DMEA Form 9
Rev. 6/57

UNITED STATES
DEPARTMENT OF THE INTERIOR
Defense Minerals Exploration Administration

OFFICIAL DOCKET FILE Idm-E NO._____ DMEA NO. 4857

Application
- [x] Denied
- [ ] Withdrawn

Contract
- [ ] Terminated - Not Certified
- [ ] Terminated - Certified
- [ ] Cancelled
- [ ] Royalty Agreement

The records contained in this file are marked (x) and arranged in this order:

Folder No. 1:

Left Side

- [ ] Royalty Audits
- [ ] Certification of Discovery
- [ ] Closing Letter
- [ ] Cost Audits
- [ ] Termination Notice or Agreement
- [ ] Recision Notice
- [ ] Assignment of Contract
- [ ] Contract Amendments
- [ ] Contract with all exhibits and annexes
- [ ] Owner's Consent to Lien and Subordination Agreement
- [x] Application and attachments

Right Side

- [ ] Project summary (final)
- [ ] Work Completed analysis (final)

All other material filed in chronological order including the following reports if checked:

- [ ] Field Team Semi-Annual Report for Certified Project
- [ ] Final Field Team Report (Tab)
- [ ] Operator's Final Report (Tab)
- [ ] Interim Field Team Reports
- [x] Operator's monthly reports and all attachments
- [x] On-site Exam Report (Tab)
- [ ] Settlement Sheets
- [ ] Drill Logs

Additional Folders:

Left Side

Folders No._____: Reports
- [ ] Analysis of Semi-Annual Inspection Reports
- [ ] Project Summary (Interim) by DMEA Engineers

Right Side

- [ ] Field Team Semi-Annual Report for Certified Project
- [ ] Field Team Interim Reports
- [ ] Operator's Monthly Reports with transmittal, narrative and maps.

Folders No._____: Maps (Use pocket folder or envelope)

Folders No._____: Settlement Sheets

Folders No._____: Drill Logs

Folders No._____: Royalty material

P. O. BOX 1980

UNITED STATES SMELTING REFINING AND MINING COMPANY
NEWHOUSE BUILDING
SALT LAKE CITY 10, UTAH

OFFICIAL FILE COPY
DMEA
RECEIVED OCT 24 1957

DATE	INITIALS	CODE

October 21, 1957

Mr. C. O. Mittendorf, Administrator
Defense Minerals Exploration Administration
Room 4624, New Interior Building
Washington, D. C.

Dear Sir:

Under date of September 7, 1955 the United States Smelting Refining and Mining Company submitted to DMEA an application which your agency designated Docket No. DMEA-3993. Your letter to me dated May 4, 1956 declined Government participation in this project. Additional information has now been obtained, the project has been revised downward in footage and cost, and a new application for aid in this exploration venture is submitted herewith.

A recent diamond drill hole in the area of the project proves the presence of limestone horizons and mineralization on the plane of the U.S. 1000 level or Bingham Tunnel on which the proposed exploration work will be done. This diamond drill hole makes it possible to more accurately determine the position of the limestone formations.

In again requesting assistance from your agency in this project we fully recognize the responsibilities of DMEA and in an effort to hold expenditures to a minimum we are limiting the revised program to an amount of work sufficient to initially examine the area. Success in this initial entry should provide information and justification for possible future expenditure. In this submittal we have also enlarged the area of the project. Our previous estimate of total expenditure was $242,118. The proposal herewith estimates a total expenditure of $95,360, of which the Government's participation at 50% would be $47,680. The following itemizes the principal changes which make this reduction possible.

1. Drifting footage was reduced from 4950 feet to 2000 feet.

2. Diamond drilling footage was reduced from 9000 feet to 2000 feet.

3. Expense of cutting 4 diamond drill stations was eliminated.

4. The absence of water in the drill hole suggests better working conditions permitting unit attainment per manshift to be increased from 1.35 to 1.5 feet.

5. The expense of sampling labor was eliminated.

6. Because of the absence of water in the drill hole, expense of the water flume ($8,131.00) was eliminated.

7. For the same reason as in (6), the expense of rubber money of $1.00 per manshift was eliminated.

This is a speculative project. But it has great merit in that success would add a large sector to the abundantly productive area of the Bingham District. We think this is a real possibility. I attach a summary of the facts which we think justify the expenditure contemplated in this project.

Very truly yours,

Oscar A. Glaeser

Oscar A. Glaeser
Vice President and General Manager
of Western Operations

OAG:G

SUMMARY

This exploration project will probe hitherto generously productive limestone horizons, particularly the so-called "B" limestone foot and hangingwall beddings, in an area on strike of the Last Chance fissure zone which embraces the Last Chance itself and the parallel Galena, Niagara, Holden, and other productive structures, from which ores having a gross value of upwards of $130,000,000 have been mined north of the stock and in stopes extending more than halfway through the stock. Though years ago a little work was done south of the stock on an upper level, these horizons and fissures have never been explored south of the stock. Here is a large volume of virgin country. One or more of these fissures can be seen on the surface in the Jordan limestone south of the stock, where shallow workings have mined small tonnages of ore. There is bleaching and some alteration of the limestone.

The position of the footwall of the Jordan limestone at the surface has been accurately determined. Our stratigraphic knowledge of the sub-Jordan section permits us to make a good guess as to the position beneath the Jordan successively of the "A", "B", "C" and "D" limes south of the Last Chance stock. In fact, they outcrop at some distance to the southeast in Butterfield Canyon. There is no question of their presence in this volume of ground.

A recent diamond drill hole on the U. S. 1000 level, shown on the accompanying map, on penetrating beyond the Last Chance stock passed immediately into limestone which is believed to be "A", though there is a possibility of it being "B". A one-and-one-half-inch stringer of commercial grade mineralization was cut (15.9% Pb, 22.8 oz. Ag).

These so-called "Alphabetical" limestones of the sub-Jordan series, particularly the "B" and "D", have been very large producers in this U. S. Section of the U. S. and Lark Mine, where they have grossed well upwards of $150,000,000. That they have produced abundantly elsewhere does not, of course, in itself mean that they will produce everywhere or here. But it does mean that chemically and physically they are replaceable formations. Given crosscutting fissures such as those of the Last Chance series, they are potential producers. Certainly structures and formations so productive 500 to 3000 feet away merit attention. There is no way except by going in to see of determining whether sufficient of mineralizers have flowed into them to produce commercial bodies. As elsewhere over most of Bingham's production the surface above cannot reveal the facts. Nevertheless, here at the surface a small quantity of ore and mineralization has been disclosed.

Form MF-103
Revised Feb. 1957

UNITED STATES
DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS EXPLORATION ADMINISTRATION

Budget Bureau No. 42-R1035.3
Approval expires June 30, 1958

APPLICATION FOR AID IN AN EXPLORATION PROJECT

PURSUANT TO DMEA ORDER I, UNDER THE DEFENSE PRODUCTION ACT OF 1950, AS AMENDED

NAME OF APPLICANT (Full legal name and mailing address as it should appear on contract if one is executed)

United States Smelting Refining and Mining Company
P. O. Box 1980
Salt Lake City 10, Utah

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APPLICANT NOT TO USE THIS BLOCK

Docket Number: DMEA-4857
Date Received: 10/24/57
Government Participation %:
Region: III
Division Code: 500

BUSINESS ORGANIZATION (Check one)

- Individual [ ]
- Corporation [X]
- Partnership [ ]
- Other (Specify) [ ]

State in which firm is organized: Maine

LIST CORPORATE OFFICERS OR PARTNERS HERE, IF APPLICABLE

Name	Address	Title
F. S. Mulock	P.O.Box 2137, Boston 6, Mass.	President
C. G. Rice	" " " " " "	Exec. Vice Pres.
J. George Gange	" " " " " "	Admin. Vice Pres.
Francis Fiske	" " " " " "	Secretary & Treasurer
Oscar A. Glaeser	P.O.Box 1980, Salt Lake City 10, Utah	Vice Pres. & Gen. Mgr. of Western Operations

Mineral(s) for which you wish to explore: Lead & Zinc

Estimated Cost of Project $: $95,360.00

LOCATION OF PROPERTY

Name	County	State
U. S. and Lark Mine	Salt Lake	Utah

GENERAL INSTRUCTIONS

Before filling out this application, please read DMEA Order—I, Amended, "Government Aid in Defense Exploration Projects." To assure prompt action, your application must provide all applicable material and information specified on the back of this application form. Avoid unnecessary correspondence and delays by submitting complete and accurate information. *Please submit four copies of this application and all accompanying papers* except as otherwise noted. Place your name and address on each sheet. Each item of information, maps, and reports required as a part of this application is described on the back of this form. Identify each attached statement by the item number to which it applies. If an item does not apply to your application, show the item number on your statement and after it write "not applicable." Maps or sketches should be used to supplement narrative descriptions of the property location and boundaries in item 1, existing mine workings and geology in item 2, and the proposed exploration project in item 4. When this information is not too complex, all of it may be shown on one map or sketch. All documents and other attachments submitted as a part of this application, except those in item 2(g) which you mark to be returned, become the property of the Government and will not be returned to the applicant. Send true copies, *not originals*, of leases, contracts, and other documents which are an essential part of your business records. *File this application with the Defense Minerals Exploration Administration, Department of the Interior, Washington 25, D. C., or with the nearest DMEA Field Office.*

CERTIFICATION

The undersigned, whether as an individual, corporate officer, partner, or otherwise, both in his own behalf and acting for the applicant, certifies that the information set forth in this form and accompanying papers is correct and complete, to the best of his knowledge and belief.

October 21, 1957
Dated

United States Smelting Refining and Mining Company
Oscar A. Glaeser
BY (Signature) Oscar A. Glaeser
Vice President and General Manager of Western Operations
Title

A wilfully false statement or certification to any Department or Agency of the United States Government is a criminal offense. U. S. Code, Title 18, Sec. 1001.

INFORMATION REQUIRED WITH THIS APPLICATION

1. *Applicant's Property Rights:*

(a) State the legal description (section, township, and range; metes and bounds; patent number of claims) of the land upon which you wish to explore and all land adjacent to the proposed project area which you own or control. Describe any part of the project land or workings which should not be subject to Government lien for royalty payments. If the land consists of unpatented claims, state the book and page number for each recorded location notice, including amended locations, and the place where recorded (courthouse, recorder's office, county, and state).

(b) State all the names by which you know the property.

(c) State your interest in the land, whether owner, lessee, purchaser under contract, or otherwise. If you are not the owner, submit with this application one exact copy of the lease, contract, or other document (with address of owner) under which you control the property.

(d) Describe all liens, mortgages, or other encumbrances on the property.

2. *Physical Description:*

(a) Describe in detail and illustrate with maps or sketches all mining or exploration operations which you know have been or are being conducted upon the lands, including existing mine workings. Describe all production facilities.

(b) State your interest, if any, in operations stated in 2*(a)*.

(c) State, as far as you know, the past and current production, supporting your statement with copies of settlement sheets, mine records, or published data if available.

(d) Describe known ore reserves on the property giving quantities and grades and sampling methods used, supporting your statement with copies of assay certificates and assay maps if available.

(e) Describe by narrative and maps or sketches the geologic features of the property, including ore minerals, geologic formations if known, and type of deposit (vein, bedded, etc.).

(f) State your reasons for expecting to find ore, and if you have sampled the area you propose to explore, show where the samples were taken, describe sampling methods used, and provide copies of assay certificates.

(g) Send with your application at least *two* copies of all geologic or engineering reports, assay maps, or technologic information which you may have, indicating on each whether you require its return to you.

3. *Accessibility of Project:*

(a) To aid DMEA representatives who may be required to examine the property, state the name and address of the person who will meet the DMEA representative; give directions for reaching the property; and describe accessibility of the property including the mine workings.

(b) Name the shipping and supply points and places where employees reside and state the distances between them and the property.

4. *The Exploration Project:*

(a) Describe fully the proposed exploration project giving individual footages and sizes of openings *for each item of work.* Use narrative, maps, plans, and longitudinal and cross sections as necessary. Show the location of the proposed work as related to geologic features such as veins, ore-bearing beds, contacts of rock formations, etc. Show also the relation of the proposed work to any existing mine workings and to *property boundaries* or to the closest identifiable corner.

(b) If an access road to the project must be built, show the location on the property map and state the length, type, and construction methods proposed.

(c) In the event that an exploration contract with DMEA is executed, how soon will the work start and how many months will be required to complete it? State your anticipated average daily or monthly rate of progress for each type of work.

5. *Experience:*

State your operating experience and background with relation to your ability to carry out this exploration project, and also that of the person or persons who will supervise the operations.

6. *Estimate of Costs:*

Furnish detailed estimates of the costs *for each item of the work proposed in 4(a)* under the headings listed below with a total for each heading and the estimated total cost of the project. Costs for any work to be performed by an independent contractor should be shown separately under category *(a)* below. Costs for any work that is not to be performed by an independent contractor should be given in detail under categories *(b)* through *(g)*.

(a) Independent contracts. State the cost of any proposed independent contract for the performance of all or any part of the work, expressed in units of work, such as per foot of drilling, per foot of drifting, per hour of bulldozer operations, per cubic yard of material moved. Cost estimates should be supported by bids from three contractors if possible. *(Note* – If none of the work is to be contracted, write "none" after this item.)

(b) Personal services. For necessary supervision, engineering and geological services, and labor, include an itemized schedule of numbers, classes, rates of wages, salaries or fees, and periods of employment. State whether these technicians and employees are available.

(c) Operating materials and supplies. List items of material and supplies with their cost. Include under this heading power, water, and fuel, and units of equipment and tools costing less than $50 each.

(d) Operating equipment. List items of operating equipment to be used giving specifications and indicating how each item is to be acquired – i.e., rented, purchased, or provided by the applicant. If it is rented or purchased, state the estimated rental or purchase price. If it is to be furnished by the applicant, give its present fair market value.

(e) Initial rehabilitation and repairs. Describe the type and the cost of necessary *initial* rehabilitation or repair of existing buildings, fixtures, installations (exclusive of mine workings), and movable operating equipment now owned by the applicant, which will be used on the exploration project.

(f) New buildings, fixtures, installations. Describe each building, fixed improvement, and installation to be purchased, constructed, or installed for the exploration project stating specifications and cost including labor, materials and supervision.

(g) Miscellaneous. For the operating equipment listed in 6*(d)*, describe the type and estimate the cost of repairs and maintenance expected during project operations. Do not repeat initial repairs listed in 6*(e)*. Show also the costs of analytical work, accounting, workmen's compensation and employees' liability insurance, payroll taxes, and other required costs that do not fall within the previous categories.

Note – No items of general overhead, corporate management, interest, taxes (other than payroll and sales taxes), or any other indirect costs, or work performed or costs incurred before the date of the contract, should be included in the estimate of costs.

7. *(a)* State whether you are prepared to furnish your share of the cost of the proposed project in accordance with the regulations on Government participation stated in Sec. 7 of DMEA Order–I, Amended.

(b) Explain to what extent you propose to furnish your share of the costs by providing money, by use of equipment owned by you, or otherwise.

* * * * *

INT.-DUP. SEC., WASH., D.C. 15539

United States Smelting Refining and Mining Company
Western Operations
P.O. Box 1980, Salt Lake City, Utah

Statement Accompanying Form MF-103

1. Applicant's Property Rights:

1. (a) Description of Project Block (map attached)

The real property comprising the project area includes all or portions of patented and unpatented lode mining claims situate in Sections 3, 4, 9 and 10, Township 4 South, Range 3 West, in West Mountain Mining District, Salt Lake County, State of Utah, as shown on the accompanying claim map, Plat I, and listed as follows:

Claims Owned - patented unless otherwise stated	U.S. Lot No. or U.S. Sur. No.
Aetna Amd.	7020
Aladin	68
Albino	70
Almeda	73
Armand	4030
Austin	4030
Austin Ray	410
Blizzard	6376
Blizzard Fraction	6375
Boston	3532
Buzzo	3531
Contact	5407
Contact Fraction	6373
Dead Thing	4463
Decoration	6971
Detroit	3528
Dandy Fraction (unpatented)*	7117
Difficult Amd.	7019
Earl Amd.	7020
Experiment	5319
Fair	3980
First Chance	135
G.H. Amd.	7019
Hard Job Amd.	7020

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* Recorded in Salt Lake County Book K Page 387

United States Smelting Refining and Mining Company
Western Operations
P.O. Box 1980, Salt Lake City, Utah

1. (a) continued

Claims Owned - patented unless otherwise stated	U.S. Lot No. or U.S. Sur. No.
Henrietta	83
Hibernia	3026
I Don't Care	4030
Indiana	3779
Josie K.	4030
Klondyke No. One	3966
Last Chance	48
Lilly	4363
Live Pine	85
Michigan	3529
Michigan Fraction	6377
Mignon	6378
Morton	6940
Ole Bull	76
Owyhee	77
Patience	6372
Percival	6374
Plumed Knight	6660
Red Cloud	145
Rip Van Winkle	3978
Royal	75
Royal Queen	4955
Scotia	3026
Silver Plume	146
Sliver Amd.	7020
Stag	3979
Stella Amd.	7020
Wide West	289

Government tie: The point of beginning is Corner No. 4 of the Mednight Bell No. 1 lode mining claim, U.S. Survey No. 5609, whence the quarter corner between Sections 3 and 10, Township 4 South, Range 3 West, Salt Lake Base and Meridian, bears South 85° 20' West, 813 feet, more or less.

The lateral and vertical limits of the property included in this project are as follows:

Lateral Limits:

Beginning at said Corner No. 4 of said Mednight Bell No. 1 Lode mining claim, U.S. Survey No. 5609, and running thence along line 4-3 of said claim South 59° 45' East, 125.3 feet, more or less, to intersect the section line between said Sections 3 and 10;

United States Smelting Refining and Mining Company
Western Operations
P.O. Box 1980, Salt Lake City, Utah

1. (a) continued

Lateral Limits - continued:

thence along said section line South 89° 49' West, 918.6 feet, more or less, to the said quarter corner between said Sections 3 and 10;

thence along the east line of the northwest quarter of said Section 10 South 0° 01' West, 1315.2 feet, more or less, to intersect the north line of the south half of the said northwest quarter of Section 10;

thence, in part along said north line of the south half of said northwest quarter, North 89° 53' 20" West, 3297.7 feet, more or less, to intersect line 4-3 of the Blizzard Fraction lode mining claim, U.S. Survey No. 6375;

thence along line 4-3 of said Blizzard Fraction lode mining claim North 9° 33' West, 705 feet, more or less, to Corner No. 3 of said claim, identical with Corner No. 3 of the Beebe lode mining claim, U.S. Survey No. 5436;

thence along line 3-2 of said Beebe lode mining claim North 52° 15' West, 300 feet, more or less, to Corner No. 2 of the Fred C. lode mining claim, U.S. Survey No. 5436;

thence along line 2-3 of said Fred C. lode mining claim North 33° 00' East, 1422.4 feet, to Corner No. 3 of said claim;

thence along line 3-4 of said claim North 52° 15' West, 426 feet, more or less, to intersect line 3-2 of the Silver Chief No. 2 lode mining claim, U.S. Survey No. 4985;

thence along said line 3-2 North 56° 19' East, 321.4 feet, more or less, to Corner No. 2 of said Silver Chief No. 2 lode mining claim, identical with Corner No. 3 of Silver Chief No. 1 lode mining claim, U.S. Survey No. 4985;

thence along line 3-4 of said Silver Chief No. 1 lode mining claim North 35° 54' East, 395.2 feet, more or less, to intersect line 6-1 of the Armand lode mining claim, U.S. Survey No. 4030;

thence along said line 6-1 of said Armand lode mining claim, North 7° 30' East, 368.3 feet, more or less, to Corner No. 1 of said claim, situate on line 3-4 of the Michigan lode mining claim, U.S. Survey No. 3529;

thence along said line 3-4 of said Michigan lode mining claim North 52° 58' West, 110.1 feet, more or less, to Corner No. 4 of said claim;

thence along line 4-1 of said claim North 59° 33' East, 112.7 feet, more or less, to Corner No. 3 of the Detroit lode mining claim, U.S. Survey No. 3528;

United States Smelting Refining and Mining Company
Western Operations
P.O. Box 1980, Salt Lake City, Utah

1. (a) continued

thence along line 3-4 of said Detroit lode mining claim North 43° 39' west, 150 feet;

thence North 80° 20' East, 1630 feet, more or less, to intersect the southerly prolongation of the East line 1-4 of the South Hooper lode mining claim, U.S. Survey No. 373;

thence North 35° 00' East, 1635 feet along and coinciding with said line 4-1 of said South Hooper lode mining claim, to a point on northerly prolongation of said side line;

thence South 71° 03' East 1812.6 feet, more or less, to intersect northerly prolongation of East side line 11-10 of Scotia lode mining claim, U.S. Survey No. 3026.

thence along said northerly prolongation of and coinciding with the east line 10-11 of said Scotia lode mining claim, South 30° 49' West, 1345 feet, more or less, to intersect line 2-3 of Silver Star lode mining claim, U.S. Survey No. 4138.

thence along said line 2-3 of said Silver Star lode mining claim South 0° 51' East, 831.9 feet, more or less, to Corner No. 3 of said claim;

thence along line 3-4 of said claim, identical, in part, with line 2-3 of the G. H. Amended lode mining claim, U.S. Survey No. 7019, North 89° 09' East, 402.9 feet, more or less, to Corner No. 3 of said G. H. Amended lode mining claim;

thence along line 3-4 of said claim South, 523.3 feet, more or less, to intersect line 5-4 of said Mednight Bell No. 1 lode mining claim, U.S. Survey No. 5609;

thence along said line 5-4 of said Mednight Bell No. 1 lode mining claim South 35° 51' West, 711.2 feet, more or less, to Corner No. 4 of said claim, the point of beginning.

Vertical Limit

The upper vertical limit of the project is 200 feet vertically below bedrock.

No lower vertical limit.

Adjacent Land

The United States Smelting Refining and Mining Company owns and controls surrounding ground which totals in excess of 600 patented claims covering over 5000 acres.

United States Smelting Refining and Mining Company
Western Operations
P.O. Box 1980, Salt Lake City, Utah

1. (b) U. S. and Lark Mine of United States Smelting Refining and Mining Company.

1. (c) Owner of project area.

1. (d) None

2. Physical Description:

2. (a) The project block lies in an area of extensively fissured Pennsylvanian limestones and quartzites which adjoin the Last Chance stock on the south. Fissures, or veins, within the stock and limestone replacement deposits just north of the stock constituted some of the early ore discoveries of the district; in fact, the old Jordan claim, located in 1863, and the first location in territory which later became the State of Utah, lies within and north of the stock. From mines in adjacent areas has come a substantial part of some 16,000,000 tons of lead-zinc ore produced from the Bingham district. The project under consideration is to drive southerly on the Bingham Tunnel level (U. S. Section 1000 Level) to explore, within a prominent fissure zone, the series of limestones which has been productive north of the Last Chance Stock. The fissure zone in which the work is planned extends southwesterly from the heart of the Bingham district.

2. (b) The existing usable facilities, equipment, buildings, or structures, owned by United States Smelting Refining and Mining Company, that will be devoted to the exploration work follows:

All the surface facilities of the U. S. and Lark Mine, including the surface plant, which includes:

Machine and electrical shops and equipment
Blacksmith and steel shops and equipment
Framing mill and equipment
General Offices
Warehouses
Engineering and Geological Offices

all completely equipped for 1200 tons per day operation, together with such mine equipment as rock drills, mucking machines, jumbos, haulage locomotives, mine cars, pumps and hoisting equipment.

2. (c) Past and Present Production,

Refer to Form MF-100 filed May 23, 1951 with Defense Minerals Administration (now DMEA). Given Serial No. 0139 by government agency.

United States Smelting Refining and Mining Company
Western Operations
P.O. Box 1980, Salt Lake City, Utah

2. (d) Ore Reserves, Grades:

Refer MF-100

2. (e) Traversing the project area of sediments south of the Last Chance stock are northeast striking fissures on which at the surface are showings of oxidized iron, manganese, lead and silver minerals. These fissures are among those in a wide belt embracing the U. S. Section of the U. S. and Lark Mine. The project area is directly on line of strike to the southwest and within this belt projected. These fissures are pre-mineral and later than the Last Chance stock in which some of them, such as the Last Chance, Galena, Holden and others, have been highly productive. Thus the project would prospect known favorable limestone measures within this belt of fissures which, both fissures and limestones, have been abundantly productive 500 to 3,000 feet to the northeast within the Last Chance stock itself and north of the Last Chance stock. The geological elements of fissures and replaceable limestone beds which make it a prospect are those which have yielded ores grossing several hundred millions of dollars elsewhere in the U. S. and Lark Mine and other mines of the district.

Small showings at the surface attracted miners of earlier times who dug into them. The area is high and of difficult access. In recent years, a road was built to provide access for lessees who made two shipments of ore from a shallow excavation. A thousand feet from the end of this road in the Etna prospect small lenses of high-grade lead carbonate appear on a northeast fissure. None of these surface workings have prospected these showings at depth.

The Yampa and Highland Boy limestones outcrop on the surface of the project area and were so mapped and named by Boutwell in U.S.G.S. Professional Paper 38. From these limestones upwards of 7,000,000 tons of copper-lead-zinc ore produced were in mines on the west side of the district and they have been highly productive in the adjacent upper workings of the United States Mining Company where they are known as the Commercial and Jordan limestones. Underlying these are the so-called sub-Jordan series of limestone members which also have been highly productive north of the Last Chance stock. The prevailing dip of this sedimentary sequence is northerly to northwesterly, toward the stock, and the strike northeasterly.

As indicated Jordan limestone outcrops at the surface where the position of its base has been mapped and is definitely known. Making use of our knowledge of stratigraphic intervals in the sub-Jordan series, the position of the "B" and "D" limestone members can be determined. As shown on an accompanying map and sections, it appears that these members can be explored on the plane of the U. S. 1000 or Bingham Tunnel level on which the proposed work would be done. They have been the most productive of the lower or sub-Jordan limestones.

United States Smelting Refining and Mining Company
Western Operations
P.O. Box 1980, Salt Lake City, Utah

2. (e) continued

A recent diamond drill hole directly downward and southward from a point on this level passed out of the Last Chance stock at a point somewhat northerly of the projected position of the contact directly into limestone. Drilling difficulties prohibited further advance of the hole. A one-and-a-half inch seam of clean sulphide appeared in the core obtained, which assayed 15.9% Pb, 22.8 oz. Ag. The more northerly position of the south contact of the Last Chance stock makes it possible for this to be the "A" limestone which had been assumed to be cut out by porphyry at this position. Thus a more complete sequence of the sub-Jordan series may be present at this elevation than had been assumed prior to the drilling of this hole.

2. (f) This project will explore productive limestones, particularly the "B" limestone footwall and hangingwall beddings in the area of the Last Chance fissure zone. Included in this fissure zone are the Last Chance, Holden, Niagara and Galena fissures which have all been highly productive immediately north of the stock and in some places, within the stock itself. Gross value of ore produced from these workings approximates $130,000,000. The limestones at the surface directly above the project area show bleaching and alteration. Small tonnages of ore have been mined from shallow surface workings. Definite assurance of the presence of sulphide mineralization was established by a recent diamond drill hole into the project area. This disclosure of sulphide ore in limestone and additional evidence of the anticipated limestone section lends strong support to the possibilities of finding ore in the favorable limestone beddings.

2. (g) See maps attached. Plat I, II, III and IV.

3. <u>Accessibility of Project</u>:

3. (a) Benton Boyd, Manager, U. S. and Lark Mine, Lark, Utah.

The U. S. and Lark Mine lies 25 miles southwesterly from Salt Lake City, Utah, and is connected to various points in the Salt Lake industrial area by excellent highways and a standard-gauge railroad.

Access to this project is gained from surface through the Bingham Tunnel.

3. (b) Ore from the project area would be hauled in underground mine trains through the Bingham Tunnel to the Lark surface plant, from whence it would be shipped via standard-gauge railroad to the USSR&MCo. Mill at Midvale.

Some employees reside at Lark, location of mine entrance; others commute from the Salt Lake Valley, an average distance of 15 miles.

United States Smelting Refining and Mining Company
Western Operations
P.O. Box 1980, Salt Lake City, Utah

4. The Exploration Project:

4. (a) The following plan assumes the position of the "B" limestone to be near that shown on accompanying maps. Since this position is based on projected geology, the specific distances to various objectives are to be regarded as approximations. However, the position of the Jordan limestone is reasonably well established at the surface, and it is known from the stratigraphic section that the favorable alphabetical limestones must lie within fairly definite vertical ranges below the Jordan and therefore be in the approximate positions illustrated on the accompanying plan and section.

The project should be carried out as follows:

(1) Drive southwesterly from the present face of 2468 Drift, in the zone of the Last Chance fissure an approximate distance of 1050 feet to the footwall of the "B" limestone - - - 1050 feet

(2) Drive northeast about 475 feet and southwesterly about the same distance on the "B" limestone footwall bedding. From conveniently spaced diamond drill locations drill "B" limestone as shown on plan - - - - - - - - - - - - - - - 950 feet
Drifting Total - - - - - - - - - - - - - - - 2000 feet

(3) The project will require approximately 2000 feet of diamond drilling to be carried out in conjunction with the above exploration work. The exact location of the holes cannot be planned until a substantial part of the drifting has been completed - 2000 feet
Diamond Drilling Total - - - - - - - - - - 2000 feet

The minimum clearance of drift section, timbered and untimbered, is 7 feet high by 6 feet wide. Size of diamond drill holes will be AX. For location of proposed work and relation to existing mine workings, see attached maps PLAT II, III, AND IV.

4. (b) None

4. (c) The work will be started within 15 days and be completed within 18 months from the date of the exploration project contract. Scheduled monthly advance of drifting is 138 feet. Diamond drilling to be done at convenient times during course of project.

United States Smelting Refining and Mining Company
Western Operations
P.O. Box 1980, Salt Lake City, Utah

5. Experience:

The applicant has been engaged in mining, milling, smelting and refining for more than 40 years.

The following person will supervise the operations:

Benton Boyd, Manager, U. S. and Lark Mine.

This person has had many years experience in the operation and management of mines.

United States Smelting Refining and Mining Company
Western Operations
P.O. Box 1980, Salt Lake City, Utah

SUMMARY

6. ESTIMATE OF COSTS

Drifting

2000' at $42.85 per foot	=	$85,700.00

Diamond Drilling

2000' at $4.83 per foot	=	9,660.00
TOTAL ESTIMATED COST	=	$95,360.00

- - - - - -

Government's participation at 50%	=	$47,680.00

- - - - - -

United States Smelting Refining and Mining Company
Western Operations
P.O. Box 1980, Salt Lake City, Utah

6. Summary of Estimated Cost of Drifting and Diamond Drilling

		DRIFTING 2000'		DIAMOND DRILLING 2000'		
		Total	Cost/ft	Total	Cost/ft	TOTALS
(a) Independent Contracts	None					
(b) Labor	=	$27,493.74	$ 13.75	$3,530.96	$ 1.77	$31,024.70
Supervision	=	4,502.29	2.25	1,184.81	.59	5,687.10
(c) Material and Supplies	=	28,700.00	14.35	3,420.00	1.71	32,120.00
Power	=	3,300.00	1.65	640.00	.32	3,940.00
Water	None					
(d) Operating Equipment (Depreciation)	=	5,526.06	2.76	451.63	.22	5,977.69
(e) Rehabilitation	None					
(f) New Buildings	None					
(g) Miscellaneous						
Drill. & Muck. Mach. Rep.	=	2,960.00	1.48			2,[illegible]00
Hoisting	=	5,980.00	2.99			5,980.00
Tramming in Bingham Tunnel	=	4,960.00	2.48			4,960.00
Handling Waste at Surface	=	380.00	.19			380.00
Engineer and Geologist	=	1,028.85	.51	270.75	.14	1,299.60
Assaying	=	513.50	.26	65.00	.03	578.50
Accounting	=	359.53	.18	94.61	.05	454.14
Totals	=	$85,703.97	$42.85	$9,657.76	$4.83	$95,361.73

United States Smelting Refining and Mining Company
Western Operations
P.O. Box 1980, Salt Lake City, Utah

6. (a) Independent Contracts

NONE

6. (b) Labor and Supervision

(available from current operating personnel)

	MINERS				DIAMOND DRILLER AND HELPER			
Months	No.	Shifts per Mo.	Labor Cost per Shift	Total Earnings per Mo.	No.	Shifts per Mo.	Labor Cost per Shift	Total Earnings
1	4	92	$20.61	$ 1,896.12			$19.19	
2	4	92		1,896.12				
3	4	92		1,896.12				
4	4	92		1,896.12				
5	4	92		1,896.12				
6	4	92		1,896.12				
7	4	92		1,896.12				
8	4	92		1,896.12				
9	4	92		1,896.12				
10	4	92		1,896.12				
11	4	92		1,896.12				
12	4	92		1,896.12				
13	4	92		1,896.12				
14	4	92		1,896.12				
15	4	46		948.06	2	46	19.19	$882.74
16					2	46		882.74
17					2	46		882.74
18					2	46		882.74
TOTALS =		1,334		$27,493.74		184		$3,530.96

Detailed Labor Cost/Shift

(a) Base Hourly Pay		$ 2.0975	$ 1.975
(b) Base Daily Pay		16.78	15.80
(c) Shift Differential		.20	
(d) Overtime on b and c		.77	.72
DIRECT LABOR COST		$17.75	$16.52
Employees Comp. Ins.	3.00%	.53	.50
Medical Expense	1.43	.25	.24
State Unemployment Ins.)	3.02	.54	.50
Federal " Ins.)			
F.I.C.A. Tax)			
Group Ins.	2.74	.48	.45
Vacation & Holiday Pay	4.95	.88	.82
Pensions	1.00	.18	.16
	16.14%		
INDIRECT LABOR COSTS		$ 2.86	$ 2.67
TOTAL LABOR COST PER SHIFT		$20.61	$19.19

	Rate per Shift
Diamond Driller	$16.78
Helper	14.82
	$31.60
Average: $31.60 / 2 =	$15.80

United States Smelting Refining and Mining Company
Western Operations
P.O. Box 1980, Salt Lake City, Utah

OTHERS

No.	Shifts per Mo.	Labor Cost per Shift	Total Earnings
.20	4.6	$19.40	$89.24
.20	4.6		89.24
.20	4.6		89.24
.20	4.6		89.24
.20	4.6		89.24
.20	4.6		89.24
.20	4.6		89.24
.20	4.6		89.24
.20	4.6		89.24
.20	4.6		89.24
.20	4.6		89.24
.20	4.6		89.24
.20	4.6		89.24
.20	4.6		89.24
.20	2.3		44.62
	66.7		$1,293.98

Supervisors	No.	Monthly Salary	Amount Per Mo.
Mine Superintendent	.02	$900.	$ 18.00
Gen. Mine Foreman	.04	665.	26.60
Foremen (2 at .22% of time)	.44	555.	244.20
Total Direct Supervisors	.50		$288.80
Total Indirect Supv. 9.4%			27.15
Total Cost per Month	=		$315.95
Total Cost for 18 Months	=		$5,687.10

1.996
15.97
-
.73
$16.70

.50
.24

.50

.46
.83
.17

$ 2.70

$19.40

Weighted Average of Others

.06	Framer	15.66	.9396
.04	Electrician	17.90	.7160
.05	Drill Doctor	16.50	.8250
.05	Timber Crew	14.26	.7130
.20			3.1936

$$\frac{3.1936}{.20} = 15.97$$

United States Smelting Refining and Mining Company
Western Operations
P.O. Box 1980, Salt Lake City, Utah

6. (c) Operating Materials and Supplies
Power, Water and Fuel.

	Drifting and Crosscutting 2000'		Diamond Drilling 2000'	
	Cost/ft	Cost	Cost/ft	Cost
Materials and Supplies:				
Explosives	$3.06	$6,120.00		
Ground Support	3.02	6,040.00		
Drill Steel and Bits	1.86	3,720.00		
Tools	1.40	2,800.00		
Track - 30#	2.20	4,400.00		
Pipe - 1" Water; 3" Air line	1.14	2,280.00		
Vent Pipe - 16"	1.67	3,340.00		
Diamond Drill Supplies			$1.71	$3,420.00
Total =	$14.35	$28,700.00	$1.71	$3,420.00
Power	$ 1.65	$ 3,300.00	$0.32	$ 640.00
Water	No Charge		No Charge	
Fuel	No Charge		No Charge	

United States Smelting Refining and Mining Company
Western Operations
P.O. Box 1980, Salt Lake City, Utah

6. (d) Operating Equipment Depreciation
(no operating equipment purchased)

No.			Cost	Depreciated Value		Monthly Depreciation 1/60 of Value	Distribution Factor	Depreciation per Mo.	Number of Months	Total Depreciation	Charge to Drifting	Charge to Diamond Drilling
	For Drifting and Crosscutting											
1	Trammer with battery and MG set at $10,040.00 each	=	$10,040.00	50%	$ 5,020.00	83.67	1.0	83.67	14.5	$ 1,213.22	$ 1,213.22	
12	36 cu.ft. mine cars at $558.75 each	=	6,705.00	75%	5,028.75	83.81	1.0	83.81	14.5	1,215.25	1,215.25	
1	25 HP fan at $1,447.76 each	=	1,447.76	75%	1,085.82	18.10	1.0	18.10	18	325.80	257.93	$ 67.87
1	5 HP fan at $377.09 each	=	377.09	75%	282.82	4.71	1.0	4.71	18	84.78	67.12	17.66
3	S58 jackhammers at $750.00 each	=	2,250.00	100%	2,250.00	37.50	1.0	37.50	14.5	543.75	543.75	
1	Eimco 12B loader at $3,028.00 each	=	3,028.00	75%	2,271.00	37.85	1.0	37.85	14.5	548.83	548.83	
1	Cherry picker at $250.00 each	=	250.00	75%	187.50	3.13	.5	1.57	14.5	22.77	22.77	
	For Diamond Drilling											
1	Diamond drill at $3,517.00 each	=	3,517.00	80%	2,813.60	46.89	1.0	46.89	4	187.56		187.56
						Monthly Depreciation 1/240 of Value (20-year period)						
	Compressor Plant	=	259,108.00	90%	233,197.20	971.66	.049	47.61	18	856.98	678.44	178.54
	Hoist	=	50,000.00	90%	45,000.00	187.50	.36	67.50	14.5	978.75	978.75	
										$5,977.69	$5,526.06	$451.63
											avg. $2.76/ft drifting	avg. 22¢/ft diamond drilling

Compressor plant consists of 4 new, Worthington air compressors: Type FV; 32", 21" x 25"; 800 HP motors; each compressor has a capacity of 4500 cfm at 115 psi. Placed in operation in 1953.

Hoist is a new Nordberg double drum; 5' diameter, 3' face; 250HP motor. Placed in operation in 1953.

United States Smelting Refining and Mining Company
Western Operations
P.O. Box 1980, Salt Lake City, Utah

6. (e) Rehabilitation and Repairs to Buildings, Installations, Fixtures

NONE

6. (f) New Buildings, Improvements, Installations

NONE

United States Smelting Refining and Mining Company
Western Operations
P.O. Box 1980, Salt Lake City, Utah

6. (g) Miscellaneous

		Drifting 2000' Cost/ft	Drifting 2000' Total	Diamond Drilling 2000' Cost/ft	Diamond Drilling 2000' Total
Drill and Mucking Machine Repairs	=	$ 1.48	$ 2,960.00		
Hoisting	=	2.99	5,980.00		
Tramming in Bingham Tunnel	=	2.48	4,960.00		
Handling Waste at Surface	=	.19	380.00		
Engineer and Geologist	=	.51	1,028.85	$ .14	$ 270.75
Assaying	=	.26	513.50	.03	65.00
Accounting	=	.18	359.53	.05	94.61
Total	=	$8.09	$16,181.88	$ .22	$ 430.36

- - - - -

Workmen's Compensation
Employers Liability Insurance
Payroll Taxes

included under "Indirect" under Labor and Supervision, and shown on 6. (b), Page 12.

- - - - -

Engineer and Geologist		Number	Monthly Salary	Amount/month on Project
Engineer	=	.06	$500.00	$ 30.00
Geologist	=	.06	600.00	36.00
Total Direct Cost	=			66.00
Total Indirect 9.4%	=			6.20
Total Cost per Month	=			$ 72.20
Total Cost for 18 Months	=			$1,299.60

- - - - -

Accounting		Number	Monthly Salary	Amount/month on project
Chief Clerk	=	.02	$575.00	$ 11.50
Time Keeper	=	.03	385.25	11.56
Total Direct Cost	=			23.06
Total Indirect 9.4%	=			2.17
Total Cost per Month	=			$ 25.23
Total Cost for 18 Months	=			$ 454.14

- - - - -

United States Smelting Refining and Mining Company
Western Operations
P.O. Box 1980, Salt Lake City, Utah

6. (g) Miscellaneous - continued

Assaying

Sampling 950 feet of drifting on the structure.
Assuming 1 sample every 6 feet or 158 samples.

Sampling 2000 feet of diamond drilling.
Assuming 1 sample every 100 feet or 20 samples.

	Total =	178 samples.
Then $3.25 X 178	=	$578.50
$3.25 X 158	=	$513.50 to Drifting.
$3.25 X 20	=	$ 65.00 to Diamond Drilling.

Sampling Labor is calculated in Engineer and Geologist.

- - - - -

7. Cost of Project

(a) Applicant is prepared to invest $47,680.00 in the proposed project, which is sufficient to pay applicant's part (50%) of the cost of the project, in accordance with regulations on government participation (Section 7, DMEA Order 1, Amended).

(b) Answered by (a).

- - - - -

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A Form 7
2-56)

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3/3	[illegible]	500
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3/5	[illegible]	130
"	[illegible]	110
"	[illegible]	100
		~~HB~~
3/6	[illegible]	225
		~~[illegible]~~

MAR 6 1958

Mr. Oscar A. Glaeser, Vice President
United States Smelting, Refining and
Mining Company
Post Office Box 1980
Salt Lake City 10, Utah

Re: Docket No. DMEA-4857 (Lead-Zinc)
U. S. Smelting, Refining & Mining
Company
Bingham Tunnel Project
Salt Lake County, Utah

Dear Mr. Glaeser:

Your application for aid for an exploration project and other reports available to us in Washington concerning the application have been reviewed.

Projects approved by the Defense Minerals Exploration Administration must, in its judgment, show definite promise of yielding materials of acceptable grade in quantities that will significantly improve the mineral supply position for the National Defense Program.

Careful study of all our information indicates to us that the fundamental data upon which the project is based are largely conjectural and not sufficiently of a specific nature. We regret to advise you, under these circumstances, that your application for exploration assistance is denied.

If, at any time, significant supporting or corroborative data are available we would be glad to give the proposal further consideration.

Sincerely yours,

[illegible]

Administrator

WRGriswold/er 2/27 & 3/3/58
Copy to: Docket
Admr R File
Op. Committee
Mr. Bishop, USBM
Mr. Kiilsgaard, USGS
Region III (2)
Chron.

8623

DMEA Form 7
(12-56)

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2/27	Zumwalt	500
2/28	Selfridge	130
2/28	Lamb	130
2/28	Kiilsgaard	130
"	Johnson	110
		100
		225

Mr. Oscar A. Glaeser, Vice President
United States Smelting, Refining and
Mining Company
Post Office Box 1980
Salt Lake City 10, Utah

Re: Docket No. DMEA-4857 (Lead-Zinc)
U. S. Smelting, Refining & Mining
Company
Bingham Tunnel Project
Salt Lake County, Utah

Dear Mr. Glaeser:

Your application for aid for an exploration project and other reports available to us in washington concerning the application have been reviewed.

Projects approved by the Defense Minerals Exploration Administration must, in its judgement, show definite promise of yielding materials of acceptable grade in quantities that will significantly improve the mineral supply position for the National Defense Program.

Careful study of all our information indicates to us that the probability of disclosing significant ore reserves by your proposed program is not sufficiently promising to justify Government participation. We regret to advise you, under these circumstances, that your application for exploration assistance is denied.

We wish to thank you for your interest in the Defense Mineral Program and for bringing your property to our attention.

Sincerely yours,

Administrator

WRGriswold/er 2/27/58
Copy to: Docket
Admr R File
Op. Committee
Mr. Bishop, USBM
Mr. Kiilsgaard, USGS
Region III (2)
Chron.

8623

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

26

2/26 C 220
WRG .500

February 25, 1958

Re: DMEA 4857; Zinc-Lead-Silver
$95,360
U. S. Smelting, Refining
& Mining Co.
United States & Lark Mine
Salt Lake County, Utah

Memorandum

To: W. R. Griswold, DMEA

From: O. M. Bishop, USBM

Subject: Review of field examiners joint report and comments by Field Team. Subject material dated February 5 and received Washington February 10, 1958.

The field examiners have inspected the project area and rendered their report. United States Smelting, Refining & Mining Co. desires DMEA help in exploring "B" bed limestone at its intersection with the Last Chance, Holden, and Niagara fissures. To accomplish this exploration the applicant proposes the extension of its #2468 drift approximately 1050 feet generally S 25 E to a point of intersection with the footwall of the "B"-bed lime, turning east and west with development headings for a distance of 475 feet in each direction along the footwall to crosscut the westerly projected fissure system. In addition 2,000 feet of AX core drilling is planned to intersect "B" bed hangingwall at regular intervals.

The field examiners and the applicant justify the project on the basis of favorable beds and structures and with mention of past production at deep levels northeast of the target. However, the appraisal of the potential of the target area must depend on evaluation of details.

If conditions south of the Last Chance Stock duplicate those in the United States & Lark mine within and to the northeast of the stock then ore may reasonably be expected in the target area. However, neither the applicant nor the field examiners have submitted factual data to demonstrate the presence of either the "B" bed lime or the southwest extension of the fissure system. Nor have they presented any evidence of mineralization of near economic merit in the target area.

The excessive distances of structure projections form a primary weakness in the project.

I recommend denial of the application on the grounds that it is an inadequate justification for the work outlined. As pointed out in my memorandum of November 5, 1957 we need facts. What evidence is there that the "B" bed is even productive north of the stock. If the applicant and field team have such evidence it is elsewhere than in the report. What evidence is there that "B" bed exists in the projected area. Stratigraphic sequence and uniformity of thickness are easily messed up by faulting, and facies changes. I think in all probability the applicant has better evidence than he has presented. If so, it should be sent us; if not the application should be denied.

O. M. Bishop

O. M. Bishop

cc: Division of Minerals
Mr. Kiilsgaard
Mr. Lamb
Mr. Callaway
Mr. Bishop
F I L E S

IN REPLY REFER TO:

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DATE	INITIALS	CODE
2-14	C	220
2-19	Griswold	500

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

February 13, 1958
Re: DMEA 4857
U.S. Smelting, Refining & Mining Co.
U. S. and Lark Mine
Salt Lake County, Utah
Appl. Est.$95,360
Rec'd Est.$95,360 Lead-Zinc

Memorandum

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

From: N. E. Nelson, U. S. Geological Survey

Subject: Review of Field Team Report

The applicant requested assistance in prospecting for the "B" limestone bed and if found, (its position is conjectural) searching for intersections of projected fissures and the "B" bed. The area to be prospected is on the southwest side of the Last Chance stock and the proposed work would be done on the Bingham Tunnel level off the Niagara No. 3 shaft.

The work proposed is part of a project on which assistance was requested in application DMEA 3993. The examiners in that case did not agree. The engineer, Mr. Howes, recommended approval of the application, the geologist, Mr. Osterstock, considered the proposed work prospecting, and recommended denial. The application was denied with the usual proviso "that in the event future work in this area discloses new and more favorable evidence, which could materially alter our opinion, you may be assured we would be pleased to consider a new application".

Work that might 'materially' alter opinions consists of about 700 or 800 feet of drifting outside the project block, presumedly in the Last Chance fissure and a diamond drill hole, No. 679, which at 477 feet ahead of the drift face and in the project block, encountered a 1-inch fissure of high grade galena-sphalerite.

Results of the drifting in the Last Chance fissure are not given us. I assume no ore was found, but at some place on the Galena 400 level in its minable portions, it carried 4.1 feet of ore. At any rate the work is in the Last Chance stock and

whether the results are good or bad, they may not be indicative of what is to be expected where the "B" limestone bed is cut by the Last Chance fissure. About 450 feet of the proposed drifting will be within the stock, the remainder in the sedimentary rocks.

The engineer examiner, again Mr. Howes, and the geologist examiner, Mr. Moore, are in agreement and recommend approval of a slightly altered work program. Mr. Osterstock following a company formula and practice arrived at a tonnage which is designated inferred ore, the target of the exploratory work. For the "B" bed the figure is 120,000 tons. Of the estimate he says, "It is the writer's opinion that the estimate, based as it is on assumptions and intangible evidence, should not be considered a reserve figure even of the inferred classification". In which connection it might be noted, the "inferred" tonnage for the project in ground adjoining this project block under DMEA 2028, Idm-360, was 550,000 tons of ore. As of October 6, 1956, 8,554.47 tons of ore valued at $183,221.22 had been produced from 3 short oreshoots as a result of the exploration. The present examiners quote the same dollar value so it probably represents the total production. The work under DMEA 2028 cost $612,453.16 (Government's share $306,226.58). The object of the work, although at a higher level, was essentially the same as that in the present case. The limestone beds and several fissures were found much as projected, but mineralization in the structures where explored is scarce to lacking.

Quoting Mr. Osterstock, "The bulk of the geologic reasoning in support of the application is conjectural. This is not a shortcoming of the applicant, the truly critical information which might support the application is not in existence. In this sense, then the program as proposed by the applicants may justiably be regarded as a methodical prospecting venture. Additional damning evidence lies in the statistical analysis of other DMEA projects aimed at targets similar to those considered in the present application. Three projects -- DMEA 1098, 2028, and 2653 -- are essentially complete. The total cost of these ventures has been approximately $885,880.00. Only one relatively small ore body has been discovered as a result of this work (Rough Wrestler fissure ore in Spiritualist tunnel, DMEA 2028, Item III amended). To date, DMEA activities in the district may hardly be regarded as successful. A fourth project, DMEA 3474, has only recently been started and is not yet subject to evaluation, the estimated total cost of this latter project is $301,930.00."(As amended probably $438,122.50). This last project, 3474, is far from and not exactly comparable to the projects on the southerly part of Last Chance stock, but it too, now nearly completed, has resulted unfavorably.

In view of the lack of success attending the 3, as now determined, prospecting projects in the general area, I recommend that the application be denied.

N. E. Nelson

N. E. Nelson

UNITED STATES
DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS EXPLORATION ADMINISTRATION
224 New Customhouse
Denver 2, Colorado

February 10, 1958

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DATE		CODE
2/13	C	220
2/13	WHK	500

Memorandum

To: Secretary to the Operating Committee, DMEA

From: DMEA Field Team, Region III

Subject: Docket No. DMEA 4857 (Lead-Zinc) United States Smelting, Refining and Mining Company (U.S. and Lark Mine) Salt Lake County, Utah - Maps for Contract.

Enclosed are 8 copies each of Plats I, II, III and IV for use in the subject contract.

W H King
W. H. King
Executive Officer

Enc.

UNITED STATES
DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS EXPLORATION ADMINISTRATION

224 New Customhouse
Denver 2, Colorado
February 6, 1958

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Memorandum

To: Secretary to the Operating Committee, DMEA

From: DMEA Field Team, Region III

Subject: Docket No. DMEA 4857 (Lead-Zinc) United States Smelting, Refining and Mining Company, (U. S. and Lark mine), Salt Lake County, Utah - Joint Report of Examination

Enclosed are the original and two copies of the joint report of examination on the subject property.

The Field Examiners conclude that the probability for making a significant discovery is sufficiently promising to justify Government participation. They recommend that the application for DMEA assistance be approved. The Field Team concurs in this recommendation.

Extra copies of maps to accompany the contract are in preparation and will be forwarded you when they are received by this office.

W. H. King
W. H. King

E. N. Harshman
E. N. Harshman

Enclosures

Reviewed by
DMEA OPERATING COMMITTEE
2-12-58
(date)

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

DEFENSE MINERALS EXPLORATION ADMINISTRATION

REPORT OF EXAMINATION BY FIELD TEAM
REGION III

DMEA
DEPARTMENT OF THE INTERIOR
FEB 5 - 1958
REGION III
DENVER, COLORADO

DMEA 4857

United States Smelting, Refining and Mining Co.

U. S. and Lark mine

Salt Lake County, Utah

Lead-zinc

Joint Engineering and Geologic Report

by

F. B. Moore, Geologist
Geological Survey

M. H. Howes, Mining Engineer
Bureau of Mines

February 4, 1958

Reviewed by
DMEA OPERATING COMMITTEE
2-12-58
(date)

DMEA
DEPARTMENT OF THE INTERIOR
FEB 6 - 1958
REGION III
DENVER COLORADO

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DMEA 4857

UNITED STATES SMELTING, REFINING AND MINING CO.
U. S. AND LARK MINE
SALT LAKE COUNTY, UTAH

INTRODUCTION AND SUMMARY

The United States Smelting, Refining and Mining Co. submitted an application dated October 21, 1957, for Government aid in an exploratory project under docket No. DMEA 4857. It is proposed to explore for lead-zinc in the "B" limestone where intersected by northeast-trending fissures south of the Last Chance stock. The proposed program, consisting of 2,000 feet of drifting and cross-cutting and 2,000 feet of diamond drilling is a modification of a previous application (DMEA 3993) which was denied without prejudice. The total estimated cost of the project is $95,360.

A field examination of the property was made December 9, 1957, by Frank B. Moore, Geological Survey, and M. H. Howes, Bureau of Mines, to determine the feasibility of the proposed exploratory work, and to appraise the estimated costs and the engineering aspects of the job. The field examiners were accompanied on the trip by Paul Fillo, Bureau of Mines, and Benton Boyd, C. L. Thornburg, and R. Rubright, representatives of the company.

Justification for the project is based almost entirely on past production from the U. S. mine. The three fissures to be explored--the Last Chance, Holden, and Niagara--have been productive in and

north of the Last Chance stock. The "B" limestone bed is one of the more productive beds in the district.

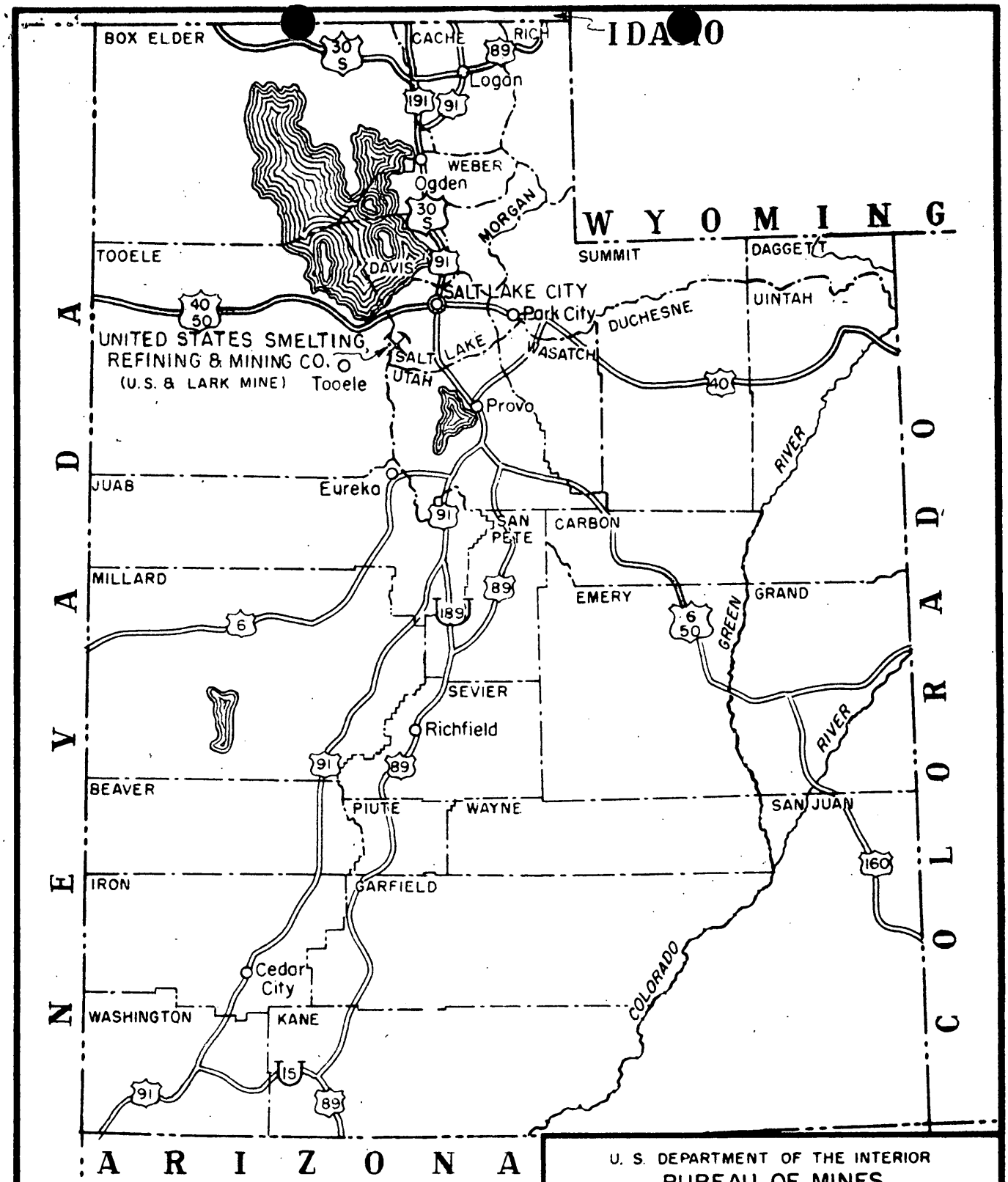
Because the exploration program appears to have a good chance of discovering significant deposits of lead-zinc ore, it is recommended that the application for DMEA assistance be approved.

LOCATION, TOPOGRAPHY, AND PHYSICAL FEATURES

The U. S. and Lark mine lies on the east slope of the Oquirrh Range in the Bingham area of the West Mountain mining district, Salt Lake County, Utah, approximately 28 miles southwest of Salt Lake City, (fig. 1). The property rises from an elevation of 5,500 feet above sea level at the portal of the Bingham Tunnel at Lark to more than 8,200 feet at the ridge above the proposed project.

HISTORY AND PRODUCTION

Active prospecting of mineral resources in Utah was first initiated and encouraged by General P. E. Connor, who was stationed at Fort Douglas, Salt Lake City, in 1862. The general freely gave furloughs to his soldiers to enable them to prospect. In the fall of 1863 the first mining claim in Utah, the West Jordan, was formally located after specimens of ore had been discovered on the site. Other discoveries and locations soon followed. During the next 30-odd years many lead, gold, and copper mines were brought



U. S. DEPARTMENT OF THE INTERIOR
BUREAU OF MINES

Fig. 1 DMEA Docket No. 4857
Location Map
UNITED STATES SMELTING, REFINING & MINING CO.
(U.S. & LARK MINE)
SALT LAKE COUNTY, UTAH

ENGINEER: M. H. HOWES	DATE: JAN. 28, 1928
TRACED: JAN., 1958; A.P.T.S.	900 - 325 - G
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into production in the area. In March 1899 the Old Jordan and Galena, Spanish, and Telegraph mines were consolidated and the United States Mining Co. was organized. In 1906 the company was reorganized and named United States Smelting, Refining and Mining Co. The company's holdings have been expanded to include 5,759 acres of mineral ground.

The Bingham district is one of the major mining camps of the world. Although it is particularly famous for its copper production from the Utah Copper mine, it is also one of the country's important sources of lead and zinc. More than 15,000,000 tons of lead-zinc ores have been produced from properties now owned by the U. S. and Lark mine of the United States Smelting, Refining and Mining Co. Production has been practically continuous since 1872. Production and grade of ores from the U. S. and Lark mine for the period 1948 through 1956 are tabulated as follows:

Year	Dry tons shipped	Ounces		Percent		
		Au	Ag	Cu	Pb	Zn
1948	322,435	0.037	5.246	0.410	8.300	7.700
1949	356,637	0.042	4.818	0.400	9.355	7.030
1950	275,774	0.054	4.897	0.440	8.535	6.490
1951	330,108	0.044	4.283	0.390	7.995	6.495
1952	371,964	0.044	4.574	0.450	8.765	6.760
1953	326,749	0.041	4.255	0.435	8.800	7.290
1954	307,435	0.040	4.609	0.435	9.410	7.815
1955	305,783	0.046	4.680	0.490	10.040	8.040
1956	319,575	0.050	4.220	0.500	9.870	8.350

Current production of the mine is approximately 1,200 tons of ores per day plus an average of about 125 tons of ores per day from lessee operations. Production from the "B" limestone bed in the area north of the Last Chance stock totals nearly 1-1/2 million tons containing 15 to 20 percent combined lead-zinc.

Several previous DMEA exploration projects have been activated in the general area of the U. S. and Lark mine. These projects have, in part, had targets similar to the present target, i.e., the "B" limestone bed. However, nearly all of the previous projects were located at distances of more than 5,000 feet east or northeast of the present target area. One project (DMEA 2028, Contract Idm-E 360) discovered ore along the Rough Wrestler (?) fissure about 1,800 feet vertically above and considerably higher stratigraphically than the present target area. The same project opened three ore shoots in the Highland limestone about 6,000 feet east of the present target area. Ore valued at $183,221.22 was produced as a result of exploration on DMEA 2028. Although in general the results of DMEA exploration in the area have been disappointing, the differences in geographic and stratigraphic locations and the different fissure systems are such that it is not believed these projects can be used to condemn the present one.

OWNERSHIP AND EXTENT

The U. S. and Lark mine, consisting of 5,739 acres of patented and unpatented mining claims, and including many well-known old operations, such as Old Jordan, Last Chance, Commercial, Galena, Kempton, Telegraph, Niagara, Brooklyn, Yosemite, Lead Mine, Dalton and Lark, Bingham Prospect, Mayflower, Tiewaukee, and Winamuck, is owned by United States Smelting, Refining and Mining Co. There are no claims, liens, or encumbrances against the property.

The real property comprising the project area includes all or portions of patented and unpatented lode-mining claims situated in Sections 3, 4, 9 and 10, T. 4 S., R. 3 W., S.L.B. and M., in West Mountain mining district, Salt Lake County, Utah as shown on figure 2, and listed as follows:

Claims Owned (patented, unless otherwise indicated)	U. S. Lot No. or U. S. Survey No.
Aetna Amd.	7020
Aladin	68
Albino	70
Almeda	73
Armand	4030
Austin	4030
Austin Ray	410
Blizzard	6376
Blizzard Fraction	6375
Boston	3532
Buzzo	3531
Contact	5407
Contact Fraction	6373
Dead Thing	4463
Decoration	6971

Claims Owned (patented, unless otherwise indicated)	U. S. Lot No. or U. S. Survey No.
Detroit	3528
Dandy Fraction (unpatented)*	7117
Difficult Amd.	7019
Earl Amd.	7020
Experiment	5319
Fair	3980
First Chance	135
G. H. Amd.	7019
Hard Job Amd.	7020
Henrietta	83
Hibernia	3026
I Don't Care	4030
Indiana	3779
Josie K.	4030
Klondyke No. One	3966
Last Chance	48
Lilly	4363
Live Pine	85
Michigan	3529
Michigan Fraction	6377
Mignon	6378
Morton	6940
Ole Bull	76
Owyhee	77
Patience	6372
Percival	6374
Plumed Knight	6660
Red Cloud	145
Rip Van Winkle	3978
Royal	75

* Recorded in Salt Lake County, Book K, page 387.

Claims Owned (patented, unless otherwise indicated)	U. S. Lot No. or U. S. Survey No.
Royal Queen	4955
Scotia	3026
Silver Plume	146
Silver Amd.	7020
Stag	3979
Stella Amd.	7020
Wide West	289

Government tie: The point of beginning is corner No. 4 of the Mednight Bell No. 1 lode mining claim, U. S. Survey No. 5609, whence the quarter corner between Sections 3 and 10, T. 4 S., R. 3 W., S.L.B. and M., bears S. 85° 20' W., 813 feet, more or less.

Lateral limits: Beginning at said Corner No. 4 of said Mednight Bell No. 1 lode mining claim, U. S. Survey No. 5609, and running thence along line 4-3 of said claim S. 59° 45' E., 125.3 feet, more or less, to intersect the section line between said Sections 3 and 10;

thence along said section line S. 89° 49' W., 918.6 feet, more or less, to the said quarter corner between said Sections 3 and 10;

thence along the east line of the northwest quarter of said Section 10, S. 0° 01' W., 1315.2 feet, more or less, to intersect the north line of the south half of the said southwest quarter of Section 10;

thence, in part along said north line of the south half of said northwest quarter, N. 89° 53' 20" W., 3297.7 feet, more or less, to intersect line 4-3 of the Blizzard Fraction lode mining claim, U. S. Survey No. 6375;

thence along line 4-3 of said Blizzard Fraction lode mining claim N. 9° 33' W., 705 feet, more or less, to corner No. 3 of said claim, identical with corner No. 3 of the Beebe lode mining claim, U. S. Survey No. 5436;

thence along line 3-2 of said Beebe lode mining claim N. 53° 15' W., 300 feet, more or less, to corner No. 2 of the Fred C. lode mining claim, U. S. Survey No. 5436;

thence along line 2-3 of said Fred C. lode mining claim N. 33° 00' E., 1422.4 feet, to corner No. 3 of said claim;

thence along line 3-4 of said claim N. 52° 15' W., 426 feet, more or less, to intersect line 3-2 of the Silver Chief No. 2 lode mining claim, U. S. Survey No. 4985;

thence along said line 3-2 N. 56° 19' E., 321.4 feet, more or less, to corner No. 2 of said Silver Chief No. 2 lode mining claim, identical with corner No. 3 of Silver Chief No. 1 lode mining claim, U. S. Survey No. 4985;

thence along line 3-4 of said Silver Chief No. 1 lode mining claim N. 35° 54' E., 395.2 feet, more or less, to intersect line 6-1 of the Armand lode mining claim, U. S. Survey No. 4030;

thence along said line 6-1 of said Armand lode mining claim, N. 7° 30' E., 368.3 feet, more or less, to corner No. 1 of said claim, situated on line 3-4 of the Michigan lode mining claim, U. S. Survey No. 3529;

thence along said line 3-4 of said Michigan lode mining claim N. 52° 58' W., 110.1 feet, more or less, to corner No. 4 of said claim;

thence along line 4-1 of said claim N. 59° 33' E., 112.7 feet, more or less, to corner No. 3 of the Detroit lode mining claim, U. S. Survey No. 3528;

thence along line 3-4 of said Detroit lode mining claim N. 43° 39' W., 150 feet;

thence N. 80° 20' E., 1630 feet, more or less, to intersect the southerly prolongation of the east line 1-4 of the South Hooper lode mining claim, U. S. Survey No. 373;

thence N. 35° 00' E., 1635 feet along and coinciding with said line 4-1 of said South Hooper lode mining claim, to a point on a northerly prolongation of said side line;

thence S. 71° 03' E., 1812.6 feet, more or less, to intersect northerly prolongation of east side line 11-10 of Scotia lode mining claim, U. S. Survey No. 3026;

thence along said northerly prolongation of and coinciding with the east line 10-11 of said Scotia lode mining claim, S. 30° 49' W., 1345 feet, more or less, to intersect line 2-3 of Silver Star lode mining claim, U. S. Survey No. 4138;

thence along said line 2-3 of said Silver Star lode mining claim S. 0° 51' E., 831.9 feet, more or less, to corner No. 3 of said claim;

thence along line 3-4 of said claim, identical, in part, with line 2-3 of the G. H. Amended lode mining claim, U. S. Survey No. 7019, N. 89° 09' E., 402.9 feet, more or less, to corner No. 3 of said G. H. Amended lode mining claim;

thence along line 3-4 of said claim south, 523.3 feet, more or less, to intersect line 5-4 of said Mednight Bell No. 1 lode mining claim, U. S. Survey No. 5609;

thence along said line 5-4 of said Mednight Bell No. 1 lode mining claim S. 35° 51' W., 711.2 feet, more or less, to corner No. 4 of said claim, the point of beginning.

Vertical limits: The applicant has agreed that there shall be no vertical limits of the project area.

Adjacent land: The United States Smelting, Refining and Mining Co. owns and controls surrounding ground which totals in excess of 600 patented claims covering over 5,000 acres.

MINABLE ORE RESERVES

The applicant reports an estimated minable reserve of 210,000 tons of ores containing 15 to 17 percent combined lead and zinc.

PRESENT STATUS

The proposed exploratory project will be conducted from a drift driven southwesterly from the Niagara No. 3 shaft on the Bingham Tunnel level (U. S. Section 1000 level).

The existing usable facilities, equipment, buildings, and structures, owned by the company, that will be devoted entirely or in part to the exploration work, consist of the following:

All of the surface facilities of the U. S. and Lark mine, which include:

Machine and electrical shops and equipment

Blacksmith and steel shops and equipment

Framing mill and equipment

General offices

Warehouses

Engineering and geological offices

all completely equipped for 1,200 tons per day operation, together with such mine equipment as rock drills, mucking machines, jumbos, haulage locomotives, mine cars, pumps, and hoisting equipment.

The minimum clearance of drift section, timbered and untimbered, is 7 feet high by 6 feet wide. Track gauge to be used on the proposed drifting will be 24 inches. Waste and ores from the project will be dumped from 24-inch-gauge cars into skip pockets at the Niagara No. 3 shaft and then hoisted up the shaft to loading bins, from which 36-inch-gauge cars will transport it through the Bingham Tunnel to the surface. Minimum size of diamond drill holes will be AX.

Ores discovered in the project area, after being mined and transported through the Bingham Tunnel to the Lark surface plant,

will be shipped via standard-gauge railroad to the United States Smelting, Refining and Mining Co. mill at Midvale, Utah, a distance of approximately 12 miles.

Ample labor is available in the Salt Lake Valley area.

Materials, supplies, and equipment not now on hand at the mine can be readily obtained in Salt Lake City.

An adequate water supply is available from the mine workings.

Power is purchased from the Utah Power and Light Co., whose main generating plants for the area are known as Olmsted, Hale and Jordan. The power company has connecting lines with its generating plants in Utah and Idaho. Power is delivered to Bingham Canyon over three separate 44,000-volt transmission lines designated as Bacchus, Jordan Narrows No. 1, and Jordan Narrows No. 2. There are two feeder lines to the mine. It is estimated that the project will consume approximately 46,000 kw.-hr. per month at a cost of 1 cent per kw.-hr.

GEOLOGY

The following sections on geology and ore deposits are taken largely from the report by Osterstock on DMRA 3993.

"The Bingham district is underlain by interbedded limestone and quartzite of Pennsylvanian age and by intrusive bodies which range in composition from diorite to quartz monzonite. Tertiary andesite flows mantle portions of the northeastern part of the district.

"The sedimentary rocks are a part of the Pennsylvanian Oquirrh formation which is about 15,000 feet thick. Although the formation is predominantly quartzitic there are interbedded limestone members up to 150 feet thick and as the formation is traced southward from the Bingham stock area there are progressively more and thicker limestone beds and less quartzite and an attendent thinning of the entire section.

"The ore deposits appear to be genetically related to the intrusive rocks which occur as irregular stocklike bodies and as dikes and sills. The major intrusive bodies in the district are the Bingham (Utah porphyry copper) stock, noted for its disseminated copper content, and the Last Chance stock, noted for its associated lead-zinc-silver deposits. These intrusives range in composition from quartz monzonite in the Bingham stock to the dioritic rock of the Last Chance stock.

"Structurally, the district is one of persistent, broad, open flexures upon which are superimposed smaller less persistent parallel folds and cross folds. The major fold in the district is a large syncline whose irregular northwesterly striking and plunging axis lies to the west of the project area. A prominent zone of northeasterly trending fissures, generally with steep dips, has accounted for a considerable portion of the production from the U. S. section of the U. S. and Lark mine. These fissures, which include the Last Chance,

Holden, Galena, Gem, Aetna, Royal, and Wide West, in a few instances have been traced southwesterly through the Last Chance stock into the sediments.

"The proposed project area except for a small northern salient lies entirely to the south of the Last Chance stock as it is delineated at the surface (Plat II). Underground evidence indicates that the south wall of this intrusive mass is nearly vertical although some local irregularities and off shoots may be expected (Plat III).

"Two stratigraphic units are mapped at the surface within the confines of the project boundaries. These are Yampa and the Highland Boy limestones which have been productive in the central part of the district. Within the project area these units are known by their correlative names, the Commercial and Jordan limestones (Plat IV). Underlying these beds are the Intermediate and Alphabetical series of limestones which have accounted for the major part of the production in the central part of the district to the north of the Last Chance stock. The beds have a general northeasterly strike and gentle northwesterly dip.

"Control for the projection of the "B" and "D" target beds to the level of the proposed exploration project is gained principally from a study of the attitude of the stratigraphically higher Commercial and Jordan limestones exposed at the surface in conjunction with the known stratigraphic interval separating these beds from the target

beds. Substantiating evidence is provided by the Butterfield tunnel work (DMEA 1098) which has explored the "F" limestone only about 1,000 feet east of the presently proposed project area."

ORE DEPOSITS

"The ore deposits in the Bingham district are of several types; veins, bedded replacements, and disseminations. The latter type is predominantly the "porphyry-copper" confined to the Bingham stock. The veins and bedded replacements are predominantly the lead-zinc-silver ores which form a roughly peripheral zone around the central copper-bearing Bingham stock. The Last Chance stock, which falls within the lead-zinc peripheral zone, is often considered as a separate center of mineralization with respect to the lead-zinc deposits.

"The most extensive lead-zinc ore bodies have been formed in receptive calcareous bedding horizons and are often further localized by a bedding fault near the footwall of the limy member. These deposits have been found to be best developed in the zone between the Bingham stock on the north and the Last Chance stock on the south.

"The vein deposits or fissure ore bodies generally strike northeast and increase in importance in proximity to the Last Chance stock; some of the fissures in fact have carried considerable ore in the stock itself. The fissures are roughly 300-500 feet apart and

dip steeply westward and eastward (Plat V). The applicants report that much of the ore mined in the U. S. section of the mine has come from steeply dipping shoots on bedding structures north of the Last Chance stock, and that this type of deposit is notably exemplified by the ore bodies in the "B" and "D" limestones.

"The several fissures which have been traced on the surface in the project area are characterized by silicified iron and manganese stained alteration zones. Company samples taken across several of the alteration zones exposed on the north slope of Butterfield Canyon have assayed from 5 to 30 oz. of silver per ton and up to 18 percent manganese. Lessees are reported to have made two shipments of gossan-type ore but there is no information available as to the metal content of these shipments. The Aetna prospect is reported by the applicants to show lenses of high grade lead carbonate ore along a prominent northeast fissure."

The projection distance is too great to provide for precise location of the fissures exposed at the surface on the level of the proposed exploration program, although one fissure, the Wide West, is shown both on the surface and underground maps (see Plats II and III). The principal fissures which are expected to be intersected by the proposed exploration are the Last Chance, along which the initial work is to take place, and the Holden and Niagara which are expected in the easterly drift proposed along the "B" limestone.

The three fissures which are to be explored have been located underground near the target area. The Last Chance fissure is cut on the Bingham Tunnel level by a crosscut about 1,200 feet northeast of the target area. At the time of the visit timber covered the exposure but the applicant states that the fissure was from 2 to 10 feet in width and contained up to 15 inches of sulfides.

The Holden fissure is being followed southwest by a drift on a level 800 feet above the Bingham Tunnel level. The face at the time of examination was an estimated 1,400 feet northeast of the target area. The fissure was from 3 to 5 feet wide and, a short distance back from the face, contained 2-1/2 feet of sulfides--mostly galena and sphalerite.

The Niagara fissure had just been cut by a drill hole 2,000 feet northeast of the target area. However, no data was available on the size or tenor.

PROJECT PROPOSALS

The applicant's proposed exploratory work is described as follows:

1. Drive southwesterly from the present face of 2468 Drift, in the zone of the Last Chance fissure, an approximate distance of 1,050 feet to the footwall of the "B" limestone---------- 1,050 feet

2. Drive northeast about 475 feet and southwesterly about the same distance on the "B" limestone footwall bedding---------- 950 feet

Total drifting---------- 2,000 feet

3. The project will require approximately 2,000 feet of diamond drilling to be carried out in conjunction with the above exploratory work. From conveniently spaced diamond drill locations the "B" limestone, as shown on the plan, will be drilled. The exact location of the holes cannot be planned until a substantial part of the drifting has been completed---------- 2,000 feet

Total diamond drilling---------- 2,000 feet

The above plan is based on the assumption that the position of the "B" limestone is fairly accurately shown on the accompanying maps. Since this position is based on projected geology, the specific distances to various objectives are to be regarded as approximations. The position of the Jordan limestone at the surface is reasonably well established, and it is known from the stratigraphic section that the favorable alphabetical limestones must lie within fairly definite vertical ranges below the Jordan, and therefore be in the approximate positions illustrated on the accompanying plans and sections.

The total distance of 2,000 feet for drifting appears to be ample to adequately explore the Last Chance fissure zone to the "B" limestone, and the footwall bedding of the "B" limestone both ways, especially to the intersection with the Holden and Niagara fissures. Since the fissures and limestone beds, as shown on Plat III, are long projections and therefore only approximately located, it is not considered feasible to specify approximate distances from the present face of 2468 Drift to the footwall of the "B" limestone, or along the "B" limestone footwall bedding to the Holden and Niagara fissures.

The following slightly altered program is hereby recommended.

The purpose of this project is to explore the "B" limestone, the Last Chance, Holden, and Niagara fissures, and any other favorable limestones or fissures encountered for lead and zinc ores, and the work is to be done from the Bingham Tunnel level.

The approximate location of the work is shown on Plat III and is described as follows:

1. Drive southwesterly from the present face of 2468 Drift in the zone of the Last Chance fissure to the footwall of the "B" limestone.

2. Drive southwesterly and northeasterly, particularly to the Holden and Niagara fissures, to the northeast, on the "B" limestone footwall bedding. Total drifting shall not exceed 2,000 feet.

3. Diamond drilling, not to exceed 2,000 feet, for the purpose of deriving geologic information, as well as the search for ore, shall be conducted in conjunction with the above exploratory work. Location of holes shall be determined by geologic evidence encountered in the drifting, and shall be subject to Government approval.

The minimum clearance of drift section shall be 7 feet high by 6 feet wide, whether timbered or untimbered. Drift track gauge shall be 24 inches.

The minimum size of diamond-drill bits shall be AX.

ESTIMATED COST OF PROJECT PROPOSALS

The estimated cost of project proposals as submitted by the applicant has been closely studied and found to be fair and accurate. The detailed figures in the application compare favorably with actual costs of similar work in recent company DMEA projects. It is therefore not considered necessary to tabulate all of the detailed costs in this report, but instead to summarize the estimated costs of the proposed project as follows:

	Drifting 2,000 feet		Diamond Drilling 2,000 feet	
	Total Cost	Cost per ft.	Total Cost	Cost per ft.
Labor	$27,493.74	$13.75	$3,530.96	$1.77
Supervision	4,502.29	2.25	1,184.81	.59
Materials and supplies	28,700.00	14.35	3,420.00	1.71
Power	3,300.00	1.65	640.00	.32
Operating equipment (depreciation)	5,526.06	2.76	451.63	.22
Equipment repairs	2,960.00	1.48		
Hoisting	5,980.00	2.99		
Tramming in Bingham Tunnel	4,960.00	2.48		
Handling waste at surface	380.00	.19		
Engineer and geologist	1,028.85	.51	270.75	.14
Sampling and analysis	513.50	.26	65.00	.03
Accounting	359.53	.18	94.61	.05
Totals	$85,703.97	$42.85	$9,657.76	$4.83

Summary of Estimated Costs

Drifting

2,000 feet at $42.85 per foot ---------- $85,700.00

Diamond Drilling

2,000 feet at $4.83 per foot ---------- $ 9,660.00

Total estimated cost of proposed project ---------- $95,360.00

Government participation at 50 percent ---------- $47,680.00

PROPOSED FINANCING

The applicant is prepared to invest $47,680.00 in the proposed exploratory project, which is 50 percent of the total estimated cost of $95,360.00, in accordance with the regulations on Government participation, as stated in Section 7, DMEA Order 1, Amended.

CONCLUSIONS AND RECOMMENDATIONS

Certain limestone beds in the Pennsylvanian Oquirrh formation are favorable to the deposition of ore in the West Mountain (Bingham) mining district, Utah. These beds include the Commercial, Jordan, Lower Intermediate, Highland, "B", and "D" limestones. A series of northeast-trending fissures have also been productive in north and east of the Last Chance stock. Among the more productive fissures are the Last Chance, Holden, Galena, Gem, Aetna, Royal and Wide West. The targets for exploration under this application are the intersections of the Last Chance, Holden, and Niagara fissures with the "B" limestone bed.

The program in general is considered geologically sound. Factors for and against such a project may be summarized:

<u>Favorable</u>

(1) The intersections of known productive fissures with known favorable beds should present an especially good target.

(2) The area has been mineralized as shown by vein outcrops, numerous small workings at the surface, and a 1-inch fissure of high-grade galena-sphalerite encountered in a diamond-drill hole 477 feet ahead of the face of 2468 Drift.

(3) Northeast fissures extend through the Last Chance stock to and beyond (southwest of) the target area. Correlation of surface fissures with the three target fissures, however, is difficult because of faulting and the limited amount of work in the area.

(4) The lateral projections of the target fissures is not considered excessive in view of their strength and persistence to the northeast.

(5) Ore has been found in the U. S. mine at depths over 2,000 feet below the target area.

(6) If ore is found in the project, an entirely new area of considerable size will be opened for exploration and mining.

(7) The Last Chance stock may be a separate center of mineralization. Direct evidence on this is lacking but the most highly mineralized ground in regard to lead-zinc is between and peripheral to the two stocks. This may indicate that mineralization resulted from solutions from both stocks.

Unfavorable

(1) Because the target area is in essentially virgin ground, few data are available for making an evaluation. The risks are, therefore, somewhat greater but so are the possible rewards.

The project is geologically sound, has a good possibility of finding significant ore deposits, and falls within the scope of DMEA i.e., to explore areas where the risks may be somewhat greater than a company would normally take but where the chances of proving up new areas are good. It is therefore recommended that the project, subject to the few minor changes suggested above, be approved.

RECEIVED FILE
2/1 C 220 ~~500~~

224 New Customhouse
Denver 2, Colorado

January 31, 1958

Memorandum

To: DMEA/SLC - Att'n: M. H. Howes

From: Executive Officer, DMEA Field Team, Region III

Subject: Docket DMEA-4857 (Lead-Zinc) U. S. Smelting Refining and Mining Company (U. S. and Lark mine) Salt Lake County, Utah - Maps to accompany the contract.

We received the copies of the maps to accompany the Report of Examination on the subject property. The contract will require ten more copies each of the following:

Plat I
Plat II
Plat III
Plat IV

Please forward this office ten copies of each of the above-mentioned maps as soon as possible for use in the contract.

Original signed by
W. H. KING

W. H. King

HMC:jy

cc: Sec. Op. Comm. (2)
Harshman
Docket 4857
Chron.

11/18	gb	220
11/18	~~WPS~~	500

224 New Customhouse
Denver 2, Colorado

November 15, 1957

Memorandum

To: E. N. Harshman) W/enclosures, Items 1-5 Below
DMEA/SLC " " " "

From: DMEA Field Team, Region III

Subject: Docket No. DMEA 4837 (Lead-Zinc) U. S. Smelting, Refining & Mining Co. (Bingham Tunnel Projects) Salt Lake County, Utah

Enclosed is the following material relating to the subject docket:

1. Copy of application for Government assistance in exploration work under the DMEA program.
2. Memorandum of Review by O. M. Bishop, USBM.
3. Memorandum of Review by W. P. Williams, USGS.
4. Letter of transmittal of the foregoing to this office, dated November 12, 1957, from the Chairman, Operating Committee, DMEA.
5. Routing Control Sheet.

A field examination of the property and a joint report of findings and recommendations pertaining to the Applicant's work proposal are requested.

Please note particularly the last paragraph of the Chairman's letter wherein he states that we would not consider an upper vertical limit of the project as being 200 feet vertically below bedrock.

If the field examiners recommend Government participation in the proposed exploration program, please submit eleven extra copies of each map used in the joint report which show the land to be subordinated and the location and extent of recommended work, relative to property boundaries.

The Bureau of Mines' copy of the application should not be returned to this office, but is to be kept for the Examining Engineer's file. The Routing Control Sheet, however, is to be completed, detached from the application, and forwarded to the Executive Officer with the Joint Examination Report.

Original signed by
E. N. HARSHMAN

E. N. Harshman
Acting Executive Officer

Enclosures

HMC:eh

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

DMEA Form 7
(12-56)

OFFICIAL FILE COPY

Date	Surname	Code
11/7	Hrusinski	500
11/8	GCL	130
"	Johnson	110
		~~400~~
		~~HD~~
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NOV 12 1957

Mr. E. N. Harshman
Acting Executive Officer
DMEA Field Team, Region III
224 New Customhouse Bldg.
Denver 2, Colorado

Re: Docket No. DMEA-4057 (Lead-Zinc)
U. S. Smelting, Refining & Mining Co.
Bingham Tunnel Projects
Salt Lake County, Utah

Dear Mr. Harshman:

The cited application is being referred to your office for consideration, a field examination of the property if warranted, and recommendations. Copies of memoranda by W. P. Williams, Geological Survey, and O. M. Bishop, Bureau of Mines, dated October 29 and November 5, 1957, respectively, relating to the project are enclosed for your information. We are also enclosing two extra copies of the application.

The target area is essentially similar to that covered by DMEA-3993 which was denied last year. At such time our denial (made without prejudice) was due to the fact that the Applicant's presentation was so sketchy and so completely lacking in fundamental geological data that we had no basis upon which to attempt a reasonable appraisal. Actually, it was difficult to avoid the conclusion that the project set-up had been made in a haphazard manner, with little preliminary spade work.

The present application appears to be a somewhat more logical presentation and a little work has been done by the company recently, in the form of diamond drilling. Therefore, it is our feeling that it warrants a careful review by the Field Team.

It is inevitable that we might feel a trifle skeptical since four projects in this general area southerly of the Last Chance stock have been unsuccessful. We refer to:

8623

Docket No. DMEA-1098 - Combined Metals Reduction Company
Docket No. DMEA-2028 - U. S. Smelting, Refining & Mining Company
Docket No. DMEA-2653 - U. S. Smelting, Refining & Mining Company
Docket No. DMEA-3474 - U. S. Smelting, Refining & Mining Company

Nevertheless, we wish to maintain a fair and reasonable attitude toward this present proposed project.

We note in the application that the company desires a vertical limit (page 4 of application) of 200 feet vertically below bedrock. We would not consider such a limitation but, on the other hand, there is nothing in any contract which requires an Operator to mine ore in any area, unless it sees fit to do so.

Sincerely yours,

George C. Selfridge

Chairman, Operating Committee (GCS)

Enclosures

APPROVED:

Frank D. Lamb (FDL)
Member, Bureau of Mines

Thor H. Kiilsgaard (THK)
Member, Geological Survey

WRGriswold/er 11/7/57

Copy to: Docket
Admr R File
Op. Committee
Mr. Bishop, USBM
Mr. Kiilsgaard, USGS
Chron.

DMEA Form 7
(12-56)

OFFICIAL FILE COPY

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11/8	Kaunt	130
11/8	Kiilsgaard	~~110~~
		~~110~~
		~~100~~
		~~HB~~
11/12	C	220
		500

500

NOV

Mr. Oscar A. Glaeser, Vice President
United States Smelting, Refining & Mining
Company
Post Office Box 1980
Salt Lake City 10, Utah

Re: Docket No. DMEA-4857 (Lead-Zinc)
U. S. Smelting, Refining & Mining
Company
Bingham Tunnel Project
Salt Lake County, Utah

Dear Mr. Glaeser:

The application of your company for Government assistance to explore the cited property has been reviewed by the Division of Base Metals of the Defense Minerals Exploration Administration and is being referred to:

Mr. E. N. Harshman
Acting Executive Officer
DMEA Field Team, Region III
224 New Customhouse Bldg.
Denver 2, Colorado

If additional information concerning your application is needed, the Field Team will get in touch with you at an early date.

Sincerely yours,

Frank E. Johnson (for)

ACTING Administration

WRGriswold/er 11/7/57
Copy to: Docket
Admr R File
Op. Committee
Mr. Bishop, USBM
Mr. Kiilsgaard, USGS
Region III (2)
Chron.

8623

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

DMEA
RECEIVED NOV 5 1957

DATE	INITIALS	CODE
11/6	gb	220
11/6	WRG	500

November 5, 1957

Re: DMEA 4857; Zinc-Lead-Silver;
$95,360
U. S. Smelting Refining and
Mining Company
United States and Lark Mine
Salt Lake County, Utah

Memorandum

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

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

Subject: Review of application of October 21, 1957 for DMEA assistance, docketed as 4857, and received October 24, 1957

The United States Smelting Refining and Mining Company seeks DMEA help in exploring a limestone horizon immediately southwest of the present mine workings on the Bingham Tunnel level of the U. S. & Lark Mine. The applicant proposes 2,000 feet of drifting and cross-cutting and 2,000 feet of AX drilling having an estimated total cost of $95,360.

A monzonite intrusion cuts Pennsylvanian age quartzites and the many included lenticular limestones. Both sediments and igneous rocks have been fissured along a northeast-southwest trend and sulfide orebodies occur along the fissures within the stock and in adjacent susceptible limestone strata.

Extensive mining has been based on limestone replacement bodies north of the intrusion and in the fissure veins within the intrusion. Mine workings essentially end at the south contact of the intrusion, though further south some small development is noted from the map in "A"- member limestone, 1,700 feet below the outcrop of the productive Jordan limestone.

The applicant wishes to drive south on the Bingham Tunnel level (1,000 ft level) to intersect the zone of juncture between "B"-d in the sub-Jordan strata and the persistent vein system that has

been productive northeastward in the intrusive body.

To accomplish this, USSR&M proposes the extention of its #2468 drift approximately 1,050 feet generally S 25 E to a point of intersection with the footwall of the "B"- bed limestone, turning east and west with development headings for a distance of 475 feet in each direction along the footwall, thereby crosscutting the southwesterly projected width of the fissure system. In addition, 2,000 feet of AX core drilling is planned "to be carried out in conjunction with the above exploration work". It is assumed (but not stated) this footage is to be drilled from the footwall drift to intersect the "B"- bed hangingwall at regular intervals.

Justifications offered by the applicant for the project are as follows:

(1) Recognized ore control in the district is the intersection of limestone beds with pre-mineral fissures.
(2) The productiveness of the "B"- bed lime north of the intrusion.
(3) The known presence of the fissure system south of the Last Chance stock.
(4) Surface pits and oxidized caps having sulfide showings vertically above the target area.
(5) A 1½- inch core intercept of high-grade lead mineralization in the base of a 500-foot hole drilled to intersect the limestone south of the monzonite.

It appears from the rather general information of the report that the applicant has a worthwhile project. Maps showing the relation of the mines to the geologic features in the entire area adjoining the Last Chance stock are needed for detailed appraisal. More detail is needed on the maps included with the application. It is stated that "B"- bed is a good ore host north of the intrusion but there are no maps or figures to substantiate the statement. Maps are needed to show specific extent and amount of mineralization found in outcrop, and a log of the core hole drilled from the #2468 drift should be submitted. In brief, the applicant should present all the evidence supporting his exploration thesis.

It is recommended that the application be referred to the field team for their study and report.

O. M. Bishop

O. M. Bishop

Copy to Division of Minerals
Branch of Base Metals (3)
T.H. Kiilsgaard, Room 5224
F.D. Lamb, Room 3608
F I L E S

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

OFFICIAL FILE COPY
DMEA
IN REPLY REFER TO:
RECEIVED OCT 29 1957

DATE	INITIALS	CODE
10/29	gb	220
10/29	wfy	500

October 29, 1957

Memorandum

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

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

Subject: Review of application, DMEA 4857 (lead-zinc), United States Smelting, Refining, and Mining Company, U. S. and Lark Mine, Salt Lake County, Utah

The applicant proposes to explore for lead-zinc ore deposits on the 1,000 foot level of the Lark Mine. The project is designed to explore fissure zones in Pennsylvanian limestones and quartzites. The potential ore zone lies adjacent to the Last Chance stock. Large tonnages of ore have been mined from similar geologic settings in the district. Part of the project work would follow a recently-drilled diamond drill hole. The hole cut a 1-1/2-inch seam of high grade sulphide ore.

The proposed work would be done not far from the locale of DMEA 2028, Idm-E360. DMEA 2028 was certified as a discovery on June 18, 1956.

I recommend that the application be referred to the Field Team for further review and report. Exploration work may be warranted within the proposed area.

W. P. Williams

W. P. Williams

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

October 24, 1957

United States Smelting Refining
and Mining Company
P. O. Box 1980
Salt Lake City 10, Utah

Gentlemen:

Subject: DMEA-4857

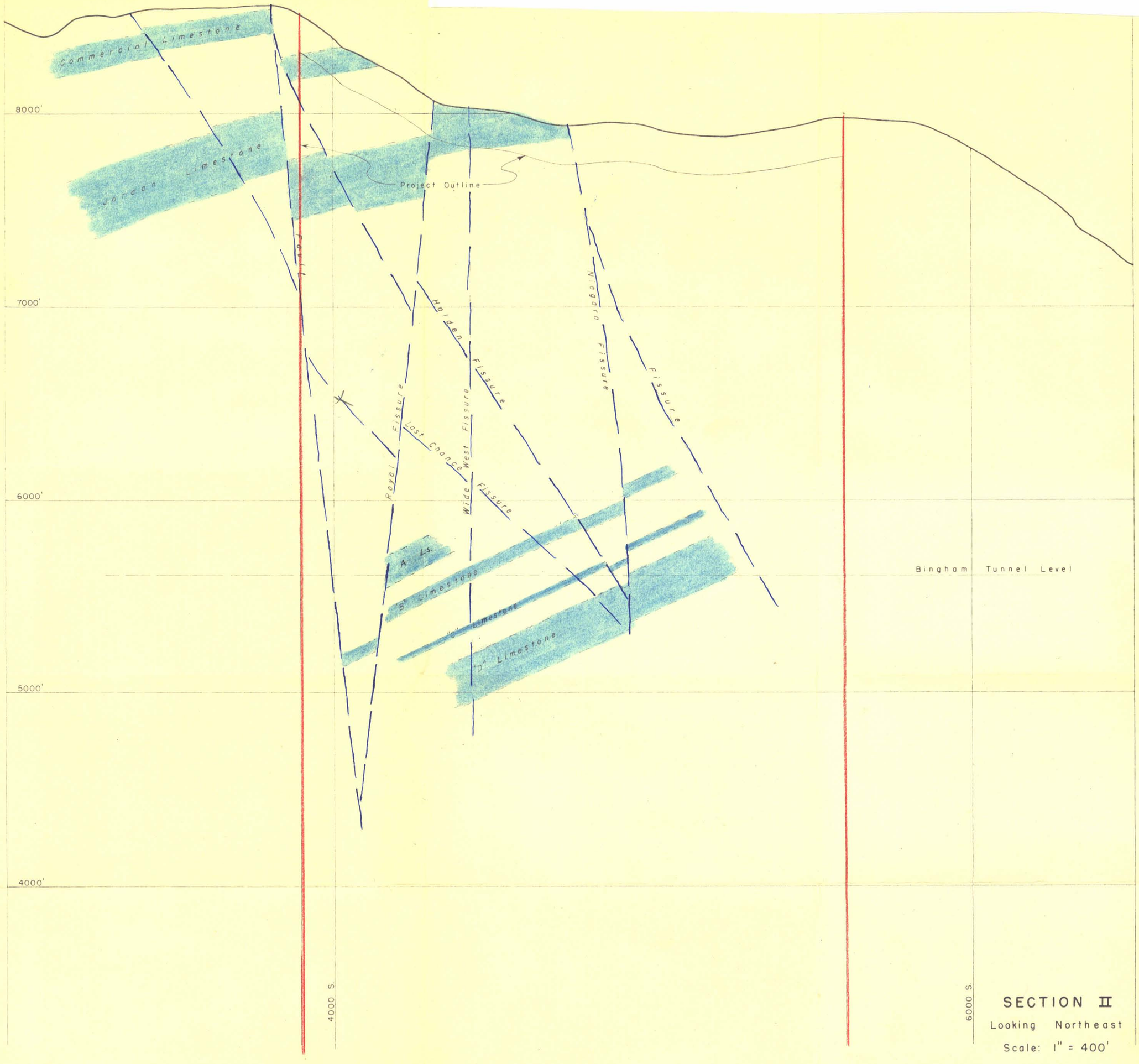
Your application for exploration assistance, dated October 21, 1957 submitted to our office at Washington, D. C. has been assigned Docket Number DMEA-4857 and referred to the Base Metals Division in the Washington office. Kindly identify all future correspondence relating to your application by this Docket Number.

Sincerely yours,

Allen S. Dakan, Director
Operations Control and
Statistics Division

Copy to:

Region III


Commercial Limestone
Jordan Limestone
Project Outline
8000'
7000'
6000'
5000'
4000'
Fault
Holden Fissure
Niagara Fissure
Fissure
Royal Fissure
Lost Chance
Wide West Fissure
A Ls.
"B" Limestone
"C" Limestone
"D" Limestone
Bingham Tunnel Level
4000 S.
6000 S.
SECTION II
Looking Northeast
Scale: 1" = 400'

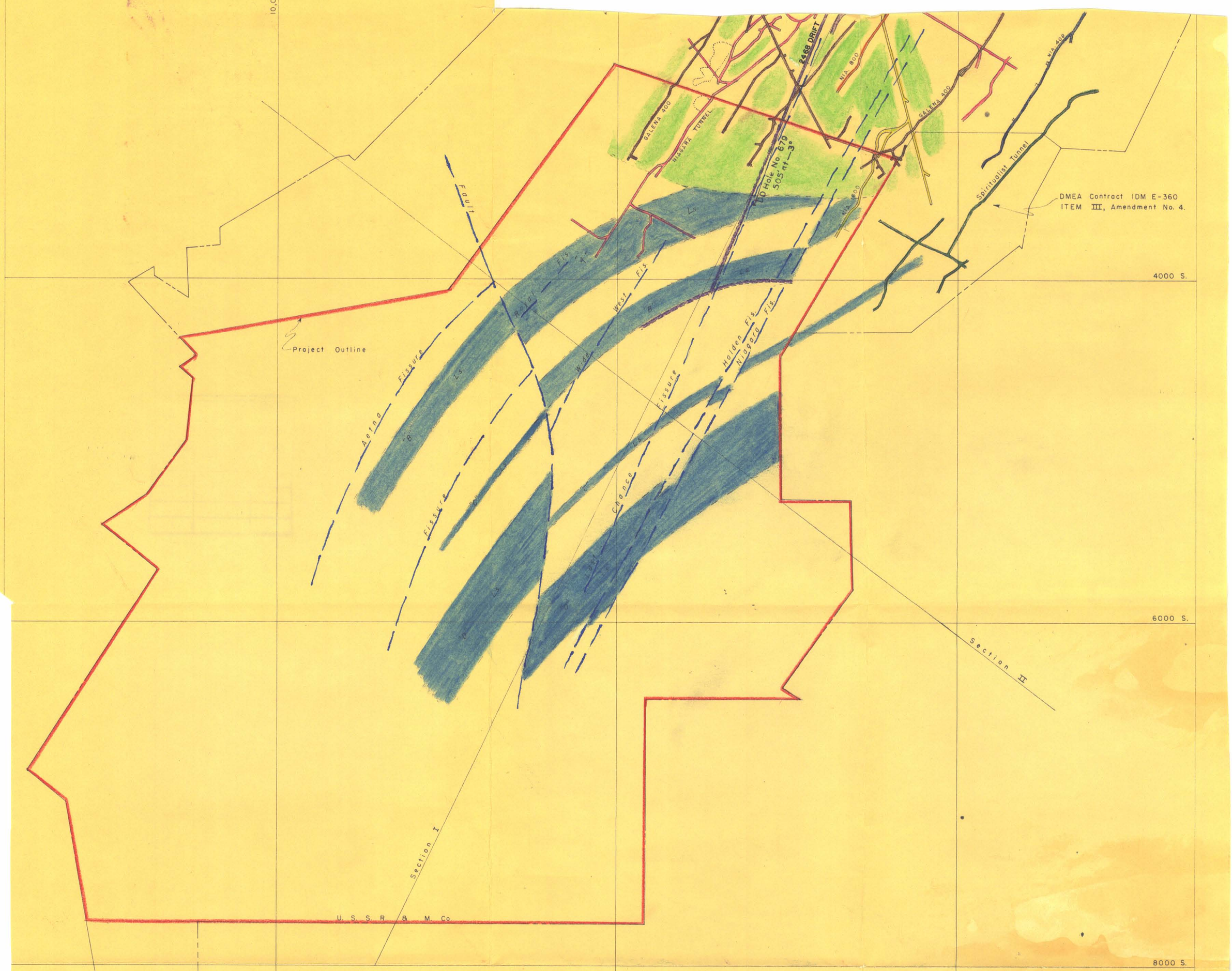
PLAT-V

SECTION I

Looking Northwest

Scale: 1" = 400'

PLAT-IV



PROPOSED DMEA PROJECT
U. S. AND LARK MINE

PROPOSED WORK ON THE U. S. 1000 LEVEL

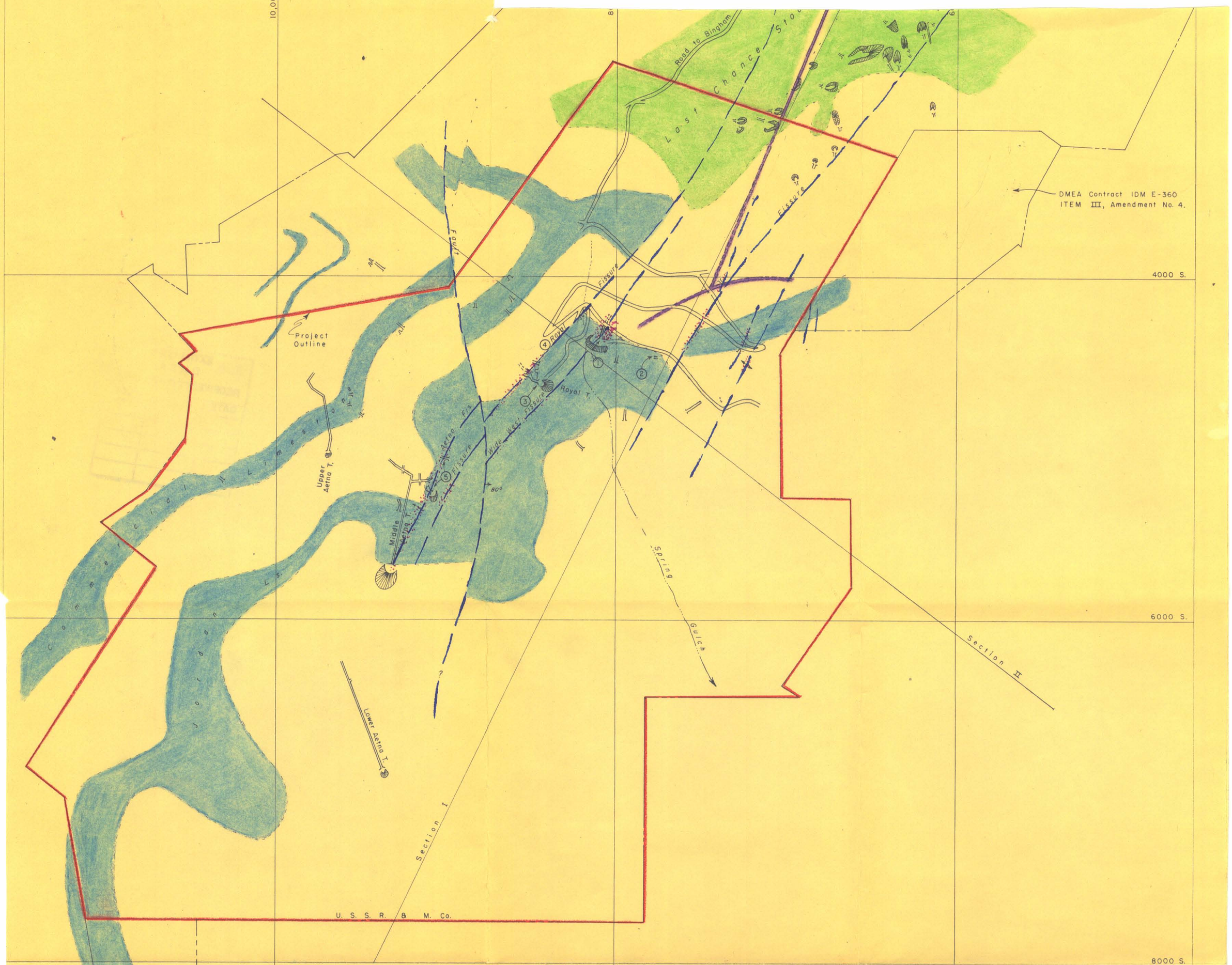
(Bingham Tunnel Level)
In Relation To
SOUTHERNMOST WORKINGS IN THE U. S. SECTION

Scale: 1" = 400'

LEGEND

- Proposed Work
- Mineralization
- Fissure
- Porphyry
- Quartzite
- Limestone

PLAT-III



① Old prospect above Jordan limestone. Average of 7 cut samples: .06 Oz. Au, 11.5 Oz Ag, .09% Cu, 1.4% Pb, 2.7% Zn.

② Outcrop - 2.5' cut sample: .04 Oz. Au, 1.6 Oz. Ag, .05 % Cu, 4.6 % Pb, 5.2 % Zn.

③ Average of 6 cut samples of mineralized limestone bedding: .08 Oz. Au, 7.7 Oz. Ag, .08 % Cu, 1.2 % Pb, 1.8 % Zn.

④ Oxidized silver ore with minor lead and zinc.

⑤ Irregular spots of lead ore on irregular fissure (up to 30% Pb).

PROPOSED DMEA PROJECT
U. S. AND LARK MINE

MAP OF SURFACE

AND

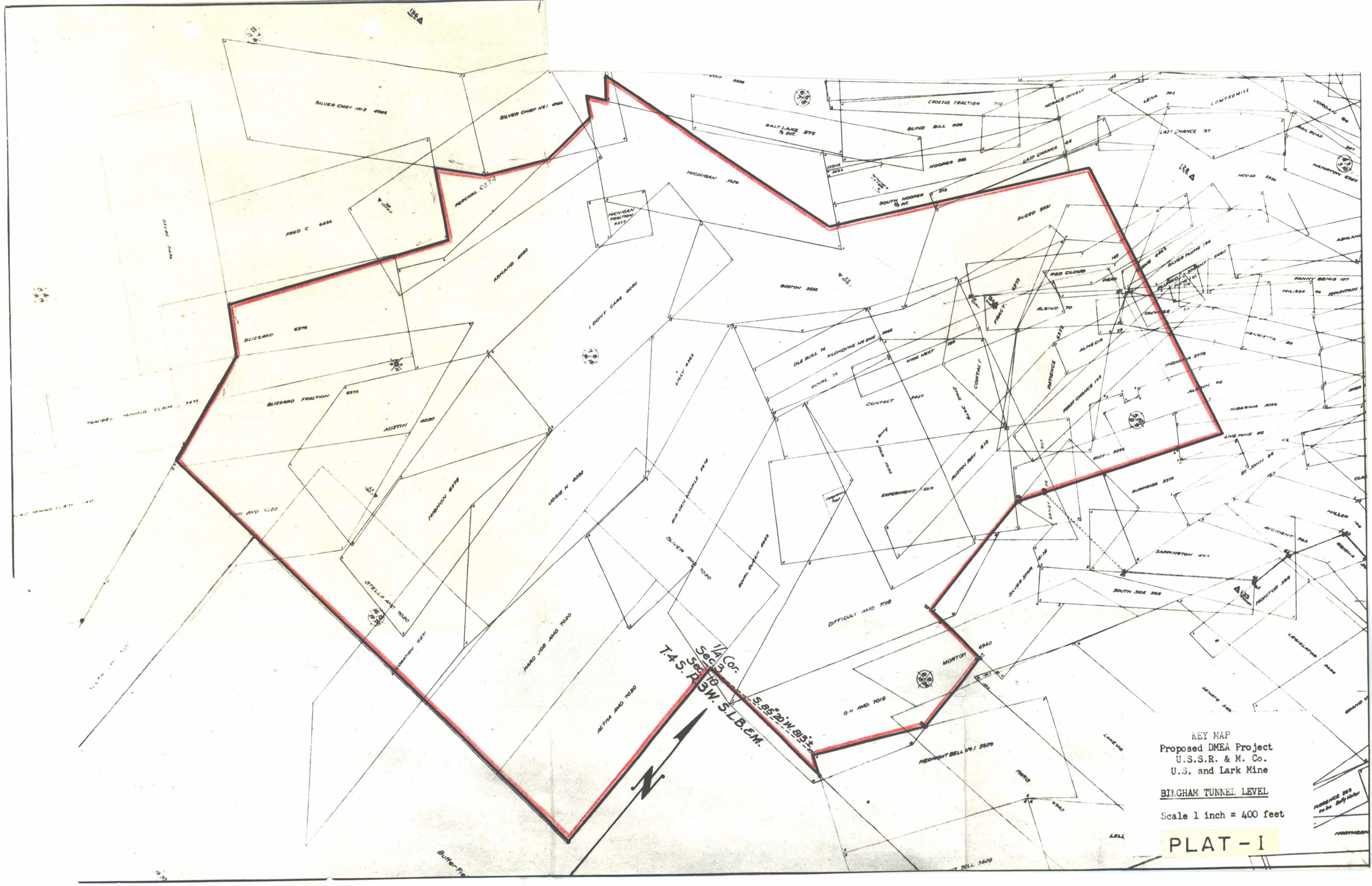
PROPOSED WORK ON THE U. S. 1000 LEVEL
(Bingham Tunnel Level)

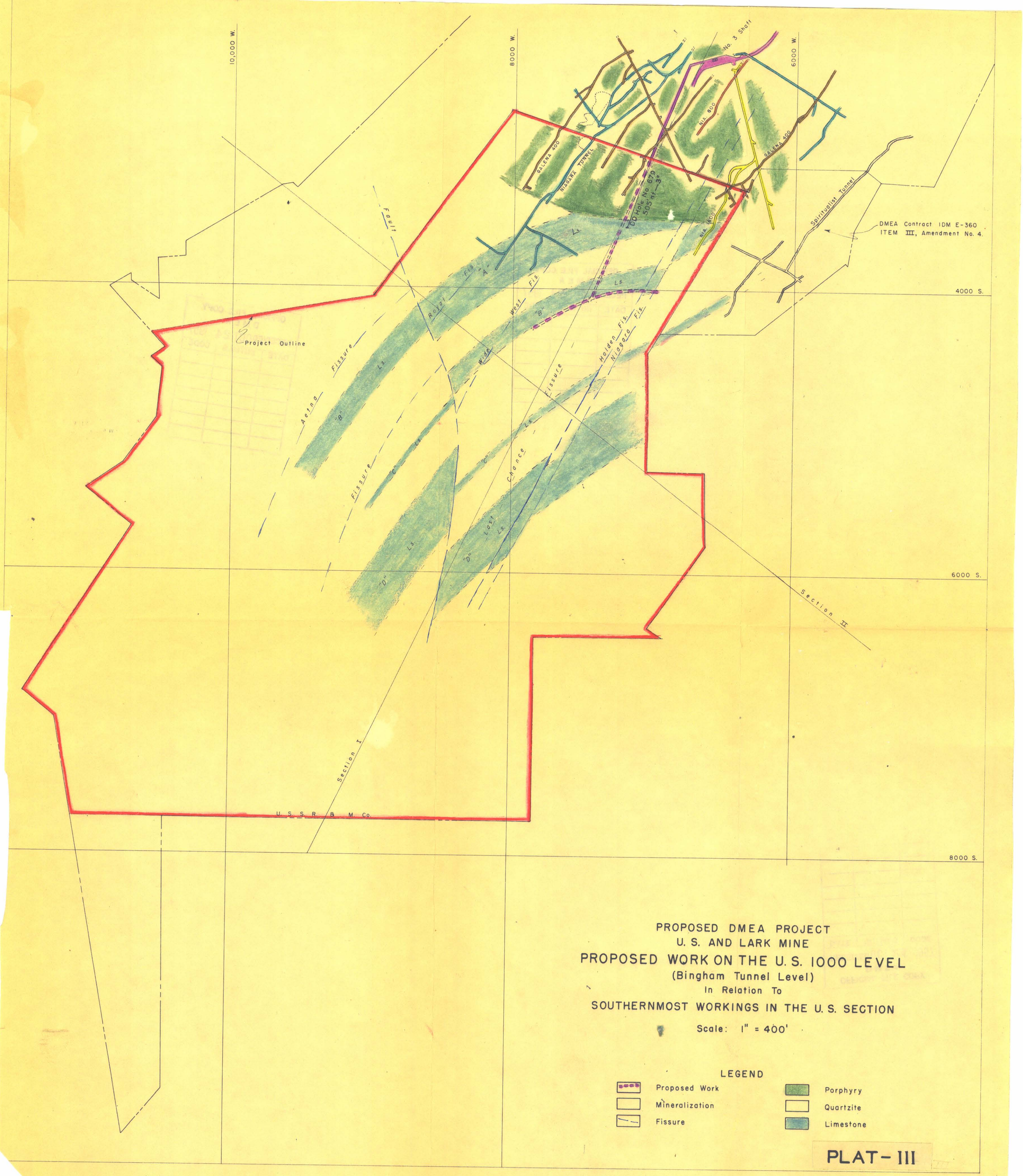
Scale: 1" = 400'

LEGEND

- Proposed Work
- Mineralization
- Fissure
- Porphyry
- Quartzite
- Limestone

PLAT-II


SILVER CHIEF No 2
SILVER CHIEF No 1
PERCIVAL 6374
FRED C 5436
ARMAND 4030
BLIZZARD 6376
BLIZZARD FRACTION 6375
AUSTIN 4030
MARION 6378
STELLA AMD 7020
HARD JOB AMD 7020
ALTHA AMD 7020
I DON'T CARE 4030
LILLY 4383
JOSIE K 4030
RIP VAN WINKLE 5178
SILVER AMD 7020
ROYAL QUEEN 4985
MICHIGAN 3529
MICHIGAN FRACTION 6377
BOSTON 3532
SALT LAKE 372
CROESUS FRACTION
BLIND BILL 406
HOPPER 205
SOUTH HOPPER
LAST CHANCE 48
LENA 382
COMPROMISE
LAST CHANCE 137
HODGE 3534
HAMPTON 6385
BUZZO 3531
RED CLOUD 165
SILVER PLUME 186
ALBINO 70
ALHEDA
FIRST CHANCE 135
INDIANA 3775
ALBION 68
HIBERNIA 3026
LIVE PINE 85
SUNRISE 5375
SCOTIA 3025
SARRINGTON 4717
SOUTH SIDE 365
MONITOR 3968
ACCIDENT 3043
HENRIETTA 45
PANNY BENIS 107
MILISSA 96
OLE BULL 76
KLONDYKE No ONE 3965
ROYAL 75
NIGH NEST 165
CONTACT 5407
CONTACT
EXPERIMENT 5379
AUSTIN BAY 410
DIFFICULT AMD 7019
G.H. AMD 7019
MORTON 6940
MIDNIGHT BELL No 1 5609
PARIS
1/4 Cor. Sec 3 Sec 10 T.4S. R.3W. S.L.B.&M.
S.86°20'W.813±
N
KEY MAP
Proposed DMEA Project
U.S.S.R. & M. Co.
U.S. and Lark Mine
BINGHAM TUNNEL LEVEL
Scale 1 inch = 400 feet
PLAT - I



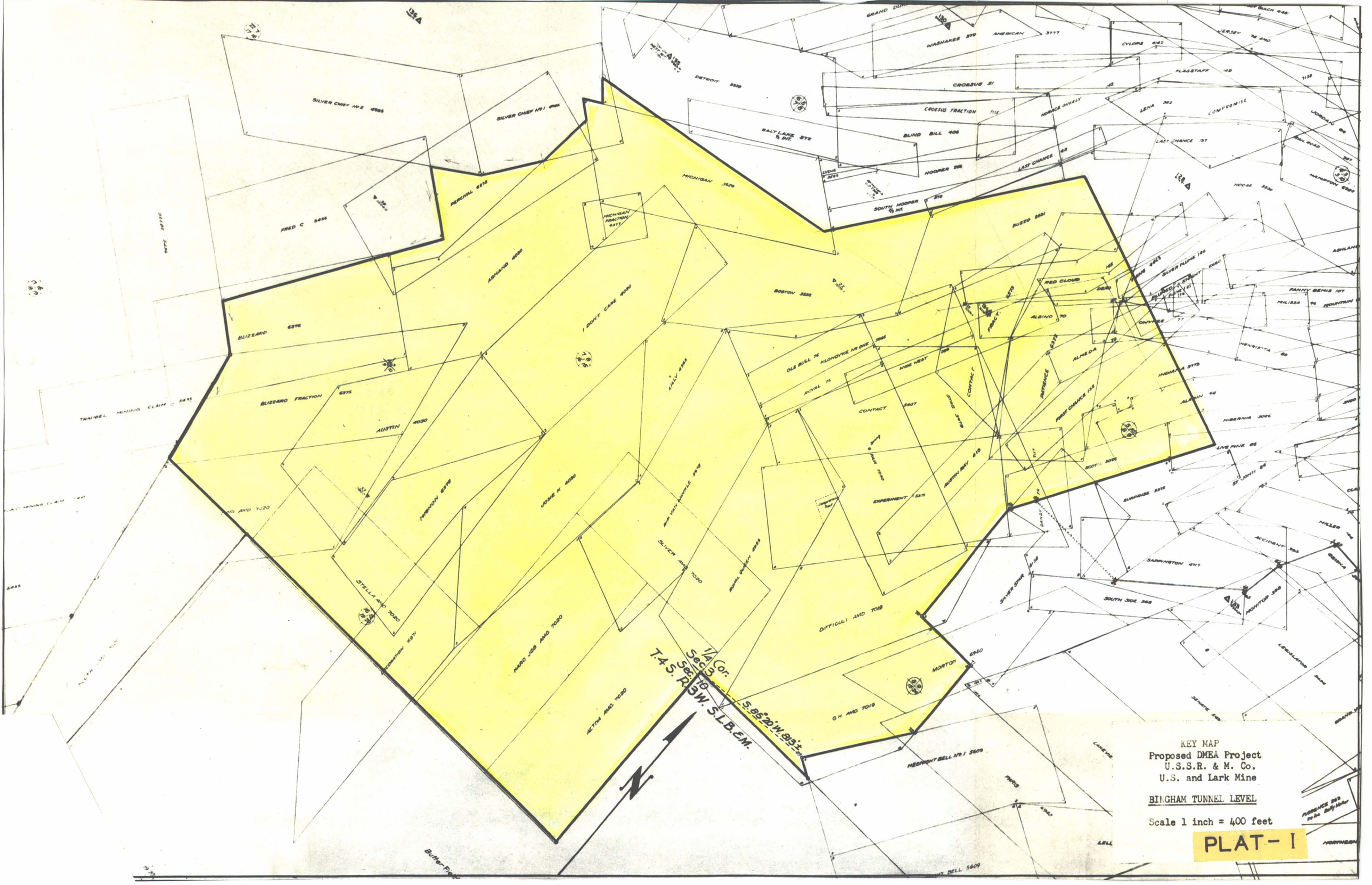
PROPOSED DMEA PROJECT
U. S. AND LARK MINE
PROPOSED WORK ON THE U. S. 1000 LEVEL
(Bingham Tunnel Level)
In Relation To
SOUTHERNMOST WORKINGS IN THE U. S. SECTION

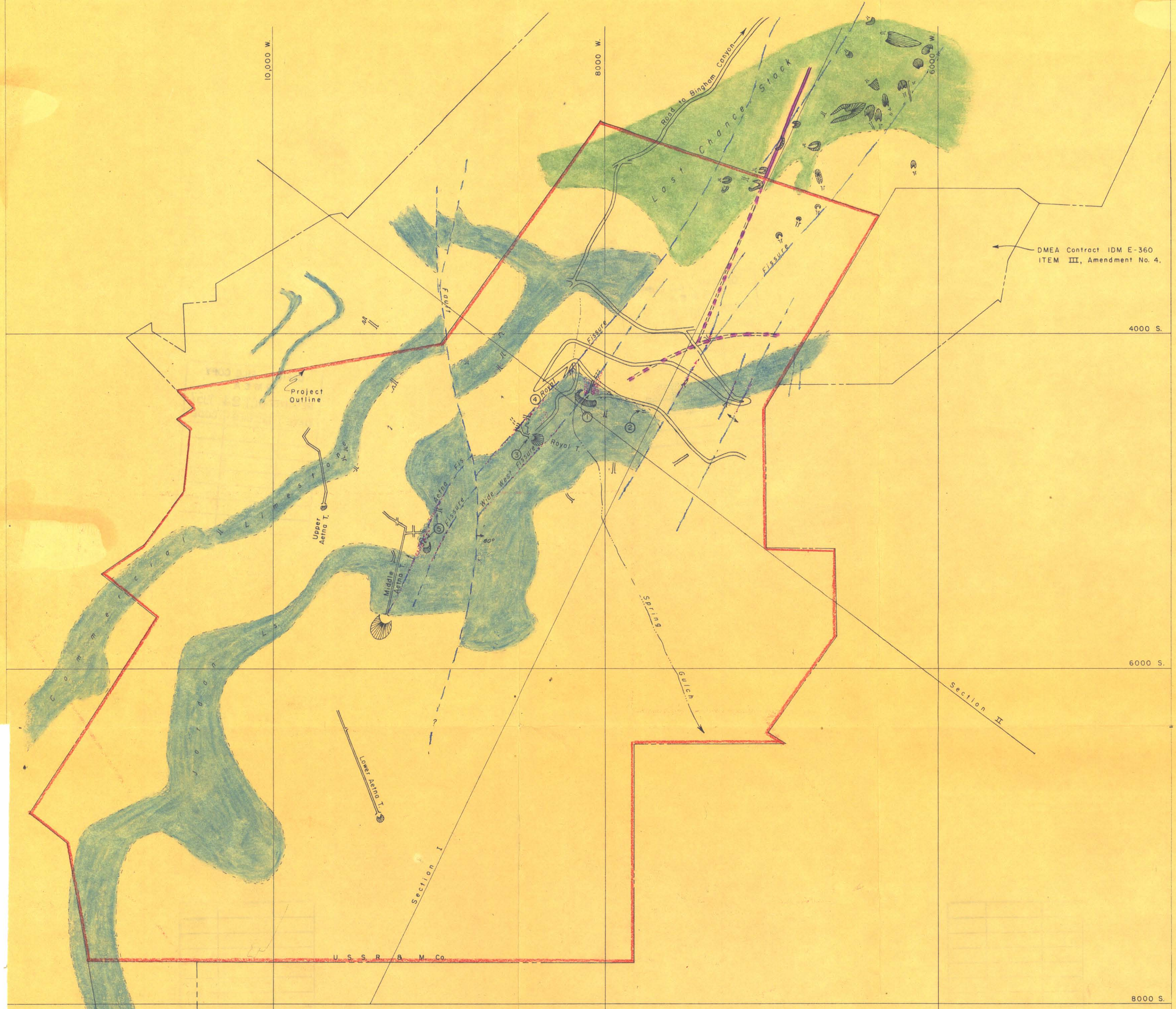
Scale: 1" = 400'

LEGEND

- Proposed Work
- Mineralization
- Fissure
- Porphyry
- Quartzite
- Limestone

PLAT - III


KEY MAP
Proposed DMEA Project
U.S.S.R. & M. Co.
U.S. and Lark Mine
BINGHAM TUNNEL LEVEL
Scale 1 inch = 400 feet
PLAT - I
1/4 Cor.
Sec. 3
Sec. 10
T.4 S. R.3W. S.L.B.&M.
S.85°20'W.893±
SILVER CHIEF No 2
SILVER CHIEF No 1
FRED C
PERCIVAL
MICHIGAN
MICHIGAN FRACTION
ARMAND
I DON'T CARE
BLIZZARD
BLIZZARD FRACTION
AUSTIN
HAVON
JOSIE K
LILLY
RIP VAN WINKLE
SILVER AND TOPO
ROYAL QUEEN
STELLA AND TOPO
HARD JOB AND TOPO
ALTHA AND TOPO
BOSTON
DIFFICULT AND TOPO
MORTON
G.H. AND TOPO
DETROIT
SALT LAKE
WASHAKIE
AMERICAN
CROESUS
CROESUS FRACTION
BLIND BILL
HOOPER
SOUTH HOOPER
LAST CHANCE
CYCLOPS
FLAGSTAFF
LENA
COMPROMISE
HODGE
BUSSO
RED CLOUD
ALBINO
ALMEDA
INDIANA
ALBION
OLE BULL
KLONDYKE No ONE
ROYAL
NIGHT HOST
CONTACT
EXPERIMENT
AUSTIN BAY
FIRST CHANCE
SCOTT
SURPRISE
SARRINGTON
SOUTH SIDE
SILVER STAR
ACCIDENT
MONITOR
HIBERNIA
LIVE PINE
ST JOHN
FANNY BEMIS
MILISSA
MOUNTAIN
HENRIETTA
MIDNIGHT BELL No 1
TRAUBEL MINING CLAIM
Butler Fract.



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PROPOSED DMEA PROJECT
U. S. AND LARK MINE
MAP OF SURFACE
AND
PROPOSED WORK ON THE U. S. 1000 LEVEL
(Bingham Tunnel Level)

Scale: 1" = 400'

LEGEND

- Proposed Work
- Mineralization
- Fissure
- Porphyry
- Quartzite
- Limestone

PLAT - II