

6426

GEOCHEMICAL AND GEOPHYSICAL REPORT
ON THE IRA EAST AND WEST GROUPS,
SURPRISE LAKE, B.C.
IRA CLAIMS - ATLIN MINING DIVISION
LAT. 59°45' N; LONG. 133°15' W
NTS MAP-SHEET 104N/10

14

for

Union Oil Company of Canada Ltd.

by

D.G. Leighton &
R.R. Culbert, P.Eng., PhD

D.G. Leighton & Associates Ltd.
Vancouver, B.C.

31 August, 1977

MINERAL RESOURCES BRANCH
ASSESSMENT REPORT

NO. _____

CONTENTS

	Page
I INTRODUCTION	1
II SUMMARY AND CONCLUSIONS	2
III GENERAL DESCRIPTIONS	3
Location and Access	3
Glaciation	3
History	3
Claims	3
IV GEOLOGY	4
V GEOCHEMISTRY	4
VI GEOCHEMICAL GRID SURVEY	5
General	5
Results	5
Interpretation	6
VII RADIOMETRIC SURVEY	6
Instrumentation	6
Ground Control	6
Results	6
Interpretation	6
VIII BREAKDOWN OF COSTS	7
IX CERTIFICATION	8
MAPS	
Index Map	follows page 3
Grouping Map	follows page 3
Radiometric Survey Results "A" Grid	in pocket
Radiometric Survey Results "B" Grid	in pocket
Soil Geochemistry "B" Grid (Uranium, Silver, Lead)	in pocket
Geochemical Reconnaissance Survey Results	in pocket
Glacial Features	in pocket
APPENDIX	
Analytical Procedures	

D. G. LEIGHTON & ASSOCIATES LTD.
GEOLOGICAL CONSULTANTS

• 3152 WEST 10TH AVENUE
VANCOUVER, B.C.
V6K 3K9

GEOCHEMICAL AND GEOPHYSICAL REPORT
ON THE IRA PROPERTY,
SURPRISE LAKE, B.C.

I INTRODUCTION

This report describes the results of a geochemical - radiometric survey completed over parts of the IRA mineral claims. Work was part of a larger program of uranium exploration covering the Surprise Lake batholith and surrounding area. Field work on the IRA property was done mainly during July, 1977.

The conclusions and recommendations set forth in this report are based on geochemical and radiometric survey results combined with geological and prospecting data.

II SUMMARY AND CONCLUSIONS

- (1) The IRA property, comprised of 6 unsurveyed mining claims (67 units) held by Union Oil Co. (Canada) Ltd., is situated roughly 20 miles northeast of Atlin, British Columbia.
- (2) The property is presently reached by helicopter based in Atlin.
- (3) Granitic rocks of Upper Cretaceous or possibly Tertiary age underlie the claims.
- (4) Prospecting work carried out in the summer of 1977 has revealed uranium mineralization in place on the IRA-4 claim. Geochemical - radiometric survey results suggest this mineralization is structurally controlled and occurs within or parallel to fault lineations. 086
- (5) The primary target at this time is a uranium occurrence on the IRA-4 claim which coincides with anomalous uranium values in soils.
- (6) Numerous additional targets comprised of geochemical anomalies have been identified which merit follow-up exploration.

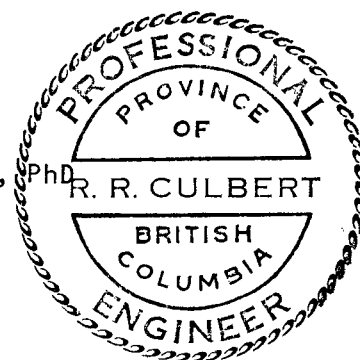
Respectfully submitted,

D.G. Leighton

D.G. Leighton

Dick Culbert

R.R. Culbert, P. Eng., PhD



31 August, 1977

III GENERAL DESCRIPTIONS

Location and Access

The IRA property is located 25 miles northeast of Atlin, B.C. This area can be reached by boat via Surprise Lake from Atlin or alternatively by means of a dirt road along Fourth of July creek. The geodetic coordinates are 59°45' N latitude, 133°15' W longitude.

Glaciation

Glacial features of the IRA property and surrounding area were determined from a study of airphotos. These are shown on a map entitled, "IRA property - glacial features" (in pocket). Also shown are some of the more obvious structural lineations. Photos used: BC 5634, 16-18.

History

There is no record of previous uranium exploration work having been carried out on the IRA property. There is, however, evidence of base metal exploration work west of Mt. Edmund, where lead, zinc and copper showings occur. These are contact - metamorphic deposits at the contact between silicated limestone and alaskite. Selco Exploration Ltd. drilled here in 1954.

Claims

The IRA property consists of the following mining claims held in the name of Union Oil Company of Canada Ltd.:

<u>Property</u>	<u>Mineral claims</u>	<u>Units</u>	<u>Record no.</u>	<u>Record date</u>	<u>Expiry date</u>	
IRA	IRA	9	110	Sept. 7, 1976	Sept. 7, 1977)	
	IRA 2	6	135	Sept. 17, 1976	Sept. 17, 1977)	IRA -
	IRA 3	12	136	Sept. 17, 1976	Sept. 17, 1977)	EAST
	IRA 4	12	137	Sept. 17, 1976	Sept. 17, 1977)	
	IRA 5	20	138	Sept. 17, 1976	Sept. 17, 1977)	IRA -
	IRA 6	8	158	Oct. 8, 1976	Oct. 8, 1977)	WEST

134° 00'

27 m

45'

30'

30'

15'

60° 00'

654

653

45'

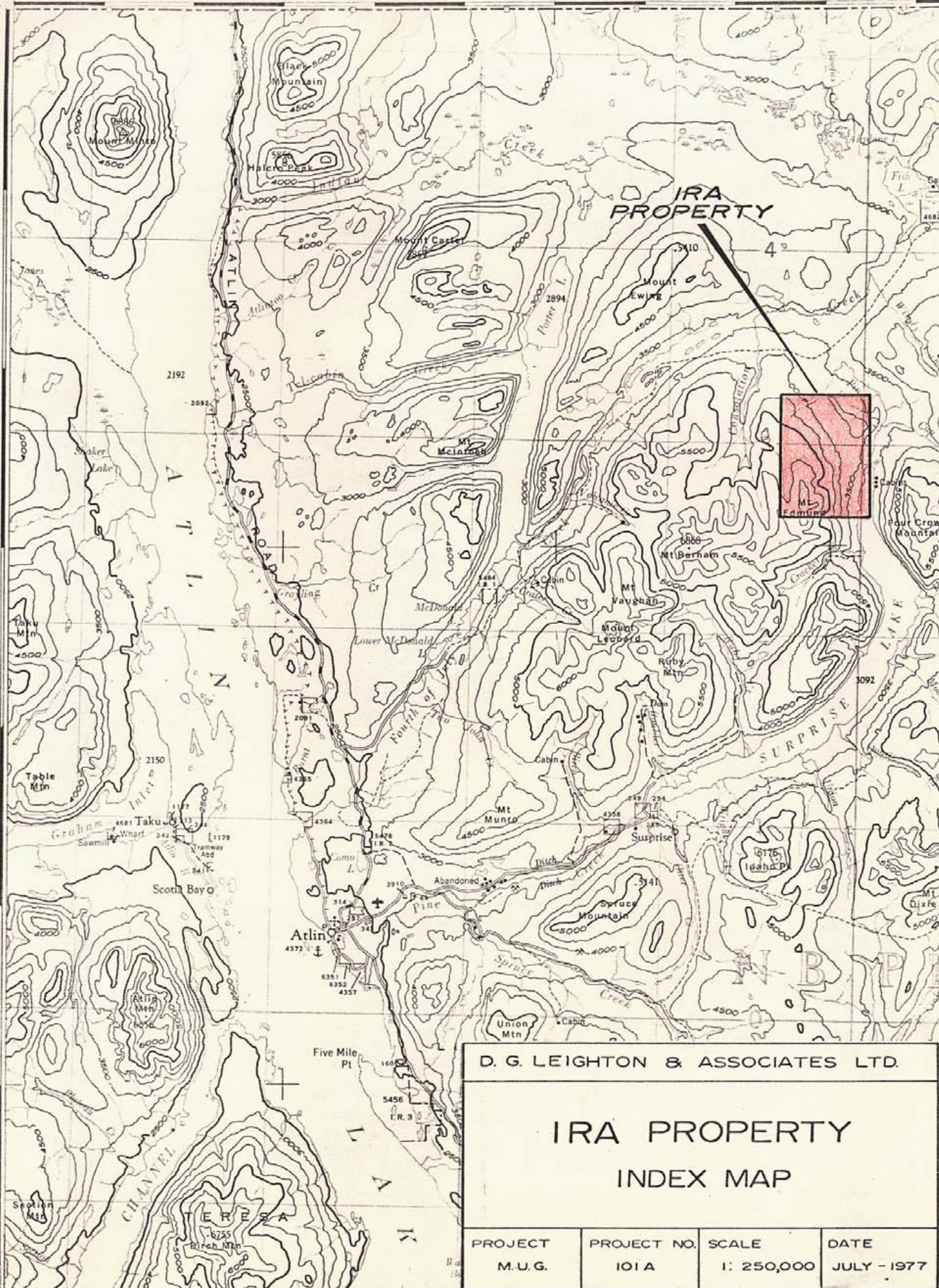
62

661

650

30'

659



D. G. LEIGHTON & ASSOCIATES LTD.

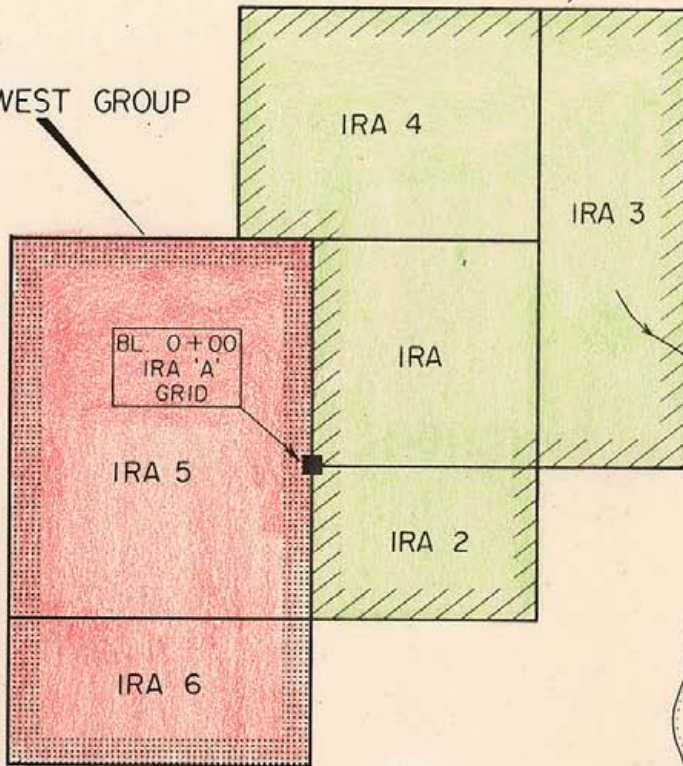
IRA PROPERTY INDEX MAP

PROJECT	PROJECT NO.	SCALE	DATE
M.U.G.	101 A	1: 250,000	JULY - 1977



IRA EAST GROUP

IRA WEST GROUP



MT.
EDMUND

SURPRISE
LAKE

CONSO LATION
CK.

CRACKER
CK.

D. G. LEIGHTON & ASSOCIATES LTD.

IRA PROPERTY GROUPING MAP

PROJECT	PROJECT NO.	SCALE	DATE
M. U. G.	101 A	1: 50,000	AUG - 1977

IV GEOLOGY

The IRA property is underlain entirely by alaskite and quartz - monzonite mapped as Cretaceous but possibly younger in age - the Surprise Lake batholith. In this particular area fine-grained porphyritic varieties are especially common, particularly on the western side of the IRA-4 claim.

A gossan zone extends from Mt. Edmund toward the north-east. The gossan averages about 1000 meters in width and extends at least 5000 meters where it is entirely concealed by overburden.

A loose 100 by 50 meter grid was established over a large part of this gossan and spectrometer measurements recorded at each station. During the survey rocks were categorized as follows:

1. fresh
2. weakly gossanous - mainly hematite staining
3. moderately gossanous - above plus red limonite and quartz veining
4. strongly gossanous - above plus manganiferous patches.

There is a rough correlation between the "strength" of the gossan and radiation. This suggests that uranium mobilized by surface waters is being trapped in minor quantities in rusty zones.

V GEOCHEMISTRY

Interest in the IRA property area originated with the identification of anomalous silt values obtained from regional reconnaissance sampling. Follow-up in 1976 resulted in the discovery of a radioactive lineament; hence, the original IRA claim was located. Further claims were added as the geochemical anomaly was extended north and west.

Four pits dug into the above-mentioned lineament in 1976 encountered no altered or unusual rocks. Radioactivity was from the soil and dominantly from the more organic layers rather than regolith. Considering that count rates as high as 2,800 cps were obtained from these pits, geochemistry was disappointing - the highest value being 550 ppm uranium and most soils running less than 100 ppm. In part this discrepancy is due to thorium, whose count rate here is approximately equal to that on the uranium channel. This is the only site met to date in the Atlin area in which thorium has been important. Another reason for the discrepancy between radioactivity and geochemistry may be that it is dominantly the daughter products of uranium which are involved. The water here is radioactive, indicating a high radon concentration. Uranium content in the water is roughly 20 ppb.

It was originally suspected that this lineament was catching ions from some uranium concentration above, but the outcrop is fairly good here and that theory seems less likely now. The alternative is that radium is being brought up along the lineament fracture itself by water which does not surface. Unfortunately, most of the gully is filled with talus blocks so that the use of geochemistry is limited.

A variety of other anomalies were discovered on the IRA property in 1976. These included radioactive springs, an area of anomalous silt near the head of Consolation Creek and scattered anomalies in the main valley which cuts through the eastern claims from the north end of Surprise Lake. These results are shown on an accompanying map entitled "Geochemical Reconnaissance Survey Results" (in pocket).

In 1977 soil samples were collected from a number of well-defined lineations also shown on the above-mentioned map. Results from the lineation sampling are shown on a set of profiles following this page. Soils were tested for uranium, silver and lead, and in some cases duplicate samples were collected, one from the central part of the linear, a second from the adjacent bank to avoid organic and water saturated soil. Lineations are labeled A.....F in the order of sampling with soil collected at 50 meter intervals.

VI GEOCHEMICAL GRID SURVEY

General

Prospecting with hand-held scintillometers resulted in the discovery of radioactive mineralization on the IRA-4 claim. Some land trenching was carried out, though ground water reduced effectiveness. A 10 x 20 meter interval grid centering on the trenched area was used to control geochemical soil and spectrometer surveys (IRA - "B" GRID).

Soil samples were collected from the "B" soil horizon using grub-hoes. All samples were shipped to Min-En Laboratories Ltd., North Vancouver, B.C., where they were prepared and tested for uranium, lead and silver. The analytical procedure is described in Appendix "A".

Results

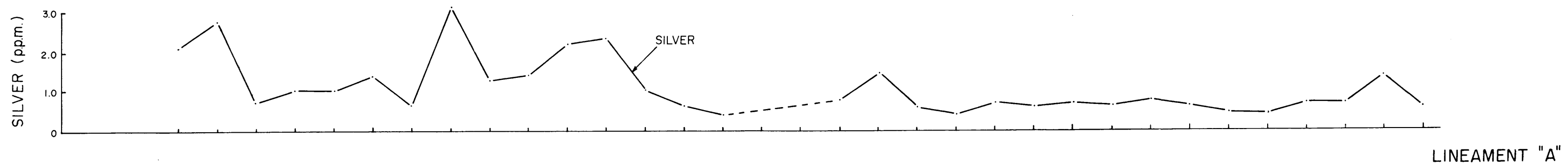
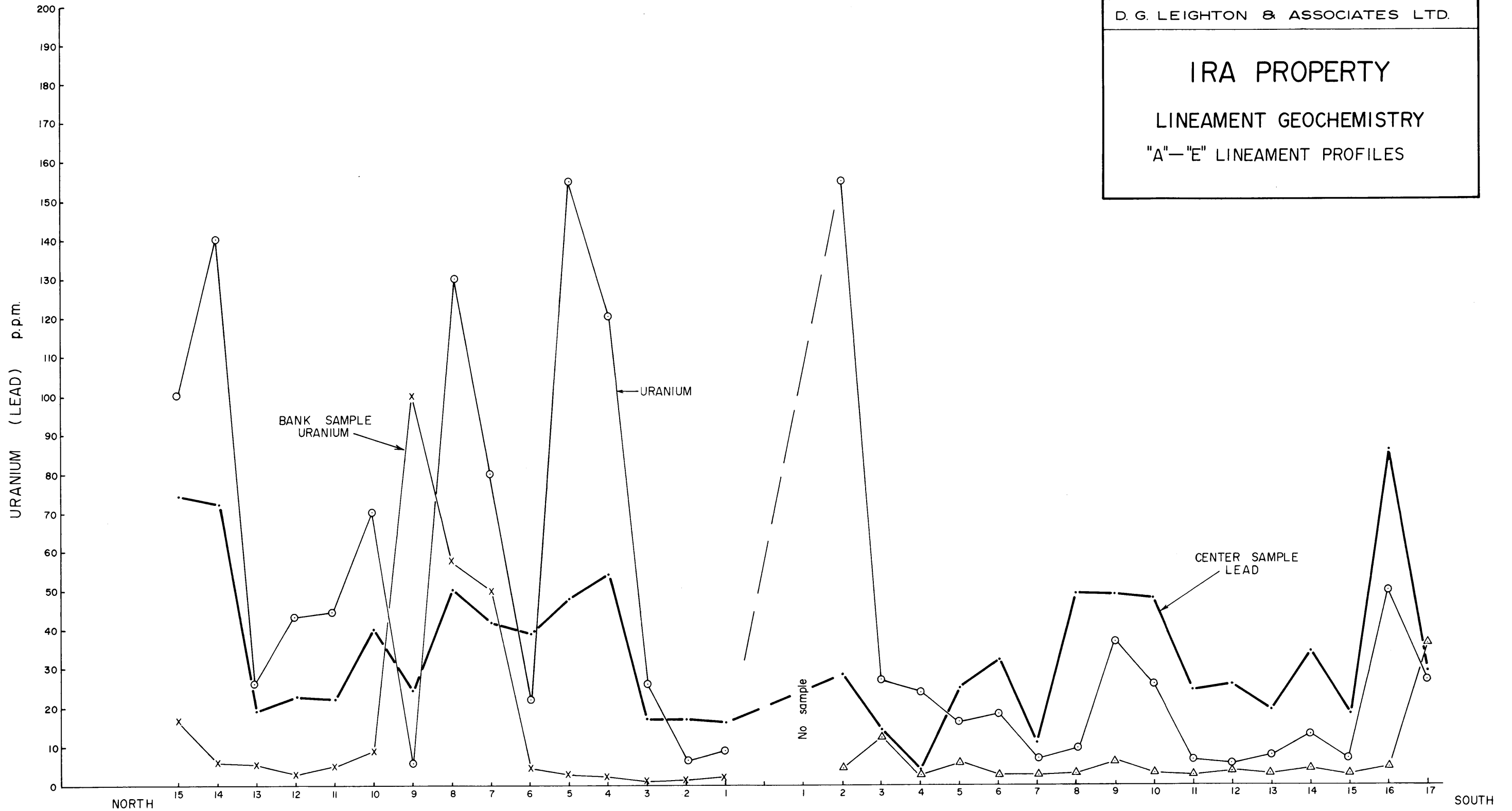
Results of the grid controlled geochemical survey on the IRA claims are shown on a set of three 1 centimeter to 2.5 meter maps (in pocket). Anomalous values have been contoured. For the most part lead and silver values "follow" uranium.

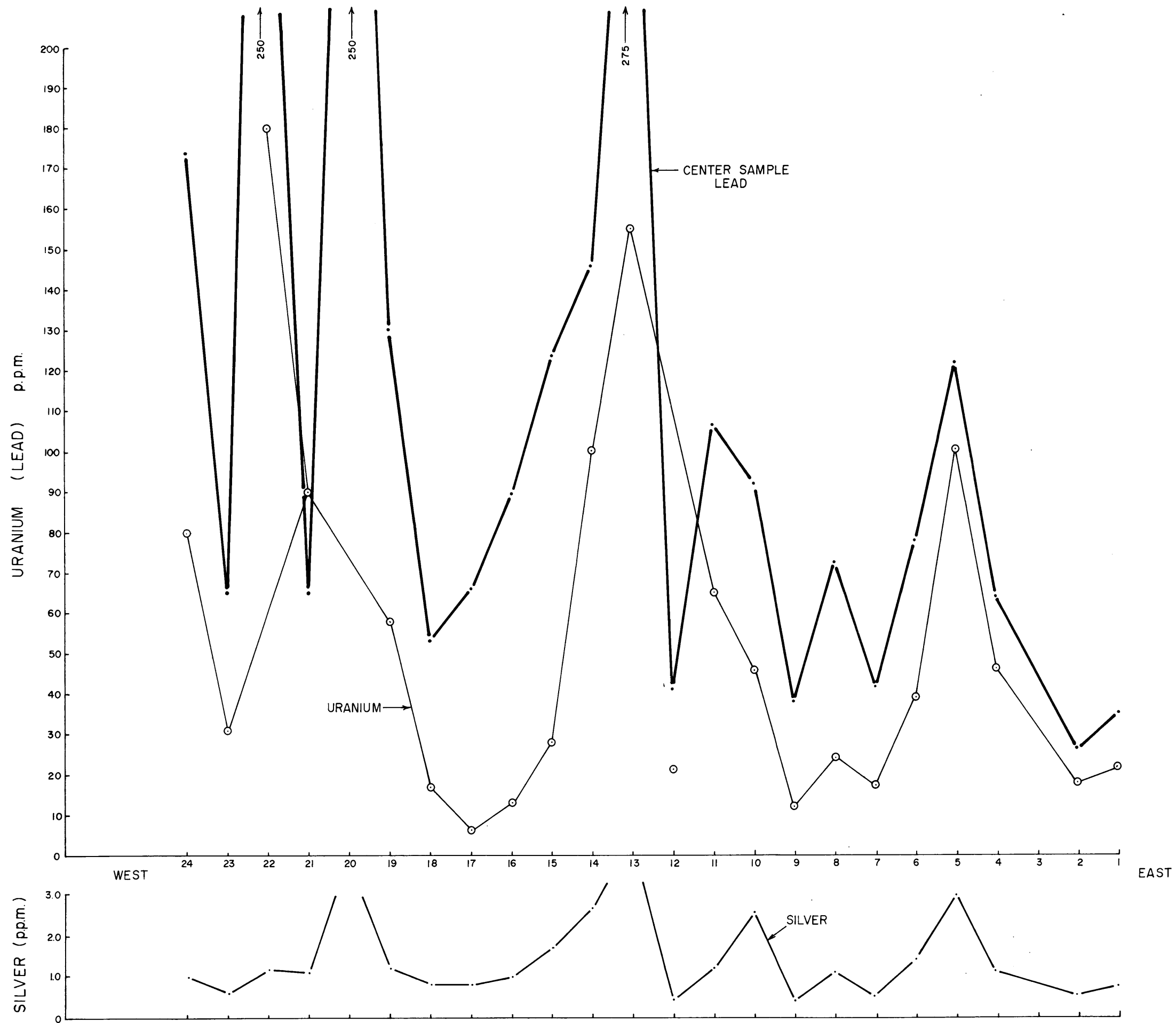
D. G. LEIGHTON & ASSOCIATES LTD.

IRA PROPERTY

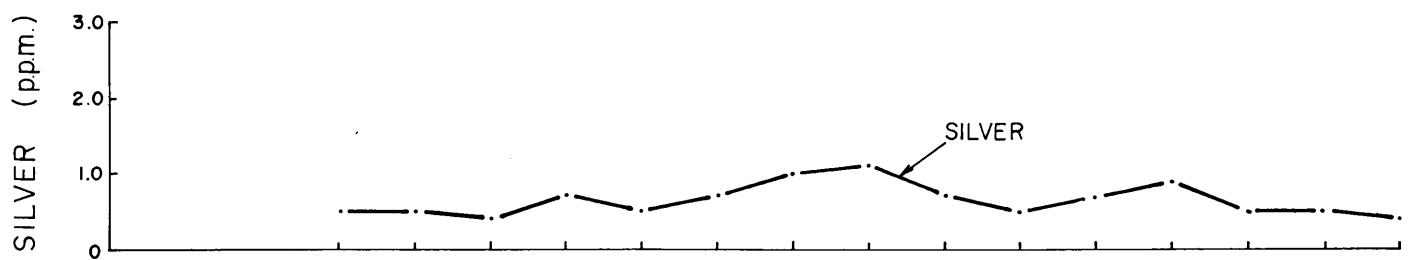
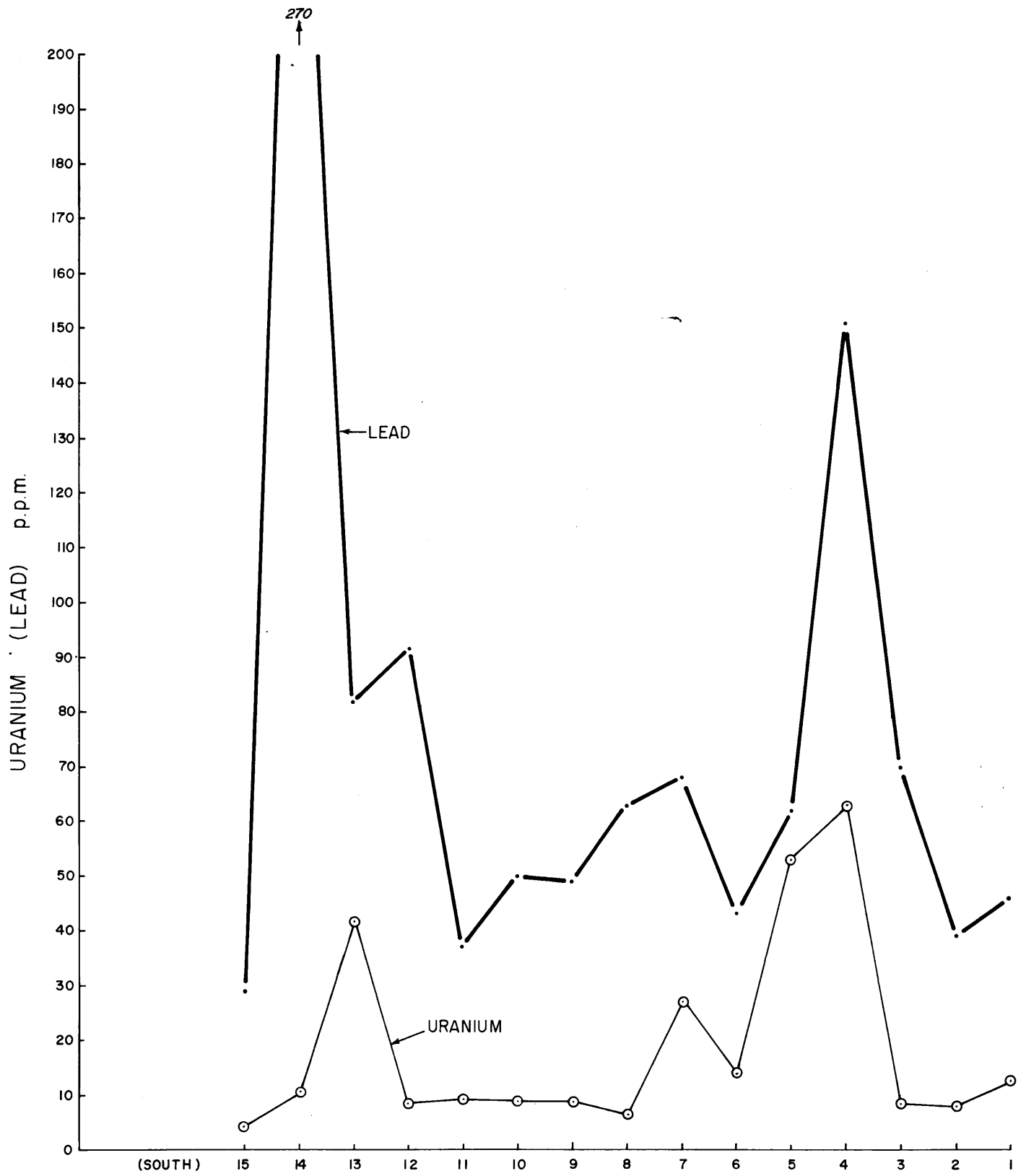
LINEAMENT GEOCHEMISTRY

"A"—"E" LINEAMENT PROFILES

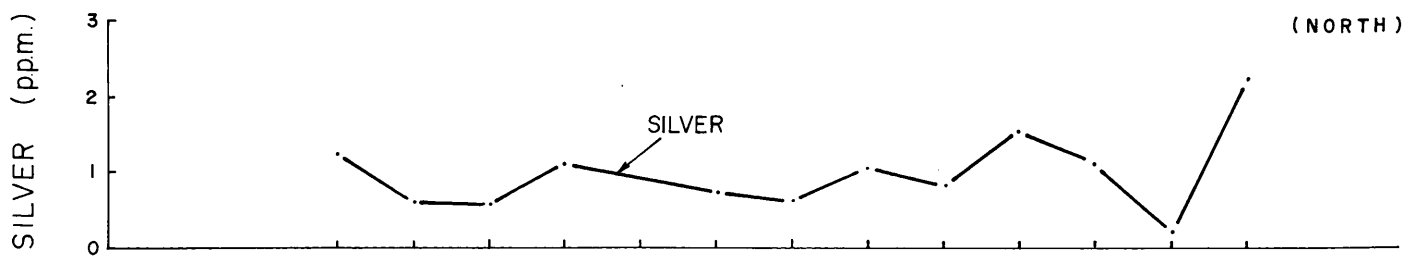
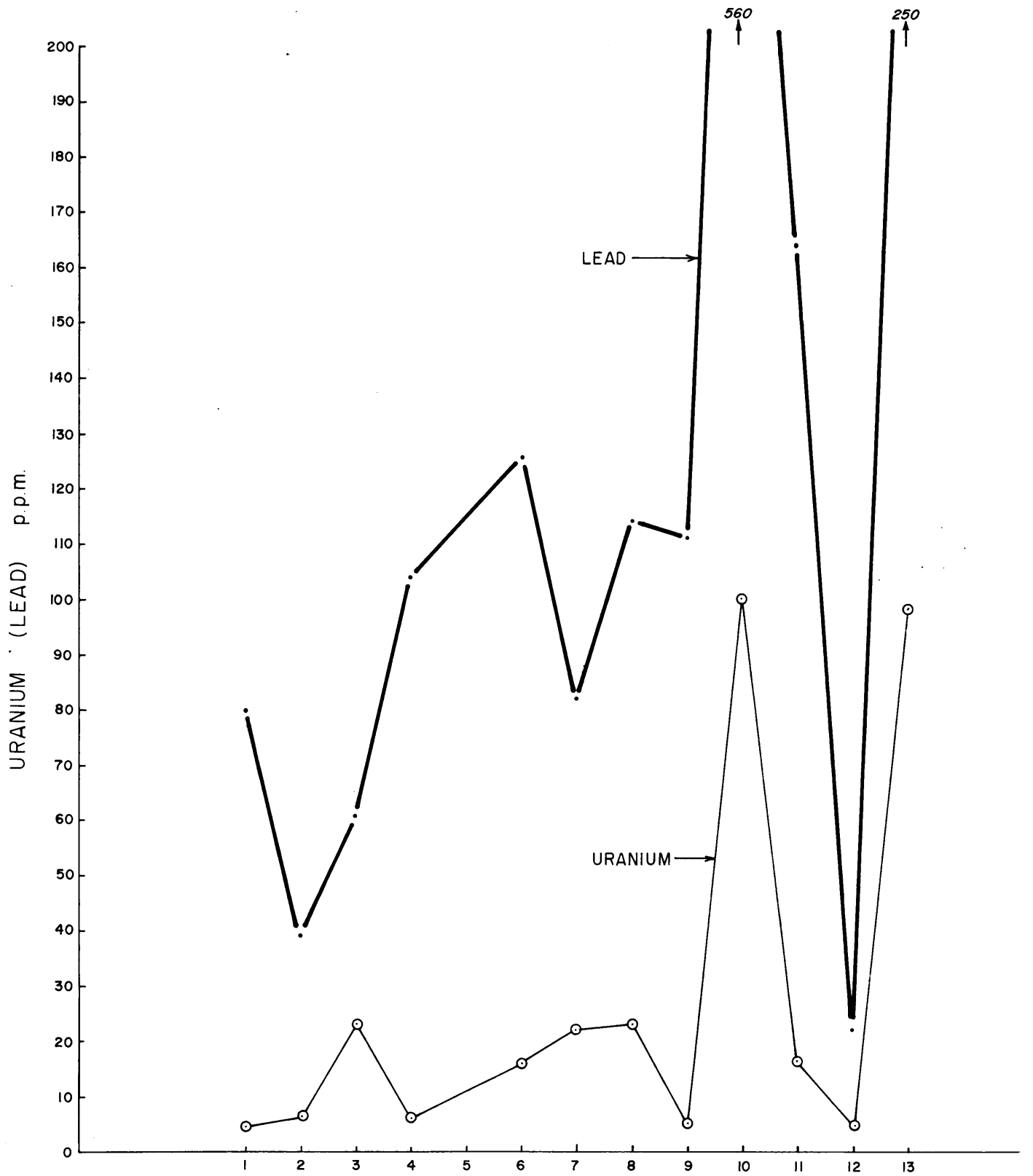




LINEAMENT "B"

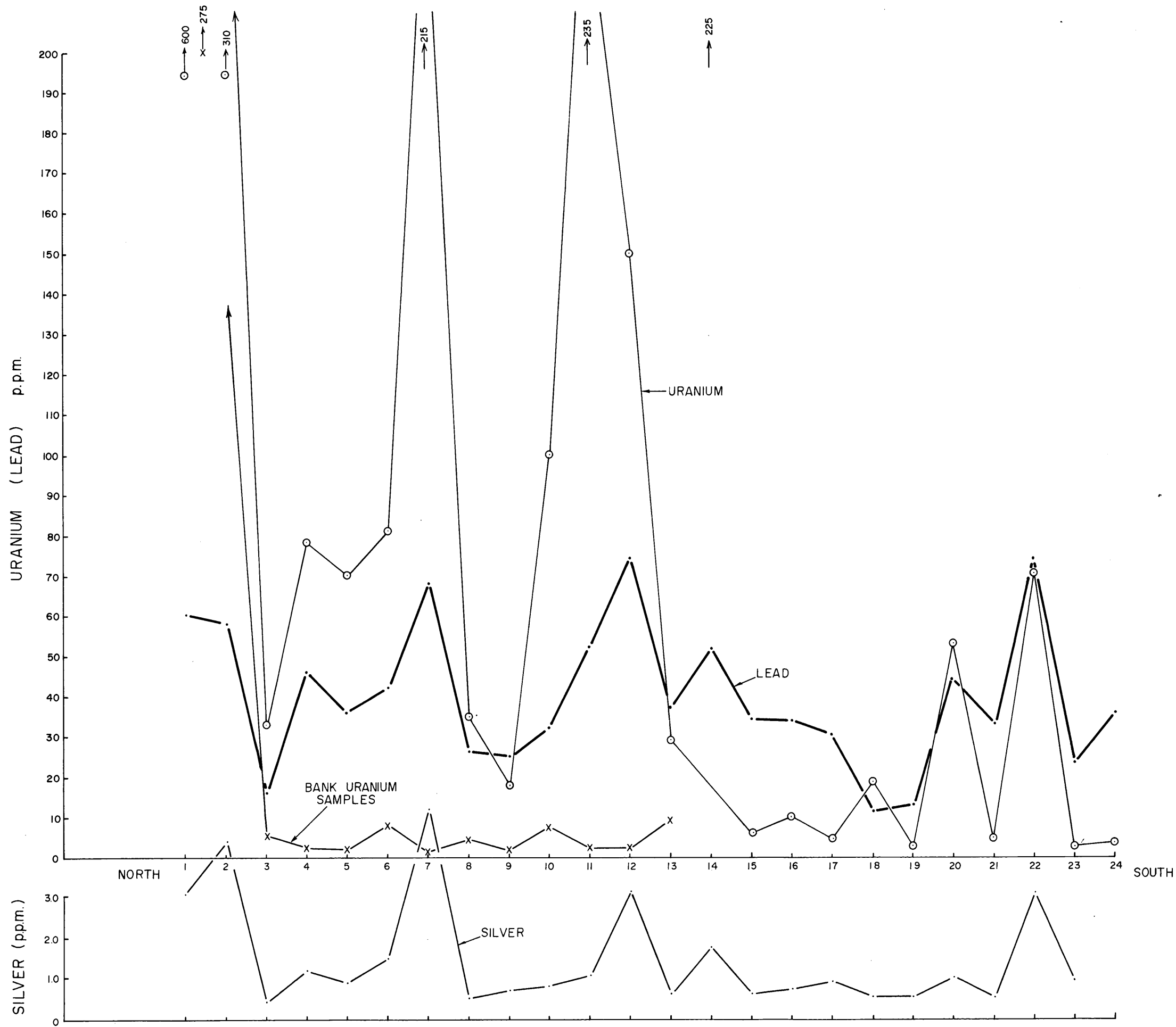


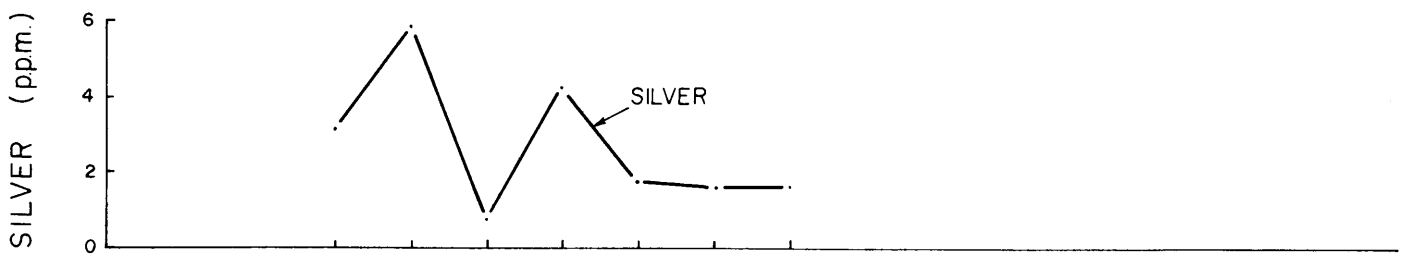
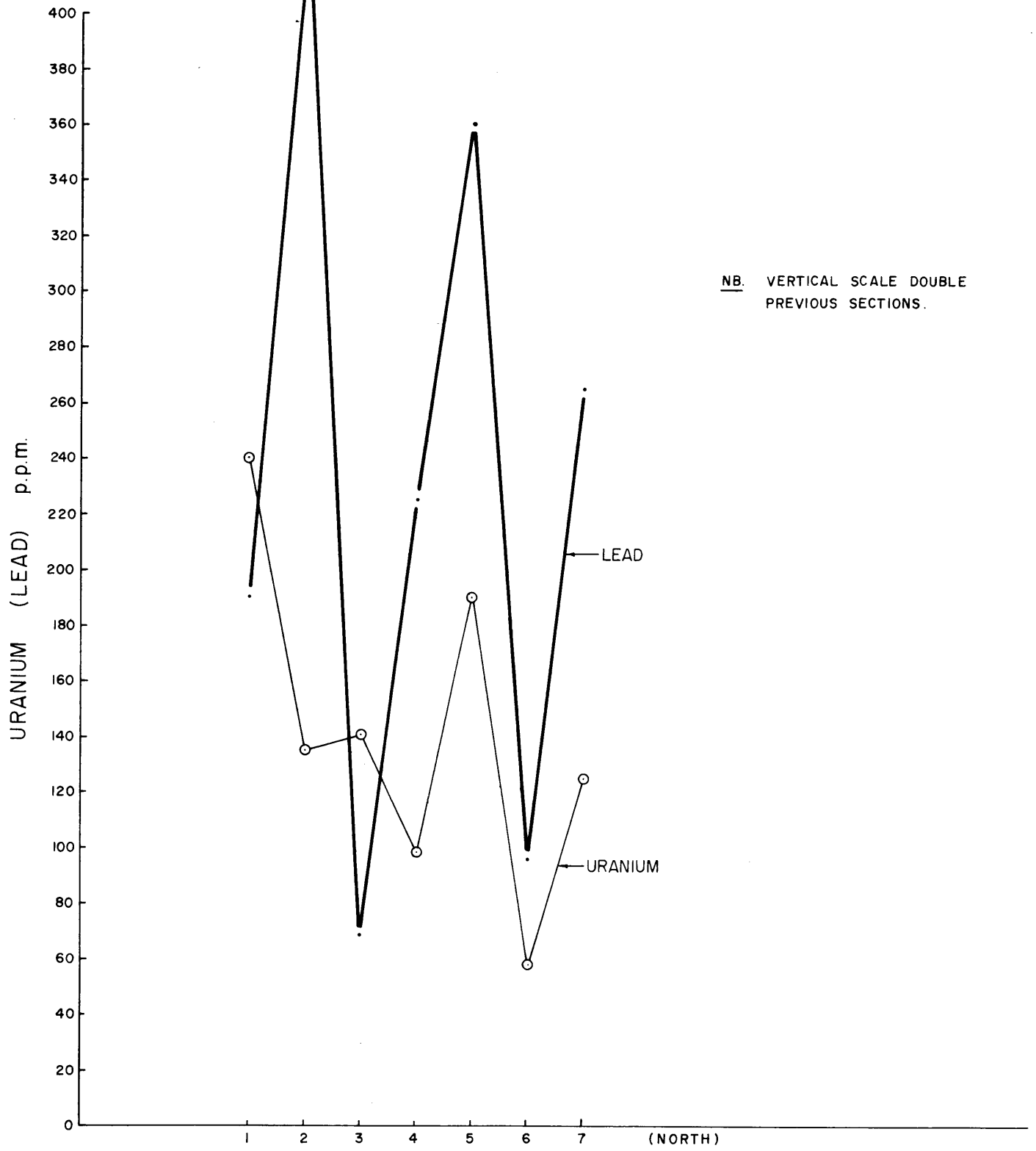
LINEAMENT "C"



(NORTH)

LINEAMENT "D"





Interpretation

Results of the geochemical grid work are interpreted as follows:

1. The anomalous uranium values relate to bedrock mineralization as proven by test pits which encountered rock assaying up to 0.05 % U_3O_8 .
2. Survey results indicate this mineralization is structurally controlled and probably hydrothermal in origin. It is largely associated with inclusions and pendants of a skarny nature within the granite, and accompanied by fluorite and minor sulphide mineralization.

VII RADIOMETRIC SURVEY

Instrumentation

A Spectra-44 gamma ray spectrometer (Serial No. 476-16) on lease from McPhar Instrument Corporation was used to survey the IRA property. The instrument was used in a digital mode with a 30 second counting time.

Ground Control

Control for radiometric work was by chain and compass survey. Grid stations were established as shown on accompanying maps entitled "Radiometric Survey Results A & B Grids".

Results

At each grid station total counts as well as data from the K-40, Bi-214 and Th-208 channels were recorded. Subsequently, values were plotted on compilation maps (see pocket). For ease of interpretation, the TC values have been contoured in 1000 count intervals.

Interpretation

Results of the radiometric work are interpreted as follows:

"A" GRID

1. High total count readings from the southwestern segment of the surveyed area are due mainly to the presence of rock bluffs - a closure effect.
2. Moderate value readings from the northern part of the surveyed area coincide with felsitic rock with a high background radio-activity.
3. Linear highs in the eastern grid area coincide with two parallel topographic lineations (probably faults) which have high uranium values in soils and silts. These are prime target areas for future work.

"B" GRID

1. High total count readings from the "B" grid area follow linear trends which follow mineralized structures.
2. The mineralization includes fluorite and sulphides as well as uranium and is therefore considered to be hydrothermal in origin.
3. Geochemistry seems to outline mineralized structures more effectively than does radiometric work.

VIII BREAKDOWN OF COSTS (for assessment purposes)

Wages and salaries	\$ 3,290.00
Benefits	823.00
Meals and accommodation	1,470.00
Mobilization	1,600.00
Assay costs	1,820.00
Miscellaneous; includes drafting, report preparation, instrument rental, etc.	<u>1,000.00</u>
Total	<u><u>\$10,003.00</u></u>

Of above costs approximately 40% apply to IRA-WEST GROUP and 60% to IRA-EAST GROUP.

IX CERTIFICATION

I, R.R. Culbert, do hereby certify that:

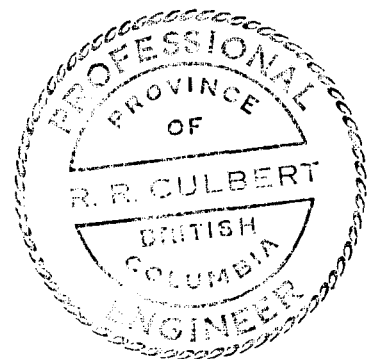
1. I am a practicing Professional Geological Engineer with offices at 3152 West 10th Ave., Vancouver, B.C.
2. I am a graduate of the University of British Columbia, B.A.Sc. (1964), Ph.D. (1971).
3. I have practiced mining exploration for fifteen years, most of which were based in British Columbia.
4. I am a member in good standing of the Association of Professional Engineers of the Province of British Columbia.
5. I have personally visited the IRA property and supervised exploration work carried out there.

Respectfully submitted,

R.R. Culbert

R.R. Culbert, P.Eng., Ph.D.

31 August, 1977



GEOCHEMICAL ANALYSIS BY MIN-EN LABORATORIES
LTD.

Samples are processed by Min-En Laboratories Ltd. at 705 W. 15th St., North Vancouver Laboratory employing the following procedures.

After drying the samples at 95°C soil and stream sediment samples are screened by 80 mesh sieve to obtain the minus 80 mesh fraction for analysis. The rock samples are crushed by jaw crusher and pulverized by ceramic plated pulverizer.

1.0 gram of the samples are digested for 6 hours with HNO_3 and HClO_4 mixture.

After cooling samples are diluted to standard volume. The solutions are analysed by Atomic Absorption Spectrophotometers.

Copper, lead, zinc, silver, cadmium, cobalt, nickel and manganese are analysed using the CH_2H_2 -Air flame combination but the molybdenum determination is carried out by C_2H_2 - N_2O gas mixture directly or indirectly (depending on the sensitivity and detection limit required) on these sample solutions.

For Arsenic analysis a suitable aliquote is taken from the above 1 gram sample solution and the test is carried out by Gutzit method using $\text{Ag CS}_2 \text{ N (C}_2\text{H}_5)_2$ as a reagent. The detection limit obtained is 1. ppm.

Fluorine analysis is carried out on a 200 miligram sample. After fusion and suitable dilutions the fluoride ion concentration in rocks or soils samples are measured quantitatively by using fluorine specific ion electrode. Detection limit of this test is 10 ppm F.

MIN-EN Laboratories Ltd.

Specialists in Mineral Environments

Corner 15th Street and Bewicke

705 WEST 15th STREET

NORTH VANCOUVER, B.C.

CANADA

ANALYTICAL PROCEDURE REPORTS FOR
ASSESSMENT WORK

Procedure for Uranium Analysis:

Rock, soil and silt samples are dried at 110°C and then rocks are crushed and pulverized to -80 mesh.

Soils and silts are sieved and the minus 80 mesh fraction is retained for analysis.

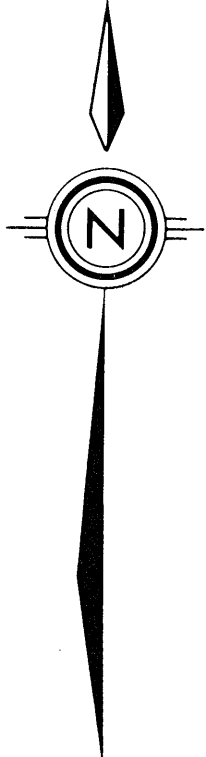
1.000 g. sub-sample is weighed and digested for eight hours with HNO_3 and HClO_4 .

Then the uranium is separated chemically from other possible interfering ions as Mn, Fe, etc.

After preparation a suitable aliquote is taken and fluxed to form a 1.5 inch diameter discs in platinum dishes.

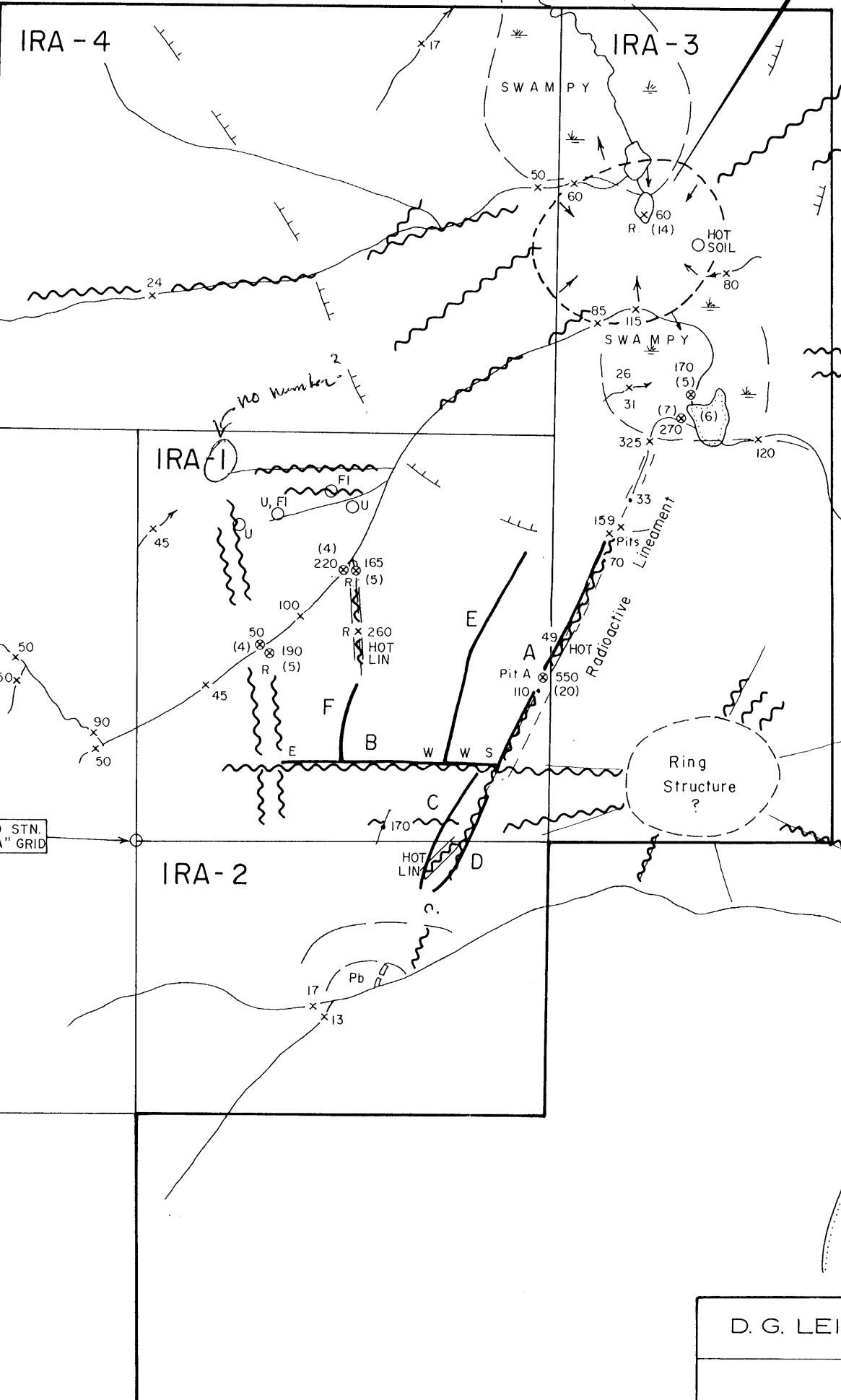
These salt discs then are compared and measured along with suitable standard with a Jarrell Ash Fluorometer.

The results are calculated accordingly to the sample aliquotes used from standard graphs.



PINE RIVER

POSSIBLE AREA FOR U COLLECTION



LEGEND

- x¹⁵ Stream sediment sample with uranium in p.p.m.
- ⊗(7)¹⁵ Water-sediment pair samples with sediment uranium in p.p.m. and water uranium in p.p.b. (in brackets)
- Lineaments where soil samples collected (1977)
- Mineral occurrences
- x Anomalous radioactivity
- Pb Lead
- U Uranium
- FI Fluorite
- Trench
- Radioactive lineament
- Lination (fault)

MINERAL RESOURCES BRANCH
ASSESSMENT REPORT
NO. **6426**

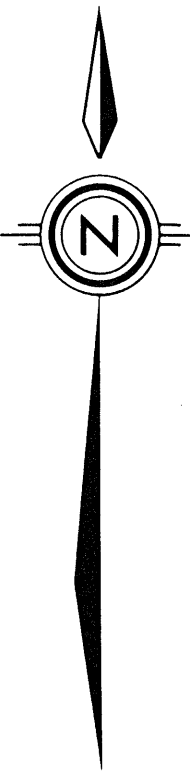
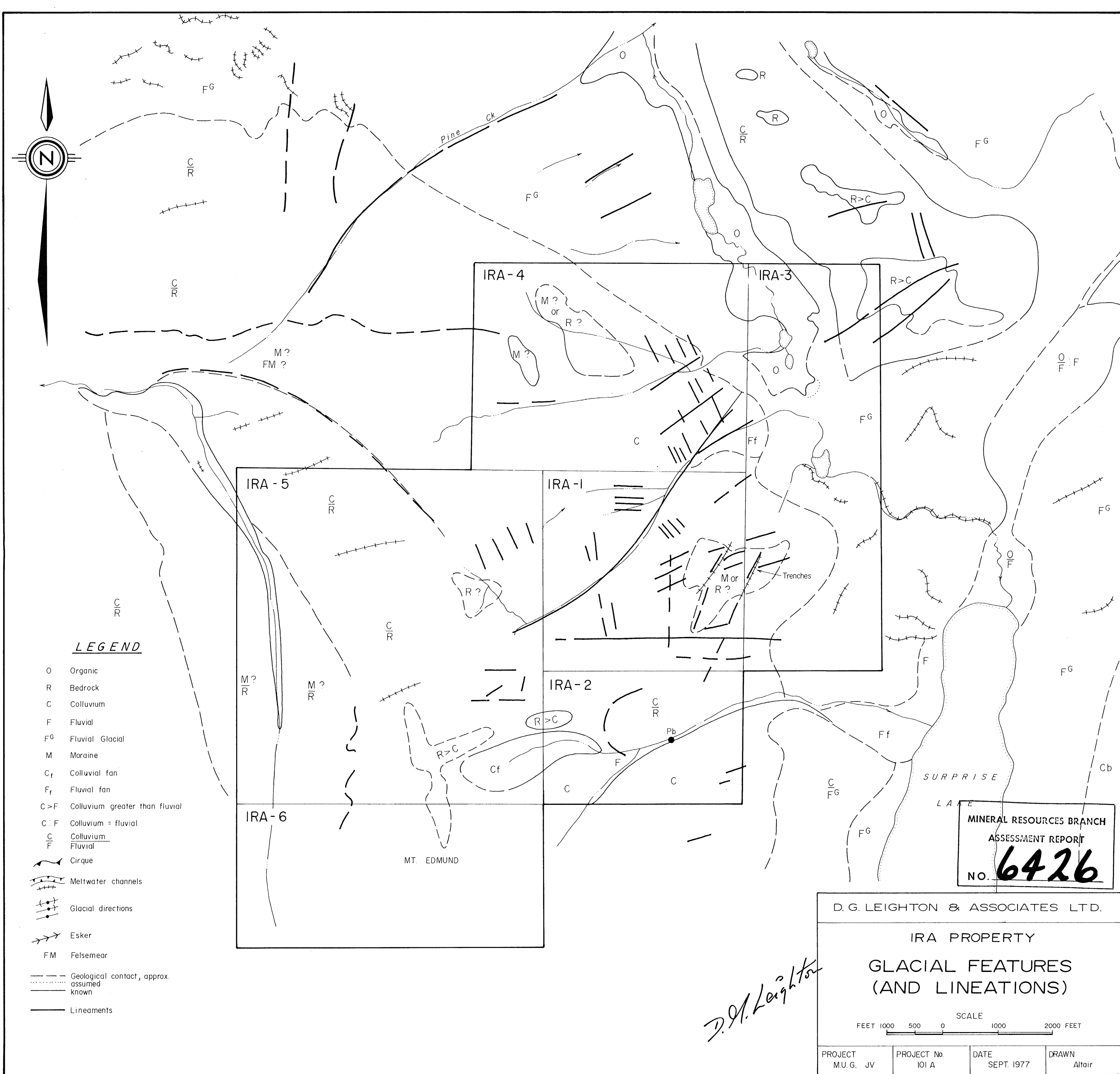
D. G. LEIGHTON & ASSOCIATES LTD.

IRA PROPERTY
GEOCHEMICAL RECONNAISSANCE
SURVEY RESULTS &
LINEAMENT SAMPLING



PROJECT M.U.G. JV	PROJECT No. 101 A	DATE SEPT. 1977	DRAWN Altair
----------------------	----------------------	--------------------	-----------------

D.G. Leighton



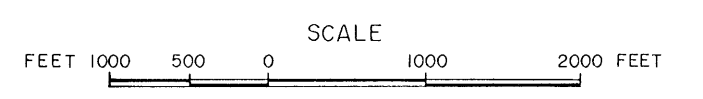
LEGEND

- O Organic
- R Bedrock
- C Colluvium
- F Fluvial
- FG Fluvial Glacial
- M Moraine
- C_f Colluvial fan
- F_f Fluvial fan
- C>F Colluvium greater than fluvial
- C:F Colluvium = fluvial
- $\frac{C}{F}$ Colluvium
Fluvial
- Cirque
- Meltwater channels
- Glacial directions
- Esker
- FM Felsemear
- Geological contact, approx.
 assumed
known
- Lineaments

MINERAL RESOURCES BRANCH
ASSESSMENT REPORT
NO. **6426**

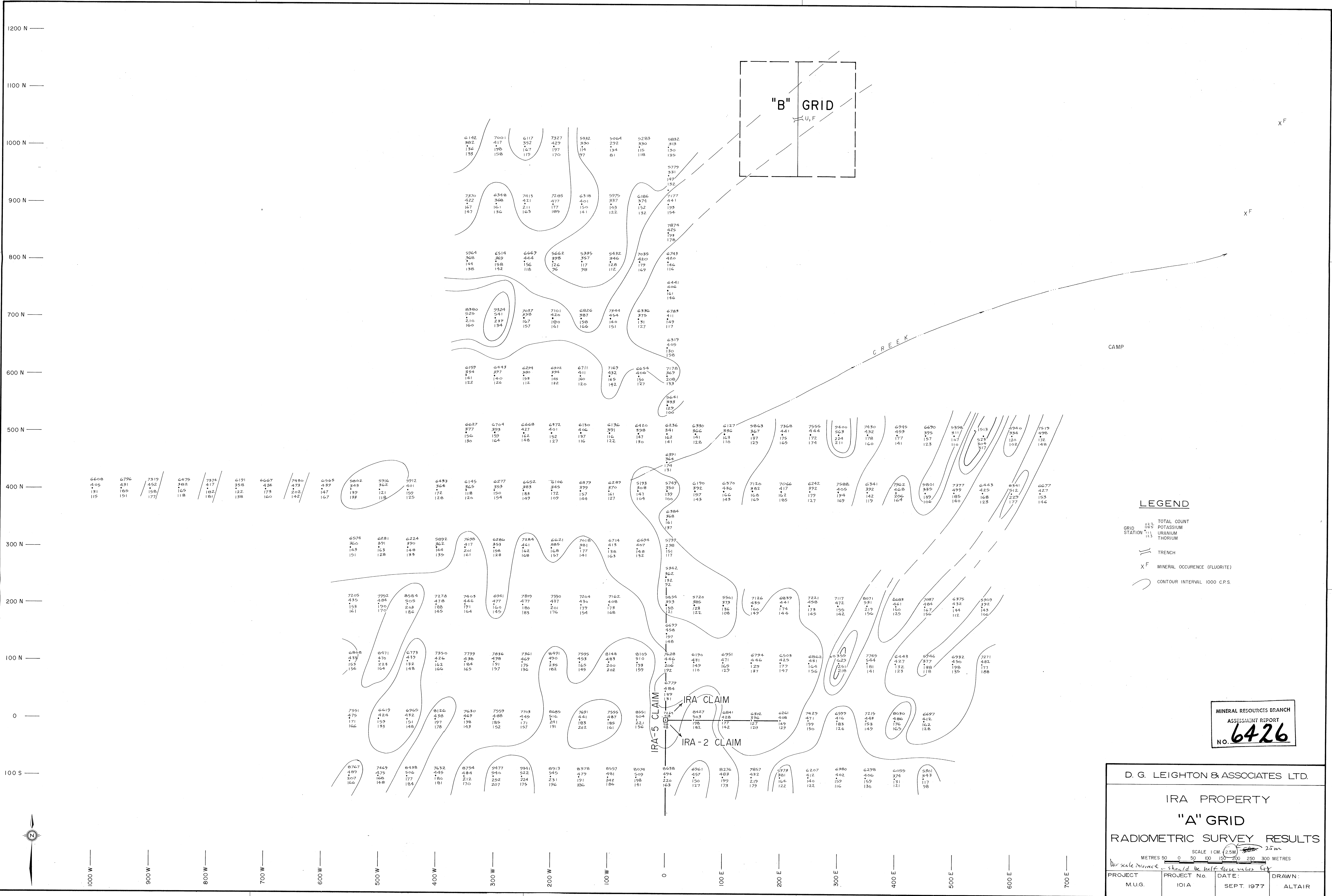
D. G. LEIGHTON & ASSOCIATES LTD.

IRA PROPERTY
GLACIAL FEATURES
(AND LINEATIONS)



PROJECT M.U.G. JV	PROJECT No. 101 A	DATE SEPT. 1977	DRAWN Altair
----------------------	----------------------	--------------------	-----------------

D. G. Leighton



LEGEND

TOTAL COUNT
 22.2 POTASSIUM
 11.1 URANIUM
 11.3 THORIUM

TRENCH

X F MINERAL OCCURENCE (FLUORITE)

CONTOUR INTERVAL 1000 C.P.S.

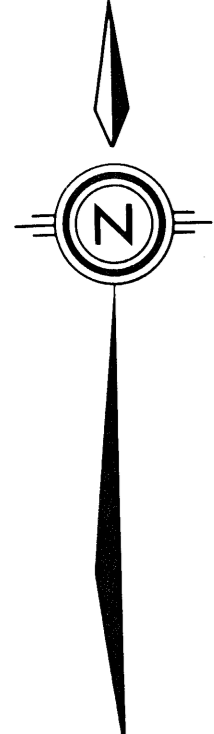
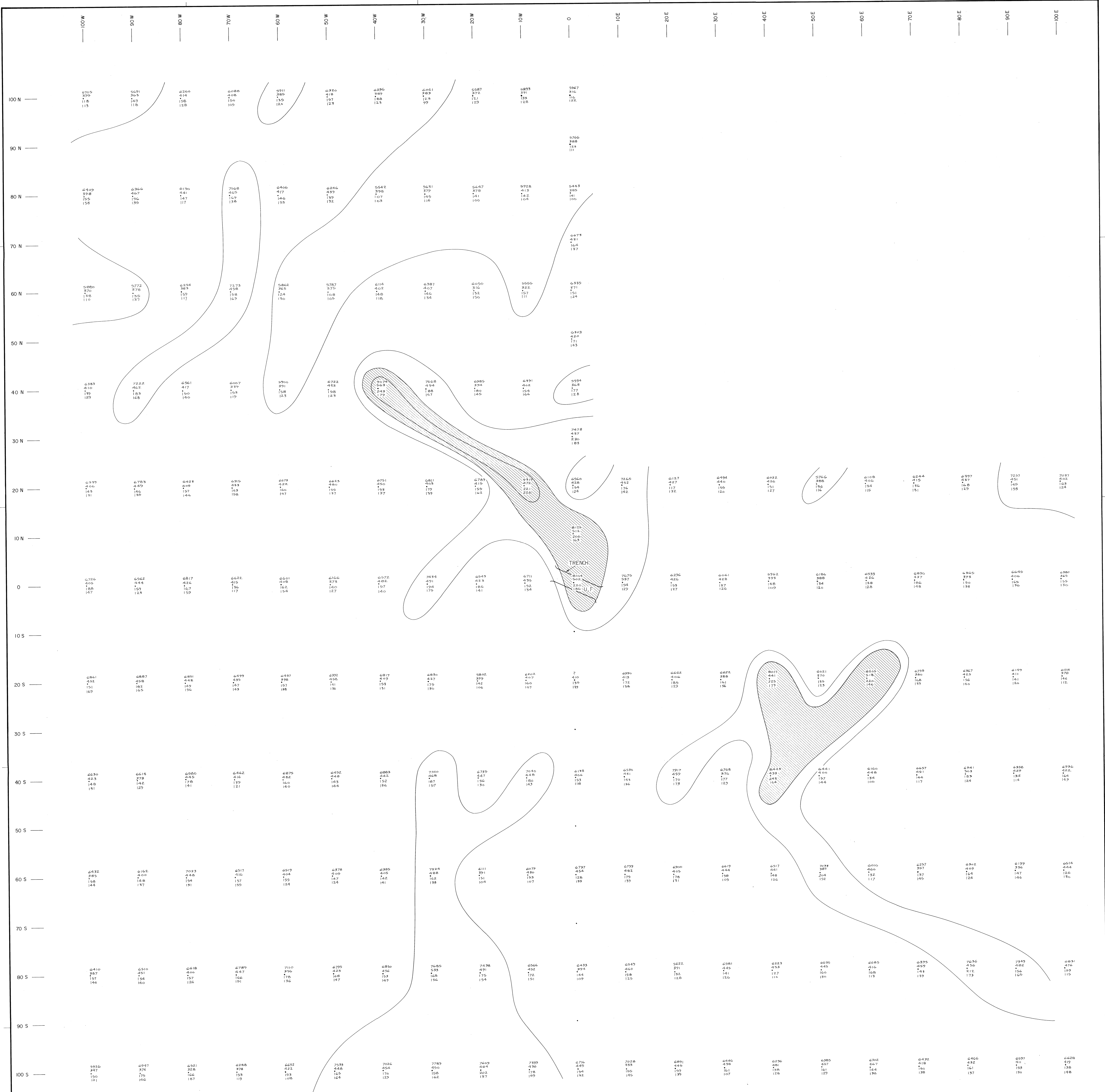
MINERAL RESOURCES BRANCH
 ASSESSMENT REPORT
 NO. **6426**

D. G. LEIGHTON & ASSOCIATES LTD.

IRA PROPERTY
 "A" GRID
 RADIOMETRIC SURVEY RESULTS

SCALE 1 CM = 25 M
 METRES 0 50 100 150 200 250 300

PROJECT M.U.G. PROJECT No. IOIA DATE: SEPT. 1977 DRAWN: ALTAIR



LEGEND
 222 TOTAL COUNT
 40K POTASSIUM
 137 URANIUM
 232 THORIUM
 TRENCH
 CONTOUR INTERVAL 1000 C.P.S

MINERAL RESOURCES BRANCH
 ASSESSMENT REPORT
 No. **6426**

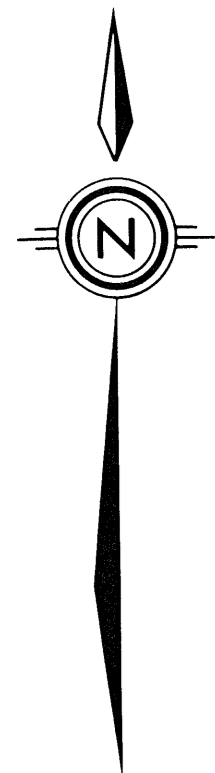
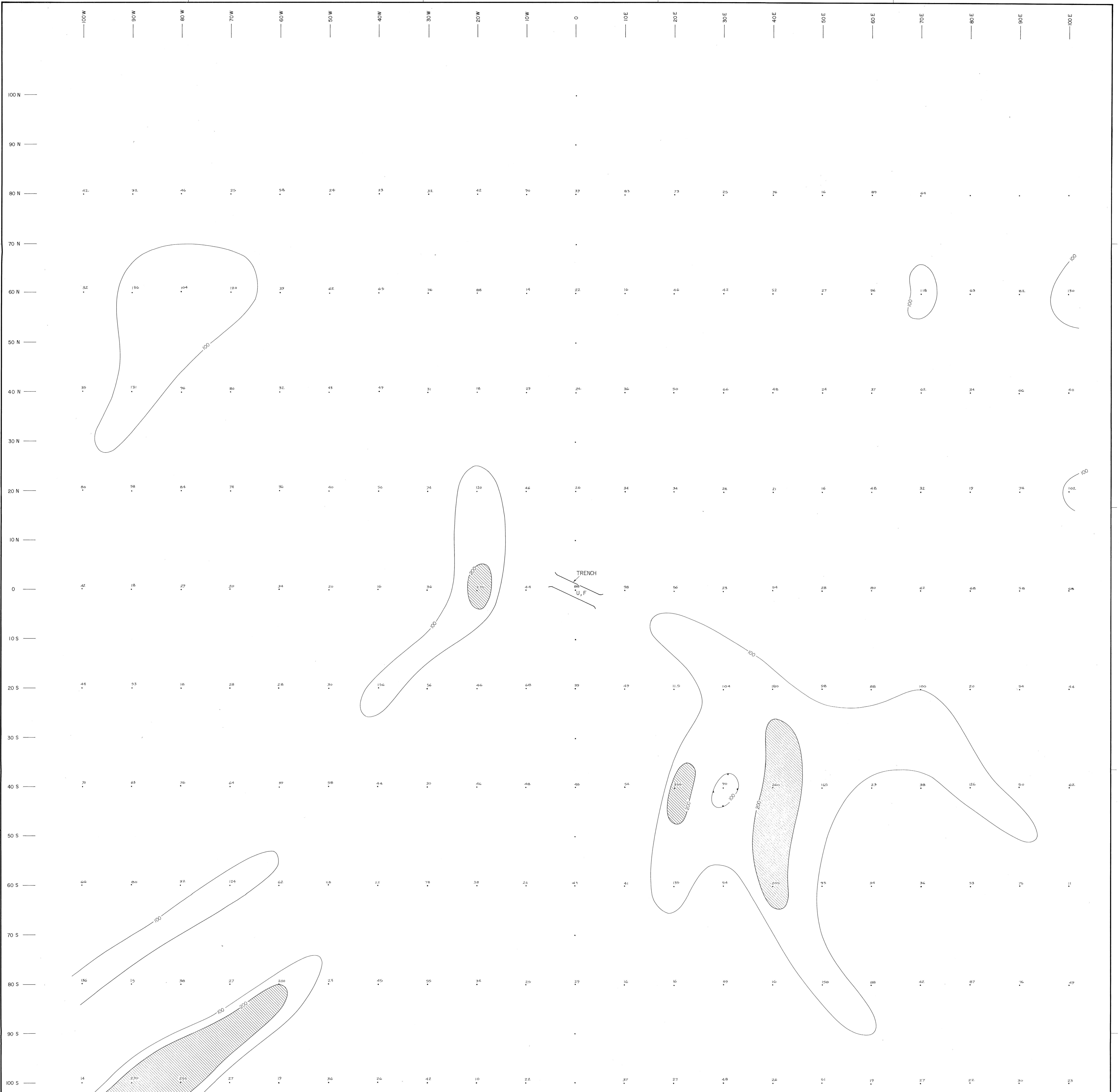
D. G. LEIGHTON & ASSOCIATES LTD.

IRA PROPERTY
"B" GRID
 RADIOMETRIC SURVEY RESULTS

SCALE 1CM = 25M

METRES 0 25 50 100 150 200 METRES

PROJECT M.U.G.	PROJECT No. 101A	DATE: SEPT. 1977	DRAWN: ALTAIR
----------------	------------------	------------------	---------------

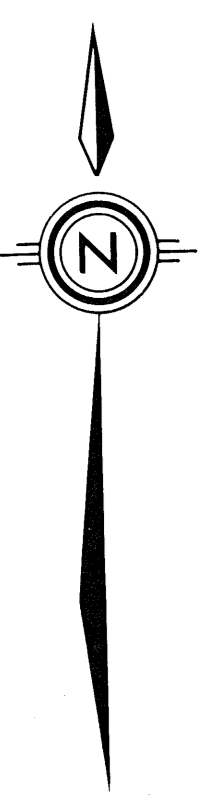
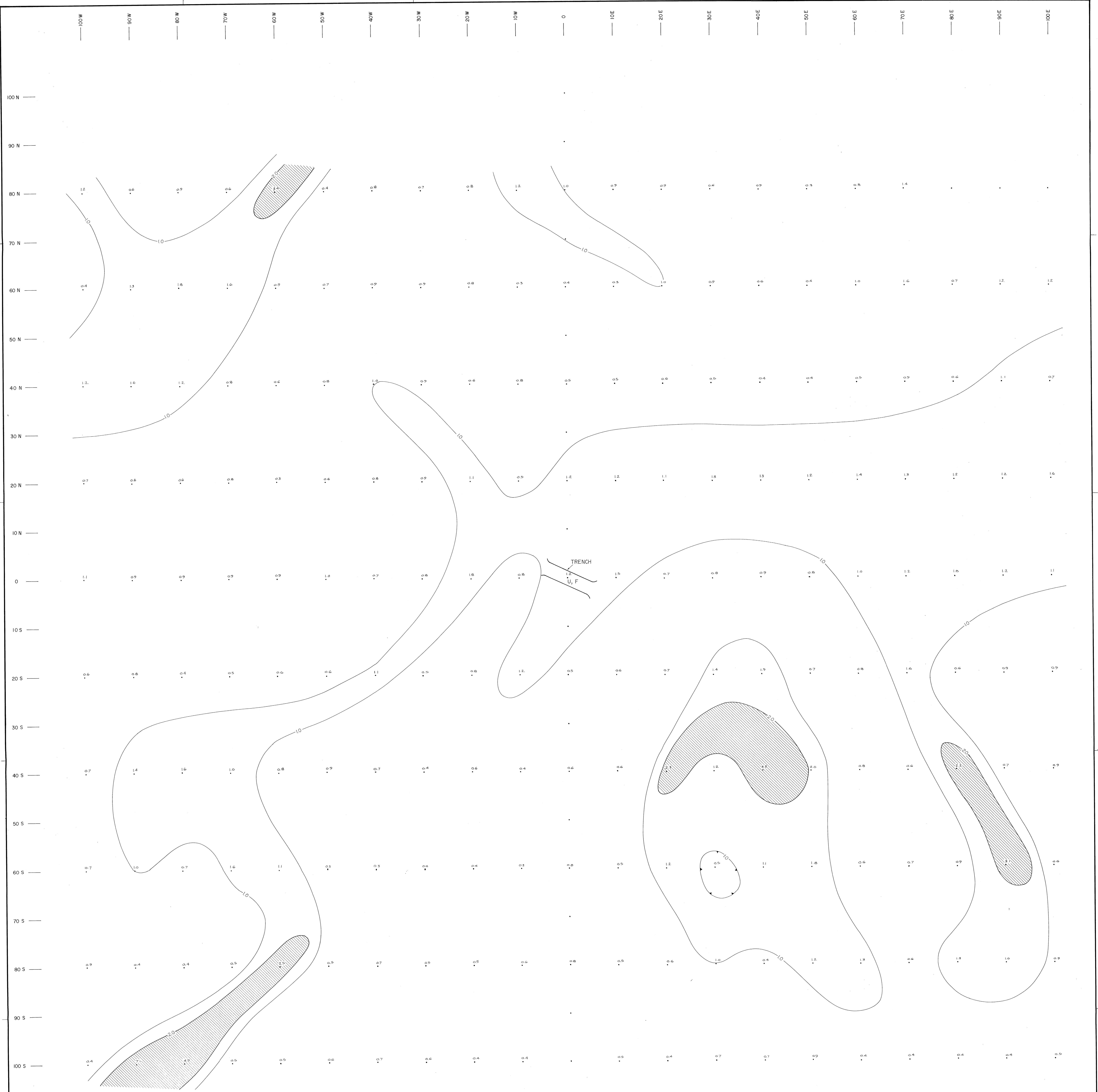


LEGEND

- < 100 PPM LEAD
- 100-200 PPM LEAD
- >200 PPM LEAD

MINERAL RESOURCES BRANCH
ASSESSMENT REPORT
NO. **6426**

D. G. LEIGHTON & ASSOCIATES LTD.			
IRA PROPERTY LEAD IN PPM "B" GRID			
GEOCHEMICAL SURVEY RESULTS			
SCALE 1 CM = 2.5 M			
METRES 5 10 15 20 30			
PROJECT M.U.G.	PROJECT No 101A	DATE: SEPT. 1977	DRAWN: ALTAIR

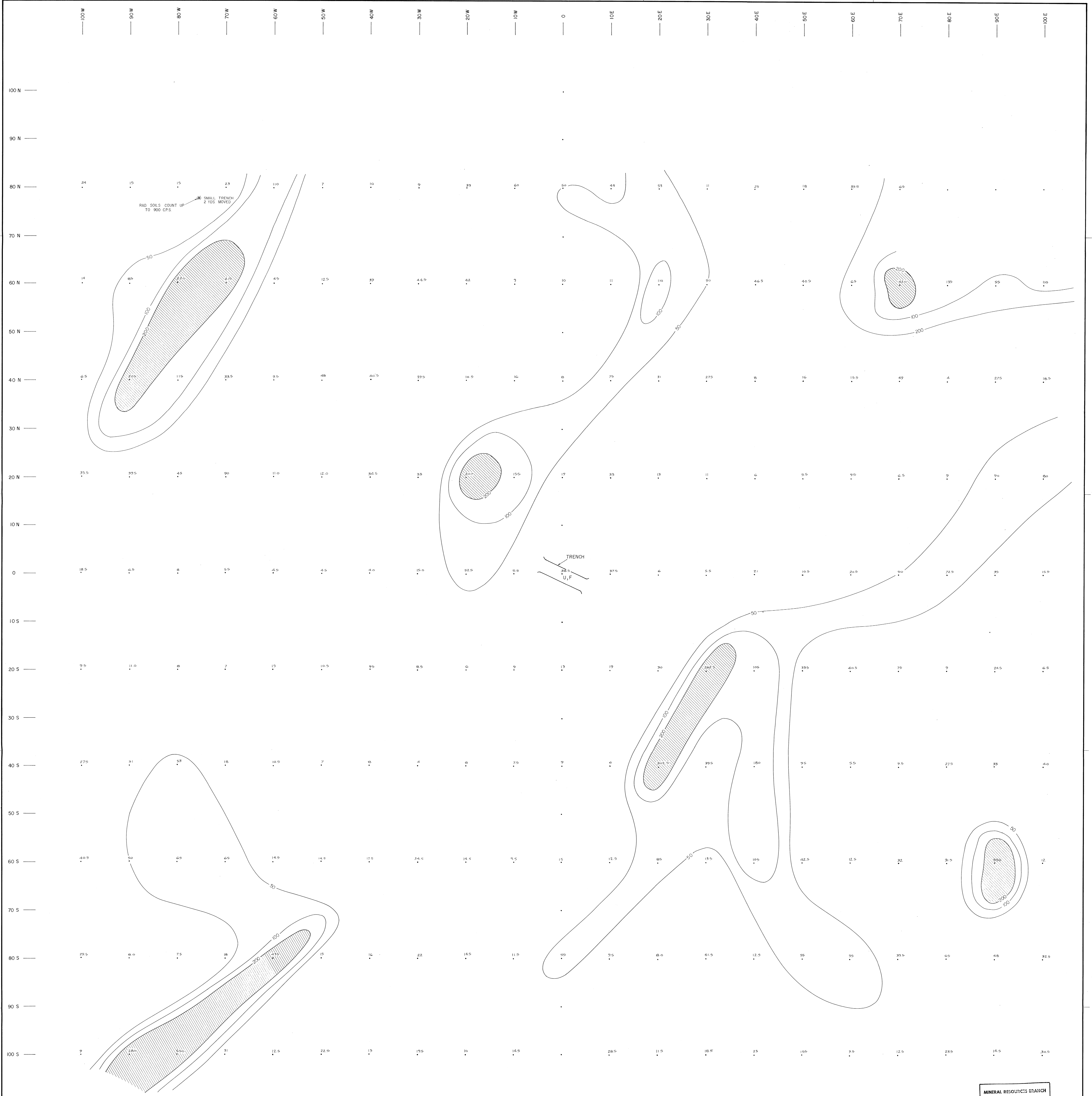


LEGEND

- <10 PPM SILVER
- 10 - 20 PPM SILVER
- >20 PPM SILVER

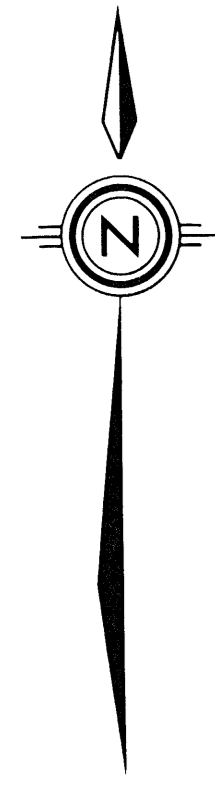
MINERAL RESOURCES BRANCH
ASSESSMENT REPORT
NO. **6426**

D. G. LEIGHTON & ASSOCIATES LTD.			
SILVER IN PPM			
"B" GRID			
GEOCHEMICAL SURVEY RESULTS			
SCALE 1 CM = 2.5 M			
METRES 0 5 10 15 20 30			
PROJECT	PROJECT No.	DATE:	DRAWN:
M.U.G.	101A	SEPT. 1977	ALTAIR



SMALL TRENCH
2 YDS DEEP
RAD. SOILS COUNT UP
TO 300 CFS

TRENCH
28.5
U, F



LEGEND

- < 50 PPM URANIUM
- 50 - 100 PPM URANIUM
- 100 - 200 PPM URANIUM
- > 200 PPM URANIUM

MINERAL RESOURCES BRANCH
ASSESSMENT REPORT
NO. 6426

D. G. LEIGHTON & ASSOCIATES LTD.

IRA PROPERTY
URANIUM IN PPM
"B" GRID
GEOCHEMICAL SURVEY RESULTS

SCALE 1 CM = 25M
METRES 5 10 15 20 30

PROJECT M.U.G.	PROJECT No. 101A	DATE SEPT. 1977	DRAWN ALTAIR
-------------------	---------------------	--------------------	-----------------