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Surname 700

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

AUG 27 1954

Ching
F. L. Kasson
Martin
Hedges
Kilgo and
Johnson

Industrial Uranium Corporation
403 Interstate Trust Building
Denver 2, Colorado

Re: Docket No. DMEA-3317 (Uranium)
Kirk Mine
Gilpin County, Colorado

Gentlemen:

Your application for aid in an exploration project and other information available to us in Washington concerning your above-named property 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, although noting a small amount of uranium mineralization on your property, indicates to us that the probability of disclosing minable 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 Minerals Exploration program and for bringing your property to our attention.

Sincerely yours,

O. D. Mittendorf

Administrator

MChing/am
8-27-54

cc to: Admin. Reading File
Operating Committee
Docket File
Messrs. J. E. Crawford, Rm. 3641
A. P. Butler, Jr. Rm. 3212, GSA
J. O. Hosted, Rm. 3210, GSA
DMEA Field Team, Reg. Reg. IV (2)
Mr. Ching
Code 700

R.C.J.

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

August 27, 1954

SUMMARY OF PROPOSED PROJECT

Docket No: DMEA-3317
Applicant: Industrial Uranium Corporation
403 Interstate Trust Building
Denver 2, Colorado

Subject: Denial of application for an exploration project

Commodity: Uranium

Property: 5 lode mining claims (Alps, Olympia, Ethan Allen, Polar Star and Kirk), Quartz Hill, Gilpin County, Colorado
Amount of application: $33,330.00
Date of application: March 22, 1954

Work proposed: Drive two crosscuts from the 555 and 688-foot levels of the Alps shaft to intersect the Kirk vein at distances of 310 and 316-feet respectively. Raise 90 feet from the 555 level to the 381 foot level of the Kirk mine. Drift 200 feet east and west on the Kirk vein on the 555-foot level. Drift 195 feet east on the Kirk vein on the 688-foot level. Total cost; 1111 feet at $30.00 per foot= $33,330.00.

Field Team Report: July 14, 1954. D. R. Maclaren, USGS and H. M. Connors, USBM.

Pitchblende occurs in the Kirk vein as small pods and lenses, erratically spaced. Its frequency of occurrence and the amount of radioactivity decreases with depth. The most productive zone was above the Kirk 141-level. Radioactivity was almost nil on the lower levels. Only 16 out of 194 samples taken in 1944 assayed .10% U_3O_8 or better and these were practically all from above the 203-foot level. This pattern of occurrence is similar in general to that in the Wood mine to the south and the German-Belcher mine to the north.

The possibilities of making a significant discovery of uranium ore on the Kirk vein below the 381-foot, or lowest, level is poor and it is recommended that the application be denied.

Commodity Members Comments:

Geological Survey: Arthur P. Butler, Jr., August 20, 1954. Notes that the mine was rehabilitated and sampled in 1944, by the Manhattan Engineering District, U. S. Army, with discouraging results. Concurs in the Field Team's recommendation to deny the application.

Bureau of Mines: John Crawford, August 25, 1954. Concurs in the Field Team's recommendation to deny the application.

Rare & Misc. Metals Div.: DMEA Michael Ching, Mining Engineer, August 25, 1944. The rather extensive examination of the Kirk mine by the Manhattan Engineering District, U. S. Army in 1944, and the recent DMEA work at the nearby Wood and German-Belcher mines indicate that pitchblende occurrences on these properties are small and erratic, and are more apt to decrease than to increase at the depths outlined for exploration by the Applicant. Consequently, further exploration, as requested, under a DMEA project is not warranted.

Conclusions and Recommendations

On the basis of the work already done in the Kirk and other nearby mines uranium ore in significant quantities is not likely to be found under the Applicant's proposed program or any modification thereof. It is recommended that the application be denied.

F. L. Knouse

F. L. Knouse
For: Ernest Wm. Ellis, Chief
Rare & Misc. Metals Division

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

August 27, 1954

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/s/ F. L. Knouse

F. L. Knouse
For: Ernest Wm. Ellis, Chief
Rare & Misc. Metals Division

MChing/am
cc to: Admr. Reading File
~~Operating Committee~~
Docket (original copy)
Code 700
Mr. Ching

August 27, 1954

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F. L. Knouse
For: Ernest Wm. Ellis, Chief
Rare & Misc. Metals Division

MChing/am
cc to: Admr. Reading File
~~Operating Committee~~
Docket (original copy)
Code 700
Mr. Ching

Mr. Ching 700

August 27, 1954

SUMMARY OF PROPOSED PROJECT

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403 Interstate Trust Building
Denver 2, Colorado

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Conclusions and Recommendations

On the basis of the work already done in the Kirk and other nearby mines uranium ore in significant quantities is not likely to be found under the Applicant's proposed program or any modification thereof. It is recommended that the application be denied.

/s/ F. L. Knouse

F. L. Knouse
For: Ernest Wm. Ellis, Chief
Rare & Misc. Metals Division

MChing/am
cc to: Admr. Reading File
~~Operating Committee~~
Docket (original copy)
Code 700
Mr. Ching

8-31-54
a.c.

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

August 25, 1954

Memorandum

To: Ernest William Ellis, DMEA Member Uranium Commodity Committee, Room 4640

From: John E. Crawford, Bureau of Mines Member Uranium Commodity Committee

Subject: Report of Examination - DMEA Docket 3317 (Uranium), Industrial Uranium Corporation (Kirk mine), Gilpin County, Colorado.

I have reviewed the subject report and have discussed it with Joseph O. Hosted, representative of the Atomic Energy Commission.

I concur with the recommendation of the Field Team that the application involved under the subject docket be denied.

The report has been forwarded to the Chief, Minerals Division, Bureau of Mines, in accord with the routing slip attached thereto.

John E. Crawford

John E. Crawford

STANDARD FORM NO. 64

Office Memorandum • UNITED STATES GOVERNMENT

TO : E. Wm. Ellis, DMEA Member, Uranium Commodity Committee

DATE: August 20, 1954

FROM : Arthur P. Butler, Jr., USGS Member, Uranium Commodity Committee

SUBJECT: Final Report of Examination, DMEA Docket 3317 (Uranium), Industrial Uranium Corporation, Kirk Mine, Gilpin County, Colorado

I have reviewed the Field Team reports identified in the subject above. The applicant proposed 1,111 feet of underground exploration at an estimated cost of $33,330, to explore the Kirk vein at depths below the Kirk shaft.

The Geological Survey is presently engaged in a detailed study of the entire Central City, Colorado, area and the Kirk Mine was rehabilitated and sampled in 1944 by the Manhattan Engineering District, U. S. Army, with discouraging results. The examining Field Team, on the basis of previous work, believes that the Kirk vein contains pitchblende in small pods and lenses erratically distributed but that most of the pitchblende was found above the 141-foot level. They do not believe that sufficient uranium ore would be found to justify Government participation in the proposed exploration and recommend denial of the application.

I concur with this recommendation.

Arthur P. Butler, Jr.

Copy to: E. Wm. Ellis (2)

E. Wm. Hills, DMA Member, Uranium Committee Chairman — August 30, 1954

Arthur P. Butler, Jr., DMA Member, Uranium Committee Chairman

Final Report of Examination, DMA Docket 3517 (Uranium), Industrial Uranium Corporation, Elk Mine, Gilpin County, Colorado

I have reviewed the Field Team reports identified in the subject above. The applicant proposed 1,111 feet of underground exploration at an estimated cost of $33,330, to explore the Elk vein at depths below the Elk shaft.

The Geological Survey is presently engaged in a detailed study of the entire Central City, Colorado, area and the Elk Mine was rehabilitated and sampled in 1953 by the Louisville Engineering District, U. S. Army, with discouraging results. The consulting Field Team, on the basis of previous work, believes that the Elk vein contains pitchblende in small pods and lenses erratically distributed but that most of the pitchblende was found above the 100-foot level. They do not believe that sufficient uranium ore would be found to justify Government participation in the proposed exploration and recommend denial of the application.

I concur with this recommendation.

Copy to: E. Wm. Hills (2)

E. Wm. Ellis, DMEA Member, Uranium Commodity Committee

August 20, 1954

Arthur P. Butler, Jr., USGS Member, Uranium Commodity Committee

Final Report of Examination, DMEA Docket 3317 (Uranium), Industrial Uranium Corporation, Kirk Mine, Gilpin County, Colorado

I have reviewed the Field Team reports identified in the subject above. The applicant proposed 1,111 feet of underground exploration at an estimated cost of $33,330, to explore the Kirk vein at depths below the Kirk shaft.

The Geological Survey is presently engaged in a detailed study of the entire Central City, Colorado, area and the Kirk Mine was rehabilitated and sampled in 1944 by the Manhattan Engineering District, U. S. Army, with discouraging results. The examining Field Team, on the basis of previous work, believes that the Kirk vein contains pitchblende in small pods and lenses erratically distributed but that most of the pitchblende was found above the 141-foot level. They do not believe that sufficient uranium ore would be found to justify Government participation in the proposed exploration and recommend denial of the application.

I concur with this recommendation.

Copy to: E. Wm. Ellis (2)

8-18-54
a.m.

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

224 New Customhouse
Denver 2, Colorado

August 13, 1954.

Memorandum

To: Secretary to the Operating Committee

From: DMEA Field Team, Region IV

Subject: Report of Examination - DMEA Docket 3317 (Uranium), Industrial Uranium Corporation (Kirk mine), Gilpin County, Colorado.

Enclosed are the original and two copies of the examination report pertaining to the above application.

One copy of this report has been sent to Mr. A. P. Butler, Building 21, TEPCO at the Denver Federal Center.

The applicant requested $40,507.00 to drive two crosscut tunnels from the Alps shaft to the Kirk vein and to explore this vein by means of raising and drifting in both directions.

Based upon the reports of the examining engineers and the report by the U. S. Army for the Manhattan District, which agency thoroughly examined the mine in 1944, we recommend that the application be denied.

W. H. King
W. H. King

E. M. Hausknecht
for A. H. Koschmann

Enclosures

Reviewed by
DMEA OPERATING COMMITTEE
8-23-54
(date)

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF MINES

Mining Division
Region IV

August 13, 1954.

Memorandum

To: DMEA Field Team, Region IV

From: Chief, Mining Division, Region IV

Subject: Engineering Report of Examination - DMEA Docket 3317 (Uranium), Industrial Uranium Corporation (Kirk mine), Gilpin County, Colorado.

Enclosed are the original and ten copies of the Summary, Conclusions, and Recommendations by H. M. Connors, Bureau of Mines, and D. R. McLaren, Geological Survey, and the original and ten copies of H. M. Connors' engineering report on the subject docket.

The applicant requested $40,507.00 to drive two crosscut tunnels from the Alps shaft to the Kirk vein and to explore this vein by means of raising and drifting in both directions.

The examining team does not believe that the exploration work would disclose a sufficient amount of uranium ore to justify Government participation in an exploration project and recommends denial of the application.

We concur in this recommendation.

W H King
W. H. King

Enclosures

Reviewed by
DMEA OPERATING COMMITTEE
8-23-54
(date)

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF MINES

Region IV

Building 20, Room 137
Denver Federal Center
Denver 2, Colorado
August 6, 1954

Memorandum

To: Executive Officer, DMEA Field Team, Region IV

From: Chief, Mineral Resources Branch, Mining Division, Region IV

Subject: DMEA 3317 (Uranium) Industrial Uranium Corp. (Kirk mine) Gilpin County, Colo.

Transmitted herewith are the original and 10 copies of a Summary, Conclusions and Recommendations by H. M. Conners, Bureau of Mines, and D. R. MacLaren, Geological Survey, and of H. M. Conners engineering report on the above docket.

Conners concludes that although it was impossible to examine the Kirk mine due to flooding, he was able to see sufficient evidence in the Alps property, from which the start of work was proposed, combined with the information available from a report by the U. S. Army (Manhattan district) resulting from their unwatering and examining the property in 1944, to justify a recommendation for denial of the loan request.

I concur with his conclusions and recommendations.

The one brochure submitted to A. H. Koschmann with your instructions of May 6, 1954, to prepare a suitable report is being returned by him.

W. M. Traver

W. M. Traver

Enclosures

WMT/ici

cc: 10
DMEA 3317
DMEA Chron.

DMEA OPERATING COMMITTEE
8-23-54
(date)

IN REPLY REFER TO:

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY
Defense Minerals Exploration Administration
Denver Federal Center
Denver 2, Colorado

August 2, 1954

Memorandum

To: DMEA Field Team, Region IV

From: A. H. Koschmann

Subject: DMEA Docket 3317, The Kirk Mine, Gilpin County, Colorado

Enclosed are 11 copies of the geologic report by D. R. MacLaren of the U. S. Geological Survey covering the above docket.

The Kirk mine was flooded at the time of the examination and the recommendations are based on reports prepared at the time the mine was unwatered by Union Mines Development Corporation for examination and sampling, on discussions with A.E.C. and U.S.G.S. personnel familiar with the property, and on the results of two DMEA projects in the immediate vicinity of the Kirk mine.

MacLaren concludes that in the Kirk mine area significant deposits of pitchblende ore will not occur in gold-sulfide veins at the depth proposed for exploration by the applicant. He therefore recommends denial of the request for exploration assistance.

I concur with this recommendation.

E. M. Hirschman
for A. H. Koschmann
Supervising Geologist
Colorado-Wyoming

Enclosures (11)

Reviewed by
DMEA OPERATING COMMITTEE
8-23-54
(date)

UNITED STATES
DEPARTMENT OF THE INTERIOR
DOUGLAS McKAY, SECRETARY

DEFENSE MINERALS EXPLORATION ADMINISTRATION

REPORT OF EXAMINATION BY FIELD TEAM
REGION IV

DMEA 3317, Industrial Uranium Corporation

Kirk Mine

Gilpin County, Colorado

Uranium

D. R. MacLaren, Geologist
Geological Survey

H. M. Connors, Mining Engineer
Bureau of Mines

July 14, 1954

Reviewed by
DMEA OPERATING COMMITTEE
8-23-54
(date)

DMEA 3317

INDUSTRIAL URANIUM CORPORATION
KIRK MINE
GILPIN COUNTY, COLORADO

Summary, Conclusions, and Recommendations

By D. R. MacLaren
Geologist
Geological Survey

H. M. Conners
Mining Engineer
Bureau of Mines

DMEA 3317

INDUSTRIAL URANIUM CORPORATION
KIRK MINE
GILPIN COUNTY, COLORADO

SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

By D. R. MacLaren and H. M. Connors

Industrial Uranium Corporation, a Colorado Corporation, made application for Government assistance (DMEA 3317) to explore the Kirk vein at horizons below the bottom of the Kirk shaft by a total of 1,111 feet of underground exploration at an estimated cost of $33,330.00.

The applicant's property rights include a lease on the Kirk lode, ownership of an undivided 3/4 interest in the Ethan Allen lode and an undivided 1/2 interest in the Polar Star lode. The Alps and Olympia lodes are controlled by the Atomic Uranium Corporation, owner of 88 percent of the stock in the applicant corporation, who have allowed the applicant the use of the Alps shaft and facilities.

Pre-Cambrian granite-gneiss and biotite schist have been intruded by pegmatite and bostonite dikes, the latter of Tertiary age. The Kirk vein is in a strong zone of faulting that strikes N. 73° E. and dips 68° - 85° south. Pitchblende has been found for the most part above the 141-foot level as small sooty black pods, lenses, and blobs in the heavy sulfide streaks. Radioactivity decreases in intensity with depth, being barely detectable on the two lowest levels. Only 16 out of 194 samples, taken in 1944, assayed .10 percent U_3O_8 or better while 84 samples assayed nil U_3O_8.

It is concluded that possibilities of making a significant discovery of uranium ore on the property is poor and is recommended that the application be denied.

THE KIRK MINE

GILPIN COUNTY, COLORADO

DMEA DOCKET 3317

Geologic Report

By D. R. Mac Laren
U. S. Geological Survey

INDUSTRIAL URANIUM CORPORATION
THE KIRK MINE
GILPIN COUNTY, COLORADO
DMEA Docket 3317

INTRODUCTION

Industrial Uranium Corporation of Denver, Colorado, has applied to the Defense Minerals Exploration Administration for assistance to explore for uranium in the Kirk mine, Quartz Hill district, Central City, Colorado. The applicant proposes to drive two cross-cuts from the Alps mine to the Kirk vein, one 310 feet long on the 555-foot level, the other 316 feet long on the 688-foot level. The cross-cuts will cut the Kirk vein 90 feet and 223 feet, respectively, below the Kirk 381-foot level, or at the Kirk 471-foot and 604-foot levels. The applicant also proposes to drift 200 feet on the Kirk 471-foot level, and raise from the 471-foot level to the 381-foot level; and to drift 200 feet on the Kirk 604-foot level. The total cost of the project is estimated by the applicant to be $33, 330 of which the Government's share will be $24, 997. 50.

The property was visited July 12, 1954, in the company of H. M. Connors of the U. S. Bureau of Mines. The superintendent was not at the property but was located and consulted in Idaho Springs. The Kirk mine was flooded to within about 50 feet of the collar of the shaft and could not be entered.

Based upon reports by J. M. Hill (1944) and Frank C. Armstrong (1953); on oral communication with R. U. King of the U. S. Geological Survey, Charles C. Towle and K. E. Baker of the AEC; and on the results of DMEA programs at the Realty mine, a few hundred feet south of the Kirk, and at the German-Belcher mine, a few hundred feet north of the Kirk, it is concluded that the chance of a significant discovery of uranium resulting from this program is

poor and it is recommended that the application be denied.

GEOLOGY

The geology of the Quartz Hill district is described in U.S. Geological Survey Professional Paper 97 by Bastin and Hill (1917). The geology of the Kirk mine is described in more detail by J. M. Hill (1944) who, with G. B. Guillotte, was in charge of unwatering and sampling the mine for Union Mines Development Corporation in October and November, 1944. Both of these sources of information have been freely consulted during the preparation of this report.

The rocks of the area are pre-Cambrian granite gneiss and biotite schist that have been intruded by pegmatite and bostonite dikes, the latter of Tertiary age. Fissures striking northeast to easterly and dipping steeply north or south, have been filled by veins containing pyrite, chalcopyrite, galena, sphalerite, silver, and gold in a gangue of quartz and brecciated wall rock. In places the wall rocks are silicified and pyritized for short distances away from the veins.

The Kirk vein is in a strong zone of faulting that has an average strike of N 73°E and dips 68° to 85° south. In zones of granite gneiss, bostonite, or pegmatite the vein walls are from 10 inches to 6 feet apart, but in zones of schist the walls are ill-defined or die out along many minor slips. Stringers and veins, varying in width from one quarter inch to fourteen inches, contain abundant pyrite, some chalcopyrite, and minor amounts of grey copper, sphalerite, and galena carrying more or less gold. They are very erratic in width along both strike and dip and apparently constituted the gold ore mined in the past. The occurrence of pitchblende is even more

erratic than the gold ore. It occurs as sooty black, soft veinlets and blobs in the heavy sulfide streaks, and was identified by Hill at only five places in the mine (fig. 4). There are four areas in the mine where radioactivity indicated the presence of pitchblende although Hill could not identify the mineral in place. The increase in radioactivity over background was very slight, where detectable, on the 239-, 301-, and 381-foot levels. Of 194 samples taken by Hill in 1944, only 16 assayed .10% U_3O_8 or better, the highest being 1.72% U_3O_8, while 84 samples showed no U_3O_8 whatever.

A few hundred feet south of the Kirk vein, the Realty Company, with DMEA assistance (Docket 1311-X) explored the Wood vein on the 600-foot level underneath an area that had produced some 52 tons of ore having an average grade of 28.92% U_3O_8. As nearly as can be determined, most of this ore came from the 135-foot and 197-foot levels, within an ill-defined, westward plunging zone. In 1113 feet of drift on the 600-foot level streaks and coatings of sooty pitchblende are exposed for a distance of 20 feet and a few small lenses and stringers of hard pitchblende are exposed in a zone 4 feet long and 6 inches wide. These small deposits are strikingly close to the downward projection of the ill-defined zone on the 136- and 197-foot levels (fig. 1, Final Geologic Report, DMEA Docket 1311-X).

A few hundred feet north of the Kirk vein, the American Mining Company, with DMEA assistance (Docket 2878), unwatered the German-Belcher mine. Production figures compiled from various sources, indicate that former operators mined slightly over eight tons of ore having an average grade of 10.03% U_3O_8. Most, if not all, of the ore came from above the 128-foot level. Radioactivity decreases on each successively lower level until, on

the two lowest levels, the 375- and the 432-foot levels there is no detectable increase in radioactivity above background.

CONCLUSIONS AND RECOMMENDATIONS

It is concluded that pitchblende occurs in the Kirk vein as small pods and lenses, erratically spaced; that the most productive zone was above the 141-foot level; that the frequency of occurrence of the pods and the amount of radioactivity decrease markedly below the 203-foot level, being almost nil on the two lowest levels; that this pattern of occurrence is generally similar to those in the Wood mine to the south, and the German-Belcher mine to the north; and that the chance of making a significant discovery of uranium ore on the Kirk vein below the 381-foot level is very poor. It is therefore recommended that this application be denied.

REFERENCES

Bastin, E. S. and Hill, J. M. (1917) U. S. Geological Survey Prof. Paper No. 94; Economic Geology of Gilpin County and adjacent parts of Clear Creek and Boulder Counties, Colo., 379 pp., 23 pls., 1917.

Hill, J. M. (1944) Unwatering and sampling of the Kirk mine, Gilpin County, Colo. and geology of the Kirk mine, Gilpin County, Colo., unpublished, 1944.

Armstrong, Frank C. (1953) Pitchblende deposits in the Central City district, Gilpin County, Colo., unpublished, 1953.

DMEA Dockets 1311-X and 2878.

DMEA 3317

INDUSTRIAL URANIUM CORPORATION
KIRK MINE
GILPIN COUNTY, COLORADO

Engineering Report

By H. M. Connors
Mining Engineer
Bureau of Mines

Reviewed by
DMEA OPERATING COMMITTEE
8-23-54
(date)

DMEA 3317

INDUSTRIAL URANIUM CORPORATION
KIRK MINE
GILPIN COUNTY, COLORADO

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3. Section thru shafts, Quartz Hill, Industrial Uranium Corporation, Gilpin County, Colo.

DMEA 3317

INDUSTRIAL URANIUM CORPORATION
KIRK MINE
GILPIN COUNTY, COLORADO

ENGINEERING REPORT

By H. M. Connors

INTRODUCTION

Industrial Uranium Corporation, incorporated in the state of Colorado, made application for Government assistance to explore the Kirk mine, Gilpin County, Colo., for uranium. The applicant proposed exploration of the Kirk vein by crosscutting from both the sixth and seventh levels of the Alps shaft to the Kirk vein at horizons below the bottom of the Kirk shaft. The proposed 616 feet of crosscutting, 90 feet of raising, and 395 feet of drifting was estimated by the applicant to cost $33,330.00.

The application, assigned Docket No. DMEA 3317, was referred to the field for examination. The property was examined July 12, 1954, by Region IV examining team.

The Kirk shaft was visited but is not accessible for examination. The surface plant has been removed and the lower part of the shaft is flooded.

In 1944 the Kirk shaft was unwatered and sampled by the U. S. Army (Manhattan district), because it was located in the center of an area known to have produced small amounts of uranium. The results of this work indicated that the 65-foot level was the best uranium-bearing section in the mine, and that the potentially best part of this area has probably been mined out through the original discovery shaft.

It was concluded, as a result of the examination, that further exploration of the Kirk mine would not result in the development of a significant amount of uranium.

The present investigation and field examination indicates that the only recommendation that can be made is for the application for a DMEA loan to further explore the Kirk vein be denied.

ACKNOWLEDGMENTS

L. S. Abbott, mine superintendent, was contacted at Idaho Springs and gave the examining team permission to go underground through the Alps shaft. Abbott stated that he would be unable to accompany them.

The report by the U. S. Army (Manhattan district) referred to above was available to the examining team and was referred to freely.

LOCATION AND PHYSICAL FEATURES

The Kirk mine is in the Illinois Central mining district on Quartz Hill, one mile west of the Virginia Canyon gravel Colorado State Highway 279, connecting Idaho Springs and Central City. The mine is 3 miles from Central City and 5 miles from Idaho Springs, and is located in sec. 14, T. 3 S., R. 73 W., Gilpin County, Colo. (fig. 1). The altitude at the mine is about 9,460 feet. The roads are maintained and the mine is accessible throughout the year.

Competent mining labor is available in the district. Materials, supplies, and equipment are available in Idaho Springs and Denver. Electric power is available from the Public Service Company of Colorado and can be readily installed.

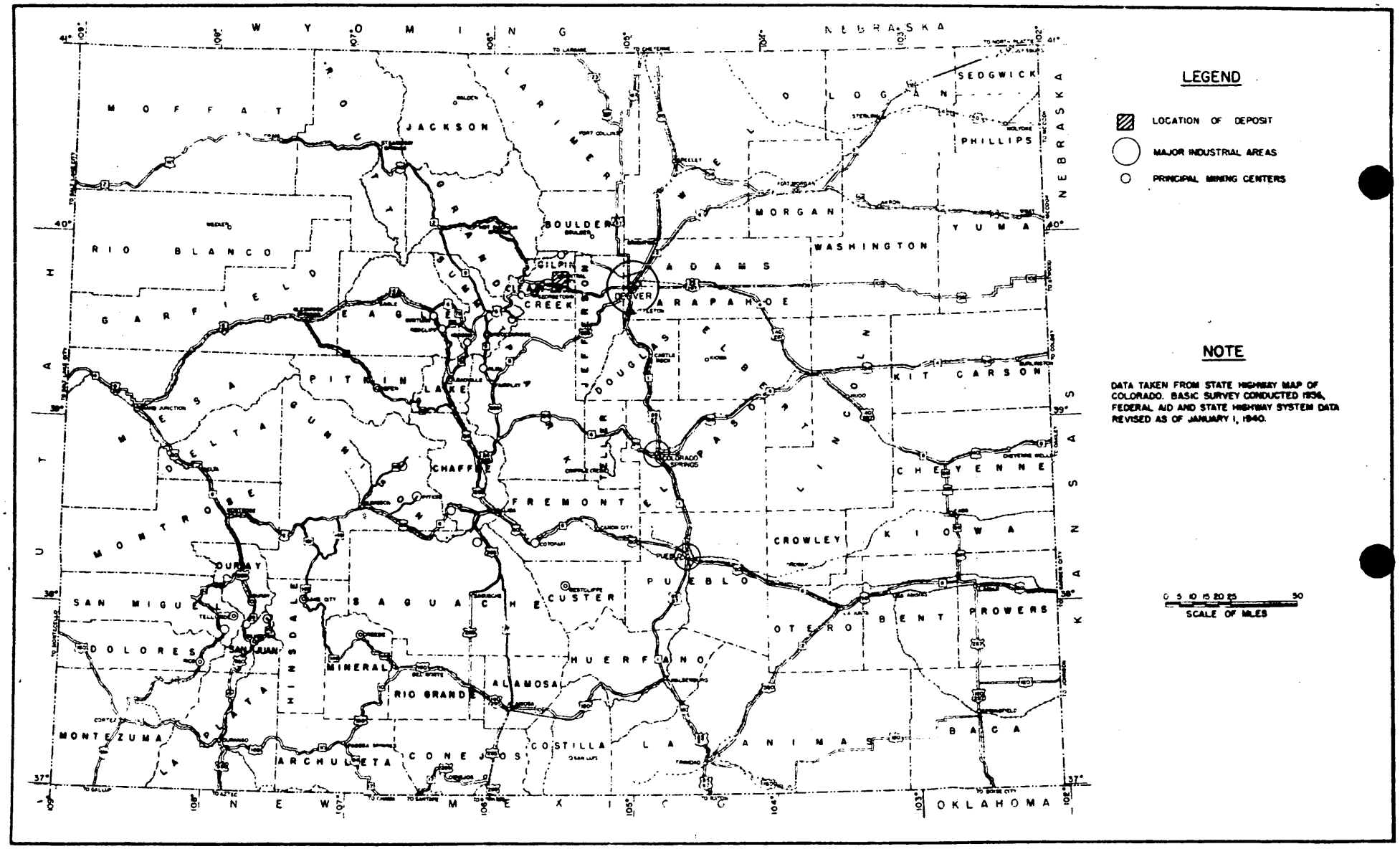

Figure 1 - Location map, Alps and Kirk property, Industrial Uranium Corp., Gilpin County, Colo.
(DMEA 3317)

OWNERSHIP AND EXTENT

The property rights of the applicant include a lease on the Kirk lode, U. S. Mineral Survey No. 198, ownership of an undivided 3/4 interest in the Ethan Allen lode, U. S. Mineral Survey No. 844, and an undivided 1/2 interest in the Polar Star lode, U. S. Mineral Survey No. 7090. The Alps and Olympia lodes are controlled by the Atomic Uranim Corporation, owner of 88 percent of the stock in the applicant company, who have allowed the applicant the use of the Alps shaft and facilities. The claims involved are shown on figure 2. The applicant proposed to drive east on the Alps vein 50 feet before starting the crosscut to the Kirk vein in order to prevent crossing the corner of the Annex lode, U. S. Mineral Survey No. 18245, on which applicant has not obtained permission to mine ore.

HISTORY AND PRODUCTION

There are no accurate records of the small uranium production from the Kirk mine. It was worked intermittently between 1905 - 1939, principally for gold, and the recorded production is as follows:

Year	Dry tons	Gold (Ounces)	Silver (Ounces)	Copper Pounds
1905	300	193.50	1656	----
1906	23	33.91	196	2506
1907	950	37,83	77	810
1908	870	297.00	1290	10800
1909	67	19.55	72	----
1910	44	7.20	67	----
1911	247	23.86	153	----
1912	48	1.14	3	----
1931	2	.42	4	----
1937	315	49.12	182	540
1938	597	84.70	447	541
1939	55	20	93	----

DESCRIPTION OF THE DEPOSIT

The Kirk vein follows a strong zone of faulting that has an average strike of N. 73° E. and a dip of 75° south. The Manhattan district report states that gold ore bodies were lenticular, of uncertain and various dimensions and occurred haphazardly along both the strike and dip of the fracture. The occurrence of pitchblende was stated to be even more erratic than the gold.

MINEABLE ORE RESERVES

There are no known ore reserves.

PRESENT STATUS

The applicant has rehabilitated the Alps shaft and, on the day the field examiners visited the property, was engaged in drifting east from the Alps shaft on the Alps vein. The face of the drift was approximately 25 feet from the shaft. The vein was 15 inches in width and contained abundant pyrite. No uranium minerals were seen by the field examiners and no radioactivity was noted. The applicant proposes to drift 25 feet more on the Alps vein before starting the crosscut to the Kirk vein. By drifting east on the vein before starting the crosscut the applicant hopes to bypass the Annex lode claim, which is not controlled.

PROJECT PROPOSALS WITH COSTS

The proposal submitted by Industrial Uranium Corp. included the following work:

1. Drive two crosscuts from the Alps vein on the Alps 555- and 688-foot levels (figs. 2 and 3) to intersect the Kirk vein. The length of the crosscuts were estimated to be 310 feet and 316 feet,

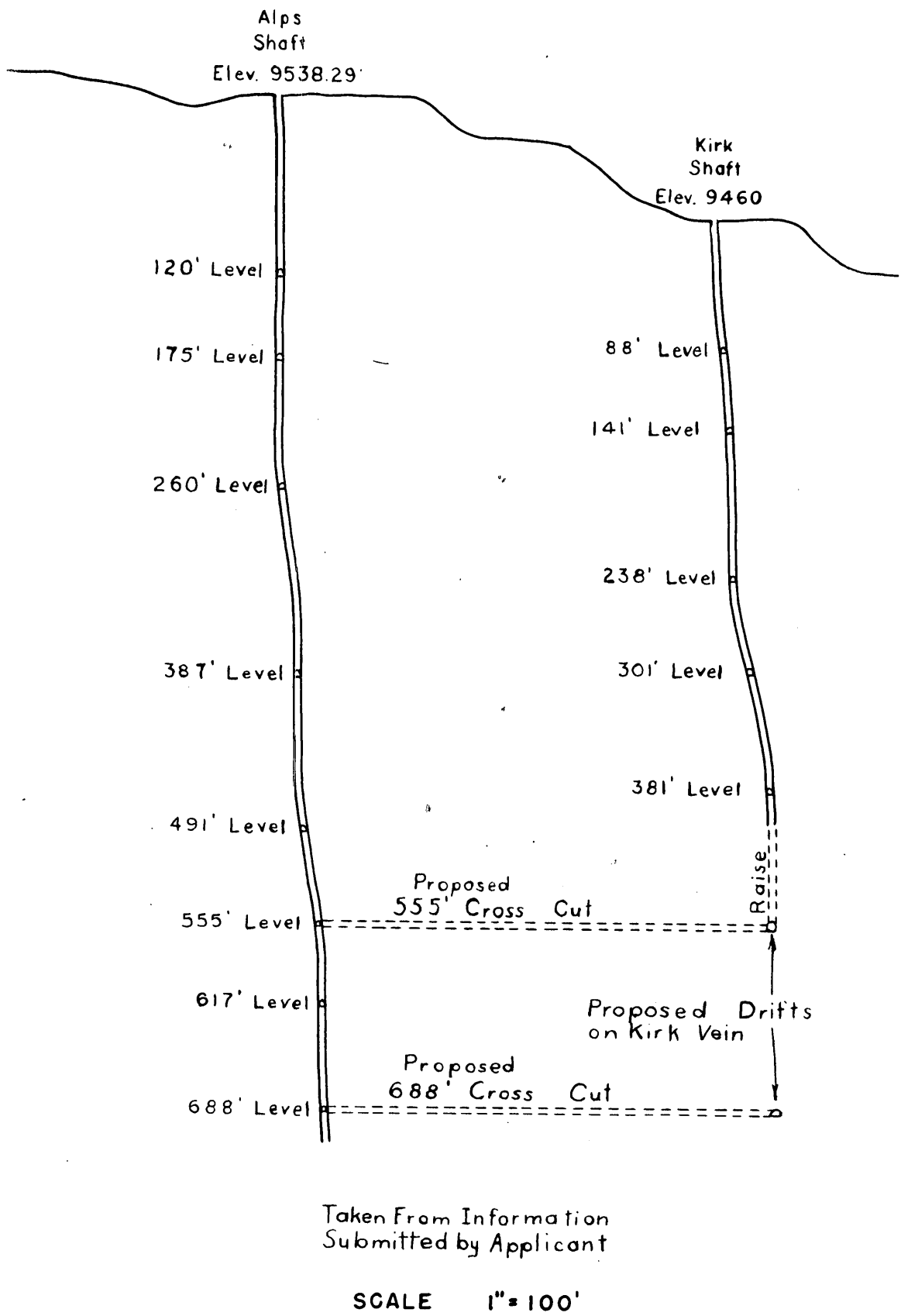

FIGURE 3 - SECTION THRU SHAFTS, QUARTZ HILL, INDUSTRIAL URANIUM CORPORATION, GILPIN COUNTY, COLO. (DMEA 3317)

respectively, and would intersect the Kirk vein 90 feet and 223 feet below the 381-foot level of the Kirk shaft.

2. On completion of the crosscut on the 555-foot level,

(a) Raise on the Kirk vein to the bottom of the Kirk shaft.

(b) Drift 150 feet east and 50 feet west on the Kirk vein on the 555-foot level.

3. On the completion of the crosscut on the 688-foot level, drift east on the Kirk vein a distance of 195 feet.

The applicant submitted detailed cost estimates for this work, which amounted to a total of $40,507.00, but stated a willingness to accept a contract based on the following unit costs:

555-foot level crosscut - 310 feet at $30.00 per foot	$ 9,300.00
688-foot level crosscut - 316 feet at $30.00 per foot	9,480.00
Raise from 555-foot level - 90 feet at $30.00 per foot	2,700.00
Drift on 555-foot level - 200 feet at $30.00 per foot	6,000.00
Drift on 688-foot level - 195 feet at $30.00 per foot	5,850.00
Total cost	$33,330.00
Government participation 75 percent	$24,997.50

CONCLUSIONS

The U. S. Army, (Manhattan district), unwatered the Kirk mine in 1944. They repaired the shaft, mapped, studied, and sampled the various working faces. A total of 89 channel samples were taken and only four of these carried more than 0.1 percent U_3O_8. The highest assay was 0.160 percent U_3O_8. Most of the samples assayed from 0.007 to 0.017 percent U_3O_8 and many failed to show any U_3O_8.

According to the Manhattan district report, it was concluded that no mineable grade ores were available and that the potentially favorable areas for development had been largely exhausted except for

a few hundred pounds of specimen material confined to a blocked-out section in the immediate vicinity of the east 65-foot sublevel in the Kirk mine.

No further work has been done on the Kirk mine since it was abandoned by the U. S. Army (Manhattan district) and no additional information has been presented or revealed by the field investigation that would justify the further expenditure of Government funds to explore the property.

RECOMMENDATIONS

The proposed exploration project, as submitted by the applicant, or any modified exploration program on the Kirk mine should be and is recommended for denial.

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

COPY

224 New Customhouse
Denver 2, Colorado

August 13, 1954.

Memorandum

To: Secretary to the Operating Committee

From: DMEA Field Team, Region IV

Subject: Report of Examination - DMEA Docket 3317 (Uranium), Industrial Uranium Corporation (Kirk mine), Gilpin County, Colorado.

Enclosed are the original and two copies of the examination report pertaining to the above application.

One copy of this report has been sent to Mr. A. P. Butler, Building 21, TEPCO at the Denver Federal Center.

The applicant requested $40,507.00 to drive two crosscut tunnels from the Alps shaft to the Kirk vein and to explore this vein by means of raising and drifting in both directions.

Based upon the reports of the examining engineers and the report by the U. S. Army for the Manhattan District, which agency thoroughly examined the mine in 1944, we recommend that the application be denied.

/s/ W. H. King

/s/ E. N. Harshman for
A. H. Koschmann

Enclosures

Reviewed by
DMEA OPERATING COMMITTEE
8-23-54
(date)

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

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/s/ W. H. King

/s/ E. N. Harshman for
A. H. Koschmann

Enclosures

GEOLOGICAL SURVEY
TEFCO
RECEIVED
AUG 27 1954
Denver

Reviewed by
DMEA OPERATING COMMITTEE

(date)

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF MINES

Mining Division
Region IV

August 13, 1954.

Memorandum

To: DMEA Field Team, Region IV

From: Chief, Mining Division, Region IV

Subject: Engineering Report of Examination - DMEA Docket 3317 (Uranium), Industrial Uranium Corporation (Kirk mine), Gilpin County, Colorado.

Enclosed are the original and ten copies of the Summary, Conclusions, and Recommendations by E. M. Connors, Bureau of Mines, and D. H. McLaren, Geological Survey, and the original and ten copies of E. M. Connors' engineering report on the subject docket.

The applicant requested $40,507.00 to drive two crosscut tunnels from the Alps shaft to the Kirk vein and to explore this vein by means of raising and drifting in both directions.

The examining team does not believe that the exploration work would disclose a sufficient amount of uranium ore to justify Government participation in an exploration project and recommends denial of the application.

We concur in this recommendation.

W. H. King

W. H. King

Enclosures

GEOLOGICAL SURVEY
TEPCO
RECEIVED

AUG 27 1954

Denver

Reviewed by
DMEA OPERATING COMMITTEE

(date)

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF MINES

Region IV

Building 20, Room 137
Denver Federal Center
Denver 2, Colorado
August 6, 1954

Memorandum

To: Executive Officer, DMEA Field Team, Region IV

From: Chief, Mineral Resources Branch, Mining Division, Region IV

Subject: DMEA 3317 (Uranium) Industrial Uranium Corp. (Kirk mine) Gilpin County, Colo.

Transmitted herewith are the original and 10 copies of a Summary, Conclusions and Recommendations by H. M. Conners, Bureau of Mines, and D. R. MacLaren, Geological Survey, and of H. M. Conners engineering report on the above docket.

Conners concludes that although it was impossible to examine the Kirk mine due to flooding, he was able to see sufficient evidence in the Alps property, from which the start of work was proposed, combined with the information available from a report by the U. S. Army (Manhattan district) resulting from their unwatering and examining the property in 1944, to justify a recommendation for denial of the loan request.

I concur with his conclusions and recommendations.

The one brochure submitted to A. H. Koschmann with your instructions of May 6, 1954, to prepare a suitable report is being returned by him.

W. M. Traver

W. M. Traver

Enclosures

WMT/isi

cc: 10
DMEA 3317
DMEA Chron.

Reviewed by
DMEA OPERATING COMMITTEE

(date)

IN REPLY REFER TO:

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY
Defense Minerals Exploration Administration
Denver Federal Center
Denver 2, Colorado

August 2, 1954

Memorandum

To: DMEA Field Team, Region IV

From: A. H. Koschmann

Subject: DMEA Docket 3317, The Kirk Mine, Gilpin County, Colorado

Enclosed are 11 copies of the geologic report by D. R. MacLaren of the U. S. Geological Survey covering the above docket.

The Kirk mine was flooded at the time of the examination and the recommendations are based on reports prepared at the time the mine was unwatered by Union Mines Development Corporation for examination and sampling, on discussions with A.E.C. and U.S.G.S. personnel familiar with the property, and on the results of two DMEA projects in the immediate vicinity of the Kirk mine.

MacLaren concludes that in the Kirk mine area significant deposits of pitchblende are will not occur in gold-sulfide veins at the depth proposed for exploration by the applicant. He therefore recommends denial of the request for exploration assistance.

I concur with this recommendation.

E. M. Shoemaker
for A. H. Koschmann
Supervising Geologist
Colorado-Wyoming

Enclosures (11)

Reviewed by
DMEA OPERATING COMMITTEE

(date)

UNITED STATES
DEPARTMENT OF THE INTERIOR
DOUGLAS McKAY, SECRETARY

DEFENSE MINERALS EXPLORATION ADMINISTRATION

REPORT OF EXAMINATION MX FIELD TEAM
REGION IV

DMEA 3317, Industrial Uranium Corporation

Kirk Mine

Gilpin County, Colorado

Uranium

D. R. MacLaren, Geologist
Geological Survey

H. M. Gommers, Mining Engineer
Bureau of Mines

Reviewed by
DMEA OPERATING COMMITTEE

(Date)

July 14, 1954

DMEA 3317

INDUSTRIAL URANIUM CORPORATION
KIRK MINE
GILPIN COUNTY, COLORADO

Summary, Conclusions, and Recommendations

By D. R. MacLaren
Geologist
Geological Survey

H. M. Somers
Mining Engineer
Bureau of Mines

Reviewed by
DMEA OPERATING COMMITTEE

_____
(date)

DMEA 3317

INDUSTRIAL URANIUM CORPORATION
KIRK MINE
GILPIN COUNTY, COLORADO

SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

By D. R. MacLaren and H. M. Connors

Industrial Uranium Corporation, A Colorado Corporation, made application for Government assistance (DMEA 3317) to explore the Kirk vein at horizons below the bottom of the Kirk shaft by a total of 1,111 feet of underground exploration at an estimated cost of $33,330.00.

The applicant's property rights include a lease on the Kirk lode, ownership of an undivided 3/4 interest in the Ethan Allen lode and an undivided 1/2 interest in the Polar Star lode. The Alps and Olympia lodes are controlled by the Atomic Uranium Corporation, owner of 88 percent of the stock in the applicant corporation, who have allowed the applicant the use of the Alps shaft and facilities.

Pre-Cambrian granite-gneiss and biotite schist have been intruded by pegmatite and bostonite dikes, the latter of Tertiary age. The Kirk vein is in a strong zone of faulting that strikes N. 73° E. and dips 68° - 85° south. Pitchblende has been found for the most part above the 141-foot level as small sooty black pods, lenses, and blobs in the heavy sulfide streaks. Radioactivity decreases in intensity with depth, being barely detectable on the two lowest levels. Only 16 out of 194 samples, taken in 1944, assayed .10 percent U_3O_8 or better while 84 samples assayed nil U_3O_8.

It is concluded that possibilities of making a significant discovery of uranium ore on the property is poor and it is recommended that the application be denied.

THE KIRK MINE

GILPIN COUNTY, COLORADO

DMEA DOCKET 3317

Geologic Report

By D. R. Mac Laren
U. S. Geological Survey

Reviewed by
DMEA OPERATING COMMITTEE

_____
(date)

INDUSTRIAL URANIUM CORPORATION
THE KIRK MINE
GILPIN COUNTY, COLORADO
DMEA Docket 3317

INTRODUCTION

Industrial Uranium Corporation of Denver, Colorado, has applied to the Defense Minerals Exploration Administration for assistance to explore for uranium in the Kirk mine, Quartz Hill district, Central City, Colorado. The applicant proposes to drive two cross-cuts from the Alps mine to the Kirk vein, one 310 feet long on the 555-foot level, the other 326 feet long on the 655-foot level. The cross-cuts will cut the Kirk vein 90 feet and 223 feet, respectively, below the Kirk 381-foot level, or at the Kirk 471-foot and 606-foot levels. The applicant also proposes to drift 200 feet on the Kirk 471-foot level, and raise from the 471-foot level to the 381-foot level; and to drift 200 feet on the Kirk 606-foot level. The total cost of the project is estimated by the applicant to be $33,320 of which the Government's share will be $26,997.50.

The property was visited July 12, 1954, in the company of H. M. Connors of the U.S. Bureau of Mines. The superintendent was not at the property but was located and consulted in Idaho Springs. The Kirk mine was flooded to within about 50 feet of the collar of the shaft and could not be entered.

Based upon reports by J. M. Hill (1944) and Frank C. Armstrong (1953); on oral communication with R. U. King of the U.S. Geological Survey, Charles C. Towle and K. E. Baker of the AEC; and on the results of DMEA programs at the Realty mine, a few hundred feet south of the Kirk, and at the German-Belcher mine, a few hundred feet north of the Kirk, it is concluded that the chance of a significant discovery of uranium resulting from this program is

poor and it is recommended that the application be denied.

GEOLOGY

The geology of the Quartz Hill district is described in U.S. Geological Survey Professional Paper 97 by Ransome and Hill (1917). The geology of the Kirk mine is described in more detail by J. M. Hill (1946) who, with G. B. Guillette, was in charge of sampling the mine for Union Mines Development Corporation in October and November, 1944. Both of these sources of information have been freely consulted during the preparation of this report.

The rocks of the area are pre-Cambrian granite gneiss and biotite schist that have been intruded by pegmatite and hornblende dikes, the latter of Tertiary age. Fissures striking northeast to easterly and dipping steeply north or south, have been filled by veins containing pyrite, chalcopyrite, galena, sphalerite, silver, and gold in a gangue of quartz and brecciated wall rock. In places the wall rocks are silicified and pyritized for short distances away from the veins.

The Kirk vein is in a strong zone of faulting that has an average strike of N 75°E and dips 65° to 80° south. In zones of granite gneiss, hornblende, or pegmatite the vein walls are from 10 inches to 6 feet apart, but in zones of schist the walls are ill-defined or die out along many minor slips. Stringers and veins, varying in width from one quarter inch to fourteen inches, contain abundant pyrite, some chalcopyrite, and minor amounts of grey copper, sphalerite, and galena carrying more or less gold. They are very erratic in width along both strike and dip and apparently constituted the gold ore mined in the past. The occurrence of pitchblende is even more

erratic than the gold ore. It occurs as sooty black, soft veinlets and blebs in the heavy sulfide stringers, and was identified by Hill at only five places in the mine (fig. 4). There are four areas in the mine where radioactivity indicated the presence of pitchblende although Hill could not identify the mineral in place. The increase in radioactivity over background was very slight, where detectable, on the 239-, 304-, and 381-foot levels. Of 194 samples taken by Hill in 1944, only 16 assayed .10% U_3O_8 or better, the highest being 1.72% U_3O_8, while 84 samples showed no U_3O_8 whatever.

A few hundred feet south of the Kirk vein, the Realty Company, with DMEA assistance (Docket 1311-X) explored the Wood vein on the 600-foot level underneath an area that had produced some 52 tons of ore having an average grade of 28.92% U_3O_8. As nearly as can be determined, most of this ore came from the 135-foot and 197-foot levels, within an ill-defined, westward plunging zone. In 1113 feet of drift on the 600-foot level streaks and coatings of sooty pitchblende are exposed for a distance of 20 feet and a few small lenses and stringers of hard pitchblende are exposed in a zone 4 feet long and 6 inches wide. These small deposits are strikingly close to the downward projection of the ill-defined zone on the 136- and 197-foot levels (fig. 1, Final Geologic Report, DMEA Docket 1311-X).

A few hundred feet north of the Kirk vein, the American Mining Company, with DMEA assistance (Docket 2878), unwatered the German-Belcher mine. Production figures compiled from various sources, indicate that former operators mined slightly over eight tons of ore having an average grade of 16.03% U_3O_8. Most, if not all, of the ore came from above the 128-foot level. Radioactivity decreases on each successively lower level until, on

the two lowest levels, the 375- and the 432-foot levels there is no detectable increase in radioactivity above background.

CONCLUSIONS AND RECOMMENDATIONS

It is concluded that pitchblende occurs in the Kirk vein as small pods and lenses, erratically spaced; that the most productive zone was above the 141-foot level; that the frequency of occurrence of the pods and the amount of radioactivity decrease markedly below the 283-foot level, being almost nil on the two lowest levels; that this pattern of occurrence is generally similar to those in the Wood mine to the south, and the German-Belcher mine to the north; and that the chance of making a significant discovery of uranium ore on the Kirk vein below the 281-foot level is very poor. It is therefore recommended that this application be denied.

REFERENCES

Bastin, E. S. and Hill, J. M. (1917) U.S. Geological Survey Prof. Paper No. 94; Economic Geology of Gilpin County and adjacent parts of Clear Creek and Boulder Counties, Colo., 379 pp., 23 pls., 1917.

Hill, J. M. (1944) Unwatering and sampling of the Kirk mine, Gilpin County, Colo. and geology of the Kirk mine, Gilpin County, Colo., unpublished, 1944.

Armstrong, Frank C. (1953) Pitchblende deposits in the Central City district, Gilpin County, Colo., unpublished, 1953.

DMEA Dockets 1311-X and 2878.

DMEA 3317

INDUSTRIAL URANIUM CORPORATION
KIRK MINE
GILPIN COUNTY, COLORADO

Engineering Report

By E. M. Summers
Mining Engineer
Bureau of Mines

Reviewed by
DMEA OPERATING COMMITTEE

_____
(date)

DMEA 3317

INDUSTRIAL URANIUM CORPORATION
KIRK MINE
GILPIN COUNTY, COLORADO

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DMEA 3317

INDUSTRIAL URANIUM CORPORATION
KIRK MINE
GILPIN COUNTY, COLORADO

ENGINEERING REPORT

By H. M. Conners

INTRODUCTION

Industrial Uranium Corporation, incorporated in the state of Colorado, made application for Government assistance to explore the Kirk mine, Gilpin County, Colo., for uranium. The applicant proposed exploration of the Kirk vein by crosscutting from both the sixth and seventh levels of the Alps shaft to the Kirk vein at horizons below the bottom of the Kirk shaft. The proposed 616 feet of crosscutting, 90 feet of raising, and 395 feet of drifting was estimated by the applicant to cost $33,330.00.

The application, assigned Docket No. DMEA 3317, was referred to the field for examination. The property was examined July 12, 1954, by Region IV examining team.

The Kirk shaft was visited but is not accessible for examination. The surface plant has been removed and the lower part of the shaft is flooded.

In 1944 the Kirk shaft was unwatered and sampled by the U. S. Army (Manhattan district), because it was located in the center of an area known to have produced small amounts of uranium. The results of this work indicated that the 65-foot level was the best uranium-bearing section in the mine, and that the potentially best part of this area has probably been mined out through the original discovery shaft.

It was concluded, as a result of the examination, that further exploration of the Kirk mine would not result in the development of a significant amount of uranium.

The present investigation and field examination indicates that the only recommendation that can be made is for the application for a DMEA loan to further explore the Kirk vein be denied.

ACKNOWLEDGMENTS

L. S. Abbott, mine superintendent, was contacted at Idaho Springs and gave the examining team permission to go underground through the Alps shaft. Abbott stated that he would be unable to accompany them.

The report by the U. S. Army (Manhattan district) referred to above was available to the examining team and was referred to freely.

LOCATION AND PHYSICAL FEATURES

The Kirk mine is in the Illinois Central mining district on Quartz Hill, one mile west of the Virginia Canyon gravel Colorado State Highway 279, connecting Idaho Springs and Central City. The mine is 3 miles from Central City and 5 miles from Idaho Springs, and is located in sec. 14, T. 3 S., R. 73 W., Gilpin County, Colo. (fig. 1). The altitude at the mine is about 9,460 feet. The roads are maintained and the mine is accessible throughout the year.

Competent mining labor is available in the district. Materials, supplies, and equipment are available in Idaho Springs and Denver. Electric power is available from the Public Service Company of Colorado and can be readily installed.

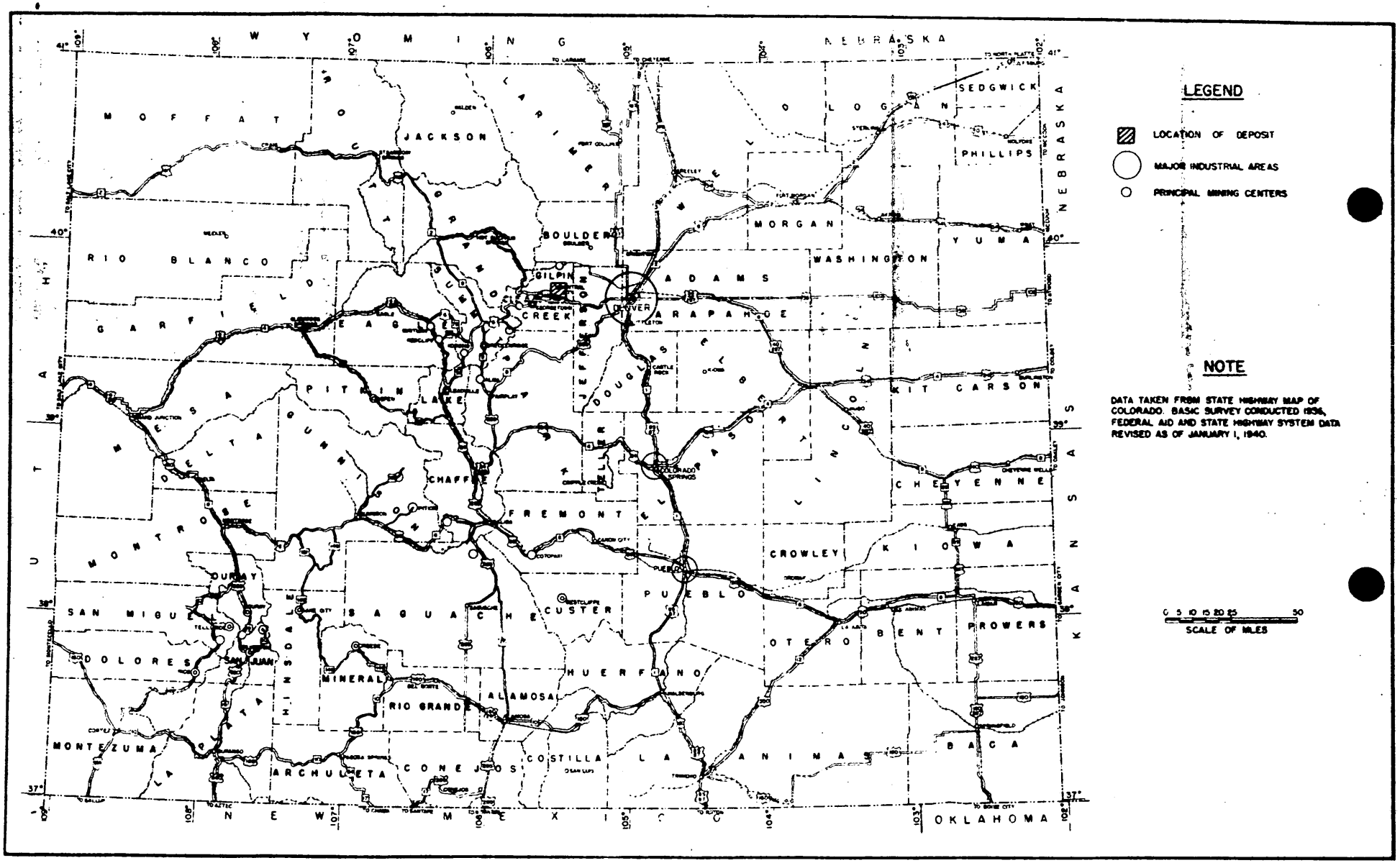

Figure 1 - Location map, Alps and Kirk property, Industrial Uranium Corp., Gilpin County, Colo.
(DMEA 3317)

OWNERSHIP AND EXTENT

The property rights of the applicant include a lease on the Kirk lode, U. S. Mineral Survey No. 198, ownership of an undivided 3/4 interest in the Ethan Allen lode, U. S. Mineral Survey No. 844, and an undivided 1/2 interest in the Polar Star lode, U. S. Mineral Survey No. 7090. The Alps and Olympia lodes are controlled by the Atomic Uranium Corporation, owner of 88 percent of the stock in the applicant company, who have allowed the applicant the use of the Alps shaft and facilities. The claims involved are shown on figure 2. The applicant proposed to drive east on the Alps vein 50 feet before starting the crosscut to the Kirk vein in order to prevent crossing the corner of the Annex lode, U. S. Mineral Survey No. 18245, on which applicant has not obtained permission to mine ore.

HISTORY AND PRODUCTION

There are no accurate records of the small uranium production from the Kirk mine. It was worked intermittently between 1905 - 1939, principally for gold, and the recorded production is as follows:

Year	Dry tons	Gold (Ounces)	Silver (Ounces)	Copper Pounds
1905	300	193.50	1686	----
1906	23	33.91	196	2506
1907	950	37.83	77	810
1908	870	297.00	1290	10800
1909	67	19.55	72	----
1910	44	7.20	67	----
1911	247	23.86	153	----
1912	48	1.14	3	----
1931	2	.42	4	----
1937	315	49.12	182	540
1938	597	84.70	447	541
1939	55	20	93	----

a few hundred pounds of specimen material confined to a blocked-out section in the immediate vicinity of the east 60-foot sublevel in the Kirk mine.

No further work has been done on the Kirk mine since it was abandoned by the U. S. Army (Manhattan district) and no additional information has been presented or revealed by the field investigation that would justify the further expenditure of Government funds to explore the property.

RECOMMENDATIONS

The proposed exploration project, as submitted by the applicant, or any modified exploration program on the Kirk mine should be and is recommended for denial.

6/29/54 gla

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

224 New Customhouse
Denver 2, Colorado

June 24, 1954

Memorandum

To: Chairman, Operating Committee, DMEA

From: Executive Officer, DMEA Field Team, Region IV

Subject: Docket No. DMEA 3317 (Uranium), Industrial Uranium Corporation, Kirk Mine, Gilpin County, Colorado

In accordance with the request of Mr. W. S. Martin, Acting Chairman of the Operating Committee, in his letter dated May 3, 1954, enclosed is a signed copy of a Mining Sublease on the Alps and Olympia claims.

W H King
W. H. King

Enclosure

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

224 New Customhouse
Denver 2, Colorado

June 24, 1954

Memorandum

To: Chairman, Operating Committee, DMEA

From: Executive Officer, DMEA Field Team, Region IV

Subject: Docket No. DMEA 3317 (Uranium), Industrial Uranium Corporation, Kirk Mine, Gilpin County, Colorado

In accordance with the request of Mr. W. S. Martin, Acting Chairman of the Operating Committee, in his letter dated May 3, 1954, enclosed is a signed copy of a Mining Sublease on the Alps and Olympia claims.

W. H. King

Enclosure

MINING SUBLEASE

This Agreement made this 11th day of June, A. D. 1954, by and between Atomic Uranium Corporation, a Delaware corporation, party of the first part, hereinafter designated as LESSEE, and Industrial Uranium Corporation, a Colorado corporation, party of the second part, hereinafter designated as SUBLESSEE,

WITNESSETH:

That the said LESSEE holds, under mining lease dated September 4, 1952 between Gold Uranium Corporation, Gold Uranium Mining Company, and Nancarrow Corporation, LESSOR, and Francis H. Knighton, LESSEE, who later assigned his right and interest to Atomic Uranium Corporation, now the LESSEE, among other mining claims, the following two patented mining claims situated in the Illinois Central Mining District, Gilpin County, Colorado:

U. S. Survey Lot No. 176 Alps Lode

U. S. Survey Lot No. 8935 Olympia Lode

and for in consideration of the sum of One Dollar ($1.00) and other good and valuable considerations to LESSEE in hand paid by said SUBLESSEE, receipt whereof is hereby acknowledged, does hereby sublease the above two patented mining claims for a period of 10 years in accordance with the terms hereinafter expressed.

The said SUBLESSEE, in consideration of the premises, has covenanted contracted and agreed, and by these presents does covenant, contract and

agree to and with said LESSEE, successors and assigns:

1. To accept and to adhere to, from this date, all the obligations, covenants, and terms set forth in the September 4, 1952 mining lease hereinafter referred to, limited however, to the two mining claims listed above.

2. To pay to LESSEE, in addition to the royalties set forth in Paragraph (11) of said mining lease, one per cent (1%) of the net settlement price of all products produced from the minerals of said two mining claims.

3. To pay all taxes assessed against said two mining claims beginning with the year January 1, 1954.

4. Time is the essence of this agreement, and each and every clause of this indenture and all the covenants and conditions contained herein shall extend to the successors, heirs, executors, administrators and lawful assigns of all of the parties hereto.

IN WITNESS WHEREOF, the parties hereto have hereunto subscribed their names the day and year first above written.

LESSEE

ATOMIC URANIUM CORPORATION

By Francis H Knighton
Francis H. Knighton
General Manager and Chairman
of the Board of Directors

SUBLESSEE:

INDUSTRIAL URANIUM CORPORATION

By G C Ridland
G. C. Ridland
Secretary

APPROVED:

GOLD URANIUM CORPORATION

By M. N. Scott
M. N. Scott
Secretary

GOID URANIUM MINING COMPANY

By M. N. Scott
M. N. Scott
Secretary

NANCARROW CORPORATION

By M. N. Scott
M. N. Scott
Secretary

STATE OF COLORADO)
COUNTY OF DENVER) ss

Before me, personally came Francis H. Knighton, G. C. Ridland, and M. N. Scott, who being duly sworn did depose and say that they do represent their respective corporations, in the capacities shown above, which did execute and approve the above instruments, and that they did so by order of the respective Boards of Directors of said Corporations.

Given under my hand and seal of office this 11th day of June, A. D. 1954.

Elva Moser
Notary Public

6/10/54 gla

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

224 New Customhouse
Denver 2, Colorado

June 7, 1954.

Dr. G. C. Ridland
Industrial Uranium Corporation
403 Interstate Trust Building
Denver 2, Colorado

Re: Docket DMEA-3317 (Uranium)

Dear Doctor Ridland:

Reference is made to the application for exploration assistance submitted by the Industrial Uranium Corporation on the Kirk Mine, Docket No. DMEA-3317.

It will be necessary for you to submit a document such as a lease agreement evidencing the company's right to operate on the Alps and Olympia claims before we can process your application.

Very truly yours,

W. H. King
Executive Officer
DMEA Field Team, Region IV

JFS:cwm

cc: Docket
Administrator, DMEA
AHKoschmann
WMTraver
Chron.

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

224 New Customhouse
Denver 2, Colorado

June 7, 1954.

Dr. G. C. Ridland
Industrial Uranium Corporation
403 Interstate Trust Building
Denver 2, Colorado

Re: Docket DMEA-3317 (Uranium)

Dear Doctor Ridland:

Reference is made to the application for exploration assistance submitted by the Industrial Uranium Corporation on the Kirk Mine, Docket No. DMEA-3317.

It will be necessary for you to submit a document such as a lease agreement evidencing the company's right to operate on the Alps and Olympia claims before we can process your application.

Very truly yours,

W H King

W. H. King
Executive Officer
DMEA Field Team, Region IV

JFS:cwm

cc: Docket
Administrator, DMEA
AHKoschmann
WMTraver
Chron.

5/27/54 gla

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

224 New Customhouse
Denver 2, Colorado

May 24, 1954.

Memorandum

To: Chairman, Operating Committee, DMEA

From: Executive Officer, DMEA Field Team, Region IV

Subject: DMEA Docket No. 3317 (Uranium), Industrial Uranium Corporation, Kirk Mine, Gilpin County, Colorado.

Reference is made to your letter dated May 3, 1954 concerning the subject application.

Enclosed is a photostat copy of an Assignment of Lease by George S. Groves to Kirk Mines, Inc. This assignment is to be made part of the application, DMEA Docket 3317.

W H King
W. H. King

Enclosure

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

224 New Customhouse
Denver 2, Colorado

May 24, 1954.

Memorandum

To: Chairman, Operating Committee, DMEA

From: Executive Officer, DMEA Field Team, Region IV

Subject: DMEA Docket No. 3317 (Uranium), Industrial Uranium Corporation, Kirk Mine, Gilpin County, Colorado.

Reference is made to your letter dated May 3, 1954 concerning the subject application.

Enclosed is a photostat copy of an Assignment of Lease by George S. Groves to Kirk Mines, Inc. This assignment is to be made part of the application, DMEA Docket 3317.

W. H. King

W. H. King

Enclosure

FOR VALUE RECEIVED, the undersigned does hereby assign, transfer and set over unto KIRK MINES INCORPORATED, a Colorado corporation, all right, title and interest of the undersigned of in and to that certain Mining Lease and Option dated the 23rd day of February, 1950, from Marjorie Carlton as Testamentary Trustee under the Last Will and Testament of Jeannette White Nesmith, deceased, to George S. Groves.

IN WITNESS WHEREOF, I have hereunto set my hand and seal this 15th day of January, 1951.

George S. Groves (SEAL)

STATE OF COLORADO)
) SS.
CITY AND COUNTY OF DENVER)

On this 15th day of January, 1951, before me personally came GEORGE S. GROVES, to me known, who, being by me duly sworn, did depose and say that he executed the above instrument for the uses and purposes therein set forth.

My commission expires February 20, 1952

WITNESS my hand and official seal.

Edna Moyes
Notary Public

5/10/54 gla

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

224 New Customhouse
Denver 2, Colorado

May 6, 1954.

Mr. G. C. Ridland
Industrial Uranium Corporation
403 Interstate Trust Building
Denver 2, Colorado

Re: Docket No. DMEA-3317
(Uranium), Kirk Mine,
Gilpin County, Colorado

Dear Mr. Ridland:

Your application (Page 1, Article 3(d) of Supporting Data) states:

> "Assignment of above lease by George S. Groves to Kirk Mines Incorporated is appended."

This is to advise you that the assignment of the lease by George S. Groves to Kirk Mines Incorporated was not appended to the application when it was submitted to this office and of this date has not been received by this office.

Very truly yours,

W H King

W. H. King
Executive Officer
DMEA Field Team, Region IV

HMC:cwm

cc: Docket
Chairman of the Oper. Comm.
AHKoschmann
WMTraver
Chron.

700
Docket
Surname
Ching
Ellis
Martin
Hoffland
Jaracke
Hedges
Eftman

MAY 3 - 1954

Mr. S. C. Midland, Geological Engineer
Industrial Uranium Corporation
801 International Trust Building
Denver 2, Colorado

Re: Docket No. DMEA-1317 (Uranium)
Black Mesa
Gilpin County, Colorado

Dear Mr. Midland:

The application for assistance in exploring your property, under the above captioned docket number, has been reviewed by the Bare and Miscellaneous Metals Division of the Defense Minerals Exploration Administration. It has been referred to the Executive Officer of Region IV at the following address:

Mr. W. E. King
Executive Officer
DMEA Field Team, Region IV
7th New Customhouse Building
Denver 2, Colorado

The Regional Office will contact you at the earliest opportunity if they desire to obtain additional information.

Sincerely yours,

C. O. Mittendorf
(eq 257)
Administrator

MCKING:fos
5-27-54
cc to: Admr., Reading File
Docket
Code 700
Mining
DMEA Field Team, Region IV

R.G.H.

DOCKET
SURNAME

Ching
Ellis
Hotlund
Martin
Hofmann

MAY 3 - 1954

Mr. W. H. King
Executive Officer
DMEA Field Team, Region IV
224 New Customhouse Building
Denver 2, Colorado

Re: Docket No. DMEA-3317 (Uranium)
Industrial Uranium Corporation
Kirk Mine
Gilpin County, Colorado

Dear Mr. King:

The subject application is being referred to you for investigation and recommendation. A copy of the application is already in your files.

Enclosed are two copies each of comments and recommendations relative to the application by Arthur P. Butler, Jr., and H. D. Keiser of the Uranium Commodity Committee, dated April 22 and April 23, 1954, respectively.

We note from Mr. G. C. Ridland's letter to you dated April 2, 1954, that the proposed work will be on five lode claims, four of which were not included in the area covered by the original application. In the event a contract is recommended, it would be necessary to secure Owner's Consent to Lien on all five claims. It would also be necessary for the Operator to submit a document, such as a lease agreement, evidencing its right to operate on the Alps and Olympia claims. — O.K.

Mr. Ridland also states that the proposed work is specifically designed not to enter ground covered by the Annex claim (No. 18245). An inspection of Map 3, entitled "Alps and German Property", shows that some of the proposed work is actually within the Annex claim where the latter is superimposed upon the Olympia and Alps claims. Applicant's property rights here should be clearly established. — Approved by King

The application (Page 1, Article 3 (a) of supporting data) refers to an appended "Assignment of above lease by George S. Groves to Kirk Mines, Inc.". We were unable to find such assignment and note that your memorandum of April 12 to the Secretary of the Operating Committee did not list such an assignment as being attached. — O.K.

R.C.H.

In appraising the merits of this application consideration should naturally be given to the results of work in this area by the Geological Survey and the Atomic Energy Commission. DMEA field examiners recently made an intensive examination of the mine workings of the nearby German-Belcher property. The Atomic Uranium Corporation, owner of 88 percent of Applicant's issued stock, has unwatered and rehabilitated the Alps shaft to a depth of 688 feet and the results of an examination of this property should be available to the Field Team. The Kirk mine, itself, was unwatered and examined in 1944 by the U. S. Army for the Manhattan District, and the report of examination should be available to the Field Team.

Sincerely yours,

W. S. Martin

ACTING Chairman, Operating Committee (246)

Enclosures 4

APPROVED:

J. H. Hedges

Member, Bureau of Mines (246)

D. M. Larrabee

Member, Geological Survey (246)

MChing:foc
cc to: Admr. Reading File
Operating Comm.
Docket
Messrs. H. D. Keiser, RM. 3641
A. P. Butler, % TEPCO, Rm. 3212, GSA
J. O. Hosted, Rm. 3210, GSA
Mr. Ching
Code 700
DMEA Field Team, Region IV

4/27/54 gla

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

April 23, 1954

Memorandum

To: Ernest William Ellis, DMEA Member
Uranium Commodity Committee, Room 4640

From: H. D. Keiser, Bureau of Mines Member
Uranium Commodity Committee

Subject: DMEA Docket 3317, Industrial Uranium Corporation,
403 Interstate Trust Building, Denver 2, Colorado.

I have reviewed the application included in the subject docket and discussed it with Joseph O. Hosted, representative of the Atomic Energy Commission.

It is recommended that the application be forwarded to the Field Team for investigation and report, and that the Field Team be requested to discuss the application with Charles C. Towle, representative of the Atomic Energy Commission at Denver, Colorado.

H. D. Keiser

H. D. Keiser

Attachment

STANDARD FORM NO. 64

4/27/54 gla

Office Memorandum • UNITED STATES GOVERNMENT

TO : E. Wm. Ellis, DMEA Member, Uranium Commodity Committee

DATE: April 22, 1954

FROM : Arthur P. Butler, Jr., USGS Member, Uranium Commodity Committee

DMEA-3317

SUBJECT: (Uranium), Application of Industrial Uranium Corporation, Kirk mine, Gilpin County, Colorado

I have reviewed the application identified in the subject above. The applicant, Industrial Uranium Corporation, proposes 1,111 feet of underground exploration at an estimated cost of $33,330, to explore the Kirk Lode beneath present workings in the Kirk mine. According to information summarized by the Geological Survey from various sources, the Kirk mine produced about 175 tons of ore containing 8 percent U_3O_8 (U. S. Geological Survey Trace Elements Memorandum Report 215).

The Geological Survey is currently preparing areal geologic maps in the vicinity of the Kirk mine and has made reconnaissance examinations for uranium of this property as well as adjoining properties. The results of this work should be considered in fully evaluating the merits of the application. In addition, careful appraisal should be made of all existing information that may give a clue to probable size and distribution of ore bodies in the Kirk structure. These factors have an important bearing on the merit of the application.

For example, the 175 tons of ore containing 8 percent U_3O_8 would be worth around $130,000 at current prices. ~~At~~ Five times as much ore of similar grade, or proportionately more ore of lower grade would have to be found to permit repayment of the loan. Because of the large amount of past mining in the district and the considerable amount of geologic data obtained in recent years, I believe that this docket should be appraised chiefly in terms of the chances of a worthwhile discovery rather than on the additional fundamental geologic data on uranium in the district that might be gained thereby.

Recommendation

1. I recommend that the application be forwarded to the Field Team for review and evaluation, expecially with respect to the general scope of the exploration in relation to the results of the work by Geological Survey personnel.

2. I suggest that the Field Team consult with Mr. Paul K. Sims, Mr. Robert U. King, and with other members of Mr. A. H. Koschmann's staff of the Geological Survey, and also with members of the Denver Exploration Branch, U. S. Atomic Energy Commission.

Arthur P. Butler, Jr.

Copies to: E. Wm. Ellis (2)

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

April 20, 1954

Memorandum

To: Executive Officer, DMEA Field Team, Region IV

From: Chief, Operation's Control and Statistics Division

Subject: Assignment of Docket Number

There is listed below the assigned docket number to an application recently received from Region IV.

DMEA
- 3317 Industrial Uranium Corp.

Robert E. Adams
Chief, Operation's Control
and Statistics Division

April 20, 1954

Industrial Uranium Corp.
403 Interstate Trust Bldg.
Denver 2, Colorado

Subject: DMEA-3317
Re: Exploration Assistance
Kirk Mine

Gentlemen:

The receipt of your application dated March 22, 1954 for exploration assistance under the Defense Production Act of 1950, as amended, is hereby acknowledged.

Your application has been assigned Docket Number DMEA-3317 and referred to the Rare and Miscellaneous Metals Division.

Kindly refer to DMEA-3317 in any future correspondence relating to your application.

Sincerely yours,

Robert E. Adams
Chief, Operation's Control
and Statistics Division

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

224 New Customhouse
Denver 2, Colorado

April 12, 1954

Memorandum

To: Secretary to the Operating Committee, Defense Minerals Exploration Administration

From: Field Team, Region IV

Subject: (Uranium), Application of Industrial Uranium Corporation, Kirk Mine, Gilpin County, Colorado

Enclosed are two copies of the subject application estimated to cost $40,507.00, but which the applicant has adjusted to $33,330.00.

Each brochure contains a letter of transmittal, Form MF-103 with six pages of supporting data, and three maps.

Attached hereto are the following:

1. A photostat of a lease agreement dated December 31, 1953 between Kirk Mines Incorporated and Francis H. Knighton signed by George S. Groves for Kirk Mines, Inc. and Exhibit A "Agreement of Lease."

2. Assignment of lease from Francis A. Knighton to the Industrial Uranium Corporation.

One copy of the application is being forwarded to Mr. A. P. Butler, TEPCO, Building 21, Denver Federal Center.

Because of the relationship of the applicant to the Reynolds Uranium Corporation, application forwarded you April 7, 1954, our attorney, Mr. Shireman, thinks it would be unethical for him to give legal advice to us on this application should it go to contract.

One copy of the application is being retained in our file.

W. H. King

A. H. Koschmann

Enclosures

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

224 New Customhouse
Denver 2, Colorado

April 12, 1954

Memorandum

To: Secretary to the Operating Committee, Defense Minerals Exploration Administration

From: Field Team, Region IV

Subject: (Uranium), Application of Industrial Uranium Corporation, Kirk Mine, Gilpin County, Colorado

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W. H. King

W. H. King

A. H. Koschmann

A. H. Koschmann

Enclosures

April 2, 1954.

Mr. W. H. King,
Executive Officer
Defense Minerals Exploration Admin.,
Field Team, Region IV
224 New Customhouse
Denver 2, Colorado.

Dear Mr. King,

Industrial Uranium Corporation
493 Interstate Trust Building
Denver 2, Colorado.

Please find attached four copies of an application for aid to explore the Kirk Lode. This was originally submitted to you on March 23rd but was returned to us for revision. The changes have been made as requested in Mr. Shaw's letter of March 31st, and the documents showing property control are included in this transmittal.

Trusting that these meet with your approval, I remain,

Very truly yours

G. Ridland

G. Carmen Ridland

Enc: 4 each Form MF-103 with supplementary pages
4 each Maps Nos. 1, 2 & 3
Documents showing property control (2)

INDUSTRIAL URANIUM CORPORATION

403 Interstate Trust Bldg.

Denver 2, Colo.

April 2, 1954

Mr. W. H. King
Executive Officer
Defense Minerals Exploration Admin.
Field Team, Region IV
224 New Customhouse
Denver 2, Colorado

Dear Mr. King:

Industrial Uranium Corp.
403 Interstate Trust Bldg.
Denver 2, Colorado

In his letter of March 31, 1954, Mr. John F. Shaw inquired about the status of the claims involved in the cross-cuts proposed by this application.

These cross-cuts traverse the following Lode Claims:

1. Alps Lode U. S. Sur. No. 176
2. Olympia Lode U. S. Sur. No. 8935 { atomic [illegible]
3. Ethan Allen Lode U. S. Sur. No. 844 Owns 3/4 interest
4. Polar Star Lode U. S. Sur. No. 7090 Owns 1/2 interest
5. Kirk Lode U. S. Sur. No. 198 Leased

The Alps and Olympia Lodes are controlled by the Atomic Uranium Corp., who have allowed the applicant the use of the Alps shaft and facilities.

The applicant owns an undivided 3/4 interest in the Ethan Allen Lode, and an undivided 1/2 interest in the Polar Star Lode, thus controlling these claims.

The Kirk Lode is leased by the applicant.

Subordination agreements can be obtained from all parties having an interest in these claims.

The only claim not controlled by the applicant in the vicinity of the proposed cross-cuts is the Annex (18245) and the proposed work is

specifically designed not to enter ground controlled by the Annex. By starting off to the east and drifting on the Alps claim for approximately 50 feet before beginning to cross cut, the actual distance of the crosscut will be reduced due to the fact that the Alps and Kirk veins converge to the east. Therefore, the cross cuts, as proposed on the accompanying maps, may be expected to be slightly less than the respective 310 and 316 feet, which are used as approximate distances in estimating costs. Any drifting done on the Alps vein prior to beginning the cross cuts will be entirely at applicant's expense.

The Alps and Kirk shafts have been accurately transit surveyed to the nearest one hundredth of a foot in the field with relation to patented claim corners. The traverse in the field was closed, with a calculated error of .027%. Their positions as shown on the accompanying map are ploted accurately, using the coordinate system as calculated from the transit survey feild notes.

A nail, acting as a point, in the east end of the Alps shaft collar situated 1.95 feet from the N E corner of the shaft and 1.85 feet from the S E corner of the shaft bears S. 38° 43' W, 231.95 feet from Cor. No. 4 of the Ingomar Lode, U. S. Sur. No. 11655. The long side of the Alps shaft bears N 82° 35' E. The coordinates for this point are: Lat. 4818.07, Dep. 4854.92.

A nail, acting as a point, in the south side of the Kirk shaft collar situated 3.12 feet from the S E corner of the shaft and 2.97 feet from the S W corner of the shaft bears S 0° 27' E, 444.96 feet from Cor. No. 4 of the Ingomar Lode U. S. Sur. No. 11655. The long side of the Kirk shaft bears N 740 16' E. The coordinates for this point on the shaft collar are: Lat. 4555.06, Dep. 5003.50.

All proposed work will be carried with precision transit control.

We trust that this explanation gives you the information you require.

Very truly yours,

INDUSTRIAL URANIUM CORP.

G. C. Ridland

G. C. Ridland

GCR/jl

MF-108
(Revised April 1952)

UNITED STATES DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS EXPLORATION ADMINISTRATION

Form Approved.
Budget Bureau No. 42-R1035.2.

APPLICATION FOR AID IN AN EXPLORATION PROJECT, PURSUANT TO DMEA ORDER 1, UNDER THE DEFENSE PRODUCTION ACT OF 1950, AS AMENDED

Not to be filled in by applicant

Docket No. 3317.
Metal or Mineral Uranium
Date Received
Estimated Cost $40,507
Participation (Government %)

INSTRUCTIONS

1. *Name of applicant.*—(*a*) State here your full legal name, in the form in which you will wish to contract, and your mailing address:

Industrial Uranium Corporation
403 Interstate Trust Building
Denver 2, Colorado

(*b*) If other than an individual, add to your name above whether a corporation, partnership, etc., and the name of the State in which incorporated or otherwise organized. Incorporated in the State of Colorado

(*c*) If a corporation, add to above statement, titles, names and addresses of officers.

(*d*) If a partnership, add to the above statement the names and addresses of all partners.

2. *General.*—Read DMEA Order 1, "Government Aid in Defense Exploration Projects," before completing this application. Submit this application and all accompanying papers in quadruplicate (four copies), with your name and address on each sheet of the application and on all accompanying papers. Where sufficient space is not provided on the form for all required information, state it on an accompanying paper, with a reference in each case to the instruction to which it refers by number. Comply with all applicable instructions; or, if not applicable, so state. File the application with Defense Minerals Exploration Administration, Department of the Interior, Washington 25, D. C., or with the nearest field executive officer thereof.

3. *Applicant's property rights.*—(*a*) State the legal description of the land upon which you wish to explore, including all land which you possess or control that may be benefited by the exploration, and excluding any land or interest in land which is not to be included in the exploration project contract Kirk Lode Mining Claim, U. S. Survey Lot No. 198, and Jeannette and Hilda Lode Mining Claim, U. S. Survey Lot No. 18953, all located in the Illinois Central Mining District, Quartz Hill, Gilpin County, Colorado.

(*b*) State any mine name by which the property is known. Kirk Mine

(*c*) State your interest in the land, whether owner, lessee, purchaser under contract, or otherwise Lessee

(*d*) If you are not the owner, submit with this application a copy of the lease, contract, or other document under which you control the property.

(*e*) If you own the land, describe any liens or encumbrances on it

(*f*) If the land consists of unpatented claims, add to the description above, the book and page numbers for each recorded location notice.

4. *Physical description.*—(*a*) Describe in detail any mining or exploration operations which have been or now are being conducted upon the land, including existing mine workings and production facilities. State your interest, if any, in such operations. Also describe accessibility of mine workings for examination purposes.

(*b*) State past and current production, and ore reserves, if any, giving quantities and grades.

(*c*) Describe the geologic features of the property, including mineralization, type of deposit (vein, bedded, etc.), and your reasons for wishing to explore. Illustrate with maps or sketches. Send with your application (but not necessarily as a part of it) any geologic or engineering report, assay maps, or other technologic information you may have, indicating on each whether you require its return to you.

(*d*) State the facts with respect to the accessibility of the project: Access roads, distances to shipping, supply and residence points.

(*e*) State the availability of manpower, materials, supplies, equipment, water, and power.

5. *The exploration project.*—(*a*) State the mineral or minerals for which you wish to explore The exploration will be conducted for uranium. Pitchblende is known to occur in the Kirk vein.

(*b*) Describe fully the proposed work, including a map or sketch of the property showing a plan (and cross sections if needed) of any present mine workings, and the location of the proposed exploration work as related to such features as contacts, veins, ore-bearing beds, etc.

(*c*) The work will start within 30 days and be completed within 24 months from the date of an exploration project contract.

(*d*) State the operating experience and background of the applicant with relation to the ability to carry out such exploration project, and also that of the person or persons who will supervise the operations.

6. *Estimate of costs.*—Furnish a detailed estimate of the costs of the proposed work (you will have to use a separate sheet), under the following headings. Add the totals under all headings to give the estimated total cost of the project:

(*a*) *Independent contracts.*—(Note.—If the applicant does not intend to let any of the work to contractors, write "none" after this item. To the extent that the work is to be contracted, do not repeat the cost of the contract-work in subsequent items.) State the cost of any proposed independent contracts for the performance of all or any part of the work, expressed in terms of units of work (such as per foot of drilling, per foot of drifting, per hour of bulldozer operations, per cubic yard of material moved, etc.).

(*b*) *Labor, supervision, consultants.*—Include an itemized schedule of numbers, classes and rates of wages, salaries or fees for necessary labor, supervision and engineering and geological consultants.

(*c*) *Operating materials and supplies.*—Furnish an itemized list, including items of equipment costing less than $50 each, and power, water and fuel.

(*d*) *Operating equipment.*—Furnish an itemized list of any operating equipment to be rented, purchased, or which is owned and will be furnished by the Operator, with the estimated rental, purchase price, or suggested use-allowance based on present value, as the case may be.

(*e*) *Rehabilitation and repairs.*—Furnish a detailed list showing the cost of any necessary initial rehabilitation or repairs of existing buildings, installations, fixtures, and movable operating equipment, now owned by the Operator and which will be devoted to the exploration project.

(*f*) *New buildings, improvements, installations.*—Furnish a detailed list showing the cost of any necessary buildings, fixed improvements, or installations to be purchased, installed or constructed for the benefit of the exploration project.

(*g*) *Miscellaneous.*—Furnish a detailed list showing the cost of repairs to and maintenance of operating equipment (not including initial rehabilitation or repairs of the Operator's equipment), analytical work, accounting, workmen's compensation and employers' liability insurance, and payroll taxes.

(*h*) *Contingencies.*—Give an estimate of any necessary allowances for contingencies not included in the costs stated above.

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*) Are you prepared to furnish your share of the cost of the proposed project in accordance with the regulations on Government participation (Sec. 7, DMEA No. 1)?

(*b*) How do you propose to furnish your share of the costs?

[X] Money [ ] Use of equipment owned by you [ ] Other

Explain in detail on acompanying paper.

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.

Dated March 22, 1954

Industrial Uranium Corporation
(Applicant)

By G C Ridland

G. C. Ridland, Geological Engineer

Title 18, U. S. Code (Crimes), Section 1001, makes it a criminal offense to make a willfully false statement or representation to any department or agency of the United States as to any matter within its jurisdiction.

U. S. GOVERNMENT PRINTING OFFICE 16—66551-1

APPLICATION FOR AID IN AN
EXPLORATION PROJECT, PURSUANT TO
DMEA ORDER 1, UNDER THE DEFENSE
PRODUCTION ACT OF 1950, AS AMENDED

1. (a) Industrial Uranium Corporation
403 Interstate Trust Building
Denver 2, Colorado

(b) Incorporated in the State of Colorado.

(c) Director and President: Charles E. Stahl, Jr.
First National Bank Bldg., Ardsley, New York

Director and Vice President: Francis H. Knighton
First National Bank Bldg.
Arsdley, New York

Director and Secretary-Treasurer: Walter H. Bond
32 Broadway, New York, New York

3. (a)

Name	U.S. Survey Lot No.
Kirk Lode Mining Claim	198
Jeannette and Hilda Lode Mining Claim	18953

all located in the Illinois Central Mining District, Quartz Hill, Gilpin County, Colorado. See Map 3, attached.

(b) Kirk Mine

(c) Lessee

(d) The following documents are appended:

1. Lease dated February 23, 1950, from Marjorie Carlton as Testamentary Trustee to George S. Groves.

2. Assignment of above lease by George S. Groves to Kirk Mines, Inc.

3. Lease dated December 31, 1953, from Kirk Mines, Inc. to Francis H. Knighton.

4. Assignment of lease dated December 31, 1953, from Francis H. Knighton to Industrial Uranium Corporation.

4. (a) The main workings are on the Kirk claim and consist of a shaft 400 feet deep and main levels at 88, 141, 238, 301, and 381 feet. The underground workings are inaccessible as the mine is flooded. However, the vein can be traced in old pits on the surface for at least 450 feet and probably continues some distance further. The mine is not being operated at this time and no operation is going on at this time.

4. (b) Current production - None since about 1910.

Past production - The U. S. Atomic Energy Commission estimates production of uranium in the form of sorted ore as follows:

356,000 lbs. 8.6% U_3O_8 Average grade - 30,490 lbs. U_3O_8

The U.S.G.S. Reports (Professional Paper 94, page 245) the production of smelting (high-grade, shipping) ores as follows:

Year	Ore Net Lbs.	Gold oz/t.	Silver oz/t.	Copper %	Silica %
1905	4,520	2.00	3.00	—	46
1905	5,506	.30	7.70	—	—
1905	1,970	1.75	16.25	9.00	45
1908	25,443	1.46	14.45	4.70	33
1908	9,457	.43	3.09	—	—
1910	1,724	.86	16.70	.60	—
1910	4,689	.69	11.29	2.10	—
1910	1,606	.81	11.19	3.32	—

Concentrating ore shipped in 1910 is said to have averaged gold 0.10 ounce and silver 0.50 ounce.

Ore reserves - Not known.

(c) Geologic features - (From U. S. Bureau of Mines Bulletin 70, page 43-44, 1913, by R. B. Moore and K. L. Kithil) - "The Kirk lode is 3 to 6 feet wide, and seems to be a fissure vein in gneiss and mica schist. It carries gold, silver, and copper in addition to pitchblende. The best pitchblende was found between the 140-foot level and the 250-foot level on the east side of the shaft. Ore was also found at other places, notably just above the 400-foot level and in this level. The ore shoot seems to pitch from east to west. Except in one place the ore was everywhere against the country rock on the hanging wall. There were practically no stringers, spurs, or other indications that the vein was near except that the country rock carried some uranium. Much of the ore was exceedingly rich, some assaying 60 to 80 per cent U_3O_8. At places this rich ore was a foot thick; one single piece was removed that measured 2 feet 8 inches by 1 foot 4 inches by 1 foot....

....."An old shaft and part of the workings are still open (1913). In this shaft and workings a considerable amount of pitchblende was mined in the early days. The miners did not know at the time what the ore was and it was wasted in an attempted treatment for gold. When the pitchblende was found the gold gave out, and therefore the owner left his shaft and started a new one 185 feet to the west, which is now the main shaft. The next owners knew the value of pitchblende and about 1898 took out several tons of good ore. When further development was unsuccessful the mine was bought by the present owner..... The vein strikes almost due east and west and dips about 80°S. The shaft follows the vein.....

....."Reliable data on the production of pitchblende from the Kirk mine before the present ownership could not be determined. Since the present owner has had the mine, in round numbers about 20 tons of ore with an average content of 35 per cent U_3O_8 and something over 100 tons of ore with a content of 3 to 4 per cent U_3O_8 have been mined. Most of this ore was produced in 1905-6, and practically all of the high-grade ore was sold abroad.

"Therefore, at a time when the Austrian mines were apparently the only producers of uranium ore the Kirk mine was sending pitchblende abroad and supplying a large proportion of the radium that was sold on the open market."

The Kirk mine was dewatered in 1944 by the U.S. Army (Manhattan District) and the report of the subsequent examination is lodged with the U. S. Atomic Energy Commission, A.E.C. File No. RMO 47. The applicant has not been allowed to make copies for this application, but copies are accessible to the D.M.E.A. field team for study.

We wish to explore the Kirk lode at horizons below the bottom of the Kirk mine (400 feet from the surface) because it is in the center of an area containing pitchblende-bearing fissure veins, and the Kirk lode has been the largest uranium producer of the district; hence, we believe the probability of making a significant discovery of uranium ore is excellent.

(d) The Kirk mine is one mile off the Virginia Canyon gravel road connecting Idaho Springs and Central City, Colorado, and is connected to this highway by a fair, County maintained, gravel road. It is three miles from Central City, and five miles from Idaho Springs. It is 40 miles west of Denver, Colorado.

The mine is accessible year around as the county keeps the road clear of snow in the winter. Nearest railroad shipping points are Rollinsville, 17 miles north, and Golden, 30 miles east of the property.

(e) Manpower is readily available from the nearby mining communities of Idaho Springs and Central City.

Materials, supplies, and equipment are easily available at Central City, Idaho Springs and Denver.

The mine supplies water in sufficient quantities for all mining purposes.

Electric power is available in any required quantity from Public Service Company of Colorado and can be installed in 24 hour's notice.

5. (a) The exploration will be conducted for uranium. Pitchblende is known to occur in the Kirk vein.

(b) The Atomic Uranium Corporation, owner of 88% of the applicant's issued stock, has leased the Alps mine located on the north side of the Kirk property. The Alps shaft is 300 feet N 25 W of the Kirk shaft. The Atomic Uranium Corporation has dewatered and rehabilitated the Alps shaft to a depth of 688 feet below the surface. The Atomic Uranium Corporation has agreed to turn over to the applicant all its mining facilities and the Alps shaft so that the Kirk vein can be explored at horizons below the bottom level of the Kirk mine.

It is proposed, therefore, to drive two cross cut tunnels from the Alps shaft on the 555 and 688 levels (see accompanying maps 1 and 2) in a direction approximately S 25 E, a distance of approximately 310 feet and 316 feet , respectfully, to intersect the Kirk vein at a depth of 90 feet below the 381 level of the Kirk mine, or approximately 70 feet below the bottom of the Kirk shaft.

On completion of the cross cut on the 555 level:
(a) Raise on the Kirk vein from the 555 level into the 381 level of the Kirk mine.
(b) Drift 150 feet E and 50 feet W on the 555 level

On completion of the cross cut on the 688 level, drift east on the Kirk vein a distance of 195 feet.

(c) The work will start within 30 days and be completed within 24 months from the date of an exploration project contract.

(d) The applicant is a corporation organized for the purpose of exploring and operating the Kirk property. The operation will be supervised by Dr. G. C. Ridland, Denver consulting geological engineer, and secretary of the corporation applicant. Dr. Ridland is known to the D.M.E.A. as he is manager of the Cold Spring mining operation at Nederland, Colorado (D.M.E.A. Docket 1447X; Contract Idm - E54).

6. <u>Estimate of costs:</u>

555 level cross cut	310' @ $30/ft.	$9,300
668 level cross cut	316' @ $30/ft.	9,480
Raise from 555 level	90' @ $30/ft.	2,700
Drift on 555 level	200' @ $30/ft.	6,000
Drift on 668 level	195' @ $30/ft.	5,850
		$33,330

Government participation - 75% based on the following: $24,997.50

(a) Independent contracts: None

Industrial Uranium Corporation
403 Interstate Trust Building
Denver 2, Colorado

(b) Labor

Miners	3840 hrs.	$ 1.75/hr.max.	$ 6720.00	
Muckers	1920 "	1.75 " "	3360.00	
Timberman	800 "	1.75 " "	1400.00	
Surface men	1920 "	1.65 " "	3168.00	
Hoistmen	1920 "	1.65 " "	3168.00	
Superintendent - foreman	12 mo.	500.00/mo.max.	6000000	
Engineer-geologist-consultants	6 "	500.00 " "	3000.00	
			$ 26,816.00	$ 26,816.00

(c) Operating materials and supplies:

Small tools, shovels, picks, hammers, etc.,	Lot		$ 100.00	
Mine Timber	16000 FBM	@$ 75.00	1200.00	
Mine T-Rail (12#yd)	5 Ton	95.00	475.00	
Pipe, 1" water, plastic	1105 ft.	1.00	1105.00	
Pipe, 2" air, plastic	1105 "	1.50	1657.50	
Vent pipe, 12"	500 ft.	1.00	500.00	
Fittings & misc.	Lot		100.00	
Electric Power(average)	52000KWH	.033	1716.00	
Water - plenty ava lable free				
Fuel-Coal for heating	4 Ton	10.00	40.00	
			6893.50	6,893.50

(d) Operating Equipment:

Air Compressor (2 drill)		5000.00	5000.00	
Electric Hoist		1800.00	1800.00	
Mucking Machine		3000.00	3000.00	
Electric Pumps	2	1250.00	2500.00	
Copco drifter drills	2	700.00	1400.00	
Ingersoll-Rand Stoper		500.00	500.00	
Connections for drills	Lot		75.00	
			$ 14275.00	
Above to be furnished by operator, so only 10% (depreciation) charged to project				1,427.50

(e) Rehabilitation - None

(f) New Buildings, improvements, installations:
None required, if proposed program to explore the Kirk from the Alps Mine at depth is carried out.

(g) Miscellaneous:

Cost of Maintenance				
Air Compressor	12 mo.	$ 25/mo	300.00	
Hoist	12 "	10/ "	120.00	
Pumps	12 "	25/ "	300.00	
Drills	12 "	10/ "	120.00	
			$ 840.00	840.00
Assaying				250.00
Accounting	12 mo.	100/mo		1,200.00
Payroll taxes, including workman's compensation, liability insurance, unemployment, etc., 10% of payroll				2,680.00

(h) Contingencies:
Allowance for contingencies not considered above $ 400.00

Grand Total $ 40,507.00 *

7. (a) Applicant is prepared to pay it's share of the cost.

(b) With money.

* The applicant believes that this estimated total of $ 40,507.00 can be reduced by (a) final liquidation of the government's equity in pipe, rail, tools, etc., and by (b) substitution of piece-work rates for some of the hourly pay rates shown. We believe that these two operating adjustments will bring the total cost of the project down to the $ 33,330.00 figure shown on Page 4, and we are willing to accept a contract based on the unit costs used to derive this lower total.

FRANCIS H. KNIGHTON

- to -

INDUSTRIAL URANIUM CORPORATION

ASSIGNMENT OF LEASE

BOND & BABSON

Attorneys

(Office and Post Office Address)

32 Broadway

Borough of Manhattan New York 4, N. Y.

Return to

L. J. WILLIAMS

[illegible] }ss.

[illegible] this instrument was [illegible] o'clock [illegible] A. M. February 13 1954 [illegible] recorded in Liber 225 [illegible] page 513

Barbara Galbraith

Recorder

KNOW ALL MEN BY THESE PRESENTS, That I, Francis H. Knighton, of Armonk, New York, in consideration of One ($1.00) Dollar and other good and valuable consideration to me in hand paid, the receipt whereof is hereby acknowledged, have sold, assigned, transferred and set over, and by these presents do sell, assign, transfer and set over unto the Industrial Uranium Corporation, a Colorado corporation, its successors and assigns, to its and their own proper use and benefit, all of my right, title and interest in and to a certain Indenture of Lease, bearing date the 31st day of December, 1953, made by Kirk Mines Incorporated, a Colorado corporation, to me, the said Francis H. Knighton, of the following described mining property and premises, situate in the mining district shown in the County of Gilpin, State of Colorado, to wit:

Kirk Mine Claim U. S. Survey No. 198

Jeannette and Hilda Lode
Mining Claim U. S. Survey No. 18953;

and improvements thereon;

TO HAVE AND TO HOLD the same unto the said Industrial Uranium Corporation, its successors and assigns, for and during all the rest, residue and remainder of the term of ninety-nine (99) years mentioned in the said Indenture of Lease, subject, nevertheless, to the rents, covenants, conditions and provisions therein also mentioned.

IN WITNESS WHEREOF, I have hereunto set my hand and seal this 31st day of December, 1953.

Francis H Knighton (L.S.)

STATE OF NEW YORK)
: ss.:
COUNTY OF WESTCHESTER)

On this 8th day of February, 1954, before me personally came FRANCIS H. KNIGHTON, to me known, who, being by me duly sworn, did depose and say that he executed the above instrument for the uses and purposes therein set forth.

Aleta E Reid

ALETA E. REID
Notary Public in the State of New York
[illegible] Westchester County
Commission expires March 30, 19[illegible]

AGREEMENT OF LEASE

between

KIRK MINES INCORPORATED,
a Colorado corporation

and

FRANCIS H. KNIGHTON

BOND & BABSON

Attorneys

(Office and Post Office Address)

32 Broadway

Borough of Manhattan **New York 4, N. Y.**

Return to

L. J. WILLIAMS

10:00

February 13 1954

517

Barbara Galbraith
Recorder

THIS AGREEMENT OF LEASE, made and entered into this 31st day of December, 1953, by and between KIRK MINES INCORPORATED, a Colorado corporation, located at 405 Interstate Trust Building, Denver, Colorado, hereinafter called the Lessor, and FRANCIS H. KNIGHTON of Armonk, New York, hereinafter called the Lessee.

W I T N E S S E T H :

That the said lessor for and in consideration of One Dollar cash in hand paid, and other valuable considerations and the further consideration of rents, royalties, covenants and agreements hereinafter expressed to be paid, kept and performed by the said Lessee, the Lessor does hereby lease, let and demise and by these presents do lease, let and demise to the said lessee, the following described mining property and premises, situate in the mining district shown in the County of Gilpin, State of Colorado, to wit:

Kirk Mine Claim	U. S. Survey No. 198
Jeannette and Hilda Lode Mining Claim	U. S. Survey No. 18953 ; and

improvements thereon;

TO HAVE AND TO HOLD the above described premises for the purpose of mining to the 31st day of December, 2052, unless sooner forfeited or terminated through the violation of any of the covenants and conditions herein contained, with no power to assign this lease or any part thereof or to sublet the whole or any part of the said leased premises without the written consent of the said lessor first had and obtained, except as follows: that the said lessee may assign this lease to a corporation to be organized by him.

The said Lessee in consideration of the premises has covenanted, contracted and agreed and by these presents does covenant, contract and agree to and with the said Lessor, its successors and assigns:

(1) To enter upon the said leased premises not later than January 1, 1955, and from then to work the same in mine fashion in manner necessary to good and economical mining, so as to take out the greatest amount of ore possible, with due regard to the development and preservation of the said mine or mining premises, as a workable mining property, and to the special covenants herein contained.

(2) To work and mine said premises as aforesaid, steadily and continuously during the period of this lease and in doing said work to perform at least eighty days mining labor per month for at least ten months each and every year during the life of this lease.

(3) To repair all old timbering wherever it may become necessary, and to well and sufficiently timber said mine and mining premises at all points where proper and necessary in accordance with good and safe mining; continuing the timbering in the working shafts now upon said premises with timber of the same dimensions as heretofore used, unless it becomes necessary for safety to use larger timber, in which event timber of sufficient size for safety and permanent mining shall be used.

(4) To allow the lessor or its agent, and either of them and the agent of either of them, from time to time to enter upon and descend into all parts of said leased premises, for the purpose of inspection, surveys or taking samples therefrom, and to render to said parties proper assistance in making such inspection, surveys or examination.

(5) To occupy and hold as the property of the lessor all cross and parallel lodes, spurs and mineral deposits of every kind which may be uncovered, disclosed or discovered within said leased ground by the said lessee or any person or persons under or in privity with him, with privilege to said lessee to work and mine the same as part and parcel of said premises.

(6) To keep at all times the drafts, shafts, tunnels and other workings thoroughly drained and clear of loose rock and rubbish, unless prevented by extraordinary mining casualty.

(7) To stow no waste underground except with the consent and under the direction of the lessor.

(8) To do no underhand stoping below the bottom of any main working level or winze and to do no stoping or breaking of ore or rock within six feet of any working shaft.

(9) Not to adulterate or mix any ores broken or mined without the consent of the lessors; it being understood that all ores mined which are too low grade for present shipment shall remain the property of and be subject to the control and disposition of the lessor.

(10) To make all working shafts at least four (4) feet by eight (8) feet in the clear; all drifts and tunnels at least three and one-half (3½) feet by six and one-half (6½) feet in the clear, and all winzes and raises at least three and one-half (3½) feet by seven (7) feet in the clear.

(11) It is expressly understood and agreed that the lessor reserves the property and right of property in and to all ores extracted from said premises during the period of this lease, but that the same may be shipped to smelter or other ore buyer in the name of the lessee, and that said lessee covenants and agrees to pay and allow the lessor as royalty upon all ores so mined, shipped or sold from said leased premises in any manner until such time as the balance due to Marjorie Carlton, Trustee, under the bond and lease in the sum of $31,000, as hereinafter referred to, has been paid in full, fifteen percent of the net smelter returns, and that said lessee will instruct the smelter or other ore buyer to deduct fifteen percent royalty from its settlement of each such shipment and to send

the check for said fifteen percent direct to Kirk Mines Incorporated, payable to it, and thereafter, and during the remainder of the life of this lease, twelve percent of the net smelter returns, and that said lessee will instruct the smelter or other ore buyer, to deduct twelve percent royalty from its settlement on each such shipment, and to send the check for said twelve percent direct to Kirk Mines Incorporated payable to it.

All royalty settlements to be made upon the smelter, mill or sampler net assay values, deducting therefrom only the actual cost of transportation and treatment charges paid by lessee.

The lessor will pay to Marjorie Carlton, as Testamentary Trustee under the Last Will and Testament of Jeannette White Nesbeth, deceased, the said fifteen percent royalty, which sum shall apply towards the bond and lease or option and lease, in accordance with the terms thereof, a copy of the same is hereto attached, marked Exhibit A. Said royalty to apply towards the balance due the said Marjorie Carlton, Trustee, under the said bond and lease in the sum of $31,000.

The royalty payments of said sum, pursuant to such bond and lease, are to be made as follows:

$10,000. on February 22, 1954
$10,500. on February 22, 1955
$10,500. on February 22, 1956

The Lessee agrees that it will anticipate and pay such payments directly to said Marjorie Carlton, Trustee, by a period of at least fifteen (15) days before due and will advise lessor that such payments have been timely made, by exhibit of a receipt of such above payments or by equivalent evidence thereof; that is, the lessee agrees to pay the following sums on the following dates:

$10,000. on February 7, 1954
$10,500. on February 7, 1955
$10,500. on February 7, 1956

When any of the above mentioned royalty payments as set forth in paragraph 11 are due and paid, any such sums received by the lessor shall be returned promptly to the lessee until the $31,000 has been repaid to the lessee.

It is hereby understood that when the above mentioned bond and lease executed by Marjorie Carlton, Trustee, is paid in full, that the lessor will own this property, will receive a deed from the said Marjorie Carlton, Trustee, and the only interest that the lessee will have in this property is this lease, providing the terms and conditions have been performed.

(12) The lessee shall and hereby does assume all responsibility in case of accident to his employees or any persons employed in or about said property by lessee or by others with his express or implied consent; and agrees to procure, before commencing work in or about said premises, to procure a State Compensation Insurance Fund policy of insurance against employer's liability in case of accident or occupational disease to employees in sufficient amount to fully protect the employer and all involved, and further agrees to keep said policy in full force and effect at all times.

(13) All taxes assessed of every nature whatsoever on both land and improvements against said demised premises, and for ores mined and shipped under this lease shall be paid by the lessee, unless the same is paid by the above mentioned Marjorie Carlton, Trustee.

(14) All bills and expenses including taxes, incurred by the lessee or those in privity with him shall be promptly paid by the lessee, and by said prompt payment said lessee shall prevent the filing of any and all liens of miners, mechanics or material men or for taxes against said demised premises; and, if by reason of the failure of said lessee to pay such bills or expenses, any lien or liens shall be filed against said premises the said lessors may at their option forthwith pay off and discharge the same, and the said lessee hold bound to pay to said lessors all sums so advanced or paid to clear said premises from liens which may be filed as aforesaid, and the said lessors may also at their election declare a forfeiture of this lease because of the filing of any such lien. The lessee will at all times keep conspicuously posted on the demised premises notices as provided for in Chapter 101, Sec. 19 of Colorado Statutes Annotated 1935.

(15) Said lessee further covenants that no person not in privity with the parties hereto shall be allowed to hold possession of said premises or any part thereof under any pretext whatever.

(16) Further, that he will deliver to said lessors quiet and peaceable possession of said demised premises in good order and condition with all drifts, tunnels and other passages thoroughly drained and cleared of loose rock and rubbish and said premises ready for immediate continued working, without demand or further notice, on the 31st day of December, 2052, at noon, or at any time previous thereto, upon demand for forfeiture and it is mutually understood that all machinery and tools which may be placed upon said premises by the said lessee may be removed therefrom within ten days after the termination of this lease; provided, however, that no such tools or machinery shall be removed while the said lessee may be in any manner indebted to the said lessors under any obligation incurred under this lease.

(17) Upon the violation of any covenant or condition herein contained, this lease shall, at the option of said lessor, expire and terminate, and the said premises with the appurtenances and all buildings and other improvements shall become forfeited to the lessor, provided said lessor shall give thirty (30) days written notice by Registered Mail, to lessee of the default or defaults complained of and unless within thirty days after the receipt of said notice, lessee shall correct said default, the said lessor or its agent may thereupon, after demand in writing for possession, enter upon said premises and dispossess all persons occupying the same, with or without force, and with or without process of law, or at the option of the lessor the said lessee and all persons found occupying said premises or any part thereof may be proceeded against as guilty of unlawful detainer.

The lessor shall not be required to give thirty days notice to lessee of default or defaults for any sums of money due in accordance with the sums due Marjorie Carlton, Trustee, mentioned herein.

(18) The giving of a purchase money mortgage for equipment placed on the demised premises shall not constitute a violation of this lease.

(19) Lessee covenants to comply with all of the Federal and State laws and regulations which may, at any time during the continuance hereof, be in effect relating to or appertaining to the operations hereunder, including the construction of suitable tailings ponds and adequate and efficient protection from stream polution from such operations.

(20) Lessee covenants, agrees and contracts to keep all necessary books and records to show all work done on the demised premises, and to

promptly advise lessors when each such shipment is made, giving the date and car numbers of each such shipment and the name of the consignee thereof; all of such books and records of lessee shall be open for the inspection of lessors or either of them during all business hours at the principal mine office on the demised premises.

(21) Time is of the essence of this agreement, and each and every clause of this indenture and all the covenants and conditions contained herein, expressed or implied, shall extend to the successors, heirs, executors, administrators and lawful assigns of all of the parties hereto.

(22) The lessee agrees to fulfill promptly and properly all of the terms and conditions set forth in the said Exhibit A hereto annexed.

IN WITNESS WHEREOF, the parties hereto have hereunto subscribed their names the day and year first above written.

LESSOR :

KIRK MINES INCORPORATED

By Geo. P. Groves
President

LESSEE:

By Francis H. Knighton
Francis H. Knighton

STATE OF NEW YORK)
: SS
COUNTY OF NEW YORK)

On the 31st day of December, 1953, before me personally came GEORGE S. GROVES, to me known, who being by me duly sworn did depose and say that he resides in Goodsprings, Nevada; that he is the President of KIRK MINES INCORPORATED, a Colorado corporation, the corporation described in and which executed the above instrument; that he knows the seal of said corporation; that the seal affixed to said instrument is such corporate seal; that it was so affixed by order of the Board of Directors of said corporation, and that he signed his name thereto by like order.

Sarah J. Peet

STATE OF NEW YORK)
: SS
COUNTY OF ~~NEW YORK~~) Westchester N.Y.

On this 14th day of January 1954 before me personally came FRANCIS H. KNIGHTON, to me known, who being by me duly sworn did depose and say that he executed the above instrument for the uses and purposes therein set forth.

Aleta E. Reid
ALETA E. REID
Notary Public in the State of New York
Appointed for Westchester County
Commission expires March 30, 1955

No. 90-A. MINING LEASE (Long Form). —The Bradford-Robinson Ptg. Co., Mfrs. Robinson's Legal Blanks, Denver.

"Exhibit A"

This Agreement of Lease, Made and entered into this 23rd day of February, A. D. 19 50, by and between Marjorie Carlton as Testamentary Trustee umder the last will and testament of Jeannette White Nesmith, deceased (Leroy J. Widfliams of Central City, Colorado) and approved by said Trustee, ~~hereinafter called the lessor, and~~ hereinafter called the lessor, and George S. Groves, of 60 East 42nd St. New York City NY (17) hereinafter called lessee;

WITNESSETH, That the said lessor for and in consideration of the rents, royalties, covenants and agreements hereinafter expressed to be paid, kept and performed by the said lessee, has leased, let and demised and by these presents does lease, let and demise unto said lessee the following described mining property and premises, situate in the Illinois Central Mining District, Gilpin County, State of Colorado, to-wit:

The Kirk Lode Mining Claim, U. S. Survey No. 198, and Jeannette and Hilda Lode Mining Claims, U. S. Survey No. 18,953; and improvements thereon;

TO HAVE AND TO HOLD the above described premises for the purposes of mining, from the 22nd day of February, A. D. 1950, to the 21 st day of February, A. D. 1956, unless sooner forfeited or terminated through the violation of any of the covenants and conditions herein contained, with ~~no~~ power to assign this lease or any part thereof or to sublet the whole or any part of said leased premises without the written consent of the said lessor first had and obtained. provided immediate notice of such assignment be given first party.

The said lessee in consideration of the premises ~~ha~~ covenanted, contracted and agreed and by these presents does covenant, contract and agree to and with the said lessor, her executors, administrators and assigns:

(1) To enter upon said leased premises and to work the same in mine fashion in manner necessary to good and economical mining, so as to take out the greatest amount of ore possible, with due regard to the development and preservation of said mine or mining premises, as a workable mining property, and to the special covenants herein contained.

(2) ~~To work and mine said premises as aforesaid, steadily and continuously during the period of this lease and in doing said work~~ to perform at least no shifts of labor ~~per month each and every month~~ during the life of this lease, providing the payments hereinafter mentioned are regularly made as herein provided.

(3) To repair all old timbering wherever it may become necessary, and to well and sufficiently timber said mine and mining premises at all points where proper and necessary in accordance with good and safe mining; continuing the timbering in the working shafts now upon said premises with timber of the same dimensions as heretofore used, unless it becomes necessary for safety to use larger timber, in which event timber of sufficient size for safety and permanent mining shall be used.

(4) To allow the lessor.....or.....her.....agent from time to time to enter upon and descend into all parts of said leased premises, for the purpose of inspection, surveys or taking samples therefrom, and to render to said parties proper assistance in making such inspection, surveys or examination.

(5) To occupy and hold as the property of the lessor.....all cross and parallel lodes, spurs and mineral deposits of every kind which may be uncovered, disclosed or discovered within said leased ground by the said lessee.....or any person or persons under or in privity with.....him....., with privilege to said lessee.....to work and mine the same as part and parcel of said premises.

(6) To keep at all times the drifts, shafts, tunnels and other workings ~~thoroughly drained and~~ clear of loose rock and rubbish, unless prevented by extraordinary mining casualty.

(7) To stow no waste underground except with the consent and under the direction of the lessor.....

(8) To do no underhand stoping below the bottom of any main working level or winze and to do no stoping or breaking of ore rock within.....six (6).....feet of any working shaft.

(9) Not to adulterate or mix any ores broken or mined without the consent of the lessor.....; it being understood that all ores mined which are too low grade for present shipment shall remain the property of and be subject to the control and disposition of the lessor.....

(10) To make all working shafts at least four (4) feet by eight (8) feet in the clear; all drifts and tunnels at least three and one-half (3½) feet by six and one-half (6½) feet in the clear, and all winzes and raises at least three and one-half (3½) feet by seven (7) feet in the clear.

(11) It is expressly understood and agreed that the lessor.....reserve...S.the property and right of property in and to all ores extracted from said premises during the period of this lease, and the said lessee.....covenant..S..and agree.S...to pay and allow the lessor.....as royalty upon all ores mined, shipped or sold from said leased premises in any manner during the life of this lease, as follows, to-wit:

Fifteen (15) per cent, the same to apply on the purchase price hereinafter mentioned.

government

All settlements to be made upon the smelter, mill or sampler net assay values, deducting therefrom only the actual cost of transportation and treament.....

The lessee, in even of ming or operating said premises, hereby agrees to immediately apply for and keep in force such workmens compensation or industrial insurance as is now or may in future be require d by law; no mining or any kind of work shall be done on said premises until said workmens compensation insurance is obtained by the lessee.

The lessee agrees to post and keep posted on said premises a notice that the lessor shall not be liable for labor, materials, machinery, fixtures or improvements rendered to or furnished in or upon said premises.

OPTION

And in consideration of the acceptance of the foregoing lease and the expenditures to be made thereunder, and the well and faithful keeping of the covenants thereof, the said lessee shall have the right to purchase the said demised premises by payment of the sum of Forty Thousand dollars ($40,000) on or before February 21, 1956 in the following manner to-wit:

Cash upon the date of execution hereof	$500.00
On or before May 22, 1950	500.00
On or before February 22, 1951	1,000.00
On or before August 22, 1951	1,000.00
On or before February 22, 1952	1,000.00
On or before February 22, 1953	5,000.00
On or before February 22, 1954	10,000.00
On or before February 22, 1955,	10,500.00
On or before February 22, 1956,	10,500.00

The said royalty shall apply upon said purchase price. Time is hereby made of the essence of this agreement. And upon tender of such full payment the lessor will make, execute, acknowledge and deliver trustee's deed for the interest of said estate in said property free and clear of incumbrance and furnish an abstract of title so showing. In event of failure of lessee to make any of said payments this lease and option may be cancelled and terminated and any sum paid thereon held by lessor as liquidated damages.

(12) The lessee.....shall and hereby do.....assume all responsibility in case of accident to.....him..... or any of.....his.....employees in or about said property.

(13) All taxes assessed against said demised premises for ores mined and shipped under this lease shall be paid by the less..ee.....The forfeiture, surrender or termination of this lease for any cause shall render this option void and the above mentioned payments may not

(14) All bills and expenses incurred by the lessee.....or those in privity with.....shall be promptly paid by the lessee....., and by said prompt payment said lessee.....shall prevent the filing of any and all liens of miners, mechanics or material men, against said demised premises; and, if by reason of the failure of said lessee.....to pay such bills or expenses, any lien or liens shall be filed against said premises the said lessor.....may forthwith pay off and discharge the same, and the said lessee.....hold..... bound to pay to said lessor.....all sums so advanced or paid to clear said premises from liens which may be filed as aforesaid, and the said lessor.....may also at.....her.....election declare a forfeiture of this lease. thereafter be made tendered

(15) Said lessee.....further covenant....that no person not in privity with the parties hereto shall be allowed to hold possession of said premises or any part thereof under any pretext whatever.

(16) Further, that.....he.....will deliver to said lessor.....quiet and peaceable possession of said demised premises in good order and condition with all drifts, tunnels and other passages thoroughly drained and cleared of loose rock and rubbish and said premises ready for immediate continued working, without demand or further notice, on the.....21st.....day of..February....., A. D. 19..56, at noon, or at any time previous thereto, upon demand for forfeiture, and it is mutually understood that all machinery and tools which may be placed upon said premises by the said lessee.....may be removed therefrom within ten days after the termination of this lease; provided, however, that no such tools or machinery shall be so removed while the said lessee.....may be in any manner indebted to the said lessor..... under any obligation incurred under this lease.

(17) Upon the violation of any covenant or condition herein contained, this lease shall, at the option of said lessor....., expire and terminate, and the said premises with the appurtenances and all buildings and other improvements shall become forfeited to the lessor....., and the said lessor..... or.....her..... agent may thereupon, after demand in writing for possession, enter upon said premises and dispossess all persons occupying the same, with or without force, and with or without process of law, or at the option of the lessor.....the said lessee.....and all persons found occupying said premises or any part thereof may be proceeded against as guilty of unlawful detainer. Lessee shall have 30 days in which to correct any violation of which he is notified.

Time is of the essence of this agreement, and each and every clause of this indenture and all the covenants and conditions contained herein, expressed or implied, shall extend to the successors, heirs, executors, administrators and lawful assigns of all of the parties hereto.

IN WITNESS WHEREOF, the parties hereto have hereunto subscribed their names the day and year first above written.

This is option as to payments and lessee shall not be liable for payments in case of default.

Lessor will place deed in escrow on request of lessee when $2000 paid hereunder.

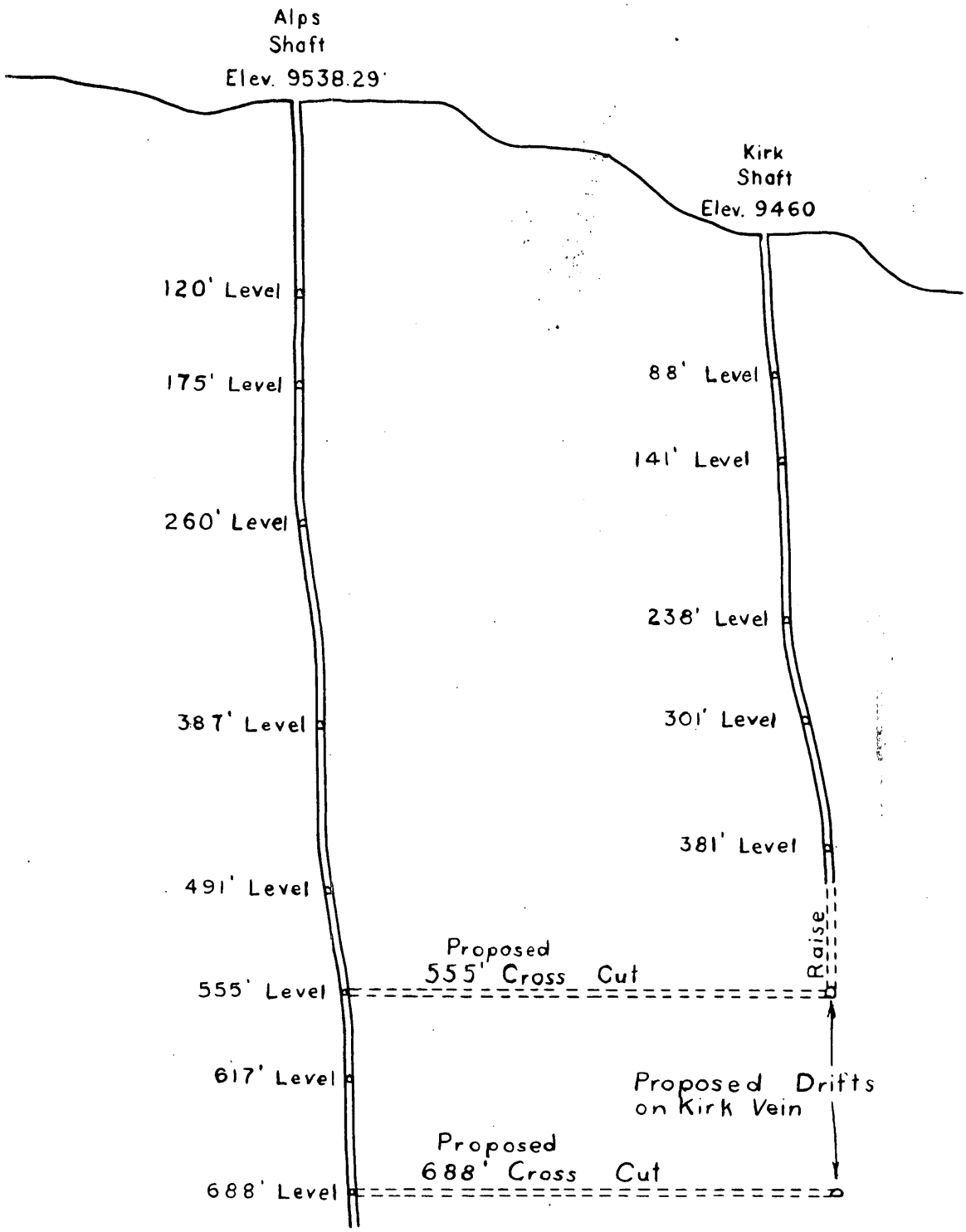
Subject to approval by
Marjorie Carlton Trustee

.....[SEAL]
As testamentary Trustee under the
Last Will and Testament of
.....[SEAL]
Jeannette White Nesmith, deceased.
By
.....[SEAL]
(Signed) Leroy J. Willis
Her attorney
Lessor

.....[SEAL]
(Signed) Geo. S. Groves
Lessee

.....[SEAL]

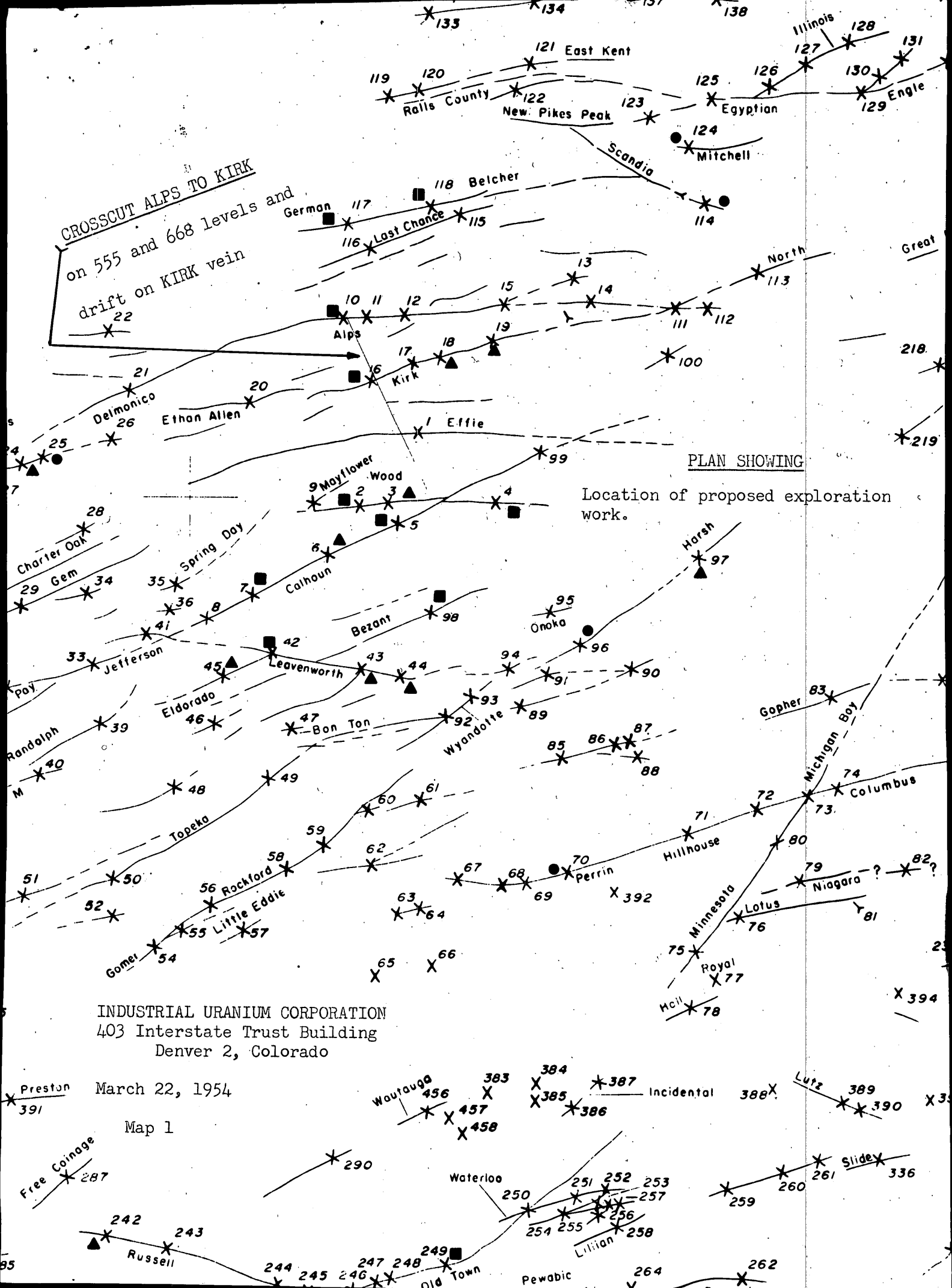
.....[SEAL]



Taken From Information
Submitted by Applicant

SCALE 1" = 100'

FIGURE 3 - SECTION THRU SHAFTS, QUARTZ HILL, INDUSTRIAL URANIUM CORPORATION, GILPIN COUNTY, COLO. (DMEA 3317)



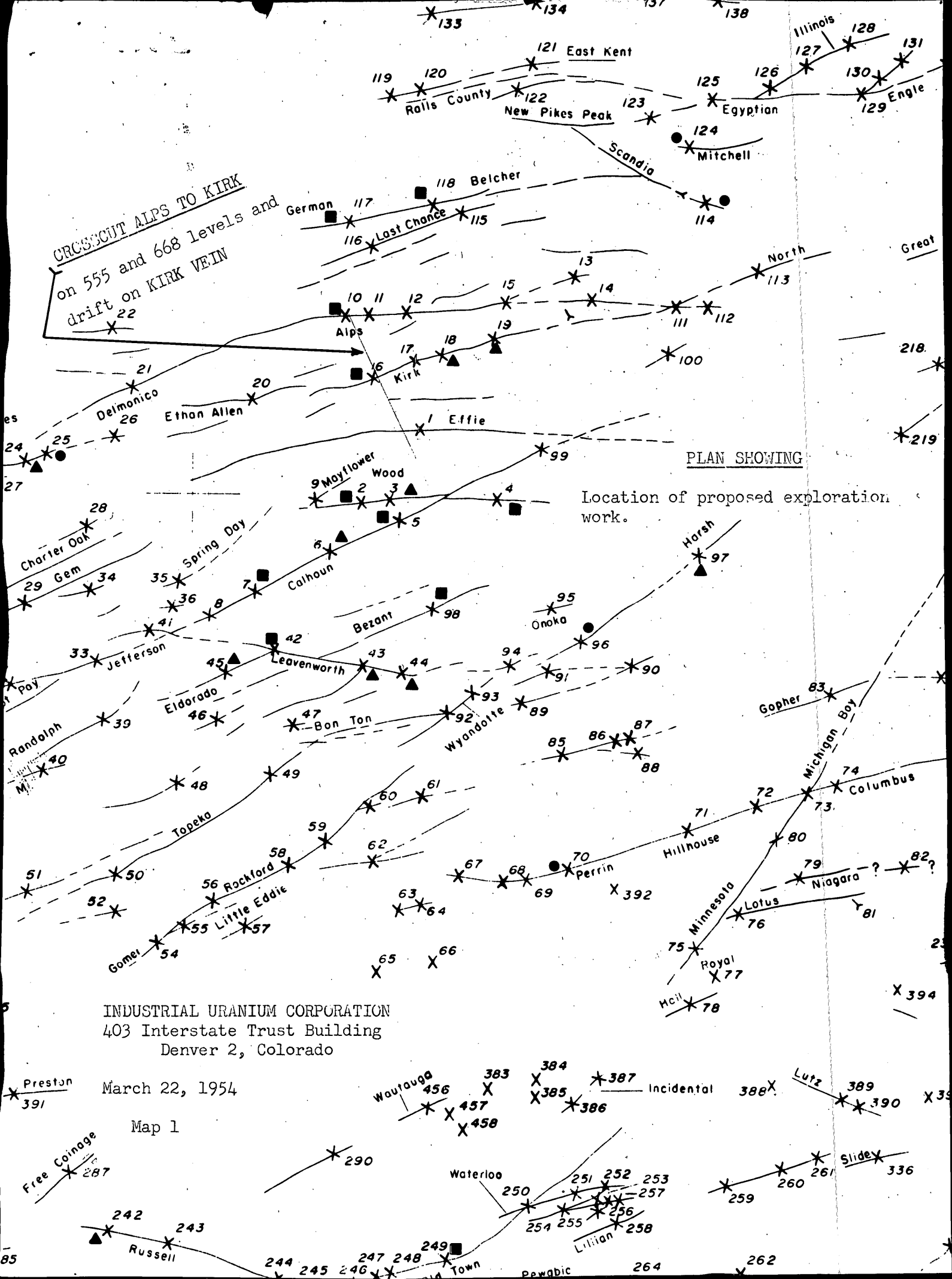
PLAN SHOWING

Location of proposed exploration work.

INDUSTRIAL URANIUM CORPORATION
403 Interstate Trust Building
Denver 2, Colorado

March 22, 1954

Map 1



INDUSTRIAL URANIUM CORPORATION
403 Interstate Trust Building
Denver 2, Colorado

March 22, 1954

Map 1

April 2, 1954.

Mr. W. H. King,
Executive Officer
Defense Minerals Exploration Admin.,
Field Team, Region IV
224 New Customhouse
Denver 2, Colorado.

Dear Mr. King,

Industrial Uranium Corporation
493 Interstate Trust Building
Denver 2, Colorado.

Please find attached four copies of an application for aid to explore the Kirk Lode. This was originally submitted to you on March 23rd but was returned to us for revision. The changes have been made as requested in Mr. Shaw's letter of March 31st, and the documents showing property control are included in this transmittal.

Trusting that these meet with your approval, I remain,

Very truly yours

G. Carmen Ridland

Enc: 4 each Form MF-103 with supplementary pages
4 each Maps Nos. 1, 2 & 3
Documents showing property control (2)

INDUSTRIAL URANIUM CORPORATION

403 Interstate Trust Bldg.

Denver 2, Colo.

April 2, 1954

Mr. W. H. King
Executive Officer
Defense Minerals Exploration Admin.
Field Team, Region IV
224 New Customhouse
Denver 2, Colorado

Dear Mr. King:

Industrial Uranium Corp.
403 Interstate Trust Bldg.
Denver 2, Colorado

In his letter of March 31, 1954, Mr. John F. Shaw inquired about the status of the claims involved in the cross-cuts proposed by this application.

These cross-cuts traverse the following Lode Claims:

1. Alps Lode U. S. Sur. No. 176
2. Olympia Lode U. S. Sur. No. 8935
3. Ethan Allen Lode U. S. Sur. No. 844
4. Polar Star Lode U. S. Sur. No. 7090
5. Kirk Lode U. S. Sur. No. 198

The Alps and Olympia Lodes are controlled by the Atomic Uranium Corp., who have allowed the applicant the use of the Alps shaft and facilities.

The applicant owns an undivided 3/4 interest in the Ethan Allen Lode, and an undivided 1/2 interest in the Polar Star Lode, thus controlling these claims.

The Kirk Lode is leased by the applicant.

Subordination agreements can be obtained from all parties having an interest in these claims.

The only claim not controlled by the applicant in the vicinity of the proposed cross-cuts is the Annex (18245) and the proposed work is

specifically designed not to enter ground controlled by the Annex. By starting off to the east and drifting on the Alps claim for approximately 50 feet before beginning to cross cut, the actual distance of the crosscut will be reduced due to the fact that the Alps and Kirk veins converge to the east. Therefore, the cross cuts, as proposed on the accompanying maps, may be expected to be slightly less than the respective 310 and 316 feet, which are used as approximate distances in estimating costs. Any drifting done on the Alps vein prior to beginning the cross cuts will be entirely at applicant's expense.

The Alps and Kirk shafts have been accurately transit surveyed to the nearest one hundredth of a foot in the field with relation to patented claim corners. The traverse in the field was closed, with a calculated error of .027%. Their positions as shown on the accompanying map are ploted accurately, using the coordinate system as calculated from the transit survey feild notes.

A nail, acting as a point, in the east end of the Alps shaft collar situated 1.93 feet from the N E corner of the shaft and 1.85 feet from the S E corner of the shaft bears S. 38° 43' W, 231.95 feet from Cor. No. 4 of the Ingomar Lode, U. S. Sur. No. 11655. The long side of the Alps shaft bears N 82° 35' E. The coordinates for this point are: Lat. 4818.07, Dep. 4854.92.

A nail, acting as a point, in the south side of the Kirk shaft collar situated 3.12 feet from the S E corner of the shaft and 2.97 feet from the S W corner of the shaft bears S 0° 27' E, 444.96 feet from Cor. No. 4 of the Ingomar Lode U. S. Sur. No. 11655. The long side of the Kirk shaft bears N 740 16' E. The coordinates for this point on the shaft collar are: Lat. 4555.06, Dep. 5003.50.

All proposed work will be carried with precision transit control.

We trust that this explanation gives you the information you require.

Very truly yours,

INDUSTRIAL URANIUM CORP.

G. C. Ridland

G. C. Ridland

GCR/jl

MF-103
(Revised April 1952)

UNITED STATES DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS EXPLORATION ADMINISTRATION

Form Approved.
Budget Bureau No. 42-R1035.2.

APPLICATION FOR AID IN AN EXPLORATION PROJECT, PURSUANT TO DMEA ORDER 1, UNDER THE DEFENSE PRODUCTION ACT OF 1950, AS AMENDED

Not to be filled in by applicant

Docket No. DMEA-3317
Metal or Mineral
Date Received
Estimated Cost
Participation (Government %)

INSTRUCTIONS

1. *Name of applicant.*—(*a*) State here your full legal name, in the form in which you will wish to contract, and your mailing address:

Industrial Uranium Corporation
403 Interstate Trust Building
Denver 2, Colorado

(*b*) If other than an individual, add to your name above whether a corporation, partnership, etc., and the name of the State in which incorporated or otherwise organized. Incorporated in the State of Colorado

(*c*) If a corporation, add to above statement, titles, names and addresses of officers.

(*d*) If a partnership, add to the above statement the names and addresses of all partners.

2. *General.*—Read DMEA Order 1, "Government Aid in Defense Exploration Projects," before completing this application. Submit this application and all accompanying papers in quadruplicate (four copies), with your name and address on each sheet of the application and on all accompanying papers. Where sufficient space is not provided on the form for all required information, state it on an accompanying paper, with a reference in each case to the instruction to which it refers by number. Comply with all applicable instructions; or, if not applicable, so state. File the application with Defense Minerals Exploration Administration, Department of the Interior, Washington 25, D. C., or with the nearest field executive officer thereof.

3. *Applicant's property rights.*—(*a*) State the legal description of the land upon which you wish to explore, including all land which you possess or control that may be benefited by the exploration, and excluding any land or interest in land which is not to be included in the exploration project contract Kirk Lode Mining Claim, U. S. Survey Lot No. 198, and Joannette and Hilda Lode Mining Claim, U. S. Survey Lot No. 18953, all located in the Illinois Central Mining District, Quartz Hill, Gilpin County, Colorado.

(*b*) State any mine name by which the property is known. Kirk Mine

(*c*) State your interest in the land, whether owner, lessee, purchaser under contract, or otherwise Lessee

(*d*) If you are not the owner, submit with this application a copy of the lease, contract, or other document under which you control the property.

(*e*) If you own the land, describe any liens or encumbrances on it

(*f*) If the land consists of unpatented claims, add to the description above, the book and page numbers for each recorded location notice.

4. *Physical description.*—(*a*) Describe in detail any mining or exploration operations which have been or now are being conducted upon the land, including existing mine workings and production facilities. State your interest, if any, in such operations. Also describe accessibility of mine workings for examination purposes.

(*b*) State past and current production, and ore reserves, if any, giving quantities and grades.

(*c*) Describe the geologic features of the property, including mineralization, type of deposit (vein, bedded, etc.), and your reasons for wishing to explore. Illustrate with maps or sketches. Send with your application (but not necessarily as a part of it) any geologic or engineering report, assay maps, or other technologic information you may have, indicating on each whether you require its return to you.

(*d*) State the facts with respect to the accessibility of the project: Access roads, distances to shipping, supply and residence points.

(*e*) State the availability of manpower, materials, supplies, equipment, water, and power.

5. *The exploration project.*—State the mineral or minerals for which you wish to explore The exploration will be conducted for uranium. Pitchblende is known to occur in the Kirk vein.

(*b*) Describe fully the proposed work, including a map or sketch of the property showing a plan (and cross sections if needed) of any present mine workings, and the location of the proposed exploration work as related to such features as contacts, veins, ore-bearing beds, etc.

(*c*) The work will start within 30 days and be completed within 24 months from the date of an exploration project contract.

(*d*) State the operating experience and background of the applicant with relation to the ability to carry out such exploration project, and also that of the person or persons who will supervise the operations.

6. *Estimate of costs.*—Furnish a detailed estimate of the costs of the proposed work (you will have to use a separate sheet), under the following headings. Add the totals under all headings to give the estimated total cost of the project:

(*a*) *Independent contracts.*—(Note.—If the applicant does not intend to let any of the work to contractors, write "none" after this item. To the extent that the work is to be contracted, do not repeat the cost of the contract-work in subsequent items.) State the cost of any proposed independent contracts for the performance of all or any part of the work, expressed in terms of units of work (such as per foot of drilling, per foot of drifting, per hour of bulldozer operations, per cubic yard of material moved, etc.).

(*b*) *Labor, supervision, consultants.*—Include an itemized schedule of numbers, classes and rates of wages, salaries or fees for necessary labor, supervision and engineering and geological consultants.

(*c*) *Operating materials and supplies.*—Furnish an itemized list, including items of equipment costing less than $50 each, and power, water and fuel.

(*d*) *Operating equipment.*—Furnish an itemized list of any operating equipment to be rented, purchased, or which is owned and will be furnished by the Operator, with the estimated rental, purchase price, or suggested use-allowance based on present value, as the case may be.

(*e*) *Rehabilitation and repairs.*—Furnish a detailed list showing the cost of any necessary initial rehabilitation or repairs of existing buildings, installations, fixtures, and movable operating equipment, now owned by the Operator and which will be devoted to the exploration project.

(*f*) *New buildings, improvements, installations.*—Furnish a detailed list showing the cost of any necessary buildings, fixed improvements, or installations to be purchased, installed or constructed for the benefit of the exploration project.

(*g*) *Miscellaneous.*—Furnish a detailed list showing the cost of repairs to and maintenance of operating equipment (not including initial rehabilitation or repairs of the Operator's equipment), analytical work, accounting, workmen's compensation and employers' liability insurance, and payroll taxes.

(*h*) *Contingencies.*—Give an estimate of any necessary allowances for contingencies not included in the costs stated above.

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*) Are you prepared to furnish your share of the cost of the proposed project in accordance with the regulations on Government participation (Sec. 7, DMEA No. 1)?

(*b*) How do you propose to furnish your share of the costs?

[X] Money [ ] Use of equipment owned by you [ ] Other

Explain in detail on acompanying paper.

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.

Dated March 22, 1954

Industrial Uranium Corporation
(Applicant)

By G. C. Ridland

G. C. Ridland, Geological Engineer

Title 18, U. S. Code (Crimes), Section 1001, makes it a criminal offense to make a willfully false statement or representation to any department or agency of the United States as to any matter within its jurisdiction.

U. S. GOVERNMENT PRINTING OFFICE 16—66551-1

APPLICATION FOR AID IN AN
EXPLORATION PROJECT, PURSUANT TO
DMEA ORDER 1, UNDER THE DEFENSE
PRODUCTION ACT OF 1950, AS AMENDED

1. (a) Industrial Uranium Corporation
403 Interstate Trust Building
Denver 2, Colorado

(b) Incorporated in the State of Colorado.

(c) Director and President: Charles E. Stahl, Jr.
First National Bank Bldg., Ardsley, New York

Director and Vice President: Francis H. Knighton
First National Bank Bldg.
Arsdley, New York

Director and Secretary-Treasurer: Walter H. Bond
32 Broadway, New York, New York

3. (a)

Name	U.S. Survey Lot No.
Kirk Lode Mining Claim	198
Jeannette and Hilda Lode Mining Claim	18953

all located in the Illinois Central Mining District, Quartz Hill, Gilpin County, Colorado. See Map 3, attached.

(b) Kirk Mine

(c) Lessee

(d) The following documents are appended:

1. Lease dated February 23, 1950, from Marjorie Carlton as Testamentary Trustee to George S. Groves.

2. Assignment of above lease by George S. Groves to Kirk Mines, Inc.

3. Lease dated December 31, 1953, from Kirk Mines, Inc. to Francis H. Knighton.

4. Assignment of lease dated December 31, 1953, from Francis H. Knighton to Industrial Uranium Corporation.

4. (a) The main workings are on the Kirk claim and consist of a shaft 400 feet deep and main levels at 88, 141, 238, 301, and 381 feet. The underground workings are inaccessible as the mine is flooded. However, the vein can be traced in old pits on the surface for at least 450 feet and probably continues some distance further. The mine is not being operated at this time and no operation is going on at this time.

4. (b) Current production - None since about 1910.

Past production - The U. S. Atomic Energy Commission estimates production of uranium in the form of sorted ore as follows:

356,000 lbs. 8.6% U_3O_8 Average grade - 30,490 lbs. U_3O_8

The U.S.G.S. Reports (Professional Paper 94, page 245) the production of smelting (high-grade, shipping) ores as follows:

Year	Ore Net Lbs.	Gold oz/t.	Silver oz/t.	Copper %	Silica %
1905	4,520	2.00	3.00	—	46
1905	5,506	.30	7.70	—	—
1905	1,970	1.75	16.25	9.00	45
1908	25,443	1.46	14.45	4.70	33
1908	9,457	.43	3.09	—	—
1910	1,724	.86	16.70	.60	—
1910	4,689	.69	11.29	2.10	—
1910	1,606	.81	11.19	3.32	—

Concentrating ore shipped in 1910 is said to have averaged gold 0.10 ounce and silver 0.50 ounce.

Ore reserves - Not known.

(c) Geologic features - (From U. S. Bureau of Mines Bulletin 70, page 43-44, 1913, by R. B. Moore and K. L. Kithil) - "The Kirk lode is 3 to 6 feet wide, and seems to be a fissure vein in gneiss and mica schist. It carries gold, silver, and copper in addition to pitchblende. The best pitchblende was found between the 140-foot level and the 250-foot level on the east side of the shaft. Ore was also found at other places, notably just above the 400-foot level and in this level. The ore shoot seems to pitch from east to west. Except in one place the ore was everywhere against the country rock on the hanging wall. There were practically no stringers, spurs, or other indications that the vein was near except that the country rock carried some uranium. Much of the ore was exceedingly rich, some assaying 60 to 80 per cent U_3O_8. At places this rich ore was a foot thick; one single piece was removed that measured 2 feet 8 inches by 1 foot 4 inches by 1 foot....

....."An old shaft and part of the workings are still open (1913). In this shaft and workings a considerable amount of pitchblende was mined in the early days. The miners did not know at the time what the ore was and it was wasted in an attempted treatment for gold. When the pitchblende was found the gold gave out, and therefore the owner left his shaft and started a new one 185 feet to the west, which is now the main shaft. The next owners knew the value of pitchblende and about 1898 took out several tons of good ore. When further development was unsuccessful the mine was bought by the present owner..... The vein strikes almost due east and west and dips about 80° S. The shaft follows the vein.....

....."Reliable data on the production of pitchblende from the Kirk mine before the present ownership could not be determined. Since the present owner has had the mine, in round numbers about 20 tons of ore with an average content of 35 per cent U_3O_8 and something over 100 tons of ore with a content of 3 to 4 per cent U_3O_8 have been mined. Most of this ore was produced in 1905-6, and practically all of the high-grade ore was sold abroad.

"Therefore, at a time when the Austrian mines were apparently the only producers of uranium ore the Kirk mine was sending pitchblende abroad and supplying a large proportion of the radium that was sold on the open market."

The Kirk mine was dewatered in 1944 by the U.S. Army (Manhattan District) and the report of the subsequent examination is lodged with the U. S. Atomic Energy Commission, A.E.C. File No. RMO 47. The applicant has not been allowed to make copies for this application, but copies are accessible to the D.M.E.A. field team for study.

We wish to explore the Kirk lode at horizons below the bottom of the Kirk mine (400 feet from the surface) because it is in the center of an area containing pitchblende-bearing fissure veins, and the Kirk lode has been the largest uranium producer of the district; hence, we believe the probability of making a significant discovery of uranium ore is excellent.

(d) The Kirk mine is one mile off the Virginia Canyon gravel road connecting Idaho Springs and Central City, Colorado, and is connected to this highway by a fair, County maintained, gravel road. It is three miles from Central City, and five miles from Idaho Springs. It is 40 miles west of Denver, Colorado.

The mine is accessible year around as the county keeps the road clear of snow in the winter. Nearest railroad shipping points are Rollinsville, 17 miles north, and Golden, 30 miles east of the property.

(e) Manpower is readily available from the nearby mining communities of Idaho Springs and Central City.

Materials, supplies, and equipment are easily available at Central City, Idaho Springs and Denver.

The mine supplies water in sufficient quantities for all mining purposes.

Electric power is available in any required quantity from Public Service Company of Colorado and can be installed in 24 hour's notice.

5. (a) The exploration will be conducted for uranium. Pitchblende is known to occur in the Kirk vein.

(b) The Atomic Uranium Corporation, owner of 88% of the applicant's issued stock, has leased the Alps mine located on the north side of the Kirk property. The Alps shaft is 300 feet N 25 W of the Kirk shaft. The Atomic Uranium Corporation has dewatered and rehabilitated the Alps shaft to a depth of 688 feet below the surface. The Atomic Uranium Corporation has agreed to turn over to the applicant all its mining facilities and the Alps shaft so that the Kirk vein can be explored at horizons below the bottom level of the Kirk mine.

It is proposed, therefore, to drive two cross cut tunnels from the Alps shaft on the 555 and 688 levels (see accompanying maps 1 and 2) in a direction approximately S 25 E, a distance of approximately 310 feet and 316 feet , respectfully, to intersect the Kirk vein at a depth of 90 feet below the 381 level of the Kirk mine, or approximately 70 feet below the bottom of the Kirk shaft.

On completion of the cross cut on the 555 level:
(a) Raise on the Kirk vein from the 555 level into the 381 level of the Kirk mine.
(b) Drift 150 feet E and 50 feet W on the 555 level

On completion of the cross cut on the 688 level, drift east on the Kirk vein a distance of 195 feet.

(c) The work will start within 30 days and be completed within 24 months from the date of an exploration project contract.

(d) The applicant is a corporation organized for the purpose of exploring and operating the Kirk property. The operation will be supervised by Dr. G. C. Ridland, Denver consulting geological engineer, and secretary of the corporation applicant. Dr. Ridland is known to the D.M.E.A. as he is manager of the Cold Spring mining operation at Nederland, Colorado (D.M.E.A. Docket 1447X; Dontract Idm - E54).

6. <u>Estimate of costs:</u>

555 level cross cut	310' @ $30/ft.	$9,300
668 level cross cut	316' @ $30/ft.	9,480
Raise from 555 level	90' @ $30/ft.	2,700
Drift on 555 level	200' @ $30/ft.	6,000
Drift on 668 level	195' @ $30/ft.	5,850
		$33,330

Government participation - 75% based on the following: $24,997.50

(a) Independent contracts: None

(b) Labor

Miners	3840 hrs.	$ 1.75/hr.max.	$ 6720.00	
Muckers	1920 "	1.75 " "	3360.00	
Timberman	800 "	1.75 " "	1400.00	
Surface men	1920 "	1.65 " "	3168.00	
Hoistmen	1920 "	1.65 " "	3168.00	
Superintendent - foreman	12 mo.	500.00/mo.max.	6000000	
Engineer-geologist-consultants	6 "	500.00 " "	3000.00	
			$ 26,816.00	$ 26,816.00

(c) Operating materials and supplies:

Small tools, shovels, picks, hammers, etc.,	Lot		$ 100.00	
Mine Timber	16000 FBM	@$ 75.00	1200.00	
Mine T-Rail (12#yd)	5 Ton	95.00	475.00	
Pipe, 1" water, plastic	1105 ft.	1.00	1105.00	
Pipe, 2" air, plastic	1105 "	1.50	1657.50	
Vent pipe, 12"	500 ft.	1.00	500.00	
Fittings & misc.	Lot		100.00	
Electric Power(average)	52000KWH	.033	1716.00	
Water - plenty ava lable free				
Fuel-Coal for heating	4 Ton	10.00	40.00	
			6893.50	6,893.50

(d) Operating Equipment:

Air Compressor (2 drill)		5000.00	5000.00	
Electric Hoist		1800.00	1800.00	
Mucking Machine		3000.00	3000.00	
Electric Pumps	2	1250.00	2500.00	
Copco drifter drills	2	700.00	1400.00	
Ingersoll-Rand Stoper		500.00	500.00	
Connections for drills	Lot		75.00	
			$ 14275.00	
Above to be furnished by operator, so only 10% (depreciation) charged to project				1,427.50

(e) Rehabilitation - None

(f) New Buildings, improvements, installations:
None required, if proposed program to explore the Kirk from the Alps Mine at depth is carried out.

(g) Miscellaneous:

Cost of Maintenance				
Air Compressor	12 mo.	$ 25/mo	300.00	
Hoist	12 "	10/ "	120.00	
Pumps	12 "	25/ "	300.00	
Drills	12 "	10/ "	120.00	
			$ 840.00	840.00
Assaying				250.00
Accounting	12 mo.	100/mo		1,200.00
Payroll taxes, including workman's compensation, liability insurance, unemployment, etc., 10% of payroll				2,680.00

(h) Contingencies:
Allowance for contingencies not considered above $ 400.00

Grand Total $ 40,507.00 *

7. (a) Applicant is prepared to pay it's share of the cost.

(b) With money.

* The applicant believes that this estimated total of $ 40,507.00 can be reduced by (a) final liquidation of the government's equity in pipe, rail, tools, etc., and by (b) substitution of piece-work rates for some of the hourly pay rates shown. We believe that these two operating adjustments will bring the total cost of the project down to the $ 33,330.00 figure shown on Page 4, and we are willing to accept a contract based on the unit costs used to derive this lower total.

respectively, would intersect the Kirk vein 90 feet and 223 feet below the 38[illegible]ot level of the Kirk shaft.

2. [illegible]n completion of the crosscut on the 555-foot level,

(a) Raise on the Kirk vein to the bottom of the Kirk shaft.

(b) Drift 150 feet east and 50 feet west on the Kirk vein on the 555-foot level.

3. On the completion of the crosscut on the 688-foot level, drift [illegible]st on the Kirk vein a distance of 195 feet.

The applicant submitted detailed cost estimates for this work, which amounted to a total of $40,507.00, but stated a willingness to accept a contract based on the following unit costs:

555-foot level crosscut - 310 feet at $30.00 per foot	$ 9,300.00
688-foot level crosscut - 316 feet at $30.00 per foot	9,480.00
Raise from 555-foot level - 90 feet at $30.00 per foot	2,700.00
Drift on 555-foot level - 200 feet at $30.00 per foot	6,000.00
Drift on 688-foot level - 195 feet at $30.00 per foot	5,850.00
Total cost	$33,330.00
Government participation 75 percent	$24,997.50

CONCLUSIONS

The U. S. Army, (Manhattan district), unwatered the Kirk mine in [illegible]44. They repaired the shaft, mapped, studied, and sampled the varia[illegible] working faces. A total of 89 channel samples were taken and only four of [illegible]e carried more than 0.1 percent U_3O_8. The highest assay was 0.160 percent [illegible]O_8. Most of the samples averaged from 0.007 to 0.017 percent U_3O_8 an[illegible]y failed to show any U_3O_8.

According [illegible] the Manhattan district report, it was concluded that no mineable gra[illegible]s were available and that the potentially favorable areas for deve[illegible]t had been largely exhausted except for

zone of faulting that has an

p of 75° south. The Manhattan

The Kir d ore bodies were lenticular, of

average strike sions and occurred haphazardly along both

district rep the fracture. The occurrence of pitchblende

uncertain

the str even more erratic than the gold.

was

MINEABLE ORE RESERVES

There are no known ore reserves.

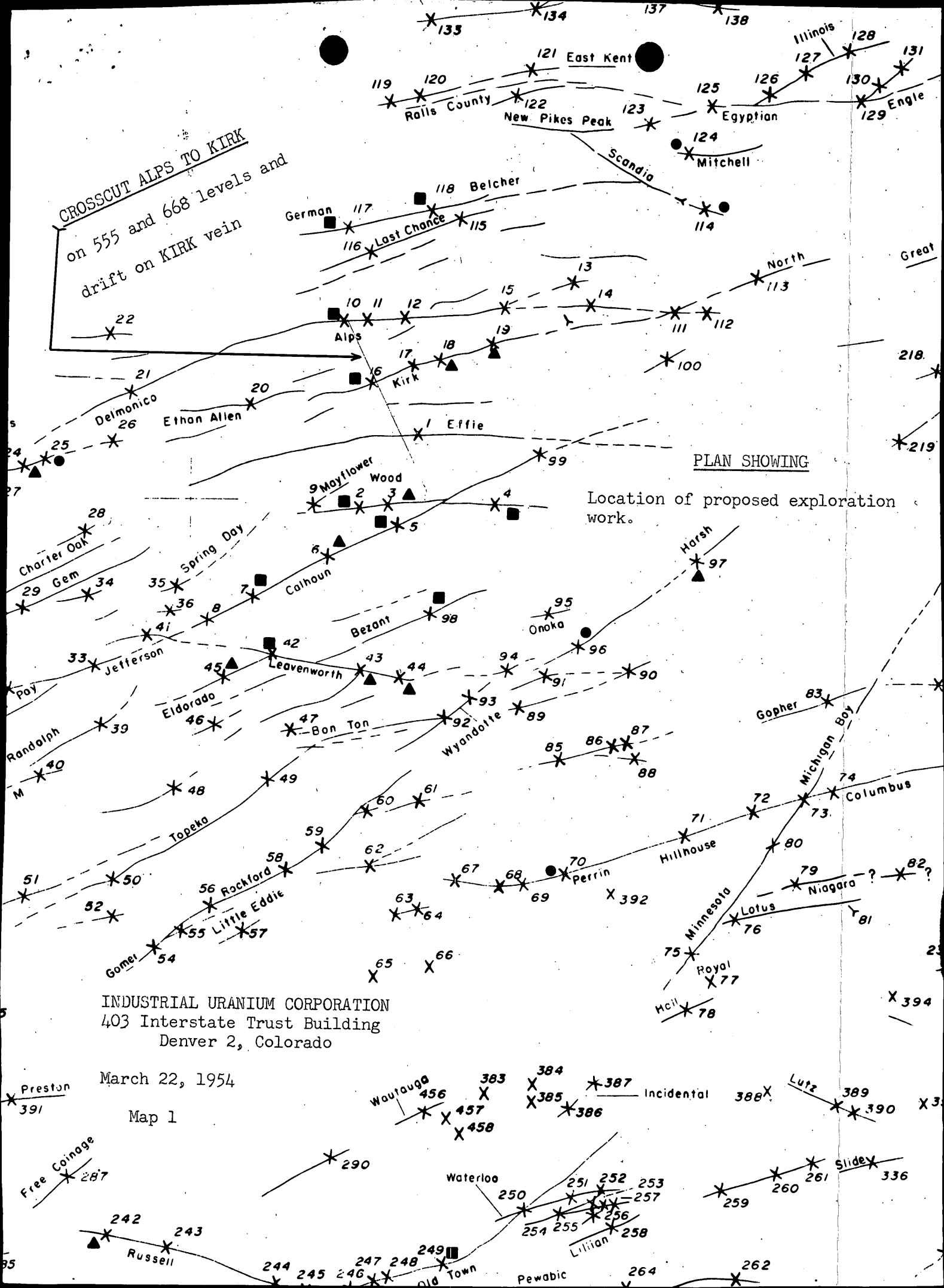
PRESENT STATUS

The applicant has rehabilitated the Alps shaft and, on the day the field examiners visited the property, was engaged in drifting east from the Alps shaft on the Alps vein. The face of the drift was approximately 25 feet from the shaft. The vein was 15 inches in width and contained abundant pyrite. No uranium minerals were seen by the field examiners and no radioactivity was noted. The applicant proposes to drift 25 feet more on the Alps vein before starting the crosscut to the Kirk vein. By drifting east on the vein before starting the crosscut the applicant hopes to bypass the Annex lode claim, which is not controlled.

PROJECT PROPOSALS WITH COSTS

The proposal submitted by Industrial Uranium Corp. included the following work:

1. Drive two crosscuts from the Alps vein on the Alps 555- and 688-foot levels (figs. 2 and 3) to intersect the Kirk vein. The length of the crosscuts were estimated to be 310 feet and 316 feet,



PLAN SHOWING

Location of proposed exploration work.

INDUSTRIAL URANIUM CORPORATION
403 Interstate Trust Building
Denver 2, Colorado

March 22, 1954

Map 1

GEOLOGICAL SURVEY
TEPCO
RECEIVED
APR 14 1954
Denver

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

224 New Customhouse
Denver 2, Colorado

April 12, 1954

Memorandum

To: Secretary to the Operating Committee, Defense Minerals Exploration Administration

From: Field Team, Region IV

Subject: (Uranium), Application of Industrial Uranium Corporation, Kirk Mine, Gilpin County, Colorado

Enclosed are two copies of the subject application estimated to cost $40,507.00, but which the applicant has adjusted to $33,330.00.

Each brochure contains a letter of transmittal, Form MF-103 with six pages of supporting data, and three maps.

Attached hereto are the following:

1. A photostat of a lease agreement dated December 31, 1953 between Kirk Mines Incorporated and Francis H. Knighton signed by George S. Groves for Kirk Mines, Inc. and Exhibit A "Agreement of Lease."

2. Assignment of lease from Francis H. Knighton to the Industrial Uranium Corporation.

One copy of the application is being forwarded to Mr. A. P. Butler, TEPCO, Building 21, Denver Federal Center.

Because of the relationship of the applicant to the Reynolds Uranium Corporation, application forwarded you April 7, 1954, our attorney, Mr. Shireman, thinks it would be unethical for him to give legal advice to us on this application should it go to contract.

One copy of the application is being retained in our file.

HMC:es
cc: Docket
Butler
Chron.
Koschmann

Enclosures

W. H. King
W. H. King

A. H. Koschmann
A. H. Koschmann

Extra

April 2, 1954.

Mr. W. H. King,
Executive Officer
Defense Minerals Exploration Admin.,
Field Team, Region IV
224 New Customhouse
Denver 2, Colorado.

Dear Mr. King,

Industrial Uranium Corporation
403 Interstate Trust Building
Denver 2, Colorado.

Please find attached four copies of an application for aid to explore the Kirk Lode. This was originally submitted to you on March 23rd but was returned to us for revision. The changes have been made as requested in Mr. Shaw's letter of March 31st, and the documents showing property control are included in this transmittal.

Trusting that these meet with your approval, I remain,

Very truly yours

G. Ridland

G. Carmen Ridland

Enc: 4 each Form MF-103 with supplementary pages
4 each Maps Nos. 1, 2 & 3
Documents showing property control (2)

INDUSTRIAL URANIUM CORPORATION

403 Interstate Trust Bldg.

Denver 2, Colo.

April 2, 1954

Mr. W. H. King
Executive Officer
Defense Minerals Exploration Admin.
Field Team, Region IV
224 New Customhouse
Denver 2, Colorado

Dear Mr. King:

Industrial Uranium Corp.
403 Interstate Trust Bldg.
Denver 2, Colorado

In his letter of March 31, 1954, Mr. John F. Shaw inquired about the status of the claims involved in the cross-cuts proposed by this application.

These cross-cuts traverse the following Lode Claims:

1. Alps Lode U. S. Sur. No. 176
2. Olympia Lode U. S. Sur. No. 8935
3. Ethan Allen Lode U. S. Sur. No. 844
4. Polar Star Lode U. S. Sur. No. 7090
5. Kirk Lode U. S. Sur. No. 198

The Alps and Olympia Lodes are controlled by the Atomic Uranium Corp., who have allowed the applicant the use of the Alps shaft and facilities.

The applicant owns an undivided 3/4 interest in the Ethan Allen Lode, and an undivided 1/2 interest in the Polar Star Lode, thus controlling these claims.

The Kirk Lode is leased by the applicant.

Subordination agreements can be obtained from all parties having an interest in these claims.

The only claim not controlled by the applicant in the vicinity of the proposed cross-cuts is the Annex (18245) and the proposed work is

specifically designed not to enter ground controlled by the Annex. By starting off to the east and drifting on the Alps claim for approximately 50 feet before beginning to cross cut, the actual distance of the crosscut will be reduced due to the fact that the Alps and Kirk veins converge to the east. Therefore, the cross cuts, as proposed on the accompanying maps, may be expected to be slightly less than the respective 310 and 316 feet, which are used as approximate distances in estimating costs. Any drifting done on the Alps vein prior to beginning the cross cuts will be entirely at applicant's expense.

The Alps and Kirk shafts have been accurately transit surveyed to the nearest one hundredth of a foot in the field with relation to patented claim corners. The traverse in the field was closed, with a calculated error of .027%. Their positions as shown on the accompanying map are ploted accurately, using the coordinate system as calculated from the transit survey feild notes.

A nail, acting as a point, in the east end of the Alps shaft collar situated 1.95 feet from the N E corner of the shaft and 1.85 feet from the S E corner of the shaft bears S. 38° 43' W, 231.95 feet from Cor. No. 4 of the Ingomar Lode, U. S. Sur. No. 11655. The long side of the Alps shaft bears N 82° 35' E. The coordinates for this point are: Lat. 4818.07, Dep. 4854.92.

A nail, acting as a point, in the south side of the Kirk shaft collar situated 3.12 feet from the S E corner of the shaft and 2.97 feet from the S W corner of the shaft bears S 0° 27' E, 444.96 feet from Cor. No. 4 of the Ingomar Lode U. S. Sur. No. 11655. The long side of the Kirk shaft bears N 740 16' E. The coordinates for this point on the shaft collar are: Lat. 4555.06, Dep. 5003.50.

All proposed work will be carried with precision transit control.

We trust that this explanation gives you the information you require.

Very truly yours,

INDUSTRIAL URANIUM CORP.

G. C. Ridland

G. C. Ridland

GCR/jl

MF-103
(Revised April 1952)

UNITED STATES DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS EXPLORATION ADMINISTRATION

Form Approved.
Budget Bureau No. 42-R1035.2.

APPLICATION FOR AID IN AN EXPLORATION PROJECT, PURSUANT TO DMEA ORDER 1, UNDER THE DEFENSE PRODUCTION ACT OF 1950, AS AMENDED

Not to be filled in by applicant

Docket No. 3317
Metal or Mineral Uranium
Date Received
Estimated Cost $40,507
Participation (Government %)

INSTRUCTIONS

1. *Name of applicant.*—(*a*) State here your full legal name, in the form in which you will wish to contract, and your mailing address:

Industrial Uranium Corporation
403 Interstate Trust Building
Denver 2, Colorado

(*b*) If other than an individual, add to your name above whether a corporation, partnership, etc., and the name of the State in which incorporated or otherwise organized. Incorporated in the State of Colorado

(*c*) If a corporation, add to above statement, titles, names and addresses of officers.

(*d*) If a partnership, add to the above statement the names and addresses of all partners.

2. *General.*—Read DMEA Order 1, "Government Aid in Defense Exploration Projects," before completing this application. Submit this application and all accompanying papers in quadruplicate (four copies), with your name and address on each sheet of the application and on all accompanying papers. Where sufficient space is not provided on the form for all required information, state it on an accompanying paper, with a reference in each case to the instruction to which it refers by number. Comply with all applicable instructions; or, if not applicable, so state. File the application with Defense Minerals Exploration Administration, Department of the Interior, Washington 25, D. C., or with the nearest field executive officer thereof.

3. *Applicant's property rights.*—(*a*) State the legal description of the land upon which you wish to explore, including all land which you possess or control that may be benefited by the exploration, and excluding any land or interest in land which is not to be included in the exploration project contract Kirk Lode Mining Claim, U. S. Survey Lot No. 198, and Jeannette and Hilda Lode Mining Claim, U. S. Survey Lot No. 18953, all located in the Illinois Central Mining District, Quartz Hill, Gilpin County, Colorado.

(*b*) State any mine name by which the property is known. Kirk Mine

(*c*) State your interest in the land, whether owner, lessee, purchaser under contract, or otherwise Lessee

(*d*) If you are not the owner, submit with this application a copy of the lease, contract, or other document under which you control the property.

(*e*) If you own the land, describe any liens or encumbrances on it

(*f*) If the land consists of unpatented claims, add to the description above, the book and page numbers for each recorded location notice.

4. *Physical description.*—(*a*) Describe in detail any mining or exploration operations which have been or now are being conducted upon the land, including existing mine workings and production facilities. State your interest, if any, in such operations. Also describe accessibility of mine workings for examination purposes.

(*b*) State past and current production, and ore reserves, if any, giving quantities and grades.

(*c*) Describe the geologic features of the property, including mineralization, type of deposit (vein, bedded, etc.), and your reasons for wishing to explore. Illustrate with maps or sketches. Send with your application (but not necessarily as a part of it) any geologic or engineering report, assay maps, or other technologic information you may have, indicating on each whether you require its return to you.

(*d*) State the facts with respect to the accessibility of the project: Access roads, distances to shipping, supply and residence points.

(*e*) State the availability of manpower, materials, supplies, equipment, water, and power.

5. *The exploration project.*—(State the mineral or minerals for which you to explore ~~The exploration will be conducted for uranium. Pitchblende is known to occur in the Kirk vein.~~

(*b*) Describe fully the proposed work, including a map or sketch of the property showing a plan (and cross sections if needed) of any present mine workings, and the location of the proposed exploration work as related to such features as contacts, veins, ore-bearing beds, etc.

(*c*) The work will start within 30 days and be completed within 24 months from the date of an exploration project contract.

(*d*) State the operating experience and background of the applicant with relation to the ability to carry out such exploration project, and also that of the person or persons who will supervise the operations.

6. *Estimate of costs.*—Furnish a detailed estimate of the costs of the proposed work (you will have to use a separate sheet), under the following headings. Add the totals under all headings to give the estimated total cost of the project:

(*a*) *Independent contracts.*—(Note.—If the applicant does not intend to let any of the work to contractors, write "none" after this item. To the extent that the work is to be contracted, do not repeat the cost of the contract-work in subsequent items.) State the cost of any proposed independent contracts for the performance of all or any part of the work, expressed in terms of units of work (such as per foot of drilling, per foot of drifting, per hour of bulldozer operations, per cubic yard of material moved, etc.).

(*b*) *Labor, supervision, consultants.*—Include an itemized schedule of numbers, classes and rates of wages, salaries or fees for necessary labor, supervision and engineering and geological consultants.

(*c*) *Operating materials and supplies.*—Furnish an itemized list, including items of equipment costing less than $50 each, and power, water and fuel.

(*d*) *Operating equipment.*—Furnish an itemized list of any operating equipment to be rented, purchased, or which is owned and will be furnished by the Operator, with the estimated rental, purchase price, or suggested use-allowance based on present value, as the case may be.

(*e*) *Rehabilitation and repairs.*—Furnish a detailed list showing the cost of any necessary initial rehabilitation or repairs of existing buildings, installations, fixtures, and movable operating equipment, now owned by the Operator and which will be devoted to the exploration project.

(*f*) *New buildings, improvements, installations.*—Furnish a detailed list showing the cost of any necessary buildings, fixed improvements, or installations to be purchased, installed or constructed for the benefit of the exploration project.

(*g*) *Miscellaneous.*—Furnish a detailed list showing the cost of repairs to and maintenance of operating equipment (not including initial rehabilitation or repairs of the Operator's equipment), analytical work, accounting, workmen's compensation and employers' liability insurance, and payroll taxes.

(*h*) *Contingencies.*—Give an estimate of any necessary allowances for contingencies not included in the costs stated above.

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*) Are you prepared to furnish your share of the cost of the proposed project in accordance with the regulations on Government participation (Sec. 7, DMEA No. 1)?

(*b*) How do you propose to furnish your share of the costs?

[X] Money [ ] Use of equipment owned by you [ ] Other

Explain in detail on acompanying paper.

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.

Dated March 22, 1954

Industrial Uranium Corporation
(Applicant)

By G. C. Ridland

G. C. Ridland, Geological Engineer

Title 18, U. S. Code (Crimes), Section 1001, makes it a criminal offense to make a willfully false statement or representation to any department or agency of the United States as to any matter within its jurisdiction.

U. S. GOVERNMENT PRINTING OFFICE 16—66551-1

APPLICATION FOR AID IN AN
EXPLORATION PROJECT, PURSUANT TO
DMEA ORDER 1, UNDER THE DEFENSE
PRODUCTION ACT OF 1950, AS AMENDED

1. (a) Industrial Uranium Corporation
403 Interstate Trust Building
Denver 2, Colorado

(b) Incorporated in the State of Colorado.

(c) Director and President: Charles E. Stahl, Jr.
First National Bank Bldg., Ardsley, New York

Director and Vice President: Francis H. Knighton
First National Bank Bldg.
Arsdley, New York

Director and Secretary-Treasurer: Walter H. Bond
32 Broadway, New York, New York

3. (a)

Name	U.S. Survey Lot No.
Kirk Lode Mining Claim	198
Jeannette and Hilda Lode Mining Claim	18953

all located in the Illinois Central Mining District, Quartz Hill, Gilpin County, Colorado. See Map 3, attached.

(b) Kirk Mine

(c) Lessee

(d) The following documents are appended:

1. Lease dated February 23, 1950, from Marjorie Carlton as Testamentary Trustee to George S. Groves.

2. Assignment of above lease by George S. Groves to Kirk Mines, Inc.

3. Lease dated December 31, 1953, from Kirk Mines, Inc. to Francis H. Knighton.

4. Assignment of lease dated December 31, 1953, from Francis H. Knighton to Industrial Uranium Corporation.

4. (a) The main workings are on the Kirk claim and consist of a shaft 400 feet deep and main levels at 88, 141, 238, 301, and 381 feet. The underground workings are inaccessible as the mine is flooded. However, the vein can be traced in old pits on the surface for at least 450 feet and probably continues some distance further. The mine is not being operated at this time and no operation is going on at this time.

4. (b) Current production - None since about 1910.

Past production - The U. S. Atomic Energy Commission estimates production of uranium in the form of sorted ore as follows:

356,000 lbs. 8.6% U_3O_8 Average grade - 30,490 lbs. U_3O_8

The U.S.G.S. Reports (Professional Paper 94, page 245) the production of smelting (high-grade, shipping) ores as follows:

Year	Ore Net Lbs.	Gold oz/t.	Silver oz/t.	Copper %	Silica %
1905	4,520	2.00	3.00	—	46
1905	5,506	.30	7.70	—	—
1905	1,970	1.75	16.25	9.00	45
1908	25,443	1.46	14.45	4.70	33
1908	9,457	.43	3.09	—	—
1910	1,724	.86	16.70	.60	—
1910	4,689	.69	11.29	2.10	—
1910	1,606	.81	11.19	3.32	—

Concentrating ore shipped in 1910 is said to have averaged gold 0.10 ounce and silver 0.50 ounce.

Ore reserves - Not known.

(c) Geologic features - (From U. S. Bureau of Mines Bulletin 70, page 43-44, 1913, by R. B. Moore and K. L. Kithil) - "The Kirk lode is 3 to 6 feet wide, and seems to be a fissure vein in gneiss and mica schist. It carries gold, silver, and copper in addition to pitcholende. The best pitchblende was found between the 140-foot level and the 250-foot level on the east side of the shaft. Ore was also found at other places, notably just above the 400-foot level and in this level. The ore shoot seems to pitch from east to west. Except in one place the ore was everywhere against the country rock on the hanging wall. There were practically no stringers, spurs, or other indications that the vein was near except that the country rock carried some uranium. Much of the ore was exceedingly rich, some assaying 60 to 80 per cent U_3O_8. At places this rich ore was a foot thick; one single piece was removed that measured 2 feet 8 inches by 1 foot 4 inches by 1 foot....

....."An old shaft and part of the workings are still open (1913). In this shaft and workings a considerable amount of pitchblende was mined in the early days. The miners did not know at the time what the ore was and it was wasted in an attempted treatment for gold. When the pitchblende was found the gold gave out, and therefore the owner left his shaft and started a new one 185 feet to the west, which is now the main shaft. The next owners knew the value of pitchblende and about 1898 took out several tons of good ore. When further development was unsuccessful the mine was bought by the present owner..... The vein strikes almost due east and west and dips about 80°S. The shaft follows the vein.....

....."Reliable data on the production of pitchblende from the Kirk mine before the present ownership could not be determined. Since the present owner has had the mine, in round numbers about 20 tons of ore with an average content of 35 per cent U_3O_8 and something over 100 tons of ore with a content of 3 to 4 per cent U_3O_8 have been mined. Most of this ore was produced in 1905-6, and practically all of the high-grade ore was sold abroad.

"Therefore, at a time when the Austrian mines were apparently the only producers of uranium ore the Kirk mine was sending pitchblende abroad and supplying a large proportion of the radium that was sold on the open market."

The Kirk mine was dewatered in 1944 by the U.S. Army (Manhattan District) and the report of the subsequent examination is lodged with the U. S. Atomic Energy Commission, A.E.C. File No. RMO 47. The applicant has not been allowed to make copies for this application, but copies are accessible to the D.M.E.A. field team for study.

We wish to explore the Kirk lode at horizons below the bottom of the Kirk mine (400 feet from the surface) because it is in the center of an area containing pitchblende-bearing fissure veins, and the Kirk lode has been the largest uranium producer of the district; hence, we believe the probability of making a significant discovery of uranium ore is excellent.

(d) The Kirk mine is one mile off the Virginia Canyon gravel road connecting Idaho Springs and Central City, Colorado, and is connected to this highway by a fair, County maintained, gravel road. It is three miles from Central City, and five miles from Idaho Springs. It is 40 miles west of Denver, Colorado.

The mine is accessible year around as the county keeps the road clear of snow in the winter. Nearest railroad shipping points are Rollinsville, 17 miles north, and Golden, 30 miles east of the property.

(e) Manpower is readily available from the nearby mining communities of Idaho Springs and Central City.

Materials, supplies, and equipment are easily available at Central City, Idaho Springs and Denver.

The mine supplies water in sufficient quantities for all mining purposes.

Electric power is available in any required quantity from Public Service Company of Colorado and can be installed in 24 hour's notice.

5. (a) The exploration will be conducted for uranium. Pitchblende is known to occur in the Kirk vein.

(b) The Atomic Uranium Corporation, owner of 88% of the applicant's issued stock, has leased the Alps mine located on the north side of the Kirk property. The Alps shaft is 300 feet N 25 W of the Kirk shaft. The Atomic Uranium Corporation has dewatered and rehabilitated the Alps shaft to a depth of 688 feet below the surface. The Atomic Uranium Corporation has agreed to turn over to the applicant all its mining facilities and the Alps shaft so that the Kirk vein can be explored at horizons below the bottom level of the Kirk mine.

It is proposed, therefore, to drive two cross cut tunnels from the Alps shaft on the 555 and 688 levels (see accompanying maps 1 and 2) in a direction approximately S 25 E, a distance of approximately 310 feet and 316 feet , respectfully, to intersect the Kirk vein at a depth of 90 feet below the 381 level of the Kirk mine, or approximately 70 feet below the bottom of the Kirk shaft.

On completion of the cross cut on the 555 level:
(a) Raise on the Kirk vein from the 555 level into the 381 level of the Kirk mine.
(b) Drift 150 feet E and 50 feet W on the 555 level

On completion of the cross cut on the 688 level, drift east on the Kirk vein a distance of 195 feet.

(c) The work will start within 30 days and be completed within 24 months from the date of an exploration project contract.

(d) The applicant is a corporation organized for the purpose of exploring and operating the Kirk property. The operation will be supervised by Dr. G. C. Ridland, Denver consulting geological engineer, and secretary of the corporation applicant. Dr. Ridland is known to the D.M.E.A. as he is manager of the Cold Spring mining operation at Nederland, Colorado (D.M.E.A. Docket 1447X; Contract Idm - E54).

6. Estimate of costs:

555 level cross cut	310' @ $30/ft.	$9,300
668 level cross cut	316' @ $30/ft.	9,480
Raise from 555 level	90' @ $30/ft.	2,700
Drift on 555 level	200' @ $30/ft.	6,000
Drift on 668 level	195' @ $30/ft.	5,850
		$33,330
Government participation - 75% based on the following:		$24,997.50

(a) Independent contracts: None

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403 Interstate Trust Building
Denver 2, Colorado

(b) Labor

Miners	3840 hrs.	$ 1.75/hr.max.	$ 6720.00	
Muckers	1920 "	1.75 " "	3360.00	
Timberman	800 "	1.75 " "	1400.00	
Surface men	1920 "	1.65 " "	3168.00	
Hoistmen	1920 "	1.65 " "	3168.00	
Superintendent - foreman	12 mo.	500.00/mo.max.	6000000	
Engineer-geologist-consultants	6 "	500.00 " "	3000.00	
			$ 26,816.00	$ 26,816.00

(c) Operating materials and supplies:

Small tools, shovels, picks, hammers, etc.,	Lot		$ 100.00	
Mine Timber	16000 FBM	@$ 75.00	1200.00	
Mine T-Rail (12#yd)	5 Ton	95.00	475.00	
Pipe, 1" water, plastic	1105 ft.	1.00	1105.00	
Pipe, 2" air, plastic	1105 "	1.50	1657.50	
Vent pipe, 12"	500 ft.	1.00	500.00	
Fittings & misc.	Lot		100.00	
Electric Power(average)	52000KWH	.033	1716.00	
Water - plenty ava lable free				
Fuel-Coal for heating	4 Ton	10.00	40.00	
			6893.50	6,893.50

(d) Operating Equipment:

Air Compressor (2 drill)		5000.00	5000.00	
Electric Hoist		1800.00	1800.00	
Mucking Machine		3000.00	3000.00	
Electric Pumps	2	1250.00	2500.00	
Copco drifter drills	2	700.00	1400.00	
Ingersoll-Rand Stoper		500.00	500.00	
Connections for drills	Lot		75.00	
			$ 14275.00	
Above to be furnished by operator, so only 10% (depreciation) charged to project				1,427.50

(e) Rehabilitation - None

(f) New Buildings, improvements, installations:
None required, if proposed program to explore the Kirk from the Alps Mine at depth is carried out.

(g) Miscellaneous:

Cost of Maintenance				
Air Compressor	12 mo.	$ 25/mo	300.00	
Hoist	12 "	10/ "	120.00	
Pumps	12 "	25/ "	300.00	
Drills	12 "	10/ "	120.00	
			$ 840.00	840.00
Assaying				250.00
Accounting	12 mo.	100/mo		1,200.00
Payroll taxes, including workman's compensation, liability insurance, unemployment, etc., 10% of payroll				2,680.00

(h) Contingencies:
Allowance for contingencies not considered above — $ 400.00

Grand Total — $ 40,507.00 *

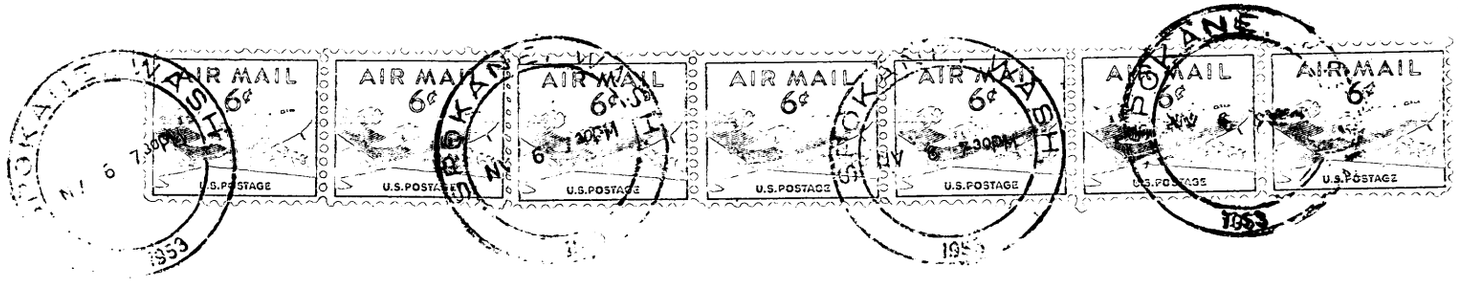
7. (a) Applicant is prepared to pay it's share of the cost.

(b) With money.

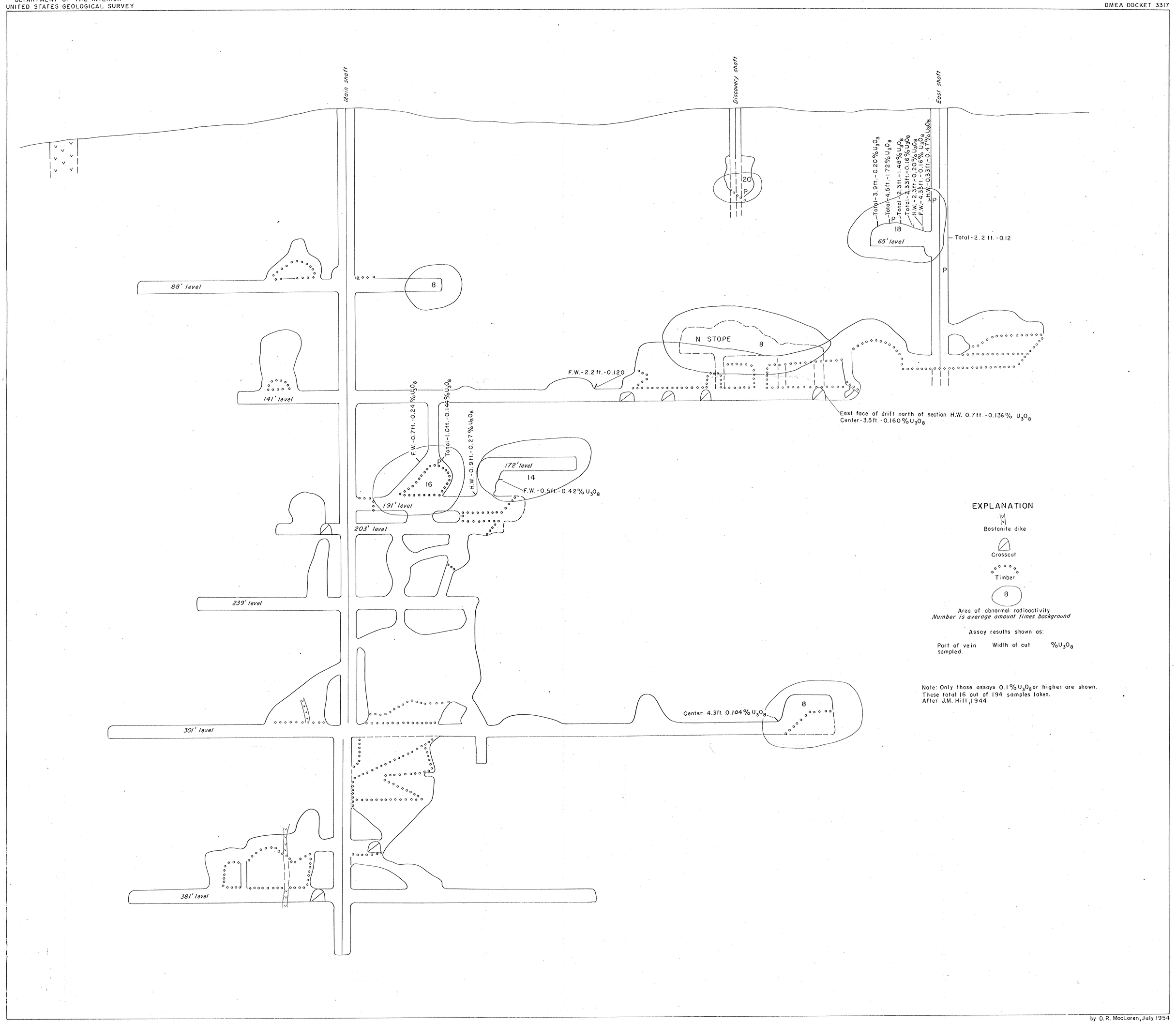
* The applicant believes that this estimated total of $ 40,507.00 can be reduced by (a) final liquidation of the government's equity in pipe, rail, tools, etc., and by (b) substitution of piece-work rates for some of the hourly pay rates shown. We believe that these two operating adjustments will bring the total cost of the project down to the $ 33,330.00 figure shown on Page 4, and we are willing to accept a contract based on the unit costs used to derive this lower total.

VIA AIR MAIL

[redacted]



Mr. George C. Selfridge, Chairman
Operating Committee
Defense Minerals Exploration Administration
Department of the Interior
Washington 25, D. C.



by D.R. MacLaren, July 1954

FIGURE 4.-LONGITUDINAL SECTION IN THE PLANE OF THE VEIN LOOKING NORTH SHOWING MINE WORKINGS, AREAS OF ABNORMAL RADIOACTIVITY, AND LOCATION AND ASSAY VALUE OF 16 OUT OF 194 SAMPLES TAKEN BY HILL, KIRK MINE, GILPIN COUNTY, COLORADO

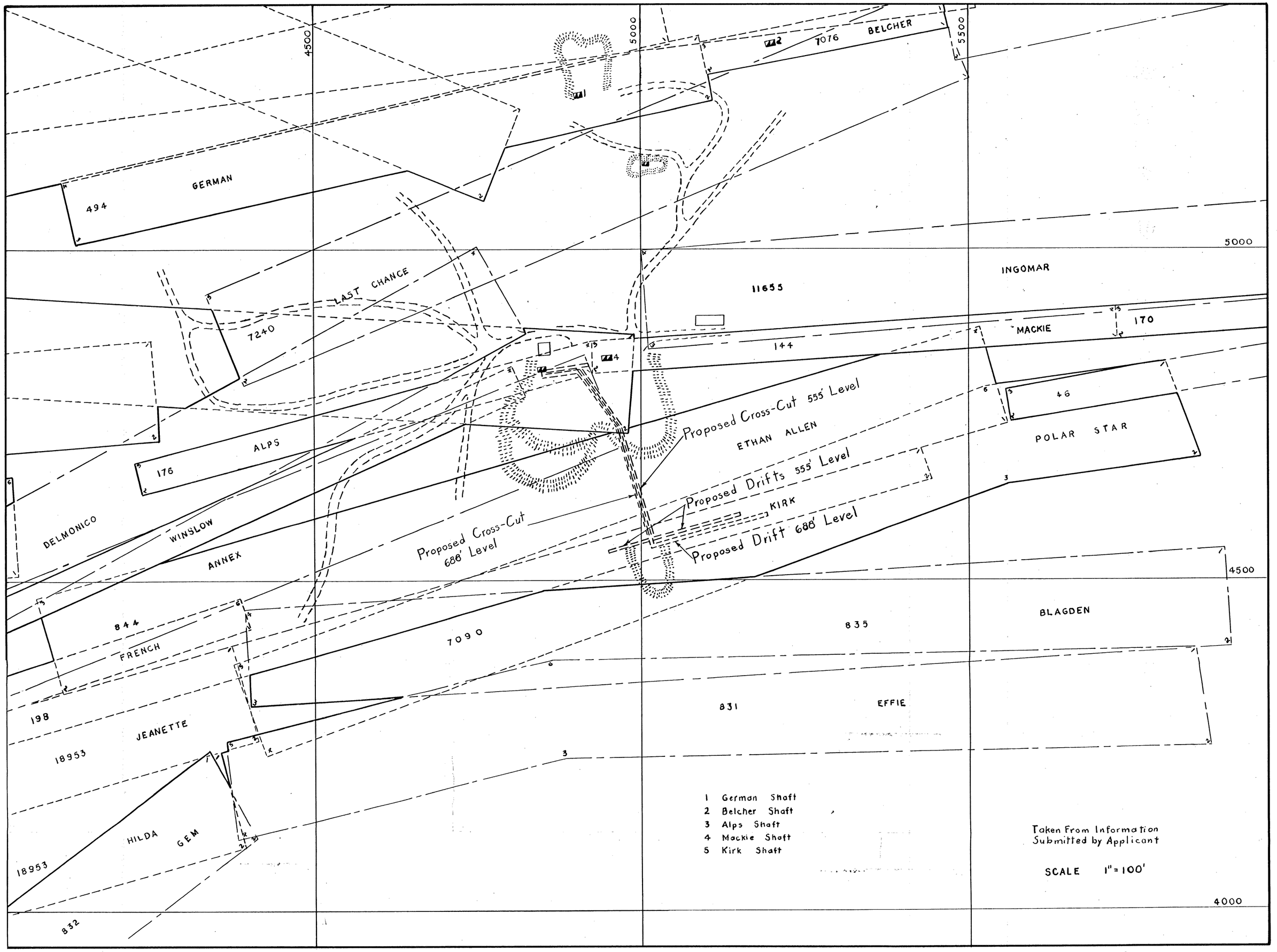
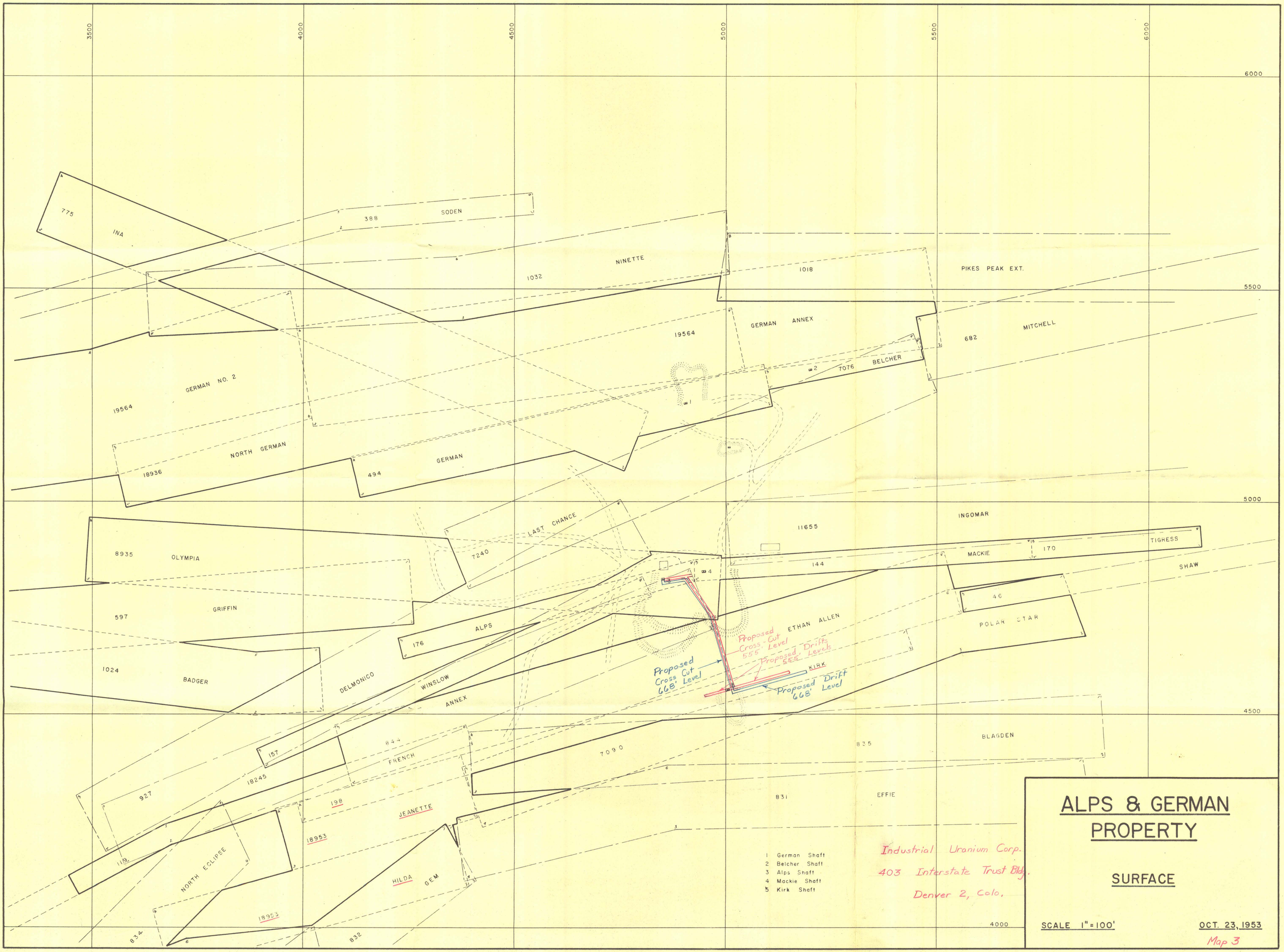


FIGURE 2 - CLAIM MAP, ALPS AND KIRK PROPERTY, INDUSTRIAL URANIUM CORPORATION, GILPIN COUNTY, COLO. (DMEA 3317)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18936
NORTH GERMAN
494
GERMAN
LAST CHANCE
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INGOMAR
8935
OLYMPIA
597
GRIFFIN
144
MACKIE
170
TIGRESS
SHAW
46
POLAR STAR
176
ALPS
ETHAN ALLEN
1024
BADGER
DELMONICO
WINSLOW
ANNEX
Proposed Cross Cut 668' Level
Proposed Cross Cut 555' Level
Proposed Drifts 555' Levels
KIRK
Proposed Drift 668' Level
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7090
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BLAGDEN
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18245
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JEANETTE
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EFFIE
18953
NORTH ECLIPSE
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HILDA
GEM
18953
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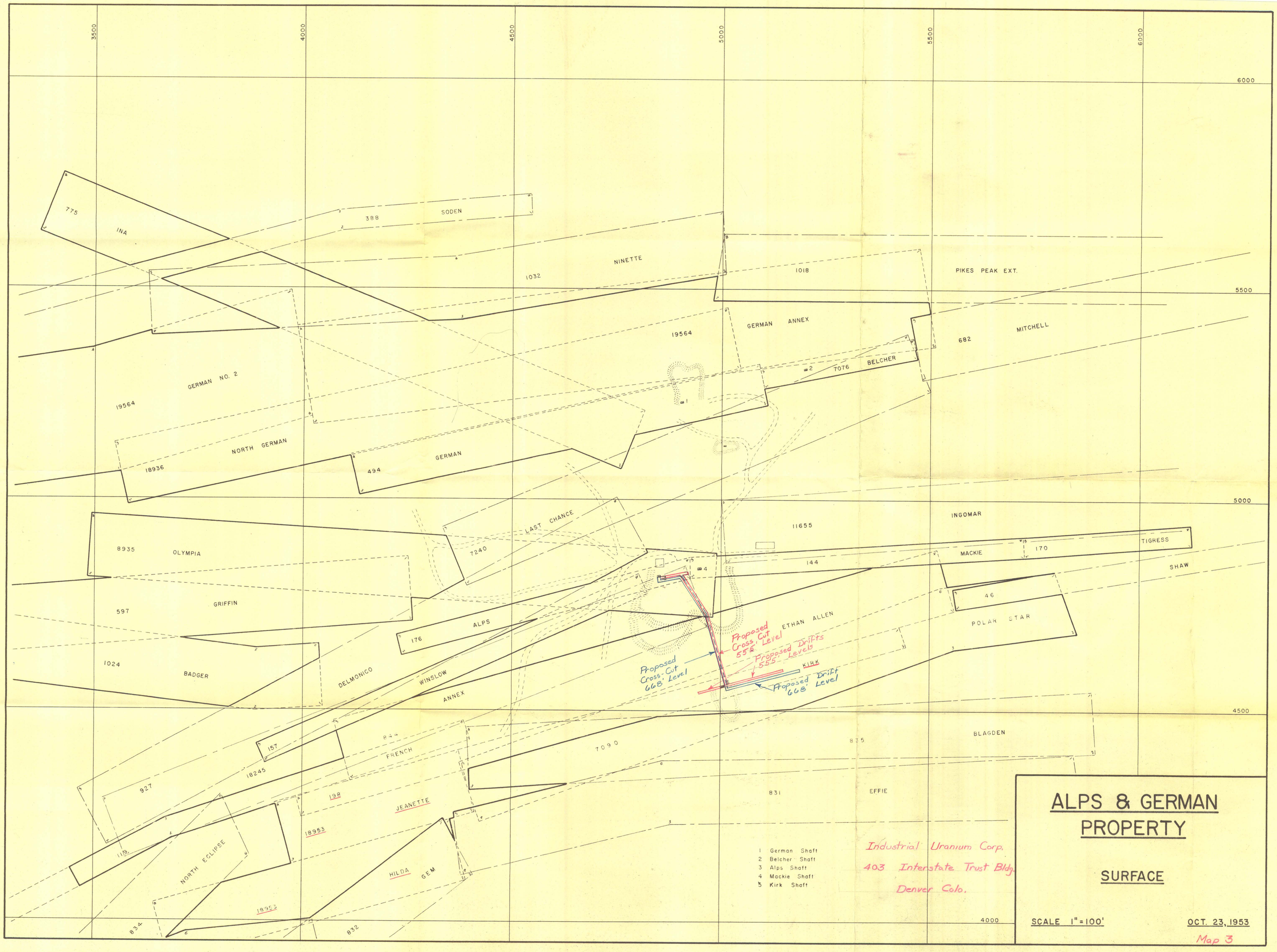
832
1 German Shaft
2 Belcher Shaft
3 Alps Shaft
4 Mackie Shaft
5 Kirk Shaft
Industrial Uranium Corp.
403 Interstate Trust Bldg.
Denver 2, Colo.
ALPS & GERMAN PROPERTY
SURFACE
SCALE 1" = 100'
OCT. 23, 1953
Map 3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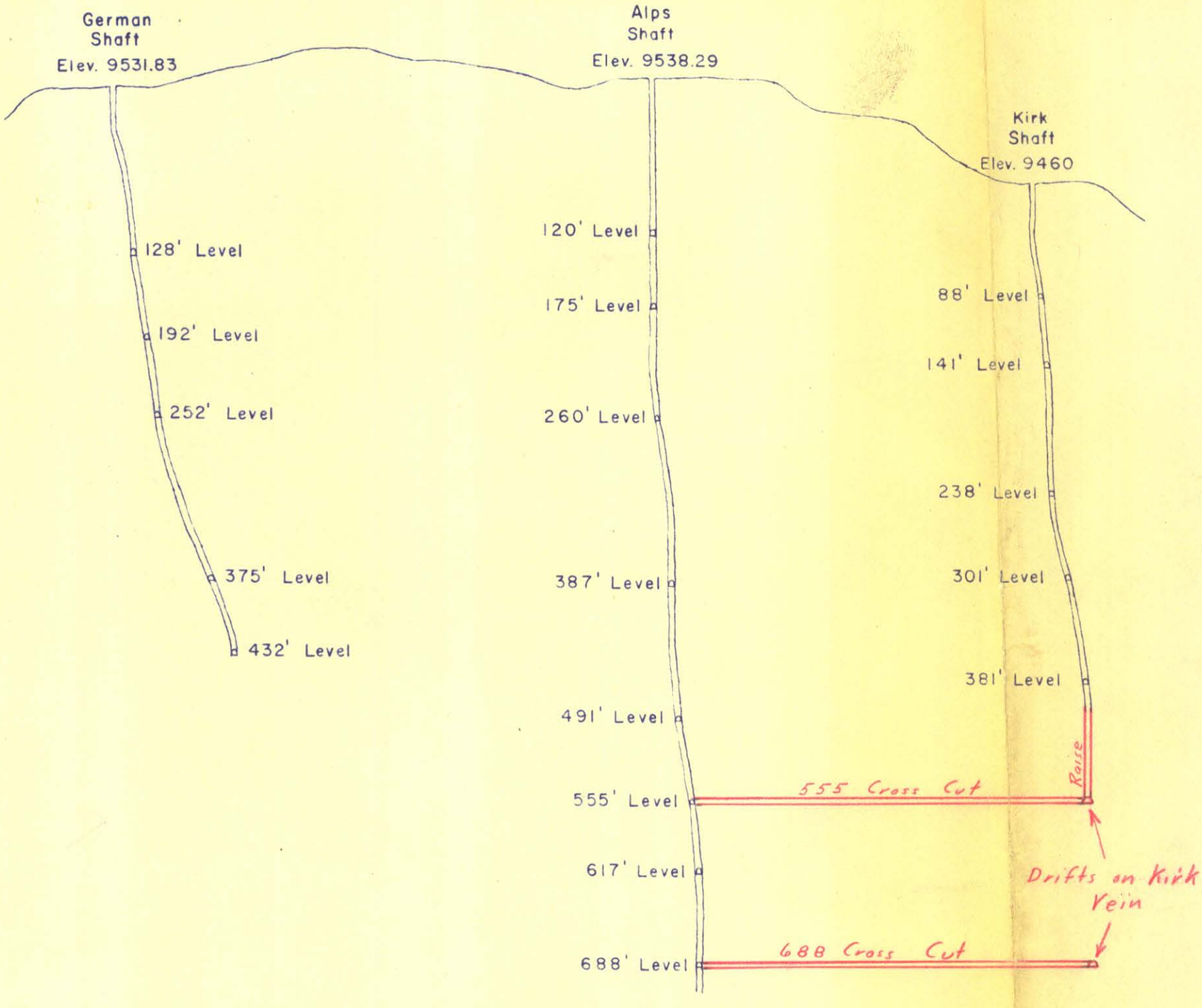


QUARTZ HILL

SECTION THRU SHAFTS

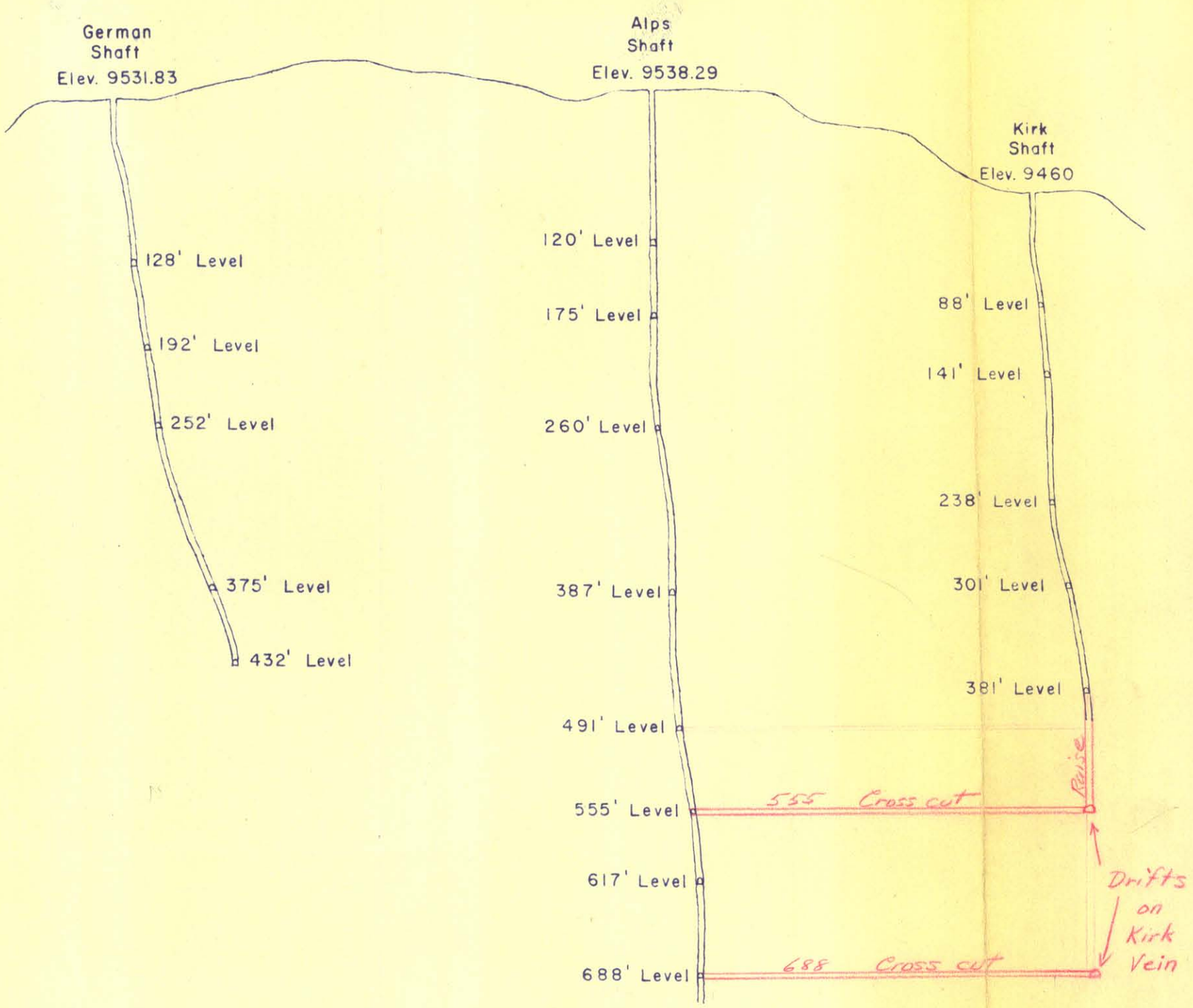
SCALE 1"=100'

MARCH 4, 1954

Industrial Uranium Corporation
403 Interstate Trust Building
Denver 2, Colorado

March 22, 1954

Map 2



QUARTZ HILL

SECTION THRU SHAFTS

SCALE 1"=100'

MARCH 4, 1954

Industrial Uranium Corporation
403 Interstate Trust Building
Denver 2, Colorado

March 22, 1954

Map 2