#6118

GEOPHYSICAL REPORT

on a

RADIOMETRIC SURVEY

RAD 2 CLAIM

LYTTON AREA, KAMLOOPS M.D., B.C.

Rad # 2 Claim:		2.2 miles N20E of the Town of Lytton, B.C.
	:	50 121 SW
	:	NTS 92I/5E

Report By: David G. Mark,
Geophysicist
GEOTRONICS SURVEYS LTD
307-475 Howe Street,
Vancouver, B.C.

For: HIGHLAND LODE MINES LTD.
728-510 West Hastings Street,
Vancouver, B.C.

Survey Date: April, 1976

Date Signed: May 12, 1976

Geotronics Surveys Ltd.
Geophysical Services — Mining & Engineering
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MAPS (at end of report)

* In pocket

SUMMARY

A radiometric survey was completed over the Rad # 2 mineral claim located two miles N20E of the Town of Lytton, B.C. during the latter part of April, 1976. The purpose of the survey was to locate potential areas of uranium mineralization.

The claims are located on the southern part of the ridge that separates Botanie Valley from the Fraser River Valley near the confluence of the Thompson and Fraser Rivers. Access is by the Botanie Valley road two to three miles out of Lytton. The terrain is quite moderate and the vegetation is that of open Pine and Fir forest with underlying grass and bramble-type brush.

The middle of the property contains gneiss of Triassic or earlier age. The western two-thirds of the property is underlain by acidic intrusives of the Mount Lytton Batholith of Lower Cretaceous or earlier age. The northern and eastern part of the property is underlain by volcanics and sediments of the Kingsvale Group which is of Lower Cretaceous age. Uranium mineralization is known to occur in the general area within altered and sheared sediments.

The radiometric survey was carried out with a scintillometer on a closely-spaced grid on east-west lines. The results were plotted and contoured on three different maps at a 0.001 MR/Hr interval.

Several anomalies were discovered, all indicative of uranium mineralization, and were labelled A to L. The anomalies varied in intensity from 0.002 MR/Hr to 0.0105 MR/Hr and in size from one value and up.

CONCLUSIONS

1. Uranium mineralization is known to occur in the area.

2. The radiometric survey 'picked up' four strong anomalous zones. Two of these anomalies apparently have anomalous uranium soil geochemistry results over them.

3. These four anomalies, especially B, C, and D may be connected by geological structure such as shear zones. It is also possible that B, C and D may be reflecting one continuous causitive source which would have an arc-shape length of over 2000 feet.

4. Anomalies I, J, K and L appear to be reflecting dark shale which may be uranium bearing.

RECOMMENDATIONS

i. It is imperative that the geology of the area of the anomalies be thoroughly mapped. This is largely to try and determine the probable strike and dip of the causitive source which is important for the spotting of diamond drill holes.

2. The boundaries of the Indian Reserve(s) should be located and mapped.

3. If possible, the anomalies should be 'cat' trenched. This is probably not possible on anomaly D which is up-slope of the road and therefore much rock would fall on the road. Furthermore, it must be considered that all one might do is uncover a weakly radioactive causitive source that has been leached of the uranium mineralization.

4. Anomalies A to D should be diamond drilled by perhaps six to eight holes. The 'spotting' of these holes will depend entirely on the results of the geological mapping.

5. It is very possible that a soil geochemistry survey may locate uranium mineralization not found by the radiometric survey simply because of overburden. A soil survey should therefore be considered. Only the east half, or less, of the property need be done.

GEOPHYSICAL REPORT

on a

RADIOMETRIC SURVEY

RAD 2 CLAIM

LYTTON AREA, KAMLOOPS M.D., B.C.

INTRODUCTION AND GENERAL REMARKS

This report discusses the procedure, compilation and interpretation of a radiometric survey carried out with a scintillometer on the property of Highland Lode Mines Ltd, near Lytton, B.C.

The field work was carried out by the writer with one helper during the latter part of April, 1976. The total number of line miles carried out was 38.5.

All of the Rad # 2 mineral claim was covered except for the southwestern part as shown on the plan, Figure 2. This part was on Indian Reserve #22A (Kleetlekut) though the location of the exact boundaries are not known.

Detailing was carried out south of the Rad 2 claim on open ground. This was subsequently staked by the writer as the Radco claim.

Considering the proximity of the anomalies to the eastern edge of the Highland Lode property, the Rad 1 claim was surveyed up to Botanie Creek. The Rad 1 claim adjoins the Rad 2 claim on the east and belongs to Ashcroft Resources Ltd (whose principals are the same as those of Highland Lode).

The object of the radiometric survey was to outline any probable areas of uranium mineralization. A uranium occurrence is located nearby on the south bank of the Thompson River and another on Seven Mile Creek, 7.3 miles north of Lytton.

PROPERTY AND OWNERSHIP

The property consists of a 12-unit mineral claim wholly owned by Highland Lode Mines Ltd and as shown on Figure 1. In addition, the writer staked a one-unit claim which as yet has not been transferred.

Name	No. of Units	Record No.	Expiry Date
Rad 2	12	166	Dec 16 1976
Radco	1	370	May 5, 1976

LOCATION AND ACCESS

The property is located 2.2 air miles N20E of the town of Lytton, B.C. on the ridge that divides Botanie Valley from the Fraser River Valley.

The geographical coordinates are 50° 16'N latitude and 121° 34'W longitude.

Access to the property is excellent and is gained by travelling 2 to 3 miles out of Lytton up the Botanie Valley road. Lytton is 165 miles from Vancouver on Highway 1. Also a dirt road which connects the Botanie Valley road to Highway 12 traverses the property.

PHYSIOGRAPHY

The Rad 2 claim is located within the physiographic subdivision known as the Clear Range which is part of the Fraser Plateau unit which itself is part of the Interior Plateau. The Clear Range borders the Coast Range which is to the west, and is characterized by peaks up to 7,600 feet asl. It has a steep front along the Fraser River to the west and more gentle slopes to the east where transition to the plateau is gradual.

The terrain of the Rad 2 claim in general is quite moderate.

It varies from flat slopes in fields in the southern section to very steep slopes interspersed with rock bluffs to the north and along Botanie Creek. The elevation varies from 1200 feet asl on the western edge to 2200 feet asl on the ridge top.

Generally speaking, no water occurs on the Rad 2 claim except in the irrigation trenches during the summer months (the western one became operational while the survey was being carried out). Otherwise, the closest source of water is Botanie Creek which is anywhere from 700 to 1800 feet away.

The vegetation is largely an open Pine and Fir forest with the underlying vegetation being grass and a bramble-type brush. Open agricultural fields occurred on the west boundary and within the southern section.

HISTORY OF PREVIOUS WORK

The only work done to date is preliminary radiometric surveying carried out along the roads in late November, 1975. Three anomalies were found, and it was on these anomalies that the Rad 1 and 2 claims were staked.

Other work very likely has been done prior to the above since old claim posts were discovered throughout the property and old orange survey flagging was found in the area of the garbage dump and up Botanie Creek.

GEOLOGY

This section is based on the writer's own observations in the field and the G.S.C. map of the area by McTaggart & Duffel. The writer did not attempt to place each outcrop in the correct petrological division, but only attempted a "field classification."

According to the G.S.C. map, the oldest rocks of the area are the schists and gneiss of Triassic age or earlier. Several outcrops of gneiss were noted by the writer mainly in the area of the ridge top within the centre of the property. Some of the outcrops the writer noted as a granite-type may in fact have been a granitic gneiss as described by McTaggart & Duffel.

Intruding the above rock-type are acidic intrusives of the Mount Lytton Batholith of Lower Cretaceous age or earlier. This batholith consists of granodiorite, quartz diorite, and diorite and has been noted in the field by the writer simply as granite. From the writer's observations, and as seen on

Figure 2, this rock type underlies the western two-thirds of the Rad 2 claim.

A large bluff, a few hundred feet high by over 1,000 feet long, occurs on the eastern side of Botanie Creek on the southern part of the Rad 1 claim. This bluff is composed of andesite with rhyolite dyking which is of the Spences Bridge Group which is of Lower Cretaceous age.

The youngest rocks occurring on the property are of the Kingsvale Group which is also of Lower Cretaceous age. From the writer's 'quick' field identifications, these rocks are basic volcanics, shales (some perhaps argillaceous), red arkose, and red conglomerate. Outcrops of these types were found along the northern part of the ridge, along the northern part of Botanie Creek, and in the southern area of the property mainly west of the Botanie Valley road.

The main structures of the area are two faults up the Botanie valley and two faults along the Fraser River. Also it is quite likely a cross fault occurs along the Thompson River.

The writer located yellow staining thought to be uranium at (L-72+50S, 1W) within shale.

The closest uranium prospect is that on the south bank of the Thompson River near its confluence with Botanie Creek and close to water level. The uranium occurs within a sheared and altered band of limestone about 150 feet wide lying within grey biotite granite. The zone of shearing within the limestone strikes N50W and dips 75°SW.

At 7-Mile Creek, seven miles north of Lytton is another uranium occurrence. Here the uranium occurs within a black slate, 2 1/2 feet wide, which occurs within a reddish sandstone. Here the shear strikes N50W and dips 50°NE. Malachite and azurite were found along the fracture surfaces.

INSTRUMENTATION AND THEORY

The instrument used for the survey was a Model 111B scintillometer manufactured by Precision Radiation Instruments Inc. of Los Angeles, California.

This instrument contains a 1" by 1½" Thallium-activated sodium iodide crystal hermetically sealed and optically coupled to a photomultiplier tube. Its reading range by way of a 5-scale switch is 0.0001 MR/Hr to 5.0 MR/Hr. Its reading time is by way of a 3-scale switch and is: fast - 1 second, medium - 15 seconds, and slow - 60 seconds.

All radiometric surveys, ground or airborne, work on the principle of gamma ray emission from radioactive sources. The most common source incurred in geophysical prospecting are radioactive isotopes of uranium (U^{238}), thorium (Th^{232}), and Potassium (K^{40}). These isotopes disintegrate spontaneously into daughter elements emitting alpha and beta particles, and gamma rays. The alpha and beta particles travel no more than 1 or 2 feet through air and thus are little use for geophysical detection. On the other hand, the gamma ray travels hundreds of feet through air and thus is of prime importance. These gamma rays are generally detected by thallium-activated sodium iodide crystals.

The gamma ray can be shielded by 2 feet of water or rock and thus over large lakes there is a minimum signal. Thus also, radiometric surveying is essentially surveying for outcrop expression of rocks containing radioactive minerals. However, around uranium showings, if the rock and overburden is porous and fractured enough (and not water-soaked), the uranium can be detected at greater depths because of the uranium daughter product, radon gas, seeping upwards.

It is readily apparent, therefore, that from the above, any reading above background should be checked. In some surveys this could be as little as 10%.

SURVEY PROCEDURE

The Rad 1 and 2 claim line was used as a base line upon which red flagging was placed every 100 feet. The survey lines were run in an east-west direction perpendicular to the base line by chain and compass. Flagging was placed every 100 feet on the lines which were run at 200-foot intervals.

It was originally proposed to take readings every 50 feet on 200-foot lines. However, the writer felt that 100-foot readings would be quite adequate with constant monitoring between stations. Therefore, the readings were taken every 100 feet on the 'medium' mode and the area between the stations was monitored on the 'fast' mode.

The instrument was 'zeroed' and calibrated at least every hour. The instrument was also checked when anomalous readings were encountered.

In anomalous areas of low intensity, readings were taken every 50 feet on the 'medium' mode. In anomalous areas of higher intensity, readings were taken every 25 feet on the 'slow' mode on lines spaced 100 feet apart.

COMPILATION OF DATA

All data, except for the 25-foot detailing of anomalies A to D were plotted on Figure 2 at a scale of 1" to 400 feet. The detailing of anomalies B to D were plotted on Figure 3,

and anomaly A, Figure 4, both maps at a scale of 1" to 100 feet.

All values were plotted without decimals so that they must be multiplied by 10^{-4} to obtain the correct reading in MilliRoentgens per Hour (MR/Hr).

The anomalies were contoured at 0.001 MR/Hr interval starting at 0.002 MR/Hr which was considered to be the anomalous threshhold level. Only the outline of anomalies A to D were plotted on Figure 2.

DISCUSSION OF RESULTS

The mean background level is about 0.001 to 0.0015 MR/Hr. From this the anomalous threshold value is taken to be 0.002 MR/Hr.

In December 1975 when the writer carried out check readings, the background level was 0.0025 MR/Hr. The higher background is undoubtedly due to a higher level cosmic rays at that time.

The anomalous zones have been labelled A to L not necessarily in order of importance. They vary in size from one value to dozens of values and in intensity from 0.002 MR/Hr to 0.0105 MR/Hr.

Anomaly A was one of the three originally discovered in December, 1975. In January, 1976 it was detailed by J.P. Elwell, P.Eng. The writer detailed it again so that it could be correlated with the rest of the survey. The results are plotted on Figure 5.

The anomaly is almost 400 feet long and up to over 150 feet wide. The writer obtained a reading up to 0.0083 MR/Hr on L-44S, 2W+75'. However, the writer obtained a higher reading of about 0.025 MR/Hr in December when he wandered freely about in attempting to obtain the highest reading.

The anomaly as a whole appears to be striking north. However, the higher intensity part of the anomaly strikes northwest.

On this anomaly, as well as anomaly D, the values gradually build up from east to west, reach a peak, and then suddenly fall to background. This feature is suggestive of a dyke-type causitive source striking northerly near the western edge of the anomaly and dipping easterly. However, another explanation could be that instead of having an easterly dip, it has a dip close to vertical and the anomalous readings on the eastern half of the anomaly are caused by uranium ions within the soil that have moved downhill.

Anomalies B, C and D are shown on Figure 3. Anomalies B and C were originally discovered along the road in December, 1975 with no further work being done on them. Anomaly D is a totally new anomaly.

These three anomalies together provide the most interesting area by far within the property. That is, the greatest potential for the occurrence of substantial uranium mineralization is within this area.

Anomaly B, taking the two parts together, has a length of about 700 feet, strikes east-west, and reaches an intensity of 0.0072 MR/Hr. It appears rather strange since the anomaly follows along one survey line. However, the writer rechecked the results on the adjacent lines.

Anomaly C is much smaller, being about 200 feet long, striking perhaps northwest, and reaching an intensity of 0.0027 MR/Hr.

Anomaly D, the most interesting of the survey, by itself appears to strike north to northeast, has a length of 900 feet and an intensity of up to 0.0105 MR/Hr.

Mr. Paul Polischuck, discoverer of anomalies A, B and C, took soil samples across anomalies A and C and had them tested for uranium. Apparently, over the anomalies, the results were anomalous in uranium.

Anomalies B, C and D, by their proximity to each other and their individual strikes, appear at least to be geologically connected. That is the causitive source of these anomalies are connected together by common structure(s). A very plausible interpretation for example, is that a shear zone strikes northwesterly along anomalies B, C and D and a second shear zone strikes northeasterly along anomaly D. This would give a total strike length along the three anomalies of over 2000 feet.

Another very interesting possibility is that anomaly D is structurally connected to anomaly A. Of course this could also mean that not only the structure but also the causitive source continues from A to D. In support of this, there are two small anomalies (labelled E and F) between these two larger zones.

Anomalies, E, F,G and H are small 1- to 4- value anomalies and are only mentioned because they should not be overlooked if further work on anomalies A to D are encouraging.

Anomalies I, J, K and L are found along and near Botanie Creek. These anomalies are generally of low intensity and have values that range from 0.002 MR/Hr to 0.0031 MR/Hr.

Anomalies I and J correlate with outcroppings of dark shale and it is therefore probable that this is the causitive source of all four anomalies. Of course, it is also possible

that the causitive source lies just below the shale.

As in the other anomalies, the causitive source is quite likely uranium within the shale, though, how much would have to be determined by further work.

Anomalous readings on L-2S around 28W correlate with granitic outcroppings and therefore the causitive source is likely potassium -40.

Respectfully submitted,

GEOTRONICS SURVEYS LTD.,

David G. Mark
Geophysicist

May 12, 1976

SELECTED BIBLIOGRAPHY

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Holland, S.S. Description of the Orlean Group and the Rosyd Group, Minister of Mines Report for 1955.

McTaggart, K.C. and Duffel, S. Geology of Map-area Ashcroft Map 1010A, 92I/west half, Geol. Surv. of Can. 1951.

Mark, David G. Letter on Checking of Anomalies A, B, and C, Rad 1 and 2 Mineral Claims, Lytton, B.C. for Ashcroft, Resources Ltd. December 22, 1975.

GEOPHYSICIST'S CERTIFICATE

I, DAVID G. MARK, of the City of Vancouver, in the Province of British Columbia, do hereby certify:

That I am a Consulting Geophysicist of Geotronics Surveys Ltd. with offices at 307-475 Howe Street, Vancouver, B.C.

I further certify:

1. I am a graduate of the University of British Columbia (1968) and hold a B.Sc. degree in Geophysics.

2. I have been practising in my profession for the past eight years and have been active in the mining industry for the past eleven years.

3. I am an active member of the Society of Exploration Geophysicists and a member of the European Association of Exploration Geophysicists.

4. This report is compiled from data obtained from a radiometric survey carried out by myself with one helper during the last part of April, 1976 on the Rad No. 1, Rad # 2, and Radco claims located 2.2 miles N20E of the town of Lytton, B.C.

5. I have no direct or indirect interest in the property described herein, the securities of Highland Lode Mines Ltd or Ashcroft Resources Ltd, nor do I expect to receive any interest therein.

David G. Mark
Geophysicist

May 12, 1976

AFFIDAVIT OF EXPENSES

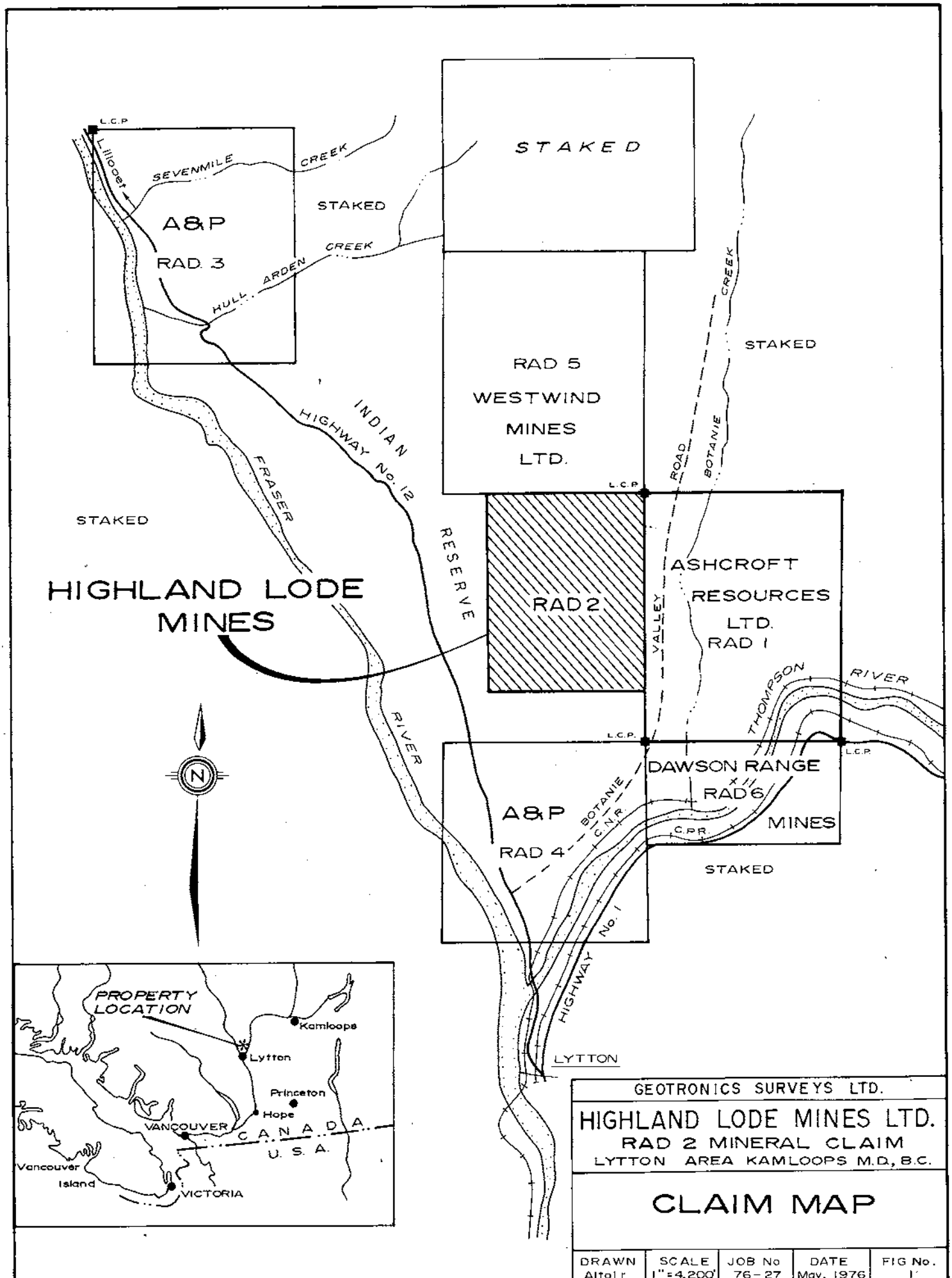
I David G. Mark, Manager of Geotronics Surveys Ltd. Certify a scintillometer survey was carried out on the Rad 1, Rad 2, and Radco Mineral Claims in the Kamloops M.D. to a value of $5,560.00 broken down as follows:

FIELD	
2 men, geophysicist and helper, for 115 hours at $35/hour	$ 4,025.00
Room and Board, 12 days at $50/day	600.00
Vehicle rental, 12 days at $20/day	240.00
Instrument rental, 2 weeks at $60/week	120.00
Miscellaneous supplies	25.00
	$ 5,010.00
REPORT	
Geophysicist, 10 hours at $25/hour	$ 250.00
Drafting and printing	200.00
Typing, xeroxing and compilation	100.00
	$ 550.00
TOTAL	$ 5,560.00

Respectfully submitted,
GEOTRONICS SURVEYS LTD.

David G. Mark, Geophysicist

May 12, 1976



GEOTRONICS SURVEYS LTD.

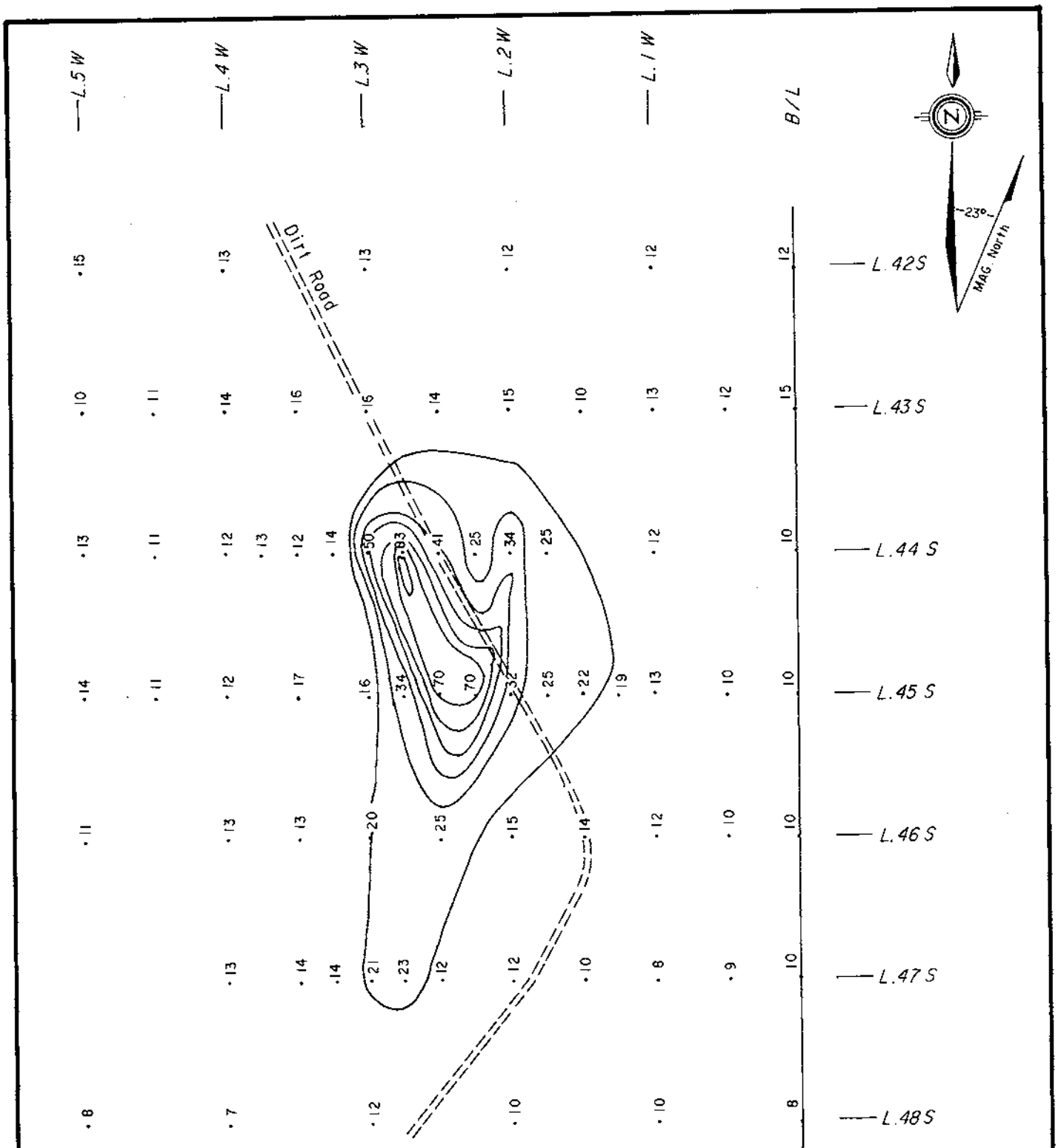
HIGHLAND LODE MINES LTD.

RAD 2 MINERAL CLAIM

LYTTON AREA KAMLOOPS M.D, B.C.

CLAIM MAP

DRAWN	SCALE	JOB No	DATE	FIG No.
Altair	1" = 4,200'	76-27	May, 1976	1



Instrument: Precision Scintillometer Model III B

Readings are in Milli Roentgens / Hour X 10⁻⁴

Background: 20

Contour Interval: 10

TO ACCOMPANY GEOPHYSICAL REPORT BY DAVID G. MARK

GEOTRONICS SURVEYS LTD.

HIGHLAND LODE MINES LTD.

RAD 2 MINERAL CLAIM

LYTTON AREA KAMLOOPS M.D., B.C.

DETAIL OF ANOMALY A

DRAWN	SCALE	JOB No.	DATE	FIG No.
Altair	1" =100'	76-27	May, 1976	4

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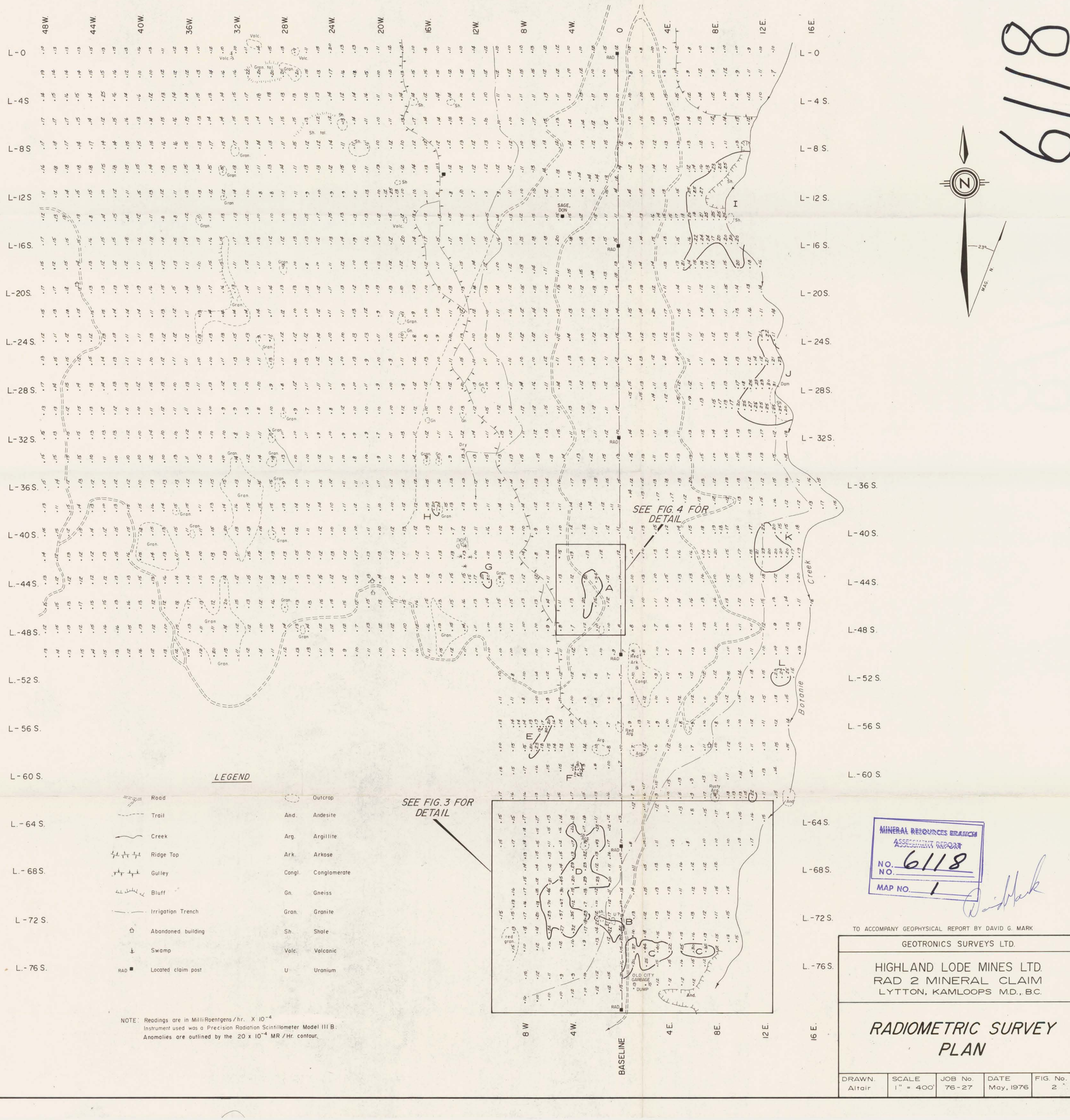

LEGEND

	Road		Outcrop
	Trail	And.	Andesite
	Creek	Arg.	Argillite
	Ridge Top	Ark.	Arkose
	Gulley	Congl.	Conglomerate
	Bluff	Gn.	Gneiss
	Irrigation Trench	Gran.	Granite
	Abandoned building	Sh.	Shale
	Swamp	Volc.	Volcanic
RAD ■	Located claim post	U	Uranium

NOTE: Readings are in MilliRoentgens/hr. X 10^{-4}
Instrument used was a Precision Radiation Scintillometer Model III B.
Anomalies are outlined by the 20 x 10^{-4} MR/Hr. contour.

TO ACCOMPANY GEOPHYSICAL REPORT BY DAVID G. MARK

GEOTRONICS SURVEYS LTD.

HIGHLAND LODE MINES LTD.
RAD 2 MINERAL CLAIM
LYTTON, KAMLOOPS M.D., B.C.

RADIOMETRIC SURVEY PLAN

DRAWN	SCALE	JOB No.	DATE	FIG. No.
Altair	1" = 400'	76-27	May, 1976	2

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L.60S
L.62S
L.64S
L.66S
L.68S
L.70S
L.72S
L.74S
L.76S
L.78S

10W 8W 6W 4W 2W 0 2E 4E 6E 8E 10E 12E

D.
B.
C
C
D

Rad 2 & Radco Legal c/p

Rad 1, 4 & Radco c/p

BOTANIE VALLEY ROAD

TO LYTTON

CREEK

BOTANIE

LARGE ANDESITE BLUFF WITH FELSITE DYKING

weathered

rusty gran

sh & volc.

Old City Garbage Dump

Bluff

and

LEGEND

- IRRIGATION TRENCH
- CLAIM POST
- OUTCROP
- and. ANDESITE
- arg. ARGILLITE
- gran. GRANITE
- sh. SHALE
- U URANIUM
- volc. VOLCANICS

NOTE: Readings are in MilliRoentgens / Hour X 10^{-4}
Instrument used was Precision Radiation Scintillometer Model 111B

Anamalous Threshold — 20 X 10^{-4} MR / Hr.
Contour interval — 10 X 10^{-4} MR / Hr.

TO ACCOMPANY GEOPHYSICAL REPORT BY DAVID G. MARK

GEOTRONICS SURVEYS LTD.

HIGHLAND LODE MINES LTD.
RAD 2 MINERAL CLAIM
LYTTON AREA, KAMLOOPS M.D., BC

RADIOMETRIC SURVEY DETAIL OF ANOMALIES B, C & D

DRAWN	SCALE	JOB No.	DATE	FIG. No
Altair	1" = 100'	76-27	May, 1976	3