

2161

GEOLOGICAL REPORT
ON THE
SUNSET & UTICA CLAIMS
TRAIL CREEK MINING DIVISION
ROSSLAND AREA, B.C.
FOR
LAKE KOZAK MINES LIMITED

BY

A. C. A. HOWE INTERNATIONAL LIMITED

Location of SE corner of the 1-degree quadrilateral.....49°, 117° 50' SE
Authors.....A. C. A. Howe, P.Eng.
P. P. Griggs
Work carried out by P. P. Griggs between.....September 21, 1969 and
October 13, 1969
Examination of drill core by A. C. A. Howe.....July 4, 1969

TORONTO, ONTARIO
REPORT NO. 237

NOVEMBER 27, 1969

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Department of	
Mines and Petroleum Resources	
ASSESSMENT REPORT	
NO. <u>2161</u>	MAP.....

INTRODUCTION

Lake Kozak Mines Limited (N.P.L.) has retained A. C. A. Howe International Limited to carry out a geological study over the Sunset Group of mineral claims located in the area seven miles south of Rosland, British Columbia.

This report describes the work as it was carried out in the field by P.P.Griggs and helper under my supervision and my interpretation of the results.

PROPERTY

The property consists of one crown granted mineral claim, twenty-one full sized unpatented mineral claims and two fractional unpatented mineral claims all as outlined below: -

<u>CLAIM</u>	<u>RECORD NO.</u>	<u>TAG NO.</u>
Sunset Crown Grant	6563	
<u>Full Sized Claims</u>		
Sunset No. 2	1205	446505
3	1206	446596
Utica No. 1	1283	503001
3	1285	503003
5	1287	503005
6	1288	503006
7	1289	503007
8	1290	503008
9	1291	503009
10	1292	503010
11	1293	503011
13	1295	503013
24	1306	503024
25	1307	503025
26	1308	503026
27	1309	503027
Lynn	1211	446508
Pat No. 19	4014	46372M
20	4015	46373M
21	4016	46374M
22	4017	43675M
<u>Fractional Claims</u>		
Sunset No. 4	1247	501411
5	1248	501412

LOCATION AND ACCESS

The approximate co-ordinates of the southeast corner of the property are 49° 00' N, 117° 50' W.

The city of Rosland is located on the B. C. Highway #3B, about seven miles north of the United States border and seven miles south from the city of Trail, B.C. The road distance from Vancouver is 400 miles. Castlegar airport, a distance of twenty-seven miles from Rosland, is served three times daily by B. C. Air Lines from Vancouver. The property under discussion lies seven miles south of Rosland to the west of B. C. Highway 22 and adjoining to the United States border.

TOPOGRAPHY AND CLIMATE

The topography could generally be described as being between rolling and rugged. Elevation changes from 2200 feet to approximately 4500 feet above sea level in a distance of two horizontal miles. The slopes are heavily timbered but little underbrush is encountered.

The climate is typical of the interior of B.C. with temperatures commonly in the 80° level in summer, and below freezing temperatures in winter. Snow fall is heavy often exceeding six feet.

PREVIOUS WORK DONE

During the early years of the twentieth century the Sunset Crown Grant Lot No. 6563 was extensively prospected. Three open cuts, an adit and a short shaft were driven or sunk. From the adit, which was driven for thirty feet, several tons of ore were shipped to the smelter in Trail. The shaft was sunk for a total depth of twenty-six feet.

In 1953 several more tons of ore were taken out and shipped again to the Trail smelter. Finally in 1963, Utica Mines Ltd. (N.P.L.) acquired outright the rights of the property and staked some thirty-odd claims around the Crown Grant. They then proceeded to carry out an exploration program that included thirteen short diamond drill holes that gave a total footage of two thousand eight hundred and one feet.

At the time of writing Lake Kozak Mines Ltd. has acquired the property and the program discussed in this report is being carried out for them.

GENERAL & REGIONAL GEOLOGY

The oldest rocks present belong to the Mount Roberts Formation and consist of argillites with interbedded siltstones, greywackes, conglomerates and limestones. These rocks have been dated by T. P. Chemney of the Geological Survey as being of Carboniferous age, from foraminifers collected in the Paterson area.

Rocks of the Rossland Group are next in succession by age. These rocks are considered to be lower and (?) middle Jurassic in age and consist of andesites, latites, basalt flows, agglomerates, flow breccias, augite porphyries and some minor interbedded siltstones. The Rossland Group overlies the Mount Roberts Formation as can be seen in one of the outcrops northwest of Paterson (Note: shown on geological map in rear).

Following the Rossland Group there is a period of intrusion but intrusion of two separate rock types namely a leucocratic granite belonging to the Sheppard Intrusions and then a porphyritic diorite. Both of these rock types are believed to have been intruded during the Lower Tertiary period.

Part of the area under discussion is overlain by Pleistocene and Recent glacial till, gravel, sand and silt thus obscuring the underlying bedrock geology.

PROPERTY GEOLOGY

There are six separate rock types within the boundaries of the property and these six rock types belong to four formations. The rock types include andesite, latite and agglomerate being members of the Rossland Group, siliceous argillites belonging to the Mount Roberts Formation, leucocratic granite being from the Sheppard Intrusions and finally the quartz diorite probably being an evenly cooled facies of the porphyritic diorite intrusive.

The Mount Roberts Formation is the oldest formation found in the area. It consists of siliceous argillites with sections of material approaching chert. Striking 038° and dipping 40° north these massive but brittle argillites are in contact with members of the Rossland Group, the Sheppard Intrusions and the dioritic intrusions. The argillites are dark grey in colour and have a heavy iron stain on their cleavage planes. In the vicinity of the old workings the argillites are cut by east-west striking shear or fracture zones.

Of the Rossland Group rocks, andesite, latite and agglomerate, the latite occurs less often than the other two. The occurrence of the other two appears to be approximately equal with the agglomerate predominating in a north-south band along the approximate contact between the Rossland Group and the other rocks.

The andesite is a medium to coarse grained volcanic that is dark grey to black in colour with inclusions or phenocrysts of feldspar. These phenocrysts are poorly formed crystallographically and generally range in size from 2 to 5 millimeters in diameter. Jointing is prominent in three directions and one set appears to be of the compression variety. This set is composed of two joints, one striking 058° with 030° dip to the north, while the other strikes 088° and dips 88° north. The third joint plane strikes 020° and dips 66° east.

RECEIVED
 JAN 20 1970
 MINING RECORDER
 Trail Creek Mining Division

DOMINION OF CANADA:
 PROVINCE OF BRITISH COLUMBIA:
 To Wit:

In the Matter of

I, **A. C. A. HOWE**

of **TORONTO**

ONTARIO

in the Province of ~~BRITISH COLUMBIA~~ do solemnly declare that

Re: Lake Kozak Mines Limited, Sunset and Utica Group of Claims

(a) The number of days, with dates, worked by every person employed:

P. P. Griggs	Sept. 21-Oct. 12	18 days
R. Clarke	Sept. 22-Oct. 2	8 days
R. Punch	Sept. 26-Oct. 2	4½ days
A. C. A. Howe	Nov. 20-No. 27	7 days

(b) Rates of fee, and the total amount charged for each man:

P. P. Griggs	\$ 1320 per month	795.00
R. Clarke	48 per day	384.00
R. Punch	48 per day	216.00
A. C. A. Howe	100 per day	700.00
Total		\$ 2,095.00

(c) Itemized other direct costs related to the assessment work for which credit is claimed:

Heys & Sons	11.00
Des O'Shannessy	103.66
Foad	5.60
Living exps. re P.Griggs	104.50
Travel and hotel exps. re P.Griggs	55.65
Miscellaneous exps. re postage, dept. of mines, express, etc.	50.47
Total	\$ 330.88

And I make this solemn declaration conscientiously believing it to be true, and knowing that it is of the same force and effect as if made under oath and by virtue of the "Canada Evidence Act."

Declared before me at the **City**
 of **Toronto**, in the
 Province of **Ontario**, this **19th**
 day of **January, 1970**, A.D.

A. C. A. Howe

[Signature]

~~A Commissioner for taking Affidavits for British Columbia or~~
~~A Notary Public in and for the Province of British Columbia~~ **Ontario or Ontario**

In the Matter of

.....

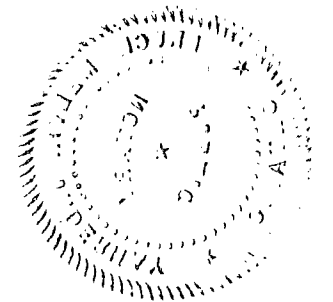
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Statutory Declaration
(CANADA EVIDENCE ACT)



The agglomerate consists of a dark grey green matrix that is fine grained almost approaching a glass in sections. Fragments in this agglomerate range in size from one sixteenth inch to four inches in diameter and there would appear to be no preferred orientation of them. The fragments are angular and consist of sandstones, diorite, latite, andesite and argillite. There would appear to be thin (less than 1 millimeter) chilled margin in the matrix around the larger fragments, the same may exist around the smaller fragments.

Lastly in the Rossland Group is the latite which is white to pink in colour. The latite is massive but brittle and is cut by two distinct joint planes, one striking 002° and dipping 70° east while the other strikes 094° and dips 86° to the north.

The leucocratic granite of the Sheppard Intrusions is a massive fine-grained (up to 5 mm.) plutonic rock consisting of approximately 95% quartz and feldspar and the remaining 5% is hematite and magnetite. The weathered surface is mottled with a colour ranging from light flesh pink to dirty white. The feldspar is generally white but at times is pink. There are two joint planes, one at 002° and dipping 85° E and the other striking 040° and dips 83° north.

Finally there is the quartz-diorite, diorite, porphyritic-diorite type rocks. Compositionally, these rocks correspond generally with the classification as described by Moorhouse. The only alteration

megascopically visible is weathering and this penetrates approximately 2 millimeters. In places where the composition tends towards quartz-diorite, the weathered surface has flesh pink splotches. Phenocrysts appear to be either augite or some other similar mineral as well as the occasional feldspar, probably oligoclase or andesine. Again jointing is prominent and again two joint planes are prominent, the first striking 173° and dipping 69° E and the second strikes 031° and dips 66° S.

ECONOMIC GEOLOGY

There are two locations of economic interest, one on the Lynn claim and the other on the Sunset Crown Grant, Lot No. 6563.

The first is approximately two hundred thirty-five feet (235') on a bearing of 210° from station forty-five north on the road. A dirty grey to white limestone containing rosettes of gypsum also contains some mineralization along bedding planes also on a contact between the limestone and a diorite there is a zone approximately two feet wide with heavy iron staining. In this zone the mineralization includes galena, pyrite and splotchy chalcopyrite. The total outcrop has a vertical thickness of twenty-to-twenty-five feet, a north-south length of eighty-five feet and an east-west width of sixty feet.

On the Sunset Crown Grant, Lot No: 6563 the mineralization is located in east-west fracture zones in argillites near the common post of Sunset #2 and #3 on the south east side of those claims. Diamond drilling was carried out by Utica Mines Limited in 1963, with a total drill program of thirteen short holes and a total footage of two thousand, eight hundred and one feet. Mineralization includes galena, sphalerite, and some chalcopyrite. This mineralization is concentrated in a fissure zone approximately one foot across but mineralization is visible over a width of up to 38 feet.

A sketch showing drill locations and old workings is included in the rear.

DESCRIPTION OF MAIN MINERALIZED SHOWINGS

The mineralization appears to be mainly galena, and sphalerite with associated silver values. Two vein systems were examined: -

1. Exposed in a short open cut and in a shaft appears to be in a fissure about six inches wide.
2. Showing appears to be wider and stronger than (1), and it is exposed in an open cut plus an adit 25 feet long. A second open cut approximately 50 feet on strike from the first one also exposes the vein.

Diamond drilling of this vein has indicated disseminated mineralization on each side of the vein over widths up to 38 feet.

Both veins strike approximately east-west and dip at about 75° to the south. Vein number 2 where exposed is between 6" and 1' wide, but disseminated mineralization occurs in each side.

Shipments of ore were made by Warren Crowe to the smelter at Trail. One shipment was made from the lower adit located approximately 200 feet vertically below the upper adit on number 2 vein. The lower adit could not be examined by the writer due to rock fall at the portal. Other shipments were made from the open cuts (see attached smelter returns).

The veins occur within limestone beds. The limestone is fine grained, siliceous and hard. At approximately 100 feet north from the number 2 vein Sophy series conglomerates occur and the contact appears to dip almost vertically and strike east-west.

EXAMINATION OF DRILL CORE

The core from a program of 13 holes was examined by the writer. The results are summarized in the following table: -

Diamond Drill Hole No.	Bearing	Dip	Length (Feet)	Vein Intersection (Feet)	Ag ozs./ton	Assays			
						Pb %	Zn %	Cu %	
1	S 5° W	-40°	201	33 - 34	12.7	12.3	15.4	1.1	
				98 -100	7.9	10.6	15.3	0.8	
2	S 5° E	-40°	264	122 -123	4.5	2.6	18.5	0.5	
3	N 5° E	-40°	169	108.5-114.5	11.4	3.3	9.6	1.4	
4	N 5° W	-56°	247	96 - 97	4.4	2.5	7.5	0.4	
				152 -153	4.0	3.0	0.6	0.4	
				165 -166	1.2	0.6	8.1	0.5	
				183.4-189.4	0.6	1.2	6.2	Tr.	
5	S 5° E	-40°	296	117.5-122	4.6	2.2	0.05	Tr.	
6	ABANDONED AT FIFTY-EIGHT FEET								
7	S 5° E	-55°	Hole Collared December 20, 1963 at which time work was halted for holiday season.						
8		-50°	227						
9		-70°	205	Too steep to intersect the shear zone					
10		-70°	187	139 -153	3.4	3.0	0.6	1.3	
				164 -167	1.4	6.0	8.1	0.9	
				175 -177	0.6	4.0	6.2	0.7	
11		-80°	207	Too steep to intersect the shear zone					
12		-60°	124	23 - 24.5	6.5	4.4	0.7	0.2	
				164 -167	0.9	1.2	0.8	Tr.	
13		-45°	400	288.5-290	0.9	1.7	4.8	0.6	
				360.5-365.5	1.3	0.2	3.6	Tr.	

Hole No.2 intersected vein No.2 from 122-123 and contains massive sulphide mineralization over a width of one foot.

However an interesting zonal alteration occurred from 123 - 126 and again from 129 - 131. This zone of alteration appears to be silicification of the argillites accompanied by pyrite disseminated throughout, and tiny hairline fractures containing sphalerite and galena mineralization.

Hole No. 3 drilled at approximately 40' west of Hole No. 2 intersected a wide zone of fracturing with sphalerite, galena, chalcopyrite mineralization occurring in small fractures and in massive sections. An assay obtained from 108.5' to 114.5' averaged 14.8 ozs. of silver, 6.9% lead, 17.2% zinc and 1.9% copper. This does not represent the true width since the hole was drilled towards the vein, however, the true width would be approximately 4 feet. It was observed that at least 3 feet of core was missing in the core boxes between 105' and 114.8' indicating heavy core loss. It is likely that the loss occurred in the higher grade sections.

Hole No. 4 intersected a 1 foot section at 96 - 97 feet with some massive sections of sphalerite, however, the core appeared to be shattered with high losses of mineralized sections. The other intersections in Hole No. 4 could not be pried loose from the core box.

Hole No. 10 intersected mineralization from 139 - 153 feet in the core with an average assay of 3.4 ozs. silver across the full width. The mineralization consists of sphalerite, galena, chalcopyrite mineralization in fractures and as replacement within the rock. It is quite noticeable that

where mineralization occurs the rock is silicified and altered. The dull grey argillites changes to a buff to white colour. Hole No. 10 was drilled at 70° and therefore true width is probably more in the order of 8 feet. In addition there are intersections at 164' - 167' and 175' - 177' which indicate an extensive zone of mineralization. In Hole No. 10 assays are available from 139' - 153' averaging 3.4 ozs. of silver, however the core has been split from 153' to 167' and mineralization can be observed throughout, but assays are not available. An assay report indicates 1.4 ozs. of silver from 164' - 167', however, the overall assay may well be in the neighbourhood of one ounce across the total width of 38 feet of core.

CONCLUSIONS AND RECOMMENDATIONS

On the basis of the geology it is recommended that: -

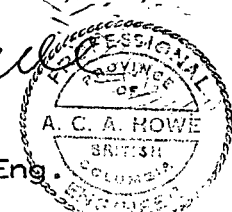
1. A geochemical survey be carried out over the entire property on lines spaced 500 feet apart and running E-W.
2. A limited induced polarization survey be carried out over the two showings and any anomalous areas as depicted by the geochemistry and magnetometer surveys.
3. A magnetometer survey be carried out over the entire property along the same lines as the geochemical as well as N-S lines, also spaced 500 feet apart.

Magnetometer work is recommended because this instrument should be able to detect boundaries between rock types and the east-west fissure zones should be picked up and possibly extended. Geochemistry is recommended since it may indicate some more fissure zones or at least mineralization which can be correlated with magnetometer and induced polarization may indicate areas containing replacement type deposits.

Respectfully submitted,

A. C. A. HOWE INTERNATIONAL LIMITED


A. C. A. Howe, P. Eng.



Expiry date

P. P. Griggs.

DATED AT TORONTO, ONTARIO THIS 12th DAY OF NOVEMBER, 1969.

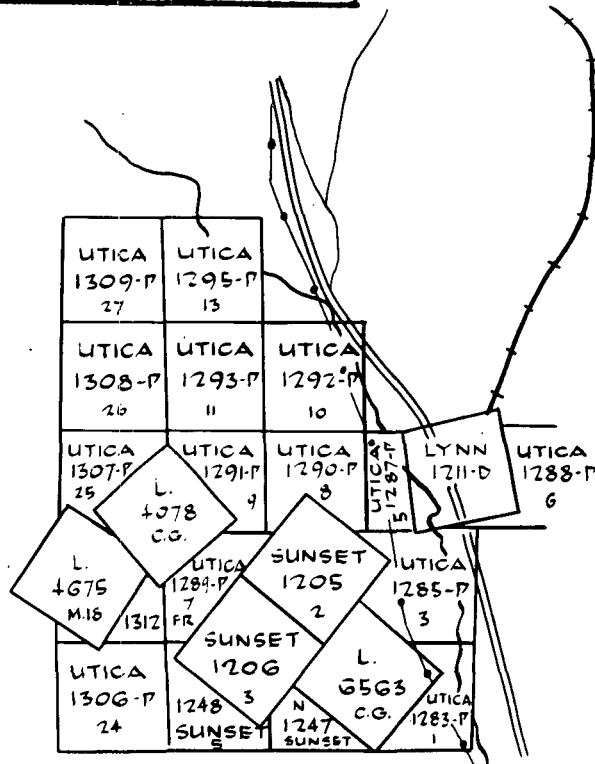
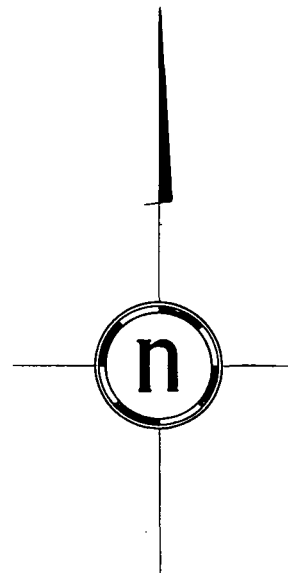
RECORD OF SHIPMENTS TO COMINCO SMELTER AT TRAIL, B.C.

<u>DATE</u>	<u>TONS</u>	<u>AU</u>	<u>AG</u>	<u>PB</u>	<u>ZN</u>	<u>CU</u>	<u>VALUE</u>	<u>SMEETING</u>	<u>RECEIVED</u>
AUG/52	1.5	TR	12.8	37.5	3.8	1.4	157.80	16.08	141.72
AUG/63	4.5	TR	14.7	11.	9.1	1.3	110.08	52.38	57.70
OCT/64	6.9	.07	11.5	7.1	23.9	2.6	248.19	97.01	151.18

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NO. 2161 MAP #1



Claims Locations Map:

LAKE KOZAK MINES LTD.

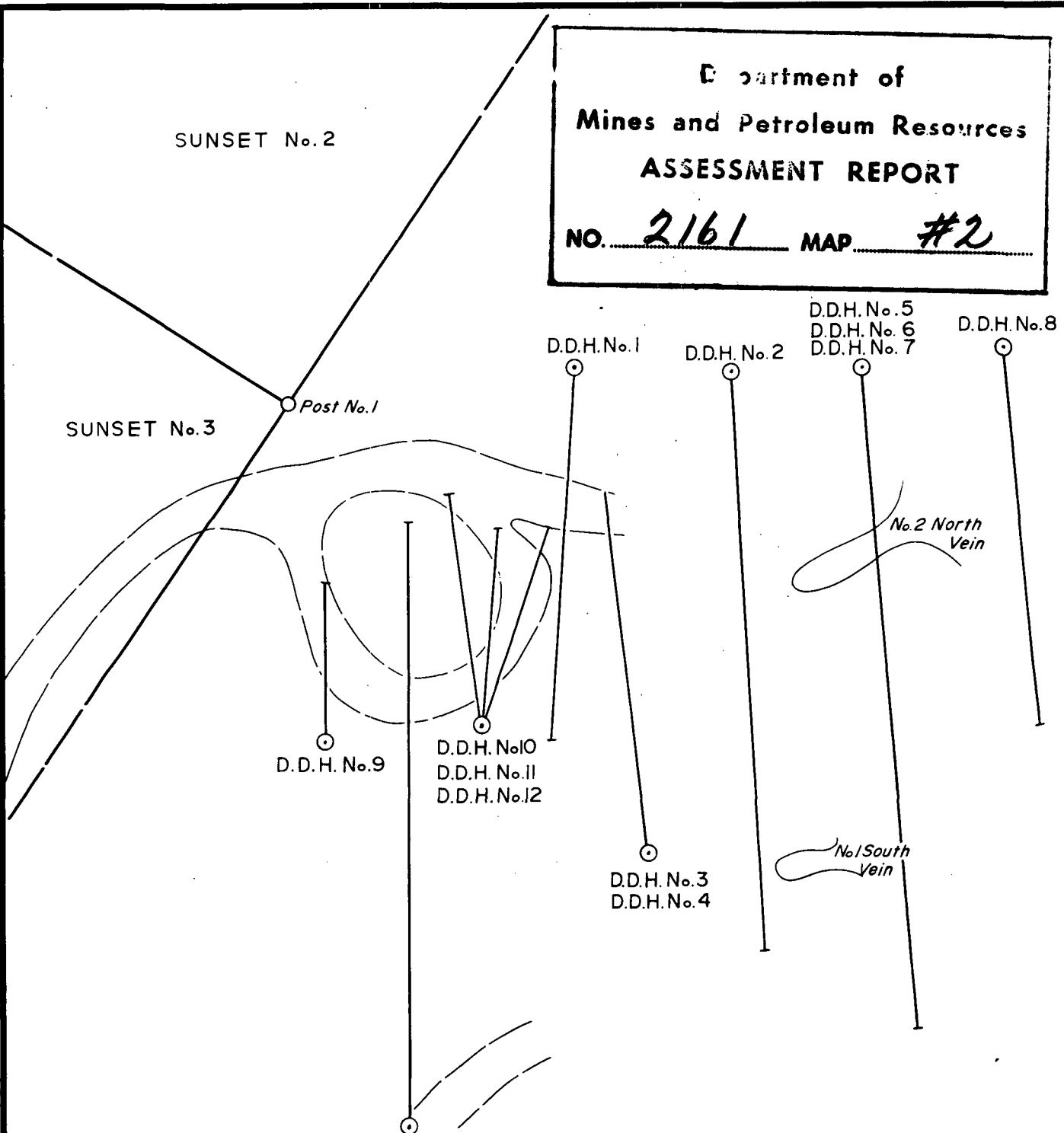
ROSSLAND AREA B.C.

ACA HOWE INTERNATIONAL LTD.

Scale 1" = 1/2 Mile

Sept. 1969

Department of
Mines and Petroleum Resources
ASSESSMENT REPORT
 NO. 2161 MAP #2



DRILL HOLE PLAN

LAKE KOZAK MINES LTD.

ROSSLAND AREA ~ B.C.

SUNSET GROUP WORKINGS

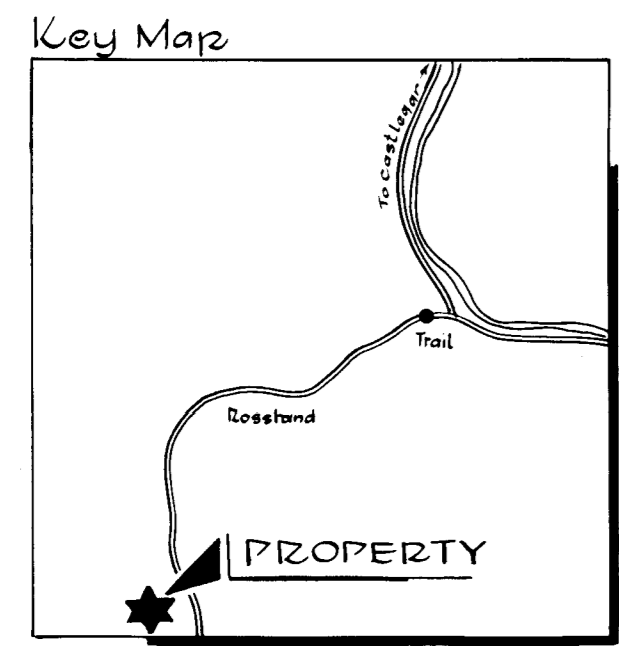
by
 A.C.A. HOWE INTERNATIONAL LTD.

SCALE: 1" = 50'

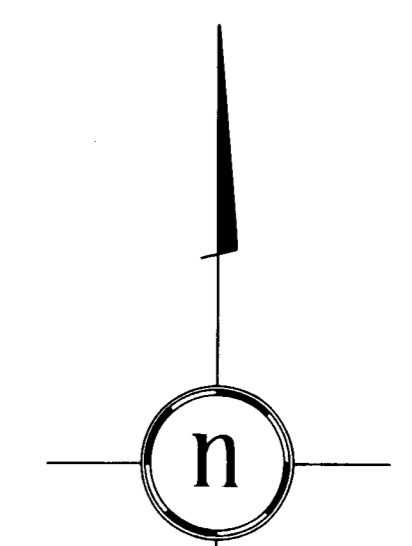
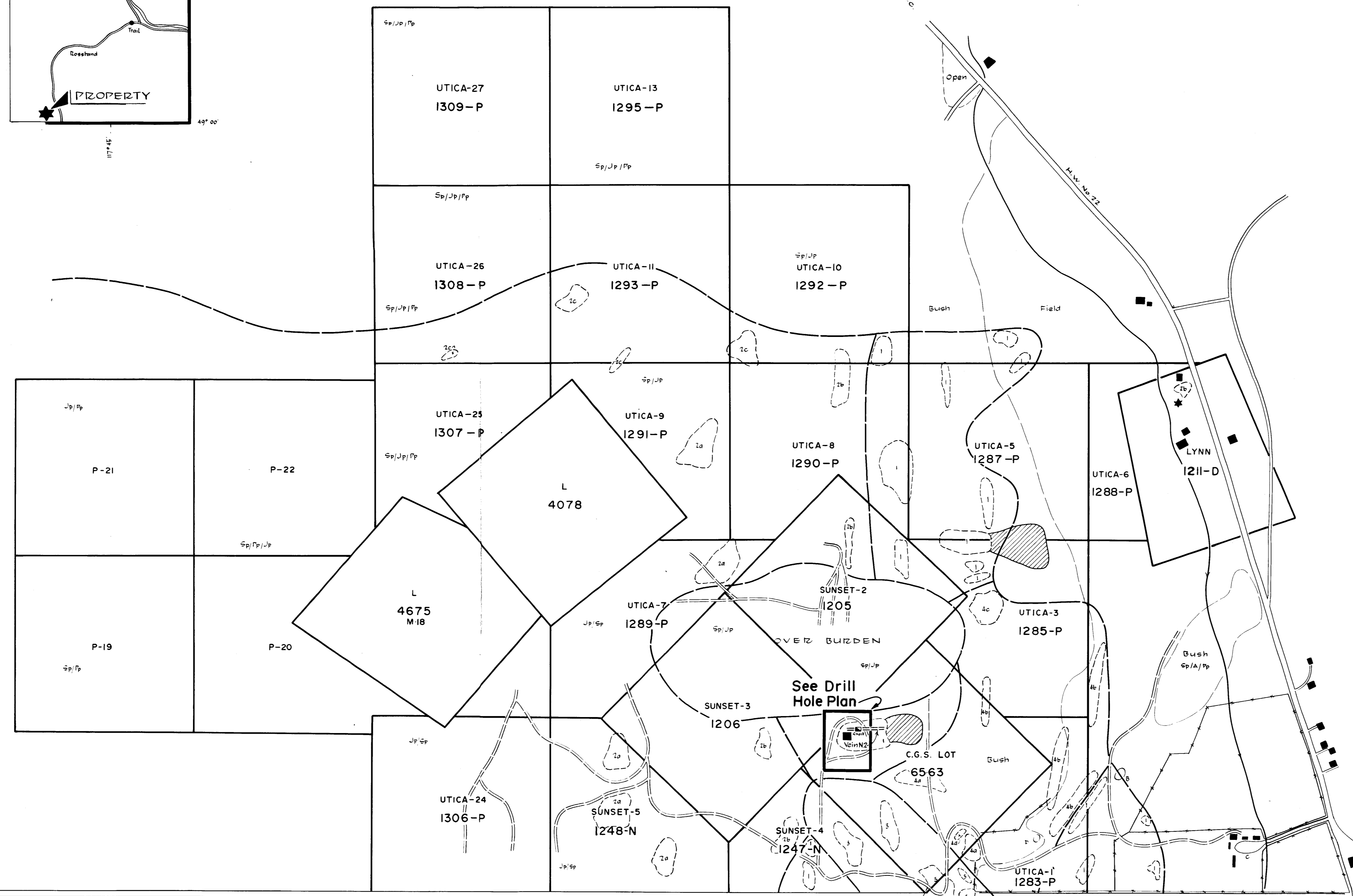
SUNSET C.G.
 Lot No. 6563



October 20, 1978



75+00N
70+00N
65+00N
60+00N
55+00N
50+00N
45+00N
40+00N
35+00N
30+00N
25+00N
20+00N
15+00N
10+00N
5+00N
0+00



Legend

- Porphyritic Diorite - a - Porphyritic Diorite
b - Quartz Diorite
c - Diorite
- Sheppard Intrusions - Leucocratic Granite
- Rossland Group - a - Andesite
b - Agglomerate
c - Latite
- Mt Roberts Formation - a - Siliceous Argillites
b - Limestone
- Scree Area
- Assumed Contact
- Replacement of Limestone by Pb and Zn
- Sp Spruce
- Jp Jack Pine
- Pp Poplar

**Department of
Mines and Petroleum Resources
ASSESSMENT REPORT
NO. 2161 MAP #3**

**SUNSET GROUP
LAKE KOZAK MINES LTD.
ROSSLAND AREA B.C.
GEOLOGY 2161
by
A.C.A. HOWE INTERNATIONAL LTD.**

