MAR 19700002: SOUTHWESTERN ALBERTA

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REPORT ON

EXPLORATION PERMITS AND CLAIMS

IN THE CLARK RANGE

SOUTHWESTERN ALBERTA

AND

SOUTHEASTERN BRITISH COLUMBIA

by

N. J. Duncan, B. Sc., P. Eng.
January 27, 1970

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INTRODUCTION

The discovery of copper in the sedimentary rocks of the Precambrian Purcell Series in the Clark Range of southwestern Alberta and southeastern British Columbia suggests that this part of the Rocky Mountains differs from most of the non-metalliferous Canadian Rocky Mountains.

This report describes some of the copper occurrences and their settings. It is based on government reports, reconnaissance and more detailed examinations by geologists, investigations by exploration companies, and data obtained from prospectors.

SUMMARY AND RECOMMENDATIONS

The property consists of about 80,600 acres held under exploration permits, located claims, and optioned claims. It is in the Clark Range of southwestern Alberta and southeastern British Columbia where most is easily accessible. It is well located with respect to water, fuel, and other services.

Several showings containing copper mineralization in the form of chalcocite, bornite, and chalcopyrite have been found in certain sandstone or quartzite beds intercalated with red and green argillites in the Grinnell Formation as well as in argillites and other rocks of other formations of the Late Precambrian Purcell Series. Mineralized beds are found at various stratigraphic levels in the Grinnell Formation in different parts of the Clark Range. The thickest mineralized interval so far discovered is on Spionkop Ridge where 0.62 percent copper was obtained across 5-1/2 feet. Other showings with interesting mineralization are on Drywood Mountain, Whistler Mountain, Barnaby Ridge facing Grizzly Creek, and near Sage Creek.

The Clark Range is part of the Lewis Thrust Sheet, a major structure of the Rocky Mountains in the southern part of Canada and the northern part of the United States. The range extends about 40 miles and is up to 20 miles wide in British Columbia and Alberta. It has the form of a syncline or basin.

Although it is uncertain whether the origin of the mineralization is sedimentary or hydrothermal, its widespread occurrence makes exploration involving prospecting, mapping, stripping, trenching, and drilling a worthwhile and promising undertaking.

RECOMMENDATIONS:

1. Prospect the areas covered by the permits in Alberta and by the claims in British Columbia.
2. Collect and study geological information on areas of interest. Map in detail the geology of the Spionkop, Drywood, and other showings warranting it.
3. Conduct geochemical surveys of stream sediments and soils.
4. Conduct electromagnetic surveys in favourable areas where the bedrock is obscured by overburden and vegetation.

5. Strip and trench the Spionkop Showing and other showings warranting it.

6. Drill the Spionkop and other worthwhile showings.

COSTS:

Prospecting, geological mapping, geochemical sampling and analyses	$ 36,500.
Geophysical surveys including line cutting	12,000.
Camp, provisions, local transportation, transportation to property	19,000.
Surface work: access to showings, stripping, trenching	15,000.
Diamond drilling 3,000 feet @ $12.	36,000.
Permit renewals	10,200.
Payments on optioned claims	23,750.
Engineering and supervision	15,250.
Administration	15,250.
Contingencies	18,250.
TOTAL	$201,200.

Respectfully submitted,

Neil J. Duncan, B. Sc., P. Eng.

PROFESSIONAL ENGINEER NEIL J. DUNCAN ALBERTA

PROPERTY

The property in British Columbia consists of 181 mineral claims as listed below. Those in the Commerce Peak - Sage Creek areas and on La Coulotte Ridge have had assessment work recorded to keep them in good standing until the anniversaries of their record dates in 1971. Those in the North Kootenay Pass - St. Eloi Brook area have had assessment work recorded to keep them in good standing until the anniversaries of their record dates in 1970. Only a few of the claim posts have been checked in the field, but all claims appear to have been located in accord with the British Columbia regulations.

Claims	Record Number	Record Date
Commerce Peak - Sage Creek		
Lion 1 to 6	10675 to 10680	June 17, 1968
Lion 8	10682	June 17, 1968
Lion 14 to 22	10688 to 10696	June 17, 1968
Lion 34	10708	June 17, 1968
Boy 13 to 17	10725 to 10729	June 17, 1968
Boy 19 and 21	10731 and 10733	June 17, 1968
Hank 15 to 18	10763 to 10766	June 17, 1968
Hank 20 and 39	10768 and 10787	June 17, 1968
Tri 1 to 43	10788 to 10830	June 17, 1968
Jim 15 to 18	10845 to 10848	June 17, 1968
Sam 8 to 10	11100 to 11102	June 17, 1968
Sam 12 and 13	11103 and 11104	June 17, 1968
Top 1 to 4	11208 to 11211	June 17, 1968
Top 10 and 12	11217 and 11219	June 17, 1968
Top 22 to 30	11229 to 11237	June 17, 1968
Aka 2 and 6	12771 and 12775	August 27, 1968

Claims	Record Number	Record Date
La Coulotte Ridge		
Stang 33 to 40	11486 to 11493	July 11, 1968
Paul 5 and 6	11498 and 11499	July 11, 1968
Paul 19 and 20	11512 and 11513	July 11, 1968
North Kootenay Pass - St. Eloi Brook		
Mike 1 to 10	11291 to 11300	June 27, 1968
Goof 1 to 8	11355 to 11362	July 5, 1968
Mike 11 to 39	11382 to 11410	July 11, 1968
Goof 11 to 33	11411 to 11433	July 11, 1968

The property in Alberta consists of six Quartz Mineral Exploration Permits totalling 67,852 acres and 75 optioned mineral claims, all listed below. Each of the claims was originally located according to the regulations in effect prior to Alberta Regulation 377/67 and so is expected to comprise approximately 51 acres except for Bighorn Fraction 95 which is smaller. None of the claims has been surveyed and none of the claim posts has been checked in the field. Nevertheless they are believed to have been located according to the regulations in effect at the time of their locations.

Quartz Mineral Exploration Permit	Acres	Date of Permit
No. 58	9,453	July 5, 1968
No. 64	9,920	August 29, 1968
No. 65	9,920	August 29, 1968
No. 66	9,440	October 3, 1968
No. 67	19,840	October 3, 1968
No. 68	9,279	October 3, 1968

Bighorn Claims	Record Number	Record Date
1, 4, 6, 2, 7, 3, 5, 8	595 to 602	March 5, 1968
9 and 10	677 and 678	July 16, 1968
12 and 13	603 and 604	March 5, 1968
18 to 21	605 to 608	March 5, 1968
22 to 30	610 to 618	March 5, 1968
31 and 32	654 and 655	May 31, 1968
33 to 43	632 to 642	May 31, 1968
44 and 45	656 and 657	May 31, 1968
46 to 51	643 to 648	May 31, 1968
53 to 55	649 to 651	May 31, 1968
56	653	May 31, 1968
57 to 61	682 to 686	August 13, 1968
62 and 63	696 and 697	August 13, 1968
64	687	August 13, 1968
81 to 86	688 to 693	August 13, 1968
87 to 91	715 to 719	October 3, 1968
92 and 93	694 and 695	August 13, 1968
Fraction 95	412	November 17, 1967
101 to 103	420 to 422	November 21, 1967

LOCATION, ACCESS
WATER, TIMBER & FUEL

The properties lie entirely within the Clark Range of southwestern Alberta and southeastern British Columbia. They comprise a large part of this range north of Waterton Lakes National Park in Alberta, and some adjoining or almost adjoining land in British Columbia. The Clark Range forms part of the southern Canadian Rocky Mountains, and straddles the Alberta - British Columbia border for about 40 miles extending northwesterly from the 49th Parallel. It contains many rugged mountains, some rising to elevations greater than 8,000 feet; the elevation of the lower valleys is about 4,500 feet.

Parts of the periphery of the Clark Range can be reached by Alberta and British Columbia Highway 3, by Alberta Highways 5 and 6, and by the southern transmountain line of the Canadian Pacific Railway and some of its branch lines in Alberta. Supplies and accommodation can be obtained in Pincher Creek or Waterton Park, Alberta or Fernie, British Columbia. Within the area are a number of all-weather Forestry, gas-well-servicing, and other gravel roads. In addition, dry-weather and 4-wheel-drive roads, and numerous trails provide access to many of the larger valleys and some of the mountain passes. Some of the mountain tops are suitable for landing helicopters, but strong winds can seriously hinder their use.

Most of the valleys contain streams or rivers of various sizes, the largest being the Flathead and Castle Rivers; hence, ample water is available except on some of the higher mountains.

Most of the lower parts of the mountain slopes are heavily timbered with spruce and other trees. Some parts are being exploited by lumber companies. Parts of the area were burned over many years ago with the resulting deadfall and second growth making travel on foot very slow in some of these areas.

Shell Canada Limited operates a large gas processing plant 12 miles south of Pincher Creek almost adjacent to Quartz Mineral Exploration Permit No.66. Coal was produced until the 1920's from large deposits near Corbin, which is west of the Flathead Range, the range immediately north of the Clark Range.

HISTORY

The Clark Range and adjoining country have received considerable attention because of the petroleum possibilities in the Paleozoic rocks of the area. This resulted in the discovery of the Waterton gas field in 1957, and the subsequent building of the gas processing plant of Shell Canada Ltd. near Pincher Creek.

For many years the metallic mineral possibilities of the Clark Range appear to have received only cursory attention. Scattered reports of copper occurrences had been made by prospectors, hunters, and trappers over the years, but not until 1963 and subsequent years did the staking of a number of claims in the vicinity of Yarrow and Spionkop Creeks on the east side of the Range almost adjoining north of Waterton Lake National Park by Frank Goble, his associates, and rivals, begin to attract the attention of mining interests.

In 1966 and 1967, Kennco Explorations Limited conducted prospecting, mapping, and drilling on some of these claims, on several Quartz Mineral Exploration Permits in the Alberta part of the Clark Range, and on and adjacent to some claims in the Commerce Peak area of British Columbia. Subsequently Kennco terminated its interest in the Clark Range.

From time to time other interests have acquired Quartz Mineral Exploration Permits, but little exploration appears to have been conducted.

In 1968, Akamina Minerals Ltd. conducted a program of prospecting, sampling, and trenching, on 75 of the Goble claims, on a number of Quartz

Mineral Exploration Permits in Alberta, and on a large number of claims located in British Columbia.

In 1969, Cominco Ltd. mapped, sampled, and trenched parts of two of Akamina's Quartz Mineral Exploration Permits.

In late 1969, Falconbridge Nickel Mines Ltd. is reported to have acquired some 200 claims in the British Columbia part of the Clark Range and in early 1970, a Quartz Mineral Exploration Permit between permits 64 and 66 in Alberta.

REGIONAL GEOLOGY

The general features of the geology of the Clark Range are well known through mapping by officers of the Geological Survey of Canada and by drilling and other geological investigations by individual companies. In the Clark Range, a block of Late Precambrian dominantly sedimentary rocks known as the Purcell Series forms part of the Lewis Thrust Sheet, a major structure of the Rocky Mountains in the southern part of Canada and the northern part of the United States. The Lewis Thrust carried the Precambrian rocks and some of the overlying Paleozoic rocks now constituting the Clark Range eastward from the vicinity of Cranbrook, superimposing them on younger Paleozoic and Mesozoic strata. The maximum stratigraphic separation is 25,000 feet to 30,000 feet, and the maximum thickness of the sheet is 20,000 feet. Other thrust faults are known particularly close to the Lewis Thrust.

The Flathead Fault is a major southwest-dipping normal fault along the west side of the Clark Range in the Flathead Valley; it extends for 50 miles or more both north and south of the Clark Range. It has dropped the strata of the Lewis Thrust Sheet at least 20,000 feet on its west side.

The Lewis Thrust Sheet in the Clark Range forms a broad synclinorium extending from the Akamina syncline in the southeast near Cameron Lake to a series of smaller synclines and anticlines in the northwest near Mount McCarty. In addition to the structures mentioned above, many smaller folds and faults are present.

Rocks of the Purcell Series have been divided into several formations; from bottom to top as designated by officers of the Geological Survey of Canada they are Waterton, Altyn, Appekunny, Grinnell, Siyeh, Purcell, Sheppard, Gateway, Phillips, and Roosville. If the minimum and maximum thicknesses measured for each formation are totalled, the thickness of the Purcell Series ranges from about 10,000 feet to more than 21,000 feet. The rocks include limestones, dolomites, argillites, siltstones, sandstones, quartzites, and andesitic lava flows. Most are cut by basic dykes and sills which are generally considered to be related to the Moyie intrusions of the Cranbrook area to the west.

NATURE OF THE MINERALIZATION

Copper sulfides - chalcocite, bornite, and chalcopyrite - and their oxidation products have been found, chiefly in the Grinnell Formation but in some other formations as well at various places from one end of the Clark Range to the other. Silver in small amounts is present with the copper.The Grinnell Formation is conspicuous among the Purcell Series because it contains bright red argillites which are dominant in the lower part. According to Price of the Geological Survey of Canada its thickness ranges from 1,700 feet in southwestern Clark Range at Sage and Kishinena Creeks to 1,100 feet in the southeast, to 750 feet in the northeast on Pincher Ridge, and to 350 feet in northwestern Clark Range. In addition to the red argillite, it contains green argillite, white and red quartzose sandstones which become quartzite in places, and conglomerates which consist of argillite pebbles in the sandstones. The quartzites are in coalescing lenticular beds, some of which can be traced several hundred feet. Mud cracks, current bedding,and ripple marks have been observed. Copper sulfides where present, can be observed in the white sandstones and quartzites, and around the edges and along cracks in the pebbles of green argillite in the conglomerates, but some weathered surfaces of sandstones containing copper sulfides appear free of the typical green copper stains.

In the Grinnell Formation, chalcocite is present chiefly in the interstices of clear, rounded, medium sized quartz grains. In places it is present in larger aggregates up to five millimeters in size. In the green argillites, where present it occurs mostly along fractures, laminations, and along the borders of pebbles in the sandstones. Bornite, where present, is mostly related to fractures and in larger aggregates than most of the chalcocite. Disseminated chalcopyrite is present in some sandstone beds, generally the less clean ones, and is much less abundant than the chalcocite in the sandstone. Some is also present in quartz-carbonate veins.

Copper mineralization has been found in some of the other formations of the Purcell Series. Conspicuous amounts of chalcocite, bornite, chalcopyrite, and their oxidation products were noted in the fine grained border phases of some diorite sills and along cracks and joints. Chalcopyrite is present in vesicles in the Purcell lava in the several localities checked and disseminated in moderate amount in grains up to three millimeters in size, for a thickness of a few inches immediately below the upper chilled margin at one place. Chalcocite is present along some laminae in a layer about six feet thick of greyish argillite within the Gateway Formation.

SHOWINGS

SPIONKOP:

The Spionkop Showing is south of Spionkop Creek, along the north side of Spionkop Ridge. It is reached by turning west from Alberta Highway No. 6 on the gravel road to the Waterton gas plant of Shell Canada Limited, south just before reaching the plant and following gas-well-servicing roads up Spionkop Creek. A bulldozed trail three miles long and suitable for 4-wheel drive vehicles leaves this road near its crossing of the Fifth Meridian, crosses Spionkop Creek and continues to the showing near the top of Spionkop Ridge.

The Spionkop showing extends for several thousand feet along the northwest side of Spionkop Ridge but the best showings are in quartzites and a sill in the upper part of the Grinnell Formation at elevations between 6,000 and 6,500 feet at the northeast end of Spionkop Ridge. Here the mountainside slopes downward at about 30° at an azimuth of 330°. The bedding in the Grinnell Formation strikes mostly between 310° and 330° and dips between 25° and 30° S.W., that is, the beds strike about parallel to the slope of the mountain and dip into it.

On Spionkop the Grinnell Formation consists of the typical red and green argillites and quartzites with the green argillites and quartzites being thicker and more abundant in the upper part of the Grinnell than in the lower part. One interval in the green argillite and the green and white quartzites near the top of the Grinnell Formation at an elevation of about 6,450 feet, consists of whitish to brownish quartzite much of which is stained with green malachite and an eight inch band of green argillite. At the one place sampled with continuous chips it contained 0.62 percent copper across 5-1/2 feet. This interval could be traced for a few hundred feet along the mountainside before disappearing below the rubble.

Short distances above and below this interval are other quartzites and argillites mineralized with copper. These were sampled with the results below. The last of these intervals is farthest down the mountain, but probably represents one of the other mineralized thicknesses repeated by faulting.

Width	Percent Copper
4'-2"	0.20
6'-6"	0.17
5'-6"	0.20

The Grinnell Formation on Spionkop Ridge is intruded by basic dykes and sills. One of these sills, stratigraphically very close to the mineralized beds which were sampled, contains conspicuous malachite staining and less conspicuous chalcocite. The copper mineralization is more abundant near the chilled edges but even there its concentration is erratic. Grab samples assaying as high as 3.45 percent copper have been obtained from this sill.

DRYWOOD:

The information given here on the Drywood Showing has been obtained from the notes of prospectors, not from an examination by a geologist. The Drywood Showing is southeast of Drywood Creek on the north slope of Drywood Mountain. It is reached by turning west from Alberta Highway No. 6 on the gravel road to the Waterton Gas Plant of Shell Canada Limited, continuing along the gas-well-servicing road up Drywood Creek, and climbing southeasterly along a creek rising on the north side of Drywood Mountain.

The Drywood Showing is in white quartzites or sandstones near the top of the Grinnell Formation at an elevation of about 5,800 feet. The mineralization consists of considerable malachite staining with chalcocite, bornite, and chalcopyrite being identified at various levels in a thickness of about 30 feet. The mineralized beds can be traced about 300 feet. No assays are available.

WHISTLER:

The Whistler Showing is on the western extension of Whistler Mountain at the Forestry Lookout at an elevation of about 7,000 feet. It is reached by taking the gravel road to West Castle from Pincher Creek, driving south about 4 miles from the Ranger Station on the road up the Castle River and then taking a trail recently bulldozed to the summit of Whistler Mountain.

On the western extension of Whistler Mountain, more than 20 green and white quartzite beds ranging up to 6 inches thick, intercalated with red argillite are mineralized with chalcocite and less bornite in the lower and middle part of the Grinnell Formation through a stratigraphic interval of about 300 feet. The distribution of the chalcocite is variable. The mineralized beds which here form part of a dip slope which dips from 27° to 42° to the south on the mountain top and side can be traced for more than 1,000 feet along strike, and several hundred feet down the dip at one place. Parts of these mineralized beds have been eroded away. Assays from four grab samples are given below.

Distance and Direction from Forestry Lookout	Thickness of Bed	Percent Copper
1,500 feet S.E.	6 inches	5.28
1,000 feet S.W.	6 inches	1.02
400 feet S.W.	2 inches	1.97
100 feet S.	4 inches	0.78

GRIZZLY:

The Grizzly Showing is at an elevation of about 6,000 feet on a spur extending east from Barnaby Ridge toward Grizzly Creek. It is reached by taking the gravel road to West Castle from Pincher Creek, driving south about 5 miles from the Ranger Station on the road up the Castle River, and then taking the 4-wheel drive road about 2 miles up Grizzly Creek, and a further one-half mile or so up a trail bulldozed in October, 1969.

In early October, only talus consisting mostly of blocks of quartzite mineralized with chalcocite, bornite, and chalcopyrite, covering an area about 50 feet by 100 feet was visible. Representative grab samples assayed 0.36 and 0.46 percent copper. Subsequent stripping is reported to have revealed an interesting thickness of quartzite carrying comparable values in copper.

NORTH KOOTENAY PASS:

The North Kootenay Pass Showing is at an elevation of about 6,700 feet about three-quarters of a mile east of the North Kootenay Pass. It is reached from the Flathead Forestry Road by taking the road to the North Kootenay Pass which leaves the Forestry Road about 1 mile east of Flathead. On this road which is better classed as a trail, the pass is about 4 miles to the northeast.

Malachite-stained greyish argillite with chalcocite along some laminae is present in a layer about 6 feet thick interbedded with red argillite in the Gateway Formation. Intermittent exposures permitted tracing this copper-bearing layer for about 200 feet. Partly oxidized samples from this layer assayed 0.24 percent and 0.98 percent copper.

SAGE CREEK:

The Sage Creek Showing is at an elevation of about 4,500 feet along the north side of Sage Creek in British Columbia. It is reached from the Flathead Forestry Road by travelling up the Sage Creek Road to the first creek west of Sunkist Brook. Part of the showing is within a few hundred feet of the road but extends both north and south of the road.

Several beds of white quartzite up to one foot thick interbedded with green and red argillite in the middle part of the Grinnell Formation are mineralized with disseminated chalcocite and chalcopyrite through a stratigraphic interval of at least 100 feet. Assays of samples from some of the mineralized beds show 0.14, 0.65, 0.24, 0.38, 0.46, and 0.50 percent copper.

EXPLORATION

Exploration of Permits 64 and 65 is being conducted by Cominco Ltd. The remaining 61,000 acres or so require a considerable exploration program for their economic assessment in addition to those previously conducted. The program planned includes prospecting of the Grinnell and other formations in which copper might have been deposited. This will include the use of stream sediment and soil sampling so that geochemical techniques can be used to assess covered parts of favourable formations. The collection of geological information will also be part of this assessment. Showings will be mapped geologically. Electromagnetic or induced polarization surveys are expected to be useful where overburden is heavy in some of the valleys.

The Spionkop Showing requires further stripping and trenching to trace the extent of the mineralized quartzite beds, and to obtain fresh unweathered samples for reliable estimations of grade. All samples obtained so far from the Spionkop Showing have been of partly oxidized surface material. When enough information has been obtained from surface work, drilling totaling between 1,000 and 2,000 feet is anticipated.

The Drywood and some of the other showings require similar stripping, trenching, mapping, and probably drilling.

ORIGIN OF THE COPPER

The origin of the copper deposited in clastic sedimentary rocks, particularly when the chief copper minerals are chalcocite and bornite, has long intrigued geologists. The well known copper deposits known as the Kupferschiefer in Germany, and from which copper has been produced for centuries are generally agreed to be syngenetic or sedimentary. The origins of the White Pine copper deposit of northern Michigan and others such as Dzhezkazgan of Kazakhstan in which the copper-bearing units are present in more than one stratigraphic interval and are of less areal extent than the Kupferschiefer but still apparently controlled by stratigraphy or possibly lithology, are less certain. The origin of the copper in the Clark Range is far from certain. The best point in favour of a sedimentary origin is the wide areal extent of the copper showings which have some stratigraphic control. On the other hand the inability to trace particular copper-bearing beds for the distances generally associated with sedimentary deposits, the presence of several copper-bearing intervals at some locations and the presence of copper-bearing beds in the lower part of the Grinnell Formation in some places and in the middle or upper parts in others, suggests an epigenetic, possibly a hydrothermal origin. In spite of this uncertainty, the Clark Range is considered to have the potential for a large copper deposit, either sedimentary or hydrothermal in origin.

CONCLUSIONS

The widespread occurrence of the copper mineralization in the Clark Range area, the favourable access and the reasonable proximity to services warrants the expenditure of some $200,000 to explore in detail the showings in Figure 3. In particular, the Spionkop and Drywood showings warrant stripping, and trenching and detail mapping. Geochemical and electromagnetic surveys will augment the geological studies of the favourable formations and structures of the Range.

Respectfully submitted,

Neil J. Duncan, B. Sc., P. Eng.

Edmonton, Alberta
January 27, 1970.

THE ASSOCIATION OF
PROFESSIONAL ENGINEERS
OF ALBERTA
PERMIT NUMBER
P462
CANFORD ENGINEERING
LIMITED

PROFESSIONAL ENGINEER ALBERTA
NEIL J. DUNCAN

CERTIFICATE

I, Neil J. Duncan, with business and residence addresses in Edmonton, Alberta do hereby certify that:

1. I am a consulting mining engineer.

2. I am a graduate of the University of Edinburgh (Scotland) in Mining.

3. I am a registered Professional Engineer in the Province of Alberta, and am a principal of Canford Engineering Limited which holds permit number 462 from the Association of Professional Engineers of Alberta.

4. I hold a First Class Mine Managers Certificate of Competency of British Columbia.

5. Commencing a Mining Career in 1946 in the United Kingdon, and having practised also in France, Germany,and South Africa, I emigrated to Winnipeg, Manitoba early in 1968 and obtained mining experience as a sales engineer to Northern Canadian metal mines, thereafter initiating a consulting practise in Alberta in November, 1969.

6. The data in this report were obtained from published and unpublished reports and maps. No personal examination has been made in the field.

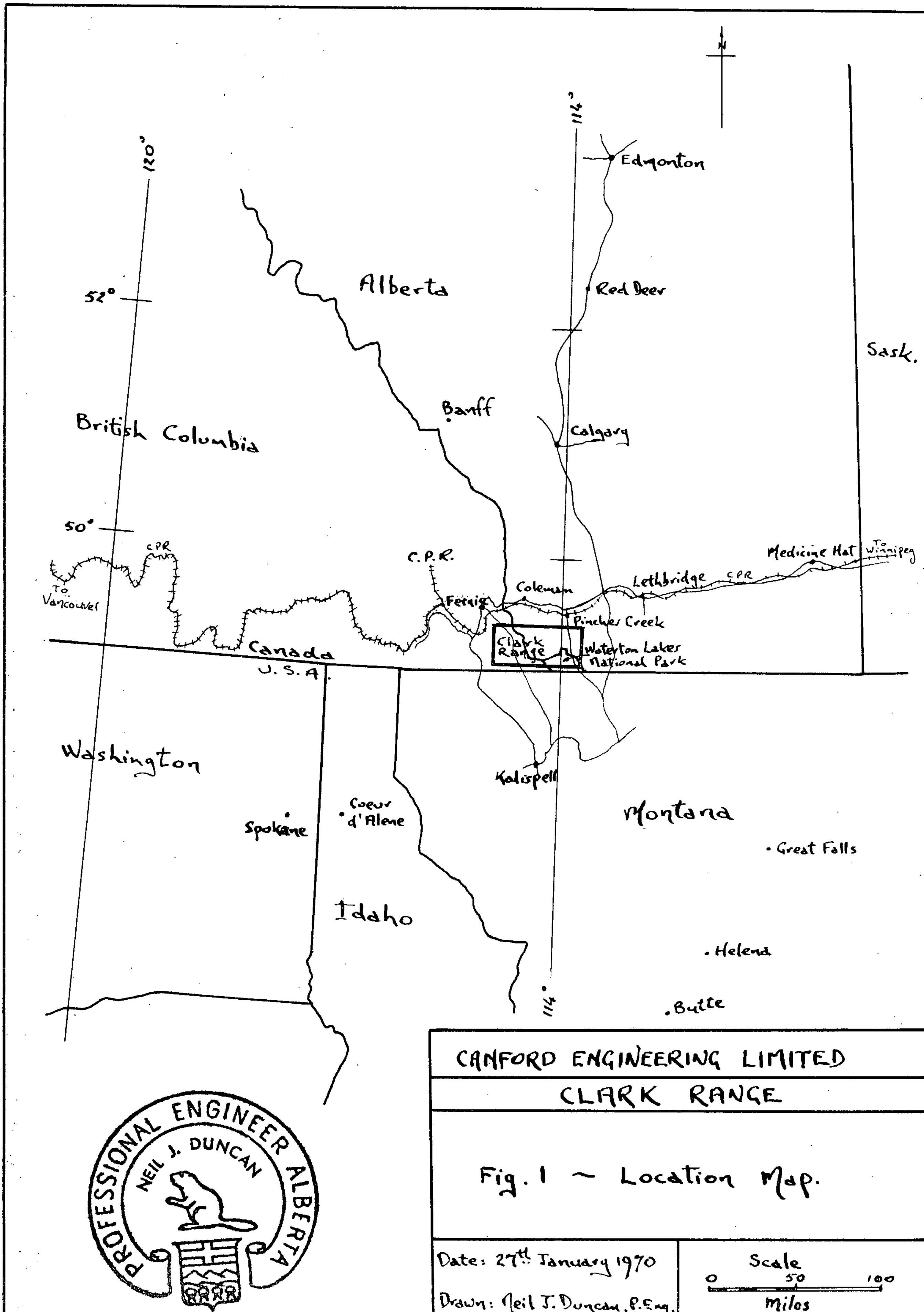
7. I do not have, nor do I expect to have, any interest directly or indirectly in the properties described in this report.

Respectfully submitted,

PROFESSIONAL ENGINEER ALBERTA
NEIL J. DUNCAN

Neil J. Duncan, B. Sc., P. Eng.

Edmonton, Alberta
January 27, 1970



CANFORD ENGINEERING LIMITED

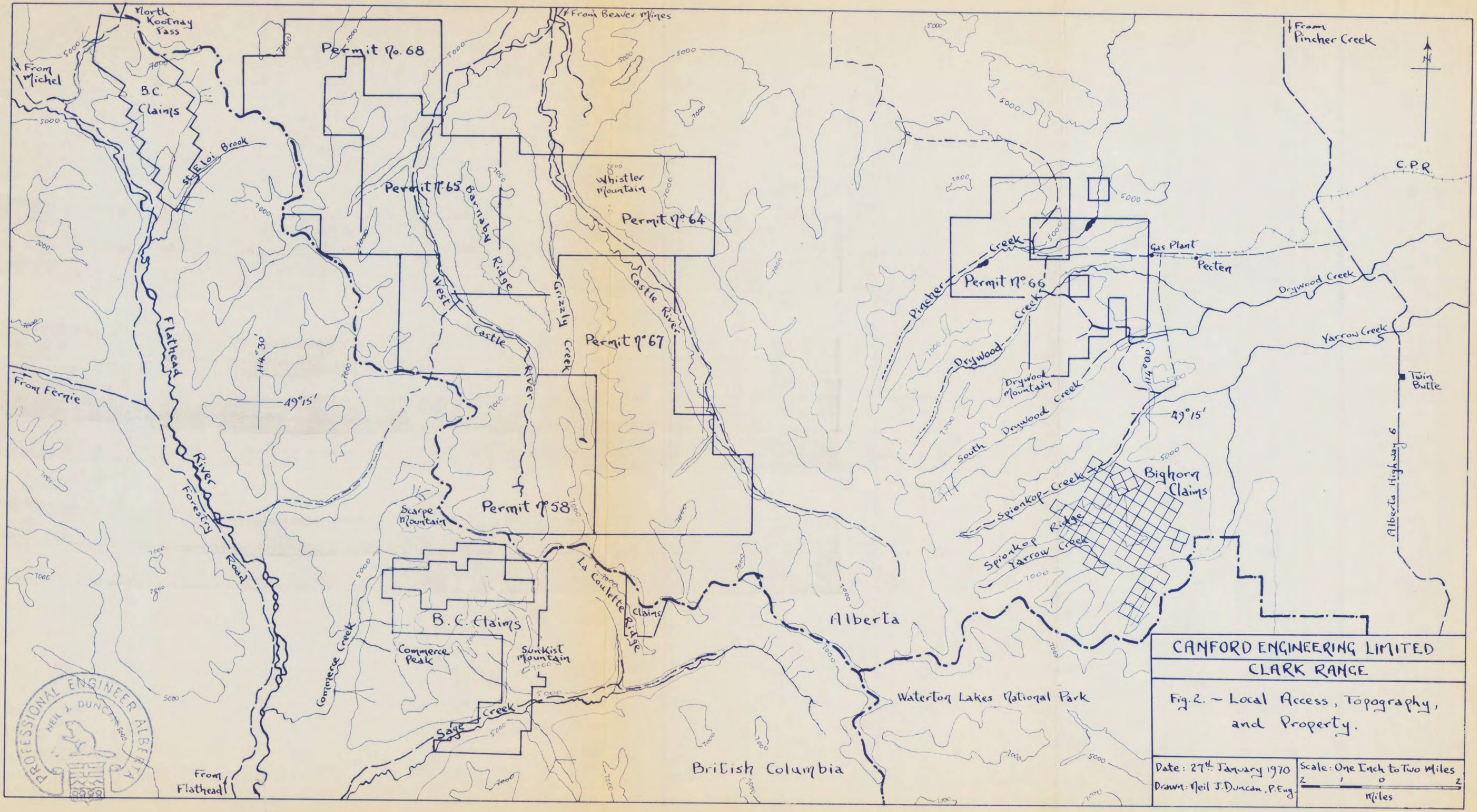
CLARK RANGE

Fig. 1 ~ Location Map.

Date: 27th January 1970

Drawn: Neil J. Duncan, P.Eng.

Scale
0 50 100
Miles



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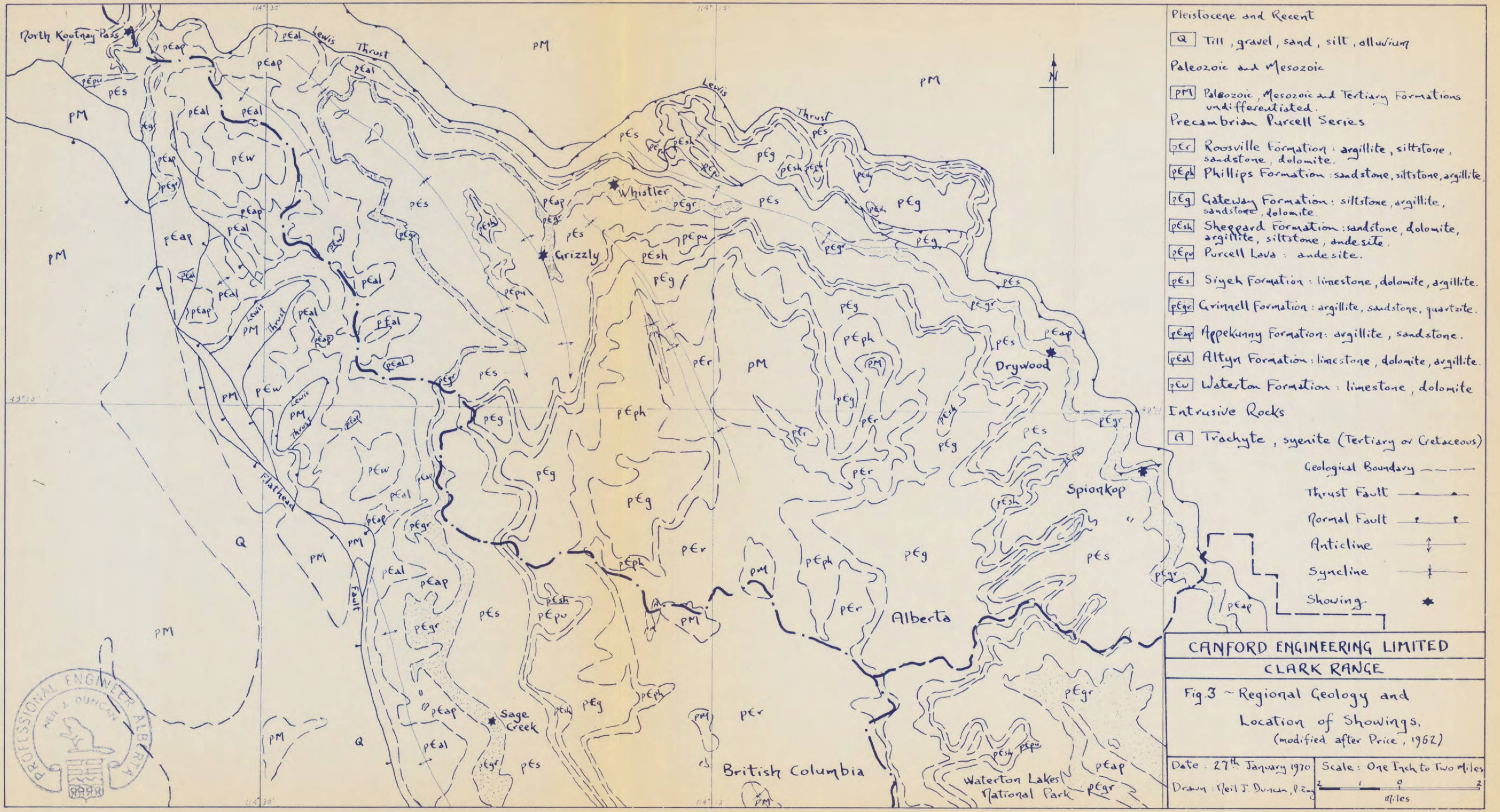
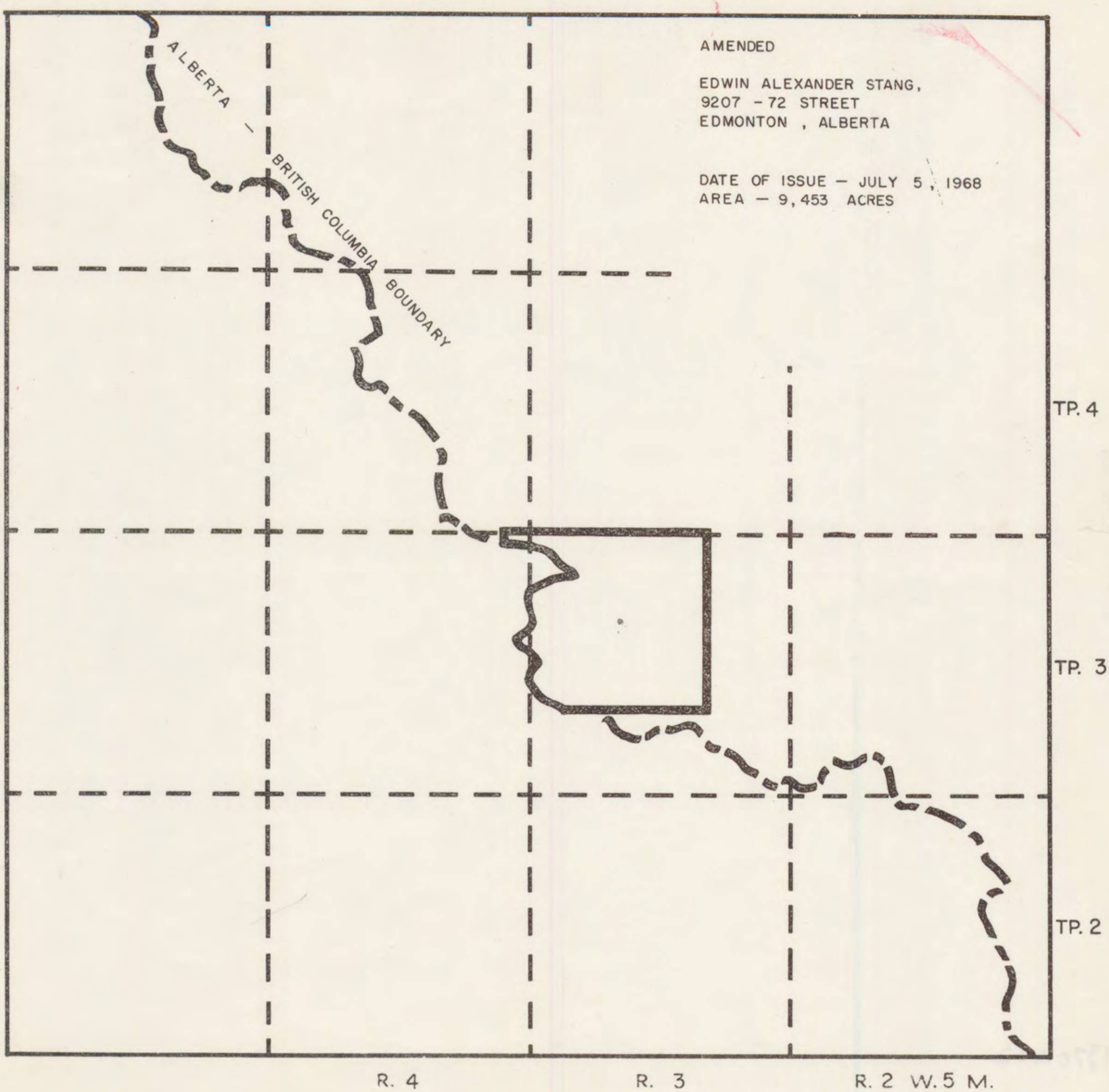
CLARK RANGE
Fig. 2. ~ Local Access, Topography, and Property.
Date: 27th January 1970
Drawn: Neil J. Duncan, P.Eng.
Scale: One Inch to Two Miles
Miles
North Kootnay Pass
From Beaver Mines
From Pincher Creek
From Michel
B.C. Claims
Permit No. 68
Permit No. 65
Permit No. 64
Permit No. 67
Permit No. 58
Permit No. 66
St. Eloi Brook
Whistler Mountain
Barnaby Ridge
West Castle River
Grizzly Creek
Castle River
Flathead River
Forestry Road
From Fernie
114°30'
49°15'
114°00'
C.P.R.
Gas Plant
Pecten
Pincher Creek
Drywood Creek
Drywood Mountain
South Drywood Creek
Yarrow Creek
Twin Butte
Alberta Highway 6
Bighorn Claims
Spionkop Creek
Spionkop Ridge
Scarpe Mountain
La Coulette Ridge
Claims
B.C. Claims
Alberta
Commerce Creek
Commerce Peak
Sunkist Mountain
Sage Creek
Waterton Lakes National Park
British Columbia
From Flathead
PROFESSIONAL ENGINEER ALBERTA
NEIL J. DUNCAN

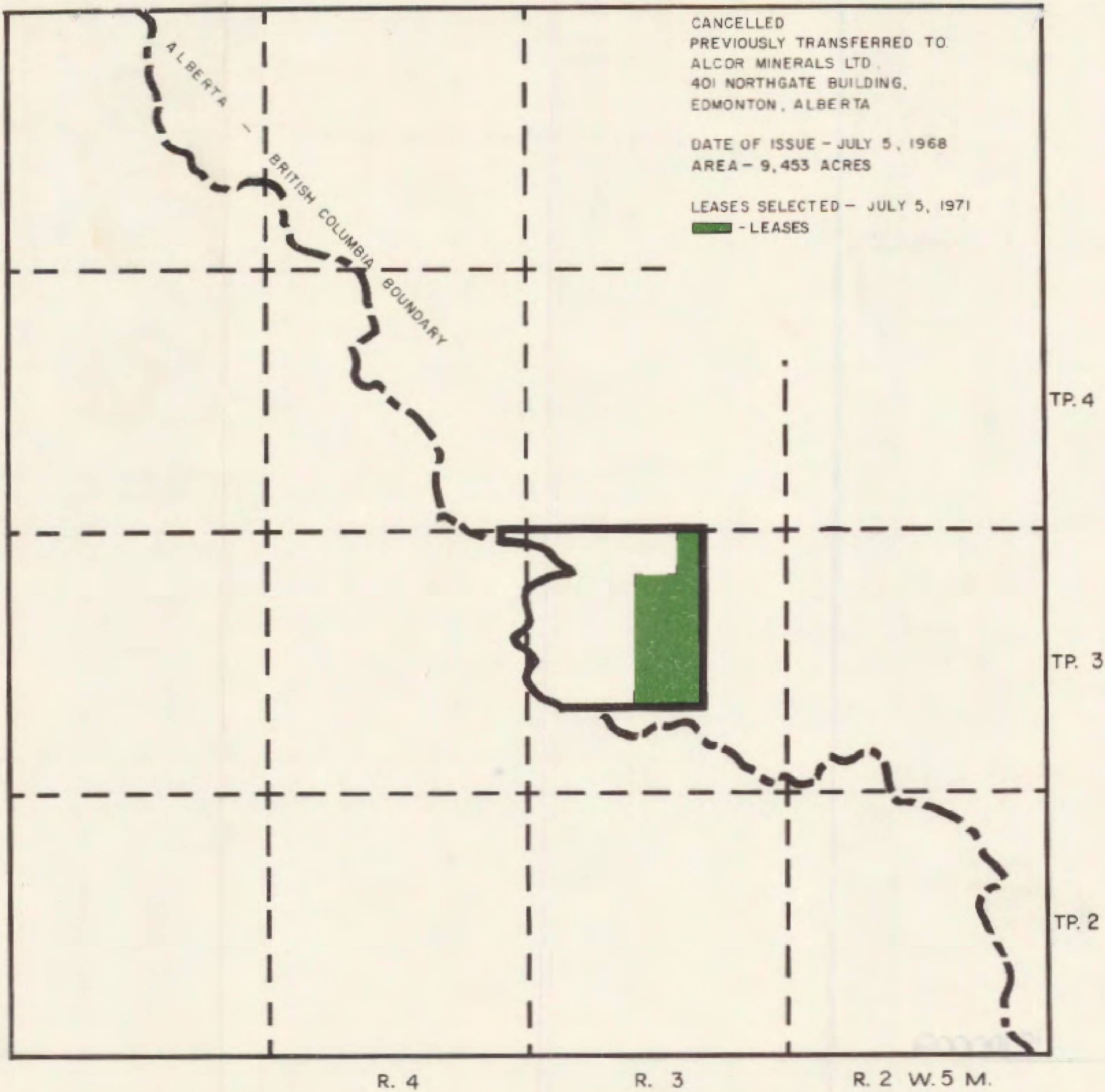

Pleistocene and Recent
Q Till, gravel, sand, silt, alluvium
Paleozoic and Mesozoic
pM Paleozoic, Mesozoic and Tertiary Formations undifferentiated.
Precambrian Purcell Series
p€r Roosville Formation: argillite, siltstone, sandstone, dolomite.
p€ph Phillips Formation: sandstone, siltstone, argillite.
p€g Gateway Formation: siltstone, argillite, sandstone, dolomite.
p€sh Sheppard Formation: sandstone, dolomite, argillite, siltstone, andesite.
p€pu Purcell Lava: andesite.
p€s Siyeh Formation: limestone, dolomite, argillite.
p€gr Grinnell Formation: argillite, sandstone, quartzite.
p€ap Appekunny Formation: argillite, sandstone.
p€al Altyn Formation: limestone, dolomite, argillite.
p€w Waterton Formation: limestone, dolomite
Intrusive Rocks
A Trachyte, syenite (Tertiary or Cretaceous)
Geological Boundary
Thrust Fault
Normal Fault
Anticline
Syncline
Showing
N
North Kootnay Pass
Lewis Thrust
Whistler
Grizzly
Drywood
Spionkop
Sage Creek
Flathead Fault
Alberta
British Columbia
Waterton Lakes National Park
114° 30'
114° 15'
114° 00'
49° 15'
PROFESSIONAL ENGINEER ALBERTA
NEIL J. DUNCAN
CANFORD ENGINEERING LIMITED
CLARK RANGE
Fig. 3 ~ Regional Geology and Location of Showings, (modified after Price, 1962)
Date: 27th January 1970
Drawn: Neil J. Duncan, P.Eng.
Scale: One Inch to Two Miles
2 1 0 2
Miles

(826/1)

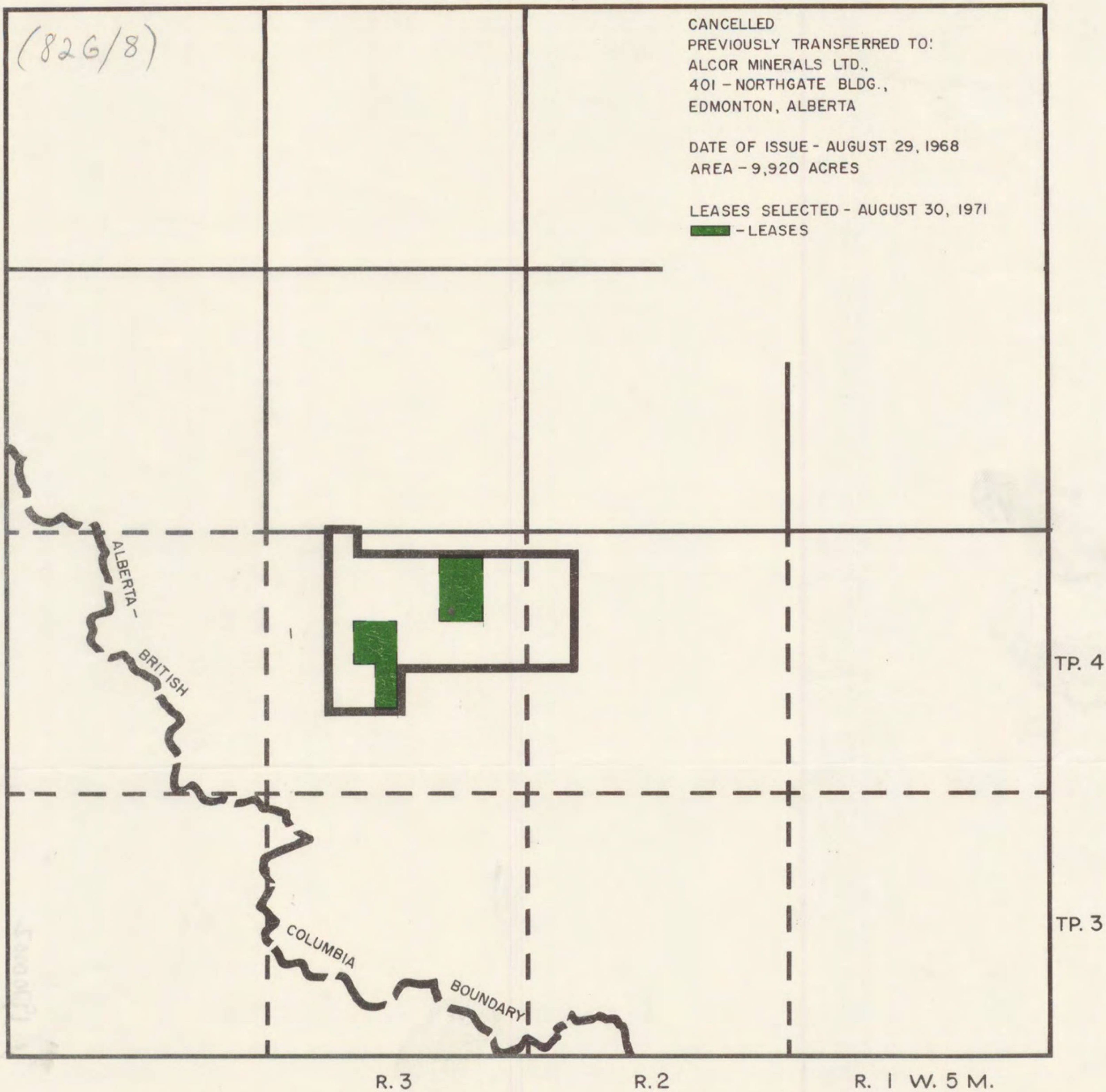
QUARTZ MINERAL EXPLORATION PERMIT No. 58



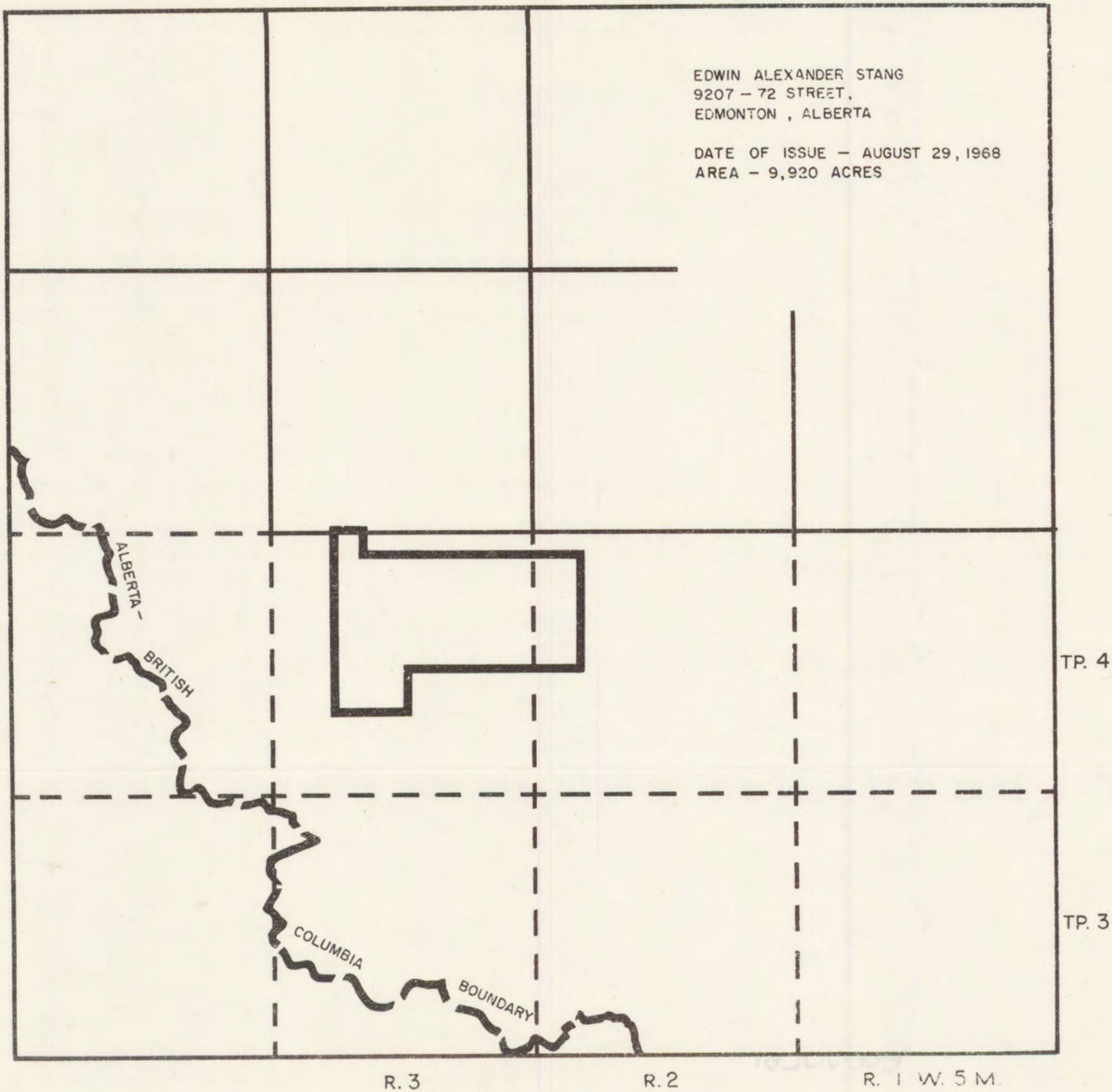
QUARTZ MINERAL EXPLORATION PERMIT No. 58



QUARTZ MINERAL EXPLORATION PERMIT No. 64(1)



QUARTZ MINERAL EXPLORATION PERMIT No. 64(2)



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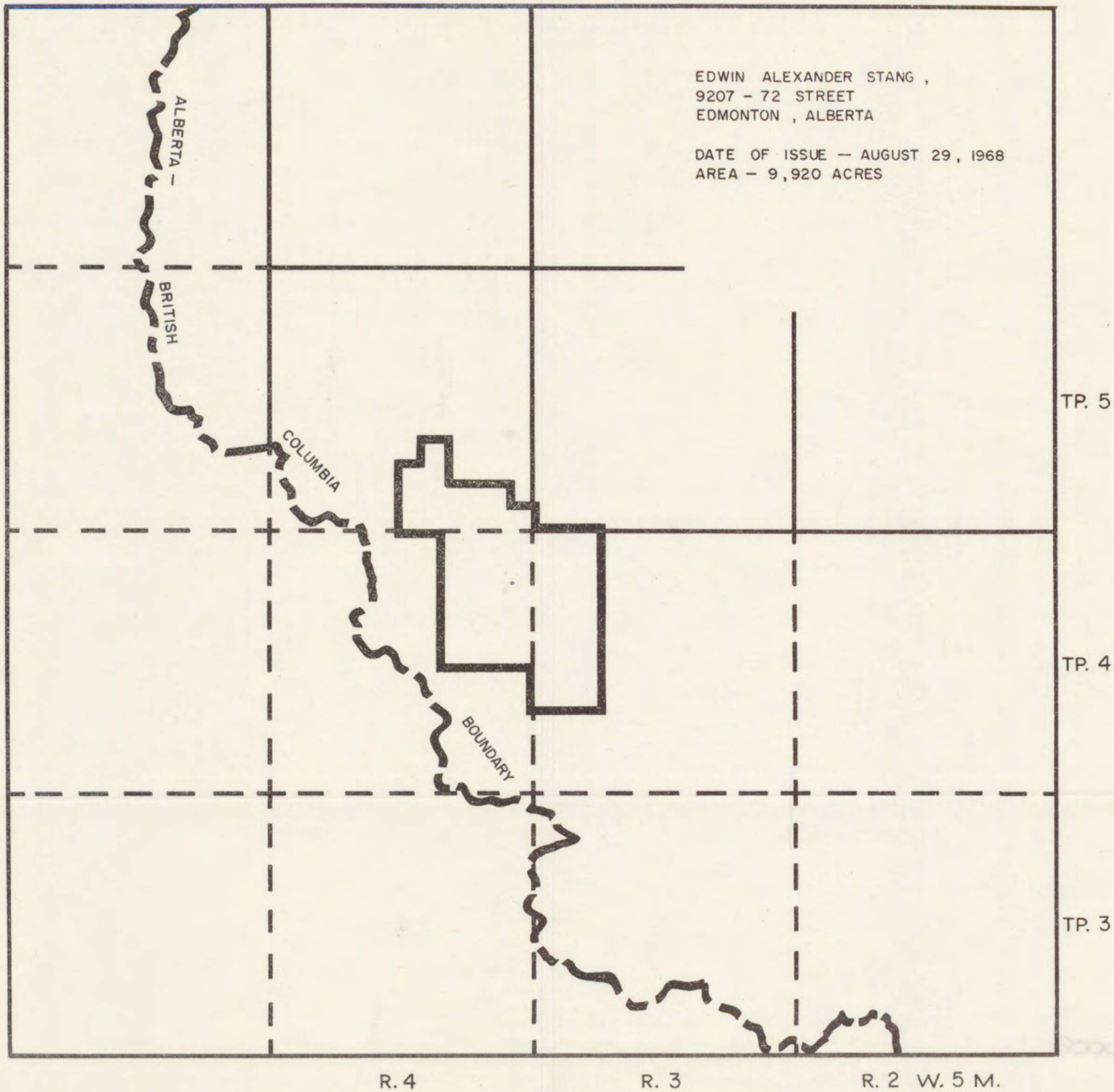
QUARTZ MINERAL EXPLORATION PERMIT No. 65



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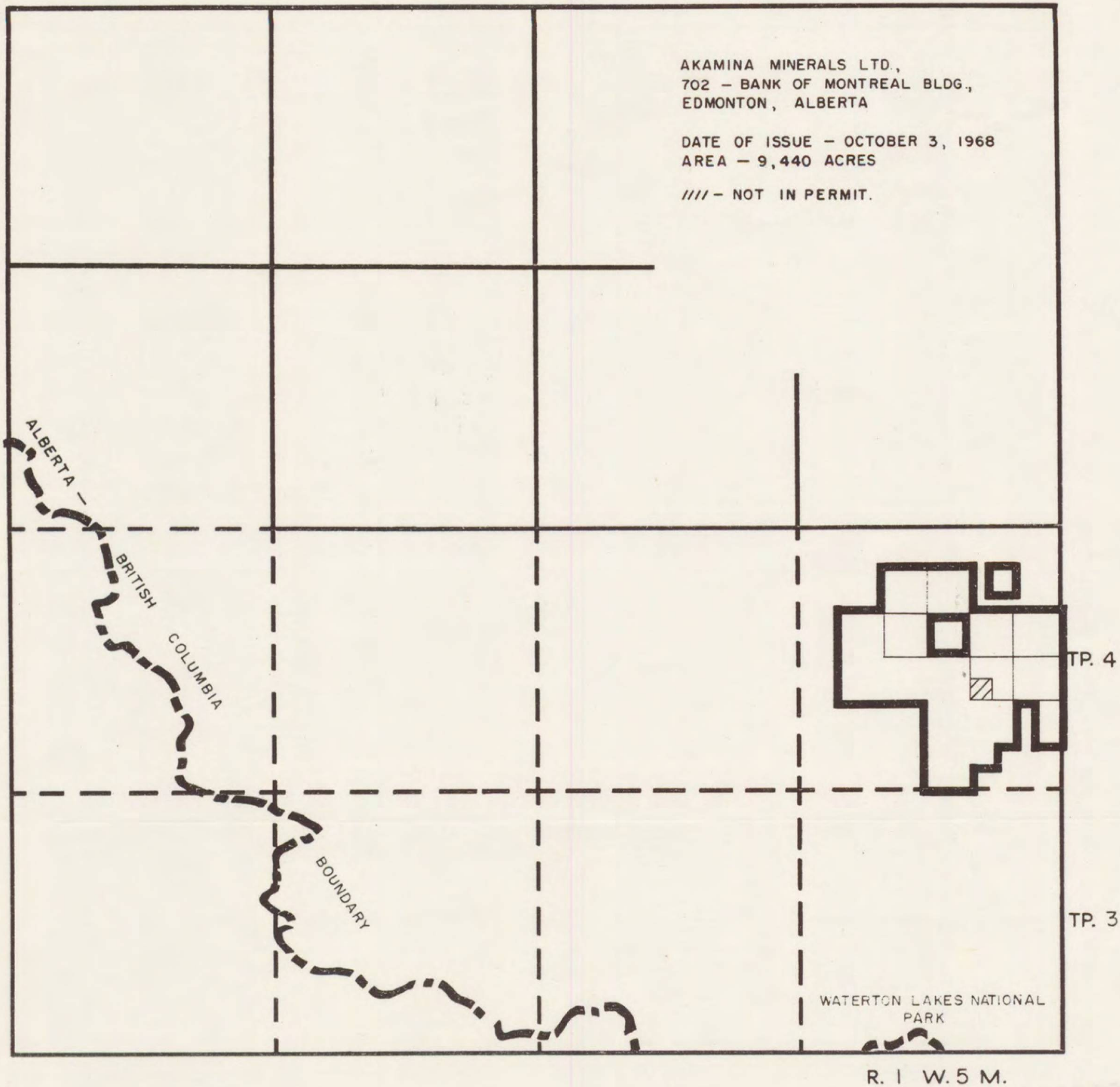
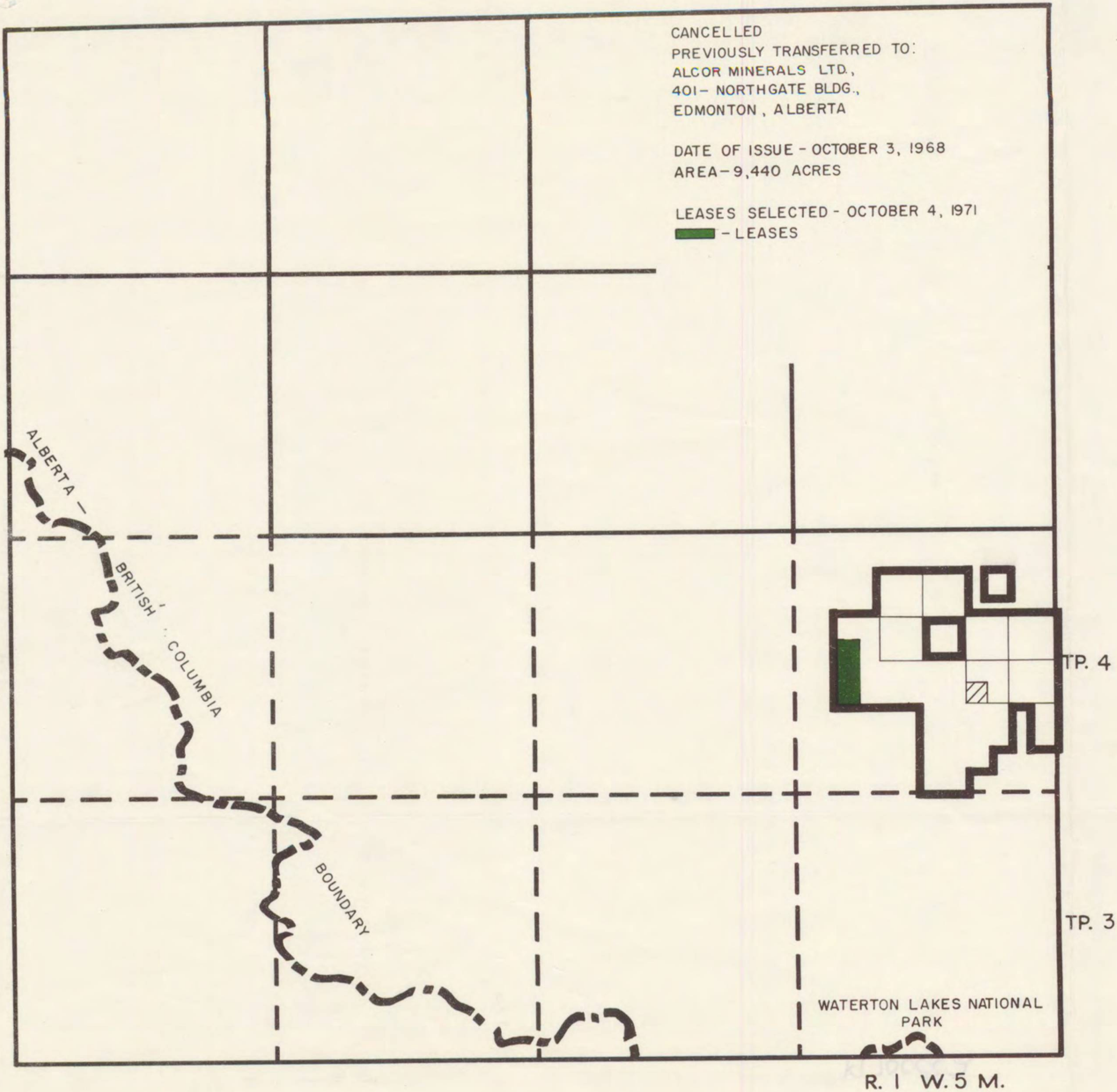
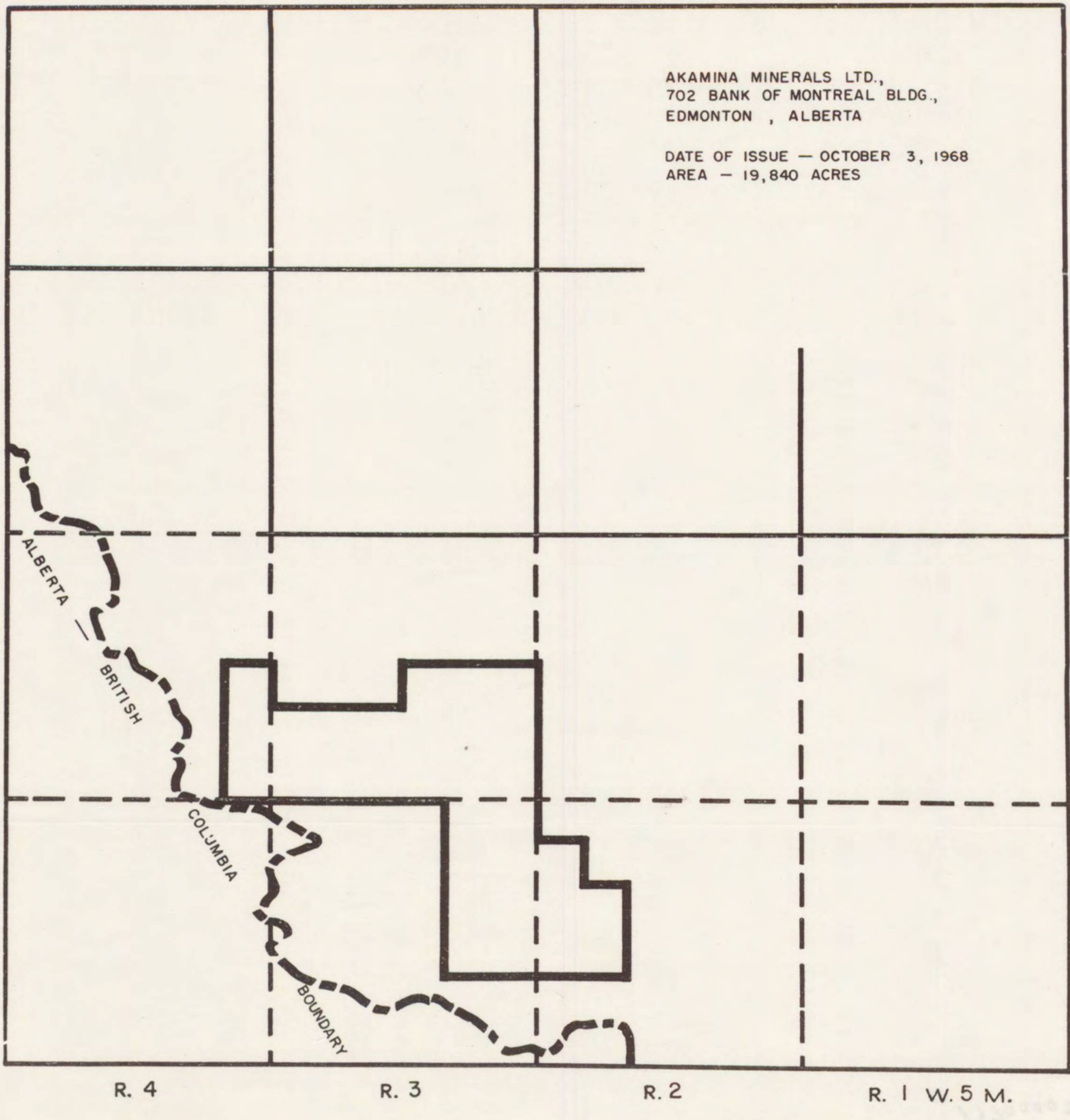
QUARTZ MINERAL EXPLORATION PERMIT No. 66 (1)



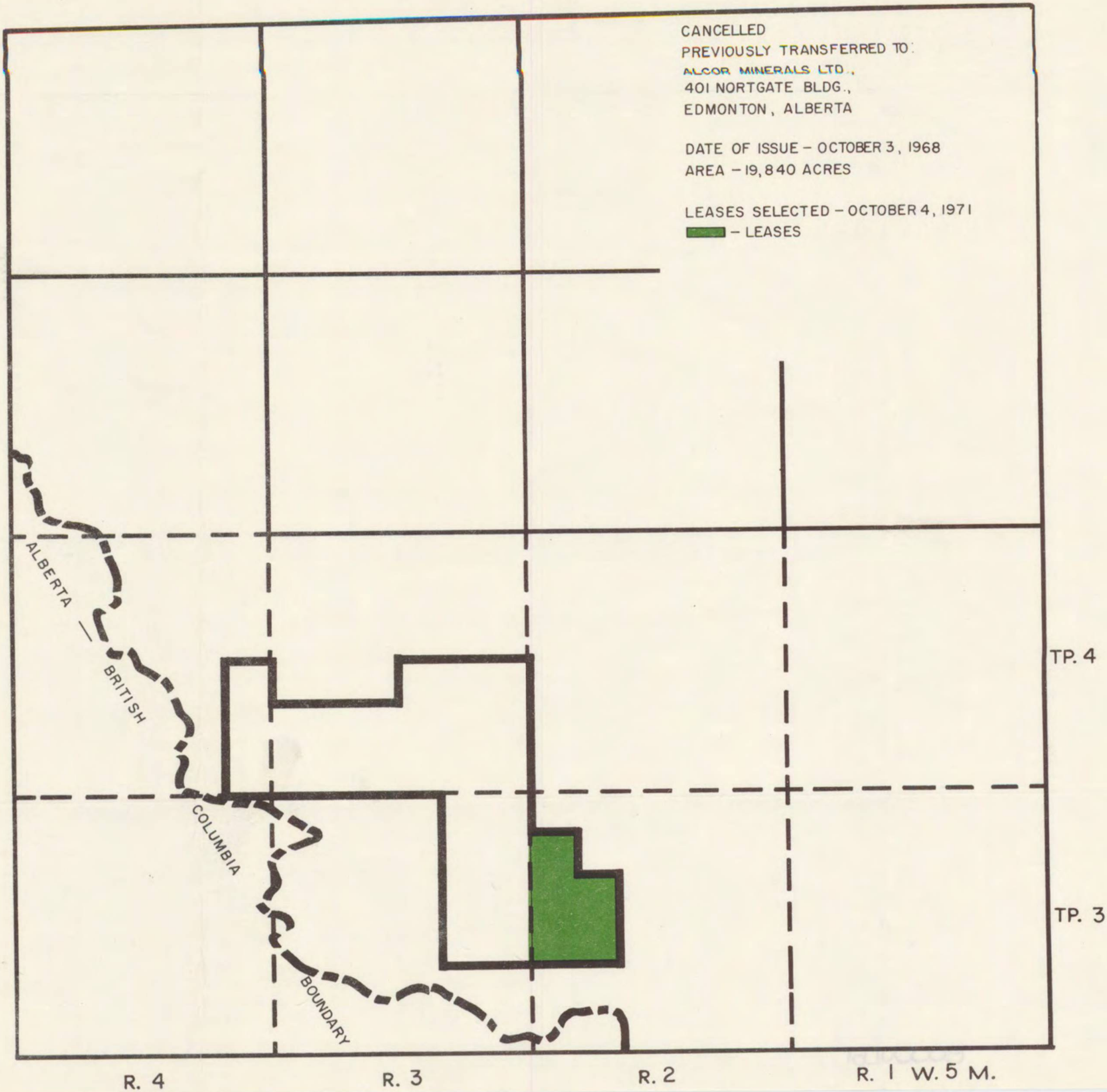
QUARTZ MINERAL EXPLORATION PERMIT No. 66 (2)



(82G/1+8) QUARTZ MINERAL EXPLORATION PERMIT No. 67 (1)



QUARTZ MINERAL EXPLORATION PERMIT No. 67 (2)



QUARTZ MINERAL EXPLORATION PERMIT No. 68

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