMI(2)
USGS(ERO)
Docket
MacLaren
Hilpert

(e) The Liberty Gem claim group lies in, or near, the northeasterly extension of an area historically known as the Hailey Gold Belt. The claims may also be described as lying on the west flank of the Mayflower Mineral Belt; and, perhaps, may be further described as lying on the extreme western edge of the major Hailey-Bellevue Mineral Belt. There is no question but what the geographical location of the subject property is extremely well situated with regard to well-known productive areas of mineralization.

The property lies along Liberty Gulch, a shallow valley tributary to the Croy Creek drainage. Too little is known of the regional geological setting to confirm that Liberty Gulch is fault-controlled, but there is a distinct suggestion of such an origin, inasmuch as virtually all major structural features are essentially parallel to the Liberty Gulch drainage. The gulch is flanked, near its mouth, by low, rounded hills; to the northwest it heads near the topographically prominent peaks of Kelly Mountain.

On a broad scale, the entire Liberty Gulch area is apparently underlain by the Pennsylvanian Wood River Formation, as noted by C. S. Ross during his mapping of the area (U.S.G.S. Bull. 814). The Liberty Gulch area however, was not mapped in great detail by Ross, inasmuch as it falls slightly outside his quadrangle boundaries. There is a distinct possibility that at least some of the Mississippian Milligan Formation may also be present in the area. On the surface, the area may be characterised as exhibiting a remarkable lack of geological features which might tend to provide for aid in definition of beds and attitudes, or their structures.

3. (e) - Continued

Previously, state, federal, and private mapping efforts have been thwarted to some extent by the lack of these features which largely, deny geologic identification of individual sedimentary units. The Wood River Formation contains no marker horizons which serve to aid in correlation, other than a basal conglomeratic unit which lies well to the east of the subject property. Ross has suggested that the Wood River Formation may attain a thickness of as much as 8,000 feet; whereas, he only provides about 3,000 feet for the underlying Milligan Formation. From its geographic position, it is felt that the subject property may lie quite close to the base of the Wood River Formation simply because the strata do show a general trend toward shales and argillites. The only details of stratigraphic information are gained from underground exposure where an interbedded complex ranging from dark gray to light gray limestone, gray to tan siliceous limestone, limy quartzite, brown to nearly black argillite, and dark gray to black carbonaceous shales are noted. In at least two areas on the 100 level of mine (See Exhibit G) siliceous beds appear to have been subjected to igneous metamorphic phenomena whereby the beds begin to assume some of the character of granite. The contacts of these zones are so poorly defined however, that their origin also might be ascribed to forceful injection of a granitic magma, followed by intense alteration.

Unknown to Ross, but nonetheless prominent in the Liberty Gulch area is a granitic mass exposed both on the surface and encountered at several points in the underground workings. This intrusive activity, even more evident a few miles to the east and west of the Liberty Claim area is probably an offshoot, or outlier of the massive Idaho batholith. There is

3. (e) - Continued

no question but what this Tertiary (?) intrusive activity has served to disrupt the sedimentary pattern which, under normal circumstances, would probably exhibit fairly uniform northwesterly attitudes. The complexity of the intrusive activity has obscured sedimentary features directly, and has effected additional complex geological phenomena with its attendant fault movement.

Virtually all contacts noted, both on the surface and underground, whether purely sedimentary or sedimentary-intrusive, show considerable slippage and shearing. It seems likely that there may also have been both pre- and post-inclusive faulting, most of which follows the regional northwesterly trend as does the broad folding pattern whose major axes also trend northwesterly. While these ground movements make geological interpretation difficult, they also provide the loci for most of the ore mineral deposits.

3. (e) - Continued

The known ore mineralization (within the Liberty Gem Claim group) has been exposed in the Liberty Gem vein, the Fields Mutual vein, the Mirror (?) vein, all trending generally northwest and dipping westerly, and the Betty Lou vein, a transverse northeasterly striking, northerly dipping structure. In addition, the 100 level crosscut has encountered a new area of mineralization along a northwesterly striking, westerly dipping structure which is hereafter simply referred to as the "New" vein. Although there may be other ore-carrying structures within the claim group, as attested to by numerous small surface workings displaying intense iron staining, the above-noted vein zones are those which constitute the target areas of the current exploration proposals. The several veins described have their individual features which set them apart from each other but, nontheless, they include a number of common characteristics. Each vein system shows intense shearing and brecciation and probably some relative movement, though this latter feature is not so easily defined for lack of identifiable markers. The more competent strata, of course, display more discrete structural breaks, whereas the breaks in the more easily crumpled shale and argillite section tend to lose their individual identities as they might be pursued into the walls. Nonetheless, the all-inclusive zone of structural breakage, or disruption, seems to retain a fair degree of linear persistence. All of the vein systems, except the Betty Lou, in one area or another, display some faulted contacts with granite. It might be stated that the multiplicity of granitic exposures along the northwesterly trending structures provides some additional evidence of forceful injection of the intrusives along pre-existing fault zones.

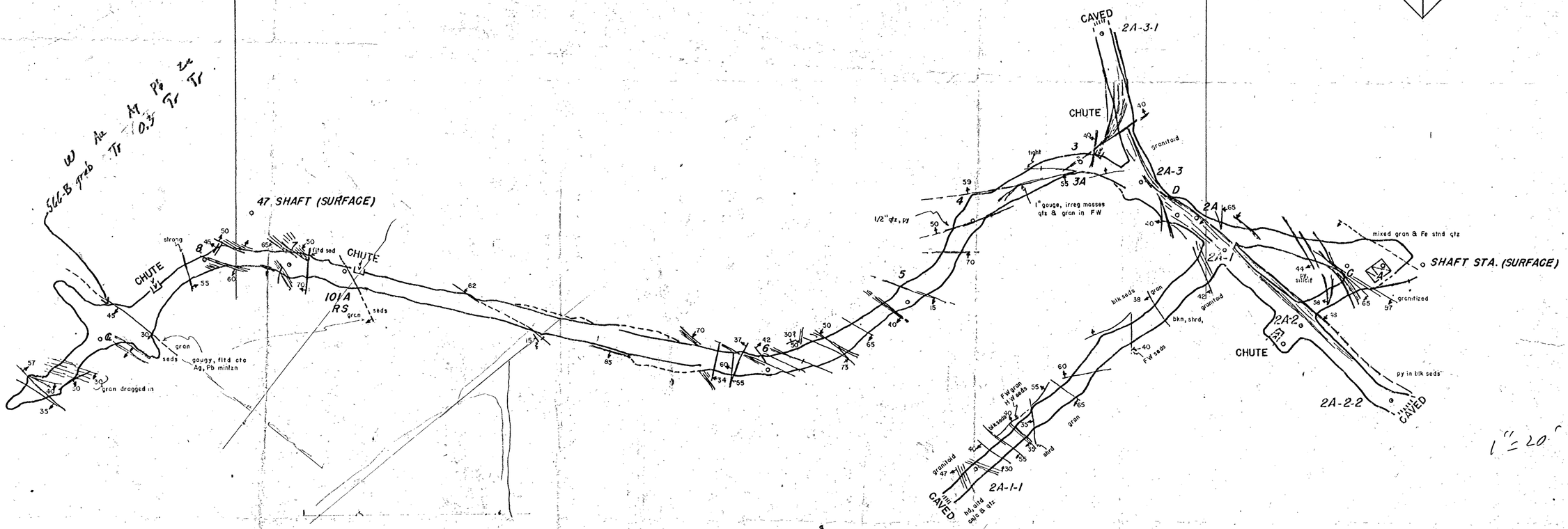
3. (e) - Continued

Ore minerals contained in the vein systems consist of: argentiferous galena, sphalerite, some tetrahedrite, minor gold, reported ruby silver, pyrite, and probably some arsenopyrite. Gangue minerals are comprised predominately of unidentified iron-bearing carbonates, some quartz, and unreplaced country rock.

The ore minerals appear to have been emplaced somewhat preferentially within the shear zones, however where the mineralizing process was sufficiently intense, there is widespread, almost massive replacement. Precisely what controls the positions of high-grade ore shoots is not entirely clear; the loci are probably due to a combination of receptive host rock, which has undergone adequate breakage preparation for ingress of solutions, all of which has probably been superimposed on major structural breaks which remained open during the mineralizing process. Except for the natural softness of much of the host rock, there appears to have been relatively little alteration in the sediments but the intrusives, without exception, have undergone substantial alteration. Brecciation of the ore zones implies at least some post-mineral movement of the ground.

The salient features of the ore mineralization in the Liberty Gem claim group are:

(1) The relative persistence of the main vein structures, perhaps more accurately described as fissures, as gross features but with loss of identification of individual strands, particularly in the less competent shaly and argillitic sections.

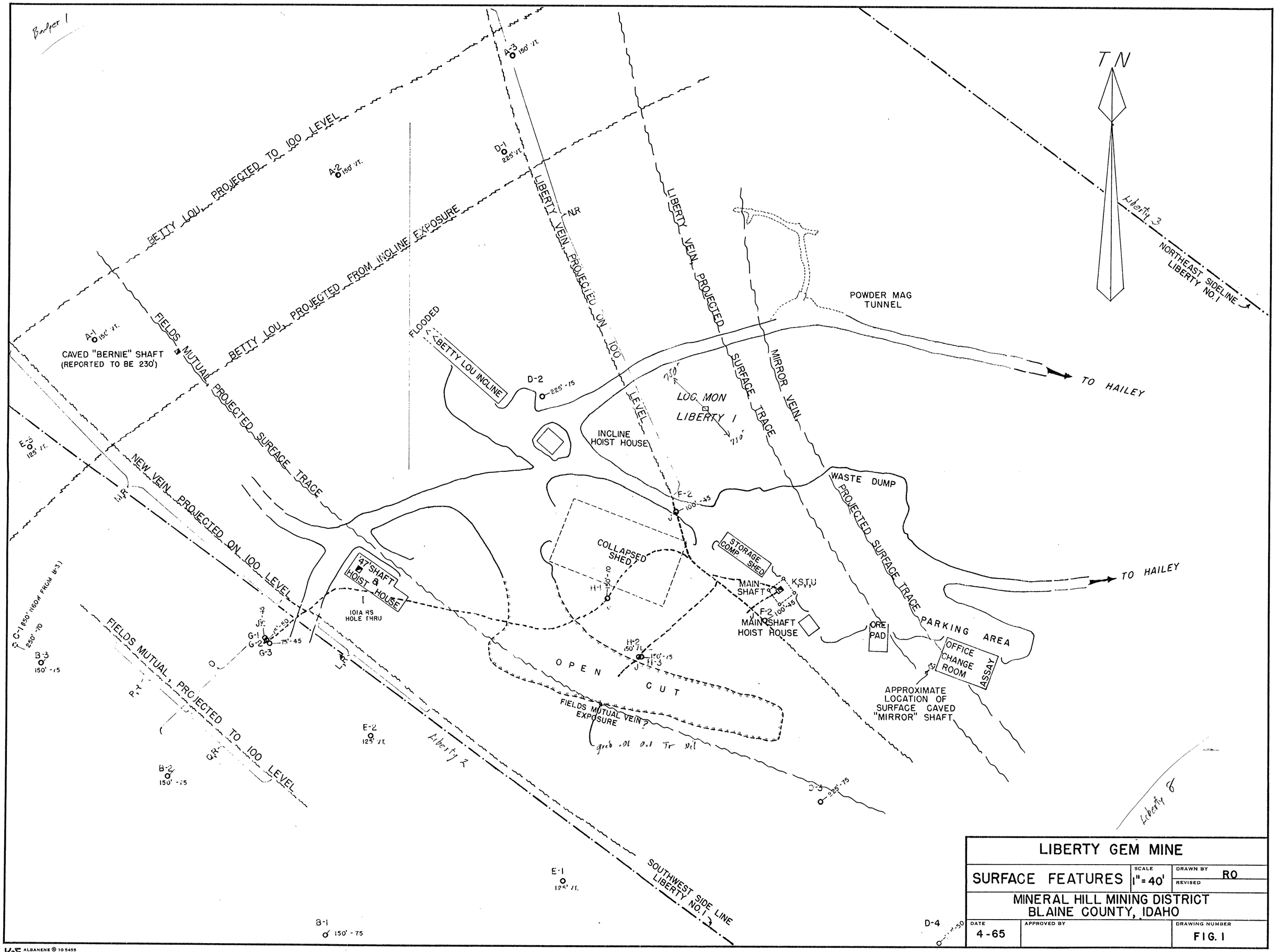


LIBERTY GEM MINE			
100 LEVEL GEOLOGIC PLAN	SCALE 1" = 20'	DRAWN BY RO	REVISED
MINERAL HILL MINING DISTRICT BLAINE COUNTY, IDAHO			
DATE 4-65	APPROVED BY	DRAWING NUMBER FIG. 2	

EXHIBIT G

K+E ALBANENE 10 5455 ARCHITECTS' STANDARD FORM

MADE IN U.S.A. 26993



LIBERTY GEM MINE		
SURFACE FEATURES	SCALE 1" = 40'	DRAWN BY RO REVISED
MINERAL HILL MINING DISTRICT BLAINE COUNTY, IDAHO		
DATE 4-65	APPROVED BY	DRAWING NUMBER FIG. 1

EXHIBIT H

K+E ALBANENE ® 10 5455 ARCHITECTS' STANDARD FORM

MADE IN U.S.A. 26992