

GEOLOGICAL, GEOPHYSICAL & GEOCHEMICAL REPORT

ON ASSESSMENT FOR

LAT. $49^{\circ}05'$ LONG. $117^{\circ}45''$

Kay #1 - #18 82F04W

Eli #1 - #22

REPORT BY A. R. BULLIS, P. ENG.

May 26 - July 5, 1969

BULLIS ENGINEERING LTD.
VANCOUVER,



Maps enclosed in back pocket for assessment work.

Key #1 - #18 - 1 map showing line cutting and geophysics.

Eli #1 - #22 - 1 map of line cutting, soil sampling.

- 1 map of geophysics.

GEOCHEMISTRY

Soil sampling : spades were used to take samples in B horizon

: samples were bagged in standard TSL soil sampling brown paper bags.

: samples were dried at 105°C in an oven

: samples were screened through 80 screen mesh

: standard hot HCl extraction method of analyses was used to determine ppm of copper and Zinc.

SALEM MINES LTD. (N.P.L.)
REPORT ON ROSSLAND PROPERTY

By:

A.R. BULLIS, P. Eng.

August 5, 1969

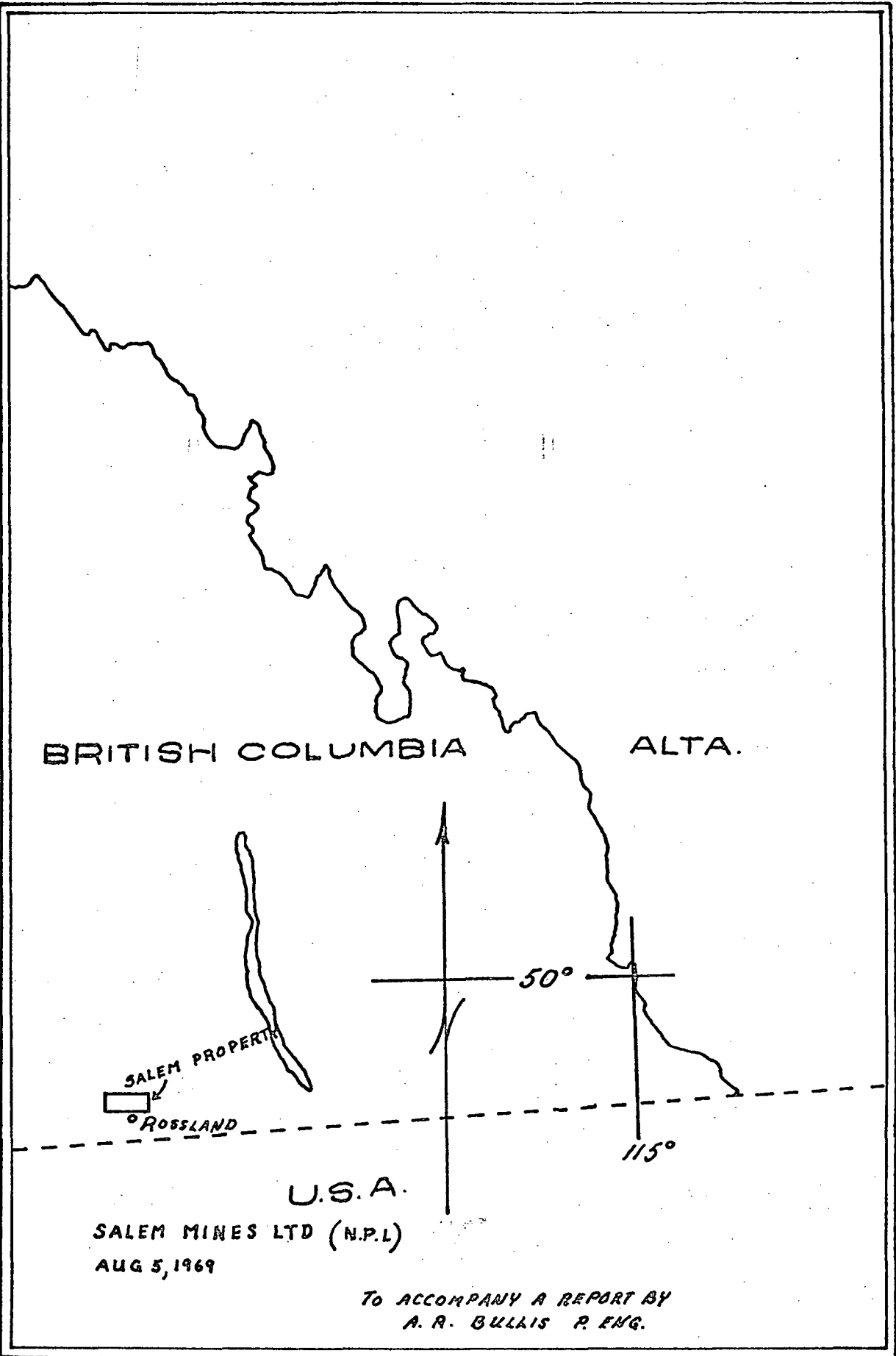
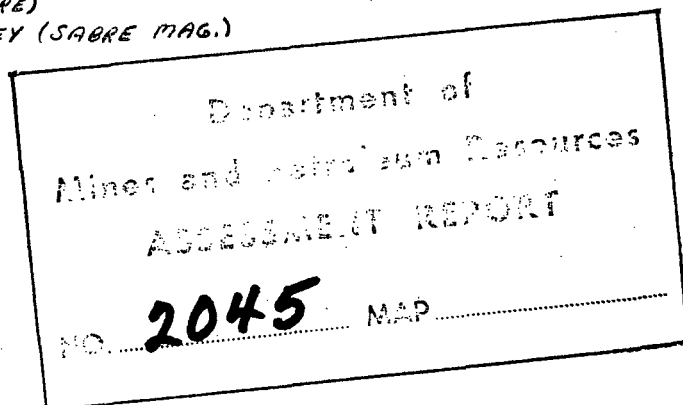


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INTRODUCTION

The author was retained by Salem Mines Ltd. (N.P.L.) in April, 1969, to examine the various claims held by Salem Mines in the Rossland area of British Columbia. At the same time, Strato Geological Ltd. was given a contract to carry out geochemical and geophysical surveys on the properties on the recommendation of the author.

The following report is a summary of the work completed to date. The results obtained are discussed and recommendations for further exploration of the claims are in the body of the report.

SALEM MINES LTD.

RECOMMENDATIONS:

1. The geochemical anomalies should be investigated further by a detailed programme of soil sampling on lines spaced at 100 or 200 foot intervals.
2. The magnetic anomaly on the Kay 3 and 5 claims should be investigated by (a) a geological mapping programme and (b) by a soil sampling programme conducted over the anomaly.
3. Additional prospecting and geological mapping should be done around all known sulfide occurrences.
4. Trenching and stripping should be carried out over any known mineralization zone and over those areas of high metal content in the soil.
5. Additional funds should be provided to allow the testing of favorable zones by diamond drilling.

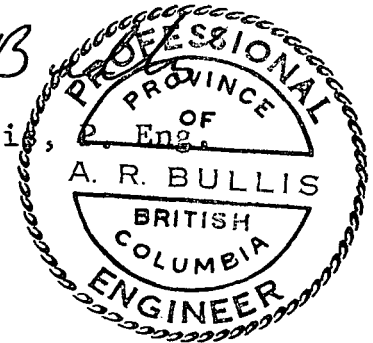
COST OF RECOMMENDED PROGRAMME

1.	Prospecting and Mapping	\$ 3,000.00
2.	Geochemical Programme	12,000.00
3.	Trenching and Stripping	8,500.00
4.	Drilling Contingency - 2,000 Ft. @ \$8.50/Ft.	17,000.00
5.	Engineering and Supervision	3,000.00
6.	Assaying and Sampling	1,500.00
	Sub Total -	<hr/> \$ 45,000.00
	Plus Contingency -	5,000.00
	TOTAL -	<hr/> <hr/> \$ 50,000.00 <hr/> <hr/>

Respectfully submitted,

CRB

A.R. Bullis,



PROPERTY

Salem Mines Ltd. holds the following claims:

<u>Claim Name</u>	<u>Claim Number</u>	<u>Expiry Date</u>
Rich #1 & #2	3072 & 3073	Apr. 26, 1970
Rich #3 & #4	3075 & 3074	Apr. 26, 1970
Rich #5 & #6 Fractions	3077 & 3076	Apr. 26, 1970
Rich #10 to #13	3170 - 73	May 16, 1970
Rich #7 Fraction	3078	Apr. 26, 1970
Rich #16 to #21	3389 - 94	June 10, 1970
Eli #1 & #2 Fractions	3619 & 3620	Oct. 3, 1969
Eli #3 to #20	3621 - 3638	Oct. 3, 1969
Eli #21 & #22 Fractions	3639 & 3640	Oct. 3, 1969
Eli #51 to #54	3953 - 56	June 17, 1970
Eli #55 & # 56 Fractions	3957 & 3958	June 17, 1970
Dollar #1 to #4	3395 - 98	June 10, 1970
Chief #2 to #13	3235 - 46	May 27, 1970
Mel #1 to #10	3670 - 79	Jan. 9, 1970
Mel #11 to #13 Fractions	3680 - 82	Jan. 9, 1970
Mel #14 to #17	3683 - 86	Jan. 9, 1970
Mel #18 Fraction	3825	Apr. 21, 1970
Mel #101 & #102 Fractions	3841 - 42	May 15, 1970
Granite #1 & #2	3655 - 56	Oct. 31, 1970
Granite #3 Fraction	3657	Oct. 31, 1970
Lucky #4 to #13	3796 - 3805	Apr. 14, 1970

PROPERTY - cont'd.

<u>Claim Name</u>	<u>Claim Number</u>	<u>Expiry Date</u>
Kay #1 to #10	3826 - 35	
Kay #11 to #18	3920 - 3927	June 9, 1970
A1 #1	3836	Apr. 29, 1970
A1 #2 & #3 Fractions	3837 - 38	Apr. 29, 1970

The claims are recorded at the Mining Recorder's Office at Rossland.

<u>Mineral Lease Name</u>	<u>Number</u>
Mocking Bird	M54
Big Chief	M55
North Star	M64
Poor Property	M66
Copper Glance	M67
Delaware No. 1	M68
Viking	M69
Zilor	M70

LOCATION & ACCESS

The property described in this report is situated wholly within the Trail Creek Mining Division in South Central B.C. The co-ordinates of the property are approximately 49 degrees 02 minutes north latitude and 117 degrees 53 minutes west longitude.

The property is located three miles south-west of the city of Rossland and about eleven miles by paved road from the Lead-zinc smelter of Cominco at Trail. The paved highway that connects Rossland with the border crossing at Patterson passes through the Salem Mines property. Any part of the property is relatively east of access from the highway and numerous local roads and trails.

HISTORY

The first claims in the district were recorded in 1887 and development came in 1890 when the Rossland Camp was discovered. Production rose to a peak of 360,000 tons of gold-copper ore in 1903 and continued at a high rate until 1917. There was a steady decline until the main mines in the Rossland Camp were closed by Consolidated Mining & Smelting Co. in 1928. Additional production came from leasers after 1928 with a total production of approximately six million tons of ore that contained one-half ounce of gold per ton and 1% copper.

In 1966, Red Mountain Mines Ltd. began production of molybdenum from their open pit mine near Rossland. Initial production was 400 tons of ore per day and recently the production has been 600 tons per day. Reserves are greater than 1/2 million

HISTORY - cont'd.

tons of ore containing 0.33% MoS₂. Production from the Red Mountain area can be expected to continue into the foreseeable future, especially as several other companies have been carrying exploration programmes on other potential molybdenum prospects in the area.

GEOLOGY OF AREA

The rocks in the Rossland area consist of volcanic flows, sills and some sediment intruded by shoots and stocks of the Nelson Batholith. The volcanic rocks are part of the Rossland formation which has a regional north-south strike with steep westerly dips. The Rossland formation can be divided into four formations that are, from east to west,:

- (1) a succession of fragmental and tuffaceous greenstones;
- (2) a thick sill of augite porphyrite;
- (3) impure quartzite of the Mt. Roberts formation;
- (4) massive andesite flows;

The intrusive rocks vary in composition from granite, thru monzonite to alkaline syenite. The oldest igneous intrusive is an elongated stock of monzonite that lies south and east of Rossland in which the main ore zones of the gold-copper camp were found. A larger body of granodiorite lies north-east of Rossland and is separated from the monzonite by a narrow belt of sediments. The Coryell syenite lies to the north-west of Red Mountain and the Sheppard granite is situated several miles south-east of Rossland. Sills and dykes of the various intrusives are common throughout the area and, in addition, lamprophyre and serpentine dykes cut the monzonite stock in the mine workings.

GEOLOGY OF AREA - cont'd.

The gold-copper ore zones of the old Rosslund Camp are replacements along fissures in the monzonite, augite porphyrite volcanics and, to a lesser degree, the sediments. The wall rocks have been altered and replaced by fine sulfides, quartz and calcite. The most favorable host rock is the augite porphyrite with the volcanics and sediments following. Most of the igneous rocks are unfavorable. The ore zones appear to be related to a local east-west set of fissures, or fractures, near the monzonite contact. The veins strike north-east and north-west and dip steeply north in most cases. The veins are interrupted by dykes that offset the mineralized shoots to form "en echelon" ore bodies along the veins. The ore-shoots are quite complex in dip and strike which makes the continuity of each difficult to predict.

The Red Mountain molybdenum deposit is localized in andesitic volcanic rocks that strike north-south and dip 35° to 40° to the west. The molybdenum mineralization occurs as disseminations and partings in a favorable horizon of volcanic rock that is more or less conformable with the gently sloping surface. The deposit is, therefore, tabular and about fifty feet thick.

The rocks exposed on the Salem Mines claims are related to the Mt. Roberts formation of impure limestone and quartzite. The western claims are underlain by massive andesite flows which are exposed in road cuts on the old Cascade highway. The Mt. Roberts formation, where it is exposed in highway cuts, is faulted and sheared and shows alteration in the argillaceous limestone. Small calcite veins and narrow lamprophyre dykes are numerous.

GEOPHYSICAL & GEOCHEMICAL SURVEYS

Strato Geological Ltd. were retained to do a reconnaissance type of magnetometer and soil sampling survey on the many claim groups of Salem Mines. The work was completed in May and June of this year.

The personnel involved were:

- | | | |
|----------------|---|----------------------------------|
| Heino Leis | - | Supervisor |
| Garry Roth | - | Instrument Operator |
| Uno Leis | - | Instrument Operator & Supervisor |
| Cliff Ralph) | - | Line cutters and Soil Samplers |
| Wayne Benson) | | |

All the above personnel are employed by Strato Geological Ltd. of #37 - 615 West Hastings Street, Vancouver, B.C.

Approximately 10½ line miles of soil sampling and 27 line miles of magnetometer readings were taken!

METHOD OF SURVEY

The instrument used for the magnetometer survey was a Sabre Electronics Magnetometer. The instrument readings were converted to gammas and an arbitrary medium reading was chosen. The plans of the survey show both positive and negative gammas.

The geochemical samples were taken in the soil below the primary layer and the samples were sent to T.S.L. Laboratories in Vancouver for analyses of zinc and copper content.

PROCEDURE

The surveys were conducted along (1) the claim lines and (2) along some crosslines located at claim-posts. Magnetic readings were taken at one hundred foot intervals along the lines. Areas of unusually high magnetic susceptibility were investigated on supplementary lines where it was thought necessary. The soil samples were taken from the same lines and at one hundred foot intervals.

SURVEY RESULTS

The magnetic readings, after adjusting for background, were plotted on plans of the various claim blocks. The readings generally increase from east to west reflecting the change in rock-type from igneous rocks through Mt. Roberts sediments to the magnetic volcanic rocks of the Rossland Formation. There are three magnetic anomalies that should be investigated further.

There is a large magnetic anomaly that occupies part of the Chief 8 and 9 claims and overlaps onto the Chief 6 and 7 claims. This anomaly is isolated and does not correspond with any geochemical anomaly. Additional magnetometer readings were made in the vicinity to establish the size and intensity of the anomaly.

A second magnetic anomaly is located on the claim line below the Eli 16 and 18 claims. Additional lines in the area establishes the anomaly to be small and hook-shaped. The magnetic anomaly is flanked on either side by anomalous high zinc content in the soil.

The third magnetic anomaly is located on the line between Kay 3 and 5 claims. The claims appear to be underlain by the Rossland volcanics and the general magnetic background here is much higher than over the eastern sections on the property. The anomaly is therefore, correspondingly higher than the other two anomalies. Nothing is known of the cause of the anomaly; the reconnaissance soil sampling did not extend to the Kay group.

SURVEY RESULTS - cont'd.

The geochemical survey has resulted in the location of three areas of anomalous high content of zinc and one of copper. An arbitrary cut-off was established at 150 p.p.m. of zinc and 50 p.p.m. of copper as most of the samples taken were much below these two figures.

The first anomaly is a strong zinc anomaly located along the claim line between Eli 7 and 8 claims and extending onto Eli 5 and 6 claims. There is a small, weak copper anomaly in conjunction with the zinc anomaly between claim Eli 7 and 8.

The second area of interest lies along the claim line between claims Eli 13 and 14, 15 and 16, and 17 and 18. Three short anomalies exist here that show an abnormal amount of zinc. Two of these zones flank the magnetic anomaly mentioned above.

The third anomalous area is located on claims Eli 1 and 2, Dollar 3 and 4 and may possibly extend to the short anomaly found on the line between Rich 16 and 17. The anomaly is not associated with a magnetic anomaly but does represent a large zone of high zinc readings.

INTERPRETATION

The magnetic intensity increases to the west as could be expected by the change in lithology from granodiorite through sediments to andesitic volcanic flows.

The long magnetic anomaly found on Chief 6, 7, 8 and 9 may be an isolated "plug" of basic rock, and may be part of the Rossland volcanics surrounded by Mt. Roberts sediments. Further

INTERPRETATION - cont'd.

field investigation will be necessary to identify the source of the anomaly.

The second magnetic anomaly located between Eli 16 and 18 claims is interesting because it is comparatively small and is flanked by two geochemical anomalies. This area definitely requires additional investigation to determine the cause of the magnetic anomaly as well as the soil anomaly.

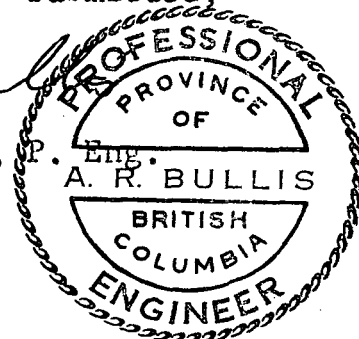
The third magnetic anomaly is interesting because of its intensity in an area of high magnetic background. The ores of the Rossland Camp contain considerable quantities of pyrrhotite and much ore was found near the contact between the sediments and intrusives. The anomaly under discussion should be investigated for a possible contact and/or pyrrhotite mineralization in the vicinity.

All the soil anomalies found to date will require further investigation by additional lines and samples before any interpretation can be attempted. All found to date are significant and each should be investigated to determine the cause of the high metal content of the soil.

Respectfully submitted,

A.R. Bullis

A.R. Bullis, P. Eng.



5th August, 1969

Delta, B.C.

EXPENDITURES TO DATE

The total expenditure on the property by Salem Mines Ltd. (N.P.L.) since April, 1969 has amounted to eight thousand, nine hundred eight-one dollars (\$8,981.00) for all phases of the work discussed in the report.

Of the total, four thousand, one hundred and five dollars (4,105.00) has been recorded as assessment work on the following claims:

Rich	16-21	\$	600.00
Chief	4-13		1,000.00
Chief	2-3	}	
Rich	1-7		
Rich	10-13		1,700.00
Dollar	1-4		
Kay	1-8		805.00

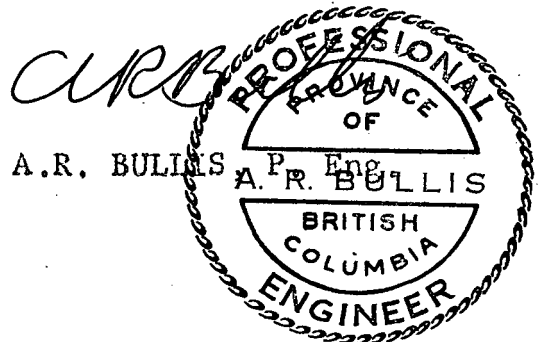
Total Recorded - \$ 4,105.00

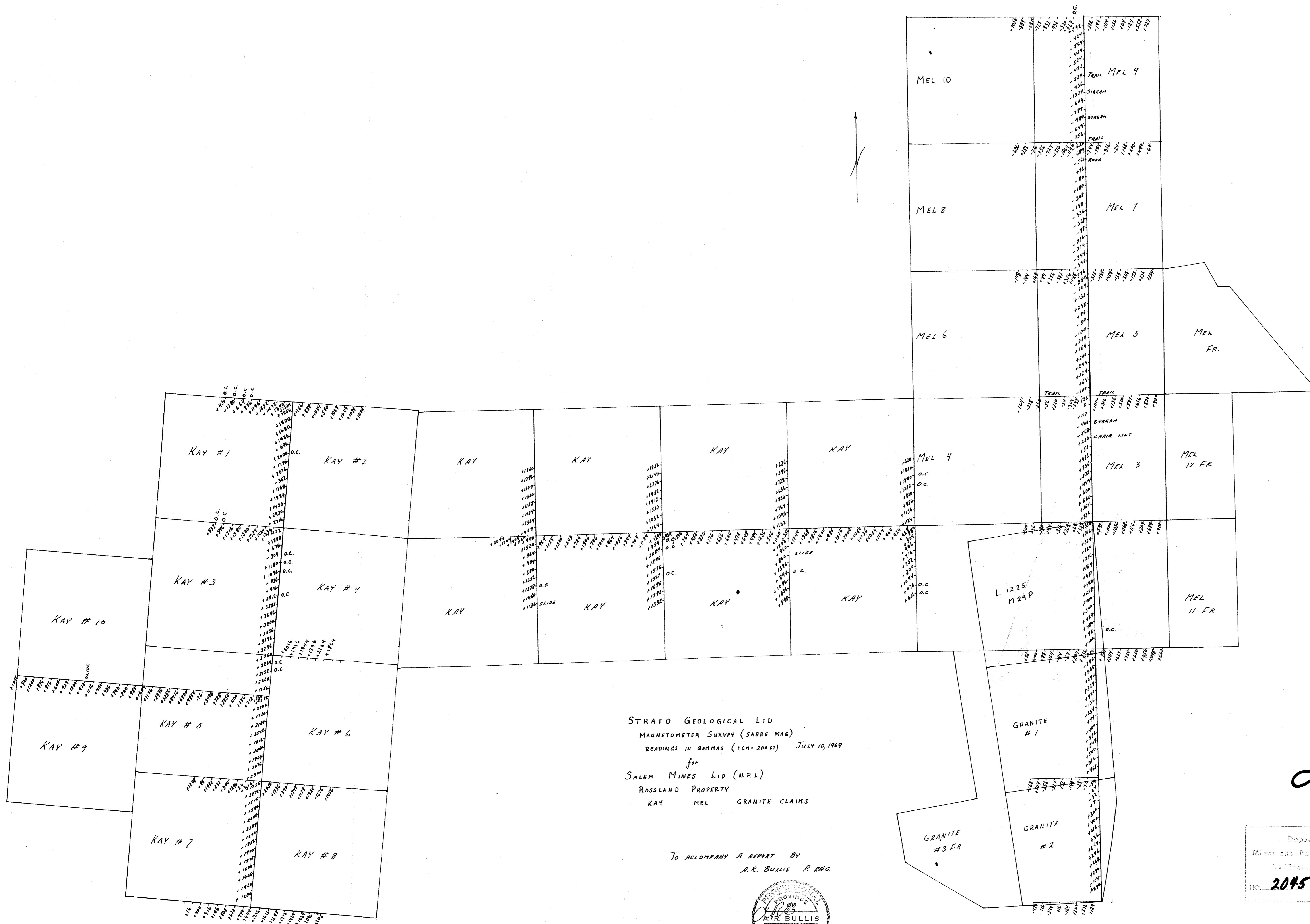
CERTIFICATE OF QUALIFICATIONS

I, Albert Ralph Bullis do hereby certify that:

1. I am a practising geological engineer with residence at 5215 Saratoga Drive, Delta, B.C.
2. I am a graduate of the University of British Columbia and have been granted the degree of Bachelor of Applied Science.
3. I have been practising my profession as a geological engineer for sixteen years.
4. I am a member of the Association of Professional Engineers of British Columbia and a member of the Association of Professional Engineers of Ontario.
5. I examined the Salem Mines Ltd. property in June, 1969.
6. I have no interest directly or indirectly in the properties or securities of Salem Mines Ltd. (N.P.L.).

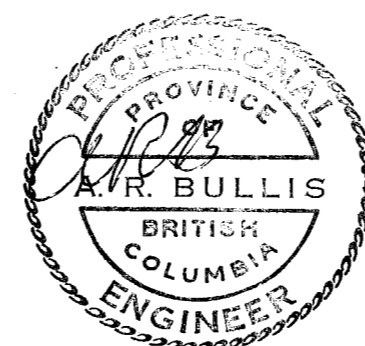
5th August, 1969
DELTA, B.C.





STRATO GEOLOGICAL LTD
 MAGNETOMETER SURVEY (SABRE MAG)
 READINGS IN GAMMAS (1CM - 200 FT) JULY 10, 1969
 for
 SALEM MINES LTD (N.P.L.)
 ROSSLAND PROPERTY
 KAY MEL GRANITE CLAIMS

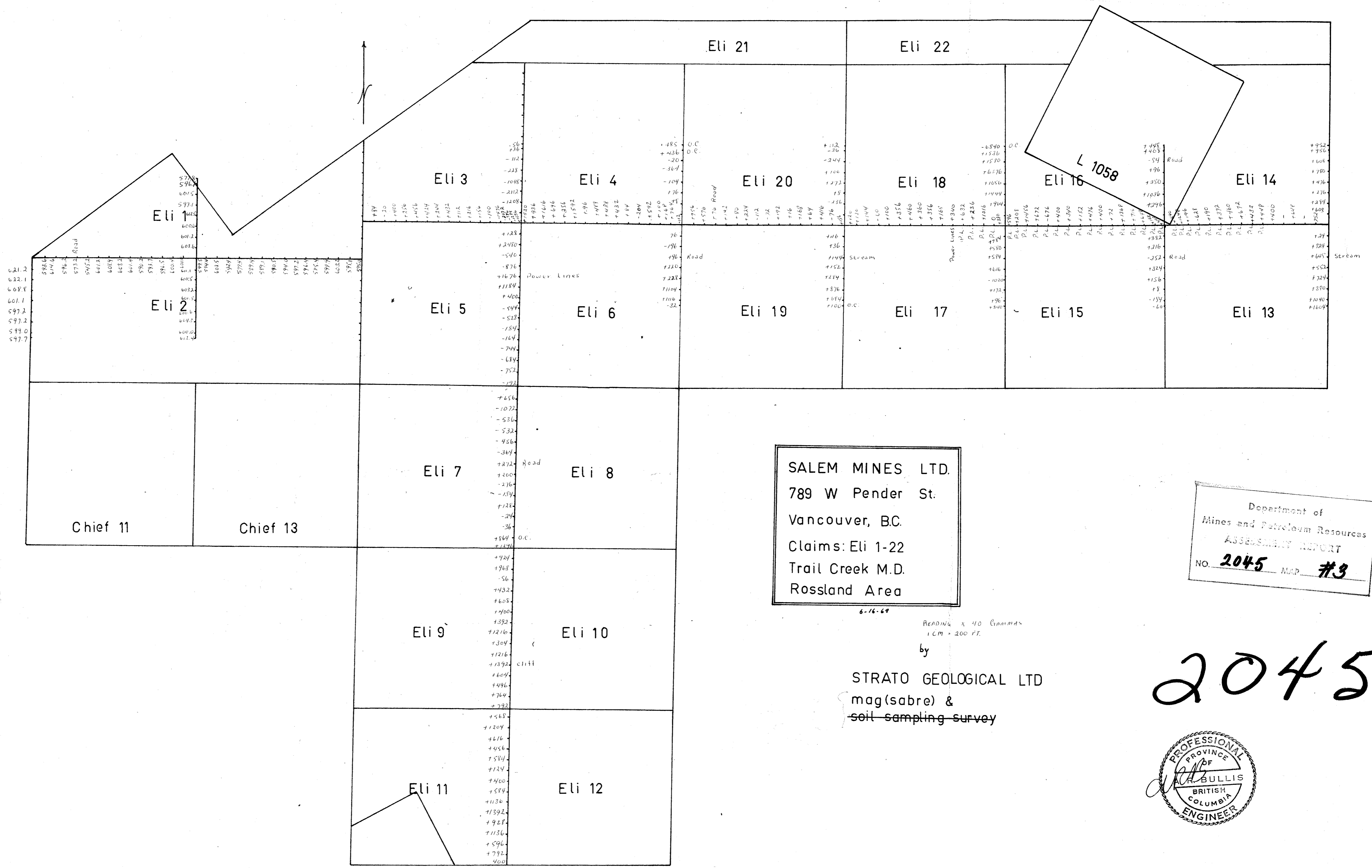
TO ACCOMPANY A REPORT BY
 A.R. BULLIS P. ENG.



2045

Department of
 Mines and Petroleum Resources
 ANNUAL REPORT
 NO. 2045 MAP #4

M. Bullis 201 NE 1/2 section



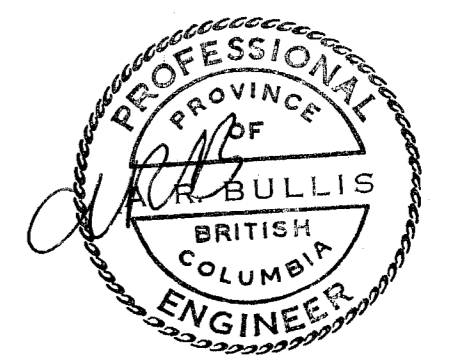
SALEM MINES LTD.
 789 W Pender St.
 Vancouver, BC.
 Claims: Eli 1-22
 Trail Creek M.D.
 Rosland Area

6-16-68
 READING x 40
 1 CM = 200 FT.

by
 STRATO GEOLOGICAL LTD
 mag(sabre) &
 soil sampling survey

Department of
 Mines and Petroleum Resources
 ASSESSMENT REPORT
 NO. 2045 MAP #3

2045



2nd Sw 7 Rosland

