83-#100-#11109

REPORT ON

GEOLOGICAL, GEOCHEMICAL, MAGNETOMETER

AND

VERY LOW FREQUENCY - ELECTROMAGNETIC SURVEYS

CONDUCTED ON THE

RICH I TO RICH VII MINERAL CLAIMS

VERNON MINING DIVISION

N.T.S. 82E/15E

49° 55' N. LATITUDE AND 118° 34' W. LONGITUDE

OWNER OF CLAIMS: R. CUNDALL

OPERATOR: MOHAWK OIL CO. LTD.

AUTHOR: M.W. WALDNER

DATE: APRIL 5, 1983

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INTRODUCTION

Exploration on the Rich I to Rich VII claims during the 1982 field season included geological mapping, plus magnetometer, VLF-EM and geochemical soil sampling surveys. This is the first exploration program conducted on the claims.

LOCATION AND ACCESS

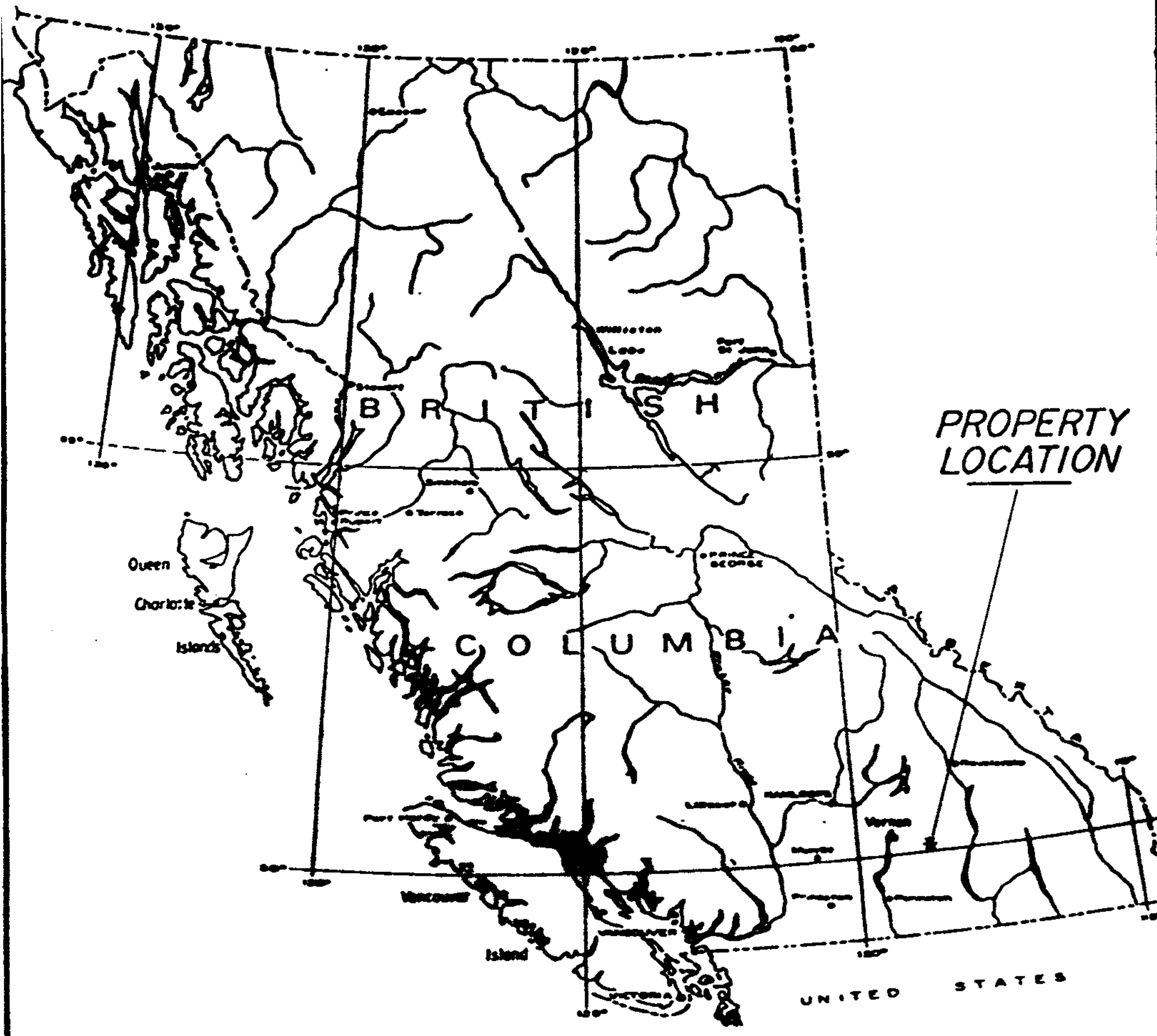
The claims are located in the Monashee Mountains approximately 3 kilometers northwest of Lightning Peak, map sheet N.T.S. 82E/15E, latitude 49° 55' N and longitude 118° 34' W.

Access to the property is via a four-wheel-drive road which joins Highway 6 approximately 110 kilometers southeast of Vernon. This road to the old Dictator Mine intersects the claim block about 35 kilometers from the highway.

PHYSIOGRAPHY

The topography slopes towards the south. From an elevation of about 1790 metres a.s.l. in the northeastern part of the claims to approximately 1620 metres a.s.l. in the south. The relief is moderate to locally steep in the creek valleys. These creek valleys are several tributaries which occur at the headwaters of Randell Creek. Rendell Creek flows southward through the claim block.

The claims are forested primarily by stands of fir, spruce, and poplar. There



MOHAWK OIL Co. LTD.

RICH CLAIMS

LOCATION MAP

SCALE
100 50 0 100 200 300 400 Km

FIGURE 1

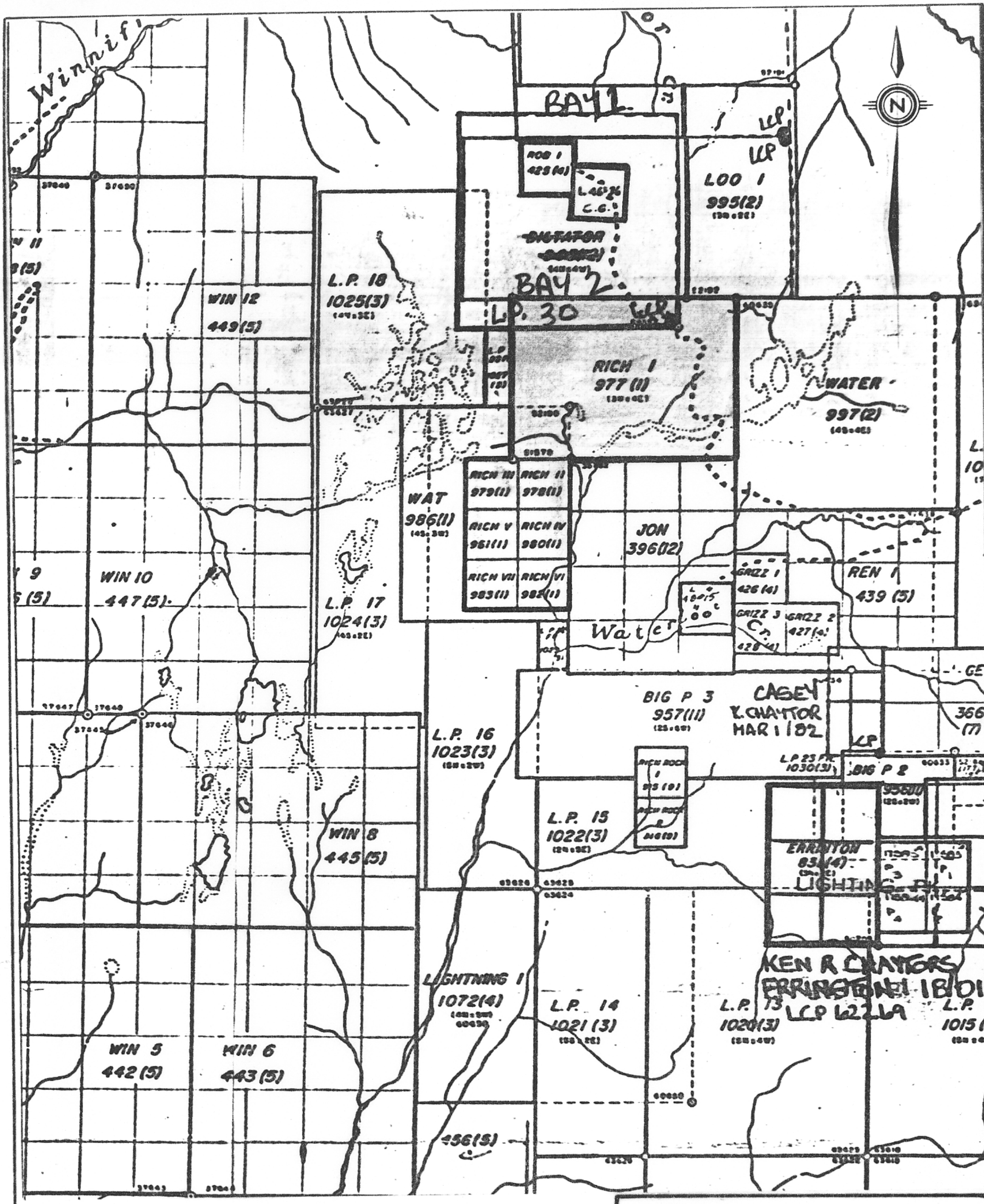
are also marshes on the Rich I claim and locally alder is abundant.

Outcrops occur primarily in the creek valleys. Only about 20 per cent of the claims area is exposed as outcrop.

PROPERTY

The property is currently under option to Mohawk Oil Co. Ltd. from Lightning Peak Mining Ltd. The registered owner of the claims is Richard Cundall who holds the claims in trust for Lightning Peak Mining Ltd. No work had been done on the claims since they were staked in January of 1981 in an area of geologically favourable rocks. The Lightning Peak area has been explored and worked since the late 1800's. Lead, zinc, silver and gold mineralization has been discovered in the area and some mining has taken place, most notably at the Waterloo Silver Mine east of the claim block about 2 kilometers. The same favourable host rocks for the Waterloo Mine mineralization occur on the Rich claims.

The property consists of one claim staked on the modified grid system and six two post mineral claims. These claims include:



82 E/15 E

MOHAWK OIL CO. LTD.		
CLAIMS MAP		
DRAWN BY	DATE	DRAWING NO.
		FIG. 2

CLAIM NAME	NO. OF UNITS	RECORD NO.	MONTH OF RECORD
Rich I	12	977	January
Rich II	1	978	January
Rich III	1	979	January
Rich IV	1	980	January
Rich V	1	981	January
Rich VI	1	982	January
Rich VII	1	983	January

SUMMARY

The entire property covers approximately 3.8 square kilometers. The property was mapped and surveyed on a scale of 1:5000. The geological mapping of the entire property included mapping and plotting of outcrop data on the 1:5000 scale base map and interpretation of the geological structures and rock types using the mapped outcrop locations, the magnetometer survey data, VLF-EM data and aerial photographs.

The geophysical surveys included a VLF-EM survey on the Rich I claim totalling about 7.5 line kilometers with dip angle readings taken about every 15 metres along the lines. A magnetometer survey was also conducted on the entire property. Magnetic readings, recorded in gammas, were taken approximately every 15 meters along flagged lines. A total of about 13.1 kilometers were surveyed using the magnetometer.

Flagged lines were established to serve as a sampling grid for the geophysical surveys, control for the geological mapping and as a sampling grid for the

geochemical soil sampling survey. A total of about 13.1 kilometers of flagged grid lines, covering all the claims comprising the property, were sampled on about 50 metre intervals along the lines. A total of 249 soil samples were collected. These soil samples were analyzed for lead, zinc, silver, copper, antimony and arsenic.

Approximately one day was spent using a chain and compass, theodelite and EDM survey instrument establishing the claims locations and tying these claims to topographic features in the area. The grid lines were established using chain and compass in conjunction with the soil sampling survey. Grid locations along the geochemical grid lines were flagged by the geochemical survey crews and the geophysical crews at the distances for the survey being conducted. The 13.1 kilometers of survey lines established were not cut lines but simply flagged lines.

GENERAL GEOLOGY

The entire property was mapped during the summer of 1982 on a scale of 1:5000 (Drawing No. 1). This reconnaissance type mapping program used the geochemical and geophysical grid lines as control in establishing outcrop locations. The general geology of the area is described by Cairnes (1930) and Little (1957). The Permian (?) Anarchist Group rocks consist of greenstone, greywache, tuffs, limestone and paragneiss. These rocks host the lead, zinc, silver mineralization at the nearby Waterloo Mine. The Anarchist Group rocks form a roof pendant in the Lightning Peak area and are intruded by Cretaceous (?) Valhalla Intrusions and Nelson Intrusions. These intrusive rocks in the vicinity of the property have been interpreted by Little to be Nelson

Intrusions.

The intrusive rocks in the northern and southern portions of the property are primarily granodiorite although the composition is somewhat variable and locally is granite in composition. There are also some outcrops which are quartz diorite in composition. These rocks are generally coarse-grained and often porphyritic distinguished by K. feldspar phenocryst of 1 to 2 cm in length. The mafic mineral is usually biotite which composes about 10 per cent of the rock. The remainder of the rock is composed generally of about 30 per cent quartz, 30 per cent plagioclase and 30 per cent orthoclase although these compositions do vary depending upon the rock type.

The Anarchist Group rocks which occur in the central portion of the property are composed of limestone, metamorphosed andesitic lava, tuffs and tuffaceous sediments. The limestone is generally medium to coarsely crystalline, grey to white in colour and massive, although veins of calcite or bands of crystalline limestone do occur within the limestone. The metamorphosed andesitic lava is generally green frequently foliated and contains fine-grained phenocrysts of biotite. The metamorphic rocks on the Rich I claim are generally the metamorphosed andesitic lavas whereas recrystallized limey tuffs predominate in the southern part (Rich II to VII claims) of the property. As illustrated on the geology map a band of limestone is interpreted to occur in the southern area in close proximity to the instrusive contact.

Minor intrusive rocks occur within the metavolcanics and tuffs. These dykes are commonly less than a metre wide and are quartz porphyry, granite porphyry or pegmatites. These dykes are generally classified as acid dykes or acid porphyries. These dykes are probably related to the batholithic intrusives (i.e. the Nelson Instrusions).

STRUCTURAL GEOLOGY

The property is segmented by various structural features interpreted to be faults. The primary directions of faulting are northeast, north and east. The VLF-EM "cross-over" data were beneficial in interpreting structural features on the Rich I claim. The magnetometer survey and aerial photographs also assisted in the structural geology interpretation. Of primary economic importance may be the north trending geochemical anamolies (particularly arsenic and lead which extend along the east side of the southern claims onto the Rich I claim and the east trending antimony anomaly crossing line 2+00 S. There are some possible northeast trending mineralized structures on the southern part of the claims. The geology map illustrates the interpreted fault locations and trends.

ECONOMIC GEOLOGY

Although only minor mineralization, in the form of pyrite was discovered in outcrops, the economic potential for the property is considered good. Silver, gold, lead, zinc, copper mineralization occur in the vicinity within the Nelson Intrusives (e.g. the Dictator Mine) or within the Anarchist Group rocks (e.g. Waterloo Mine). The limestone is considered an excellent potential area because it hosts lead, zinc, silver, copper mineralization in other localties nearby and is close to the intrusive rocks which could be a source of mineralization. Structures are indicated to exist on the property which could assist in localizing mineralization and act as conduits for hydrothermal fluids.

The primary economic potential of the property can only be surmised at present due to the lack of detailed exploration. The best indicators of possible economic mineralization are the soil geochemistry results. These results are discussed and interpreted in the section dealing with geochemistry.

GEOCHEMISTRY

The geochemical soil survey was conducted on grid lines approximately 500 metres apart on Rich I and 200 metres apart on Rich II to Rich VII. Soil samples were taken along these lines on 50 metre intervals. The grid lines were established as flagged lines only. All results were plotted on 1:5000 scale base maps.

A total of 249 soil samples were collected. The samples were taken in the "B" horizon whenever possible. This horizon was generally reddish-brown in colour and occurred at a depth of 10 to 50 cm and was about 20 cm thick. A small mattock was used to dig the hole. Coarse rock debris and organic matter was discarded. Samples were not collected in swampy areas, in areas of talus or rock outcrop. If the "B" horizon was not developed but a "C" soil horizon was developed the "C" horizon was sampled. The grid location, soil horizon type and depth, degree of oxidation of soil and exposure were noted at each soil sample site.

All soil samples were boxed and freighted to Kamloops for preparation and analyses by Kamloops Research and Assay Laboratories Ltd. Samples were dried and screened to minus 80 mesh. A measured amount of the minus 80 mesh material was then digested in hot aqua regia. Atomic absorption was used to determine the value in parts per million for lead, zinc, silver, copper, antimony and arsenic.

The assay data has been plotted on single element maps at a scale of 1:5000. The data treatment has included contouring, statistical analyses and definition of subanomalous, anomalous and 2nd order anomalous values for the five elements over the intrusive rocks and Anarchist Group metamorphic rocks. Table I illustrates the statistical data, contour intervals, and subanomalous, anomalous and 2nd order anomalous values for each of the six elements analyzed. Generally subanomalous values for each element are the mean plus one standard deviation, anomalous values are the mean plus two standard deviations and 2nd order anomalous values are the mean plus three standard deviations.

INTERPRETATION OF GEOCHEMISTRY

Lead values are generally lower on the Rich I to VII claims where the Anarchist Group rocks predominate, as illustrated on the Lead Geochemistry map, drawing number 2. Lead anomaly "A" located on line 15+00 N relates to a weak VLF-EM cross-over. Relating the VLF-EM data south of lead anomaly "A", the "A" silver anomaly on line 10+00 N, the zinc anomalies on line 5+00 N and 0+00 S, and lead anomaly "A" a north-south striking lead, zinc, silver mineralized structure is a possiblity. Connecting lead anomalies "C_3" to "C_4" and "C_1" to "C_2" indicate two possible north striking lead silver anomalies. There are also two magnetic dipoles, one on line 5+00 N (dipole "A_1" on Drawing #10) which corresponds with a subanomalous lead value of 23 p.p.m. and a weak magnetic dipole on line 0+00 N due south of magnetic dipole "A_1". This could indicate a north striking structure mineralized with lead, silver and either magnetite or pyrrhotite.

TABLE I - GEOCHEMICAL PARAMETERS

Parameter	Anarchist Group Rocks (PPM)						Intrusive Rocks (NELSON INTRUSIVES) (P.P.M.)					
	Pb	Zn	Ag	Cu	As	Sb	Pb	Zn	Ag	Cu	As	Sb
Mean	16.9	60.4	.74	17.5	2	7.5	17	53.2	.67	11.8	2	5.6
Standard Deviation	3.6	20.6	.21	10.1	3.7	2.2	4.6	22.5	.19	8.7	3.7	2.2
Contour Interval	5	20	.2	10	5	2	5	20	.2	10	5	2
Sub Anomalous	20	80	1.0	30	5	10	20	80	.8	20	5	8
Anomalous	25	100	1.2	40	10	12	25	100	1.0	30	10	10
2nd Order Anomalous	30	120	1.4	50	15	14	30	120	1.2	40	15	12

The zinc soil geochemistry data are illustrated on drawing number 3. An anomalous and subanomalous zinc zone extends from line 0+00 S north through line 10+00 N. The anomaly is strongest (121 p.p.m.) on line 0+00 S and is marked as zinc anomaly "A". This anomaly is also coincident with subtle VLF-EM cross-overs on lines 15+00 N, 10+00 N and 5+00 N (see Drawing No. 8). The highest zinc anomalies are within the Anarchist Group rocks (i.e. zinc anomalies "A", "B", "C") and appear to be structurally controlled. Although zinc anomaly "C" does not appear to relate to other anomalies it still may exhibit a general northeast trend, as do zinc anomalies "A", "B" AND "D". The intrusive rocks in the southern part of the property generally are higher in zinc than the instrusives in the northern sector. This depletion of zinc in the north could indicate the source of zinc mineralization to be the last, most volatile stages of intrusion of the northern Nelson Intrusions.

The silver geochemistry is illustrated on drawing number 4. There are some correlations between silver anomalies and lead anomalies on the Rich I claim, primarily within the intrusive rocks. These anomalies exhibit an apparent northeast trend which coincides with major fault trends illustrated on the geological map. There is no obvious structural control to the silver anomalies in the southern sector of the property. However a subtle north-south trend may connect silver anomalies on the eastern ends of lines 10+00 S, 8+00 S and 4+00 S.

Arsenic analyses, illustrated on drawing number 5, were done primarily as a "pathfinder" for gold mineralization and ruby-silver mineralization. The coincidence of arsenic, antimony and silver mineralization may indicate the possible presence of gold and/or ruby-silver mineralization or arsenic alone could indicate the presence of gold. There are north trending arsenic anomalies along the eastern boundary of the Rich II to VII claims coincident with silver anomalies on lines 10+00 S, 8+00 S and 4+00 S and a zinc anomaly on 0+00 S. The lack of a corresponding anomaly on lne 6+00 S may be because no sample was taken in this location. There are broad arsenic anomalies on lines 8+00 S and 10+00 S which appears related to the intrusive-metamorphic rock contact rather than to structural features. There are some minor coincidences between arsenic and zinc anomalies.

The antimony anomalies generally occur on the Rich II to VII claims as illustrated on drawing number 6. There is a distinct antimony anomaly on line 2+00 S which may indicate the presence of a mineralized east striking structure in the vicinity of this line. The antimony dispersion patterns and anomalous values do not correlate with silver anomalies indicating a limited value for identifying possible pyrargyrite mineralization or that no pyrargyrite mineralization was detected using antimony as a "pathfinder" element.

Copper is another element which is only anomalous on the southern part of the property. Drawing number 7 illustrates the copper soil geochemistry results. Copper and silver anomalies are coincident on lines 6+00 S, the east end of line 4+00 S and on line 13+50 S. These anomalies could indicate the presence of tetrahedrite mineralization which is commonly associated with Waterloo Mine type mineralization. The copper anomaly on line 4+00 S also has a coincident arsenic anomaly and the anomaly on line 13+50 S also has a coincident antimony anomaly. These copper anomalies may indicate the presence of economic copper or silver mineralization.

There are some general conclusions regarding the soil geochemistry survey which may assist in discovery of economic mineralization:

1. The silver, arsenic anomalies and weaker copper and zinc anomalies along the eastern boundary of the Rich II to VII claims indicate the presence of a possible north striking mineralized structure. This general north trend of anomalies continues onto line 5+00 N where a zinc anomaly occurs, onto line 10+00 N where silver anomaly "A" is present and perhaps to line 15+00 N where lead anomaly "A" occurs.

2. The area covered by the Rich I claim is primarily intrusive rocks. The anomalies generally appear controlled by north or northeast trending structures. The anomalies in this area are primarily coincident lead-silver or lead and silver occurring separately but on the same structural trends.

3. The soil geochemistry anomalies on the Rich II to VII claims are complex. This may be due to the variety of rock types and contacts and the presence of three different structural trends; east, north and northeast striking structures.

GEOPHYSICS

A VLF-EM survey was conducted on the Rich I claim at 15 metre intervals on lines approximately 500 metres apart. Measurements of dip angles were recorded using the VLF radio transmissions from Hawaii (for northerly striking structure) and Annapolis (for easterly striking structures). The instrumentation and theory for Very Low Frequency - Electromagnetic Surveys are described in Appendix I. The unfiltered and Fraser Filtered VLF-EM dip measurements are shown in Appendix IV. The Fraser Filtered data were plotted and profiled. This is presented for Annapolis and Hawaii VLF radio transmitters on drawings 8 and 9 respectively. No dip readings for Hawaii are presented on line 15+00 N because the radio transmitter was not operating on the day the line was traversed. Differences in field strength proved negligible, therefore the field strength readings were not recorded. It was also thought that both Hawaii and Annapolis detected easterly striking and northerly striking structures with no significant differences between the two. Many of the geological structures presented on the geology map, drawing #1, were interpreted by identifying the VLF-EM dip "cross-overs". This data was very useful in interpreting fault locations on the Rich I claim. Several subtle "cross-overs" correlate with the geochemical anomalies described above but not interpreted fault structures. There may be a north striking vein structure which crosses line 15+00 N approximately 780 metres east of the western claim boundary. Again there is a corresponding "cross-over" on line 10+00 N.

The theory and instrumentation of magnetic surveys is outlined in Appendix II. A magnetometer survey was conducted over the entire property. A total of 919 readings were taken on 13.1 kilometers of line. This contoured data plotted in gammas is presented on drawing number 10. The magnetic data was found useful in interpreting rock contacts, structures and identifying possible locations of magnetically susceptible minerals such as pyrrhotite, magnetite or ilmenite. It is possible these magnetic minerals may occur in association with economically important mineralization. Magnetic "Dipoles", areas of extreme magnetic relief, may indicate the presence of a vein or narrow structure containing a magnetic mineral. Three strong dipoles identified as "A_1", "A_2", and "A_3" are shown on the magnetic map. Dipole "A_1", is estimated to be flat-lying and 12.5 metres deep. Dipoles "A_1" and "A_2" coincide with the contact between the Anarchist Group and intrusive rocks. Dipole "A_2" is interpreted to be 9.5 metres deep and vertical. "A_3" dipole is coincident with a silver, copper and zinc anomaly and is on a northerly strike with dipole "A_2". Dipole "A_3" is interpreted to represent a vertical dipping vein-like structure 18.5 metres deep. This dipole could indicate the presence of a north striking structure mineralized with a magnetic mineral associated with copper, zinc and silver mineralization.

As indicated above, the magnetic survey assisted in identifying rock types and contact areas. The areas underlain by intrusive rocks generally were characterized by intermediate to high magnetic susceptibility with measurements ranging above 57800 gammas. The meta-volcanic rocks and tuffs were generally in the medium to low range (57600 to 57800 gammas). The limestone appeared to consistently respond in the less than 57750 gammas range.

Although the topographic relief is high in some areas there is no apparent correlation with the magnetic relief. There is an area on the Rich I claim where the magnetic relief shows up as a northeast trending band of magnetic "lows". This is subparallel to the structural fabric in the area.

CONCLUSIONS AND RECOMMENDATIONS

The anomalies identified in the geochemical soil survey, VLF-EM survey and magnetic survey indicate that economic lead, zinc, copper, silver or gold mineralization may occur on the Rich I to Rich VII mineral claims. A detailed geological, geochemical and geophysical survey should be initiated to explain the various geochemical anomalies especially where these anomalies correspond with VLF-EM and/or magnetic anomalies.

Specifically, VLF-EM should be completed on the Rich II to VII claims and detailed VLF-EM conducted in anomalous areas interpreted to be related to possible vein type mineralization within fault zones or having associated "clay-type" alteration. Follow-up soil geochemistry surveys should be conducted on all geochemisty anomalies. Detailed geological mapping should be completed in areas of geochemical anomalies, especially if VLF-EM "cross-overs" and/or magnetic "dipoles" correspond with the geochemical soil anomalies. The north trending zone of arsenic anomalies along the eastern side of Rich II to VII should be sampled and analyzed for gold. Detailed exploration should be conducted around magnetic dipoles "A_2" and "A_3" keeping in mind the possible existence of a north striking mineralized structure or structures.

AUTHOR'S QUALIFICATIONS

MATTHEW WILLIAM WALDNER

I graduated from the University of British Columbia in 1969 with a Bachelor of Science degree in Geology. Since graduating, I have continuously practiced my profession in various levels of responsibility in industry. The following is a synopsis of my employment experience:

1969	7 months as junior geologist and party chief in southern B.C. and Yukon Territory-Atlas Explorations Ltd. (N.P.L.)
1970-1973	3 1/2 years as open pit geologist at Endako Mines Ltd. - Placer Development Ltd.
1973-1979	6 1/3 years as pit geologist, Mine geologist and Chief Mine Geologist at Lornex in the Highland Valley of B.C. - Lornex Mining Corporation Ltd.
1979	4 months as Projects and Reclamation Engineer - Lornex Mining Corporation Ltd.
1979-1981	13 months as Chief Mine Engineer, in charge of the Mine Engineer Department - Lornex Mining Corporation Ltd.
1981 (Jan) Present	Chief Geologist - Responsible for mining exploration in Canada and Alaska - Mohawk Oil Co. Ltd., Mining Division.

DATE: March 21, 1982

SIGNED: M.W. Waldner

M.W. WALDNER,
Chief Geologist

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APPENDIX I

Very Low Frequency Electromagnetic Survey - Instrumentation and Theory

A VLF-EM receiver, Model 27, manufactured by Sabre Electronics was used for the VLF-EM surveys. A transmitter located in Hawaii, U.S.A. and Annapolis, U.S.A. were used. The instrument measures the magnetic component of a very low frequency (VLF) electromagnetic (EM) field. The dip angles were measured on grid lines with the instrument oriented towards Hawaii and Annapolis. The VLF radio transmission from Hawaii and Annapolis produce an alternating magnetic field (primary). If a conductive mass such as a sulphide body or clay filled fault zone is within the magnetic field, a secondary alternating current is induced within it which in turn induces a secondary magnetic field that distorts the primary magnetic field. It is this distortion that the EM receiver measures. The VLF-EM uses a frequency range from 16 to 24 KHz. whereas most EM instruments use frequencies ranging from a few hundred to a few thousand KHz. Because of its relatively high frequency, the VLF-EM can pick up bodies of a much lower conductivity and therefore is more susceptible to clay beds, electrolyte-filling fault or shear zones and porous horizons, graphite, carbonaceous sediments, lithological contacts as well as sulphide bodies of too low a conductivity for other EM methods to pick up.

Consequently, the VLF-EM has additional uses in mapping structure and in picking up sulphide bodies of too low a conductivity for conventional EM methods and too small for induced polarization (in places it can be used instead of IP). However, its susceptibility to lower conductive bodies results in a number of anomalies, many of them difficult to explain and, thus, VLF-EM preferably should not be interpreted without a good geological knowledge of the property and/or other geophysical and geochemical surveys.

Subsequent to the collection of dip angle measurements at each station on the grid lines the data is "Fraser Filtered". The dip angle measurements for Hawaii and Annapolis are treated separately. North to Northeast striking structures should respond better to the Hawaiian signal and West or Northwest striking structures should respond best to the Annapolis signal.

The Fraser Filter is essentially a 4-point difference operator which transforms zero crossings into peaks, and a low pass smoothing operator which reduces the inherent high frequency noise in the data. Therefore, the noisy non-contourable data are transformed into contourable data. Another advantage of this filter is that a conductor that does not show up as a cross-over on the unfiltered data quite often will show up on the filtered data.

Profiles of the filter data were prepared for Hawaii and Annapolis separately. These plots were then analyzed and structures interpreted and possible zones of sulphide mineralization or clay alteration indentified.

APPENDIX II

Magnetic Surveys - Instrumentation and Theory

The instrument used to perform the magnetic surveys was a proton precession magnetometer, model MP-2 manufactured by Scintrex. This instruments measures the magnitude of the total magnetic field at any given point on the surface. The total field is the sum of the external field and the internal field within and surrounding the material being measured. The magnetometer sensor consists of a chamber filled with a proton rich fluid enclosed within two wire wound coils. When a current passes through these coils for a short period of time a magnetic field is set up which aligns the spinning protons. When this polarizing current is abruptly switched off, the protons begins to precess around the earth's magnetic field and eventually re-align with it. This precession induced a small, exponentially decaying, AC signal in the sensor coils whose frequency is proportional to the flux of the ambient magnetic field. This frequency is measured, converted to gammas and presented on the digital display of the instrument.

The surveys consist of measuring accurately the resultant magnetic field of the earth's magnetism acting on rock formations having different magnetic properties and configurations. The resultant field is the vector sum of induced and remanent magnetism.

Thus there are three factors, excluding geometrical factors, which determine the magnetic field at any particular locality. These are the strength of the earth's magnetic field, the magnetic susceptibility of the rocks present and their remanent magnetism.

Magnetic surveys are useful in conjunction with geological mapping and for exploration for magnetically susceptible minerals. Interpretation of magnetic profiles and maps can assist in interpretation of rock type distribution and the locations of structural features. Often magnetic minerals such as magnetite, pyrrhotite or ilmenite are associated with the mineral deposits which are sought, or there may be a depletion of such minerals. Either case can assist in mineral exploration.

APPENDIX III

Itemized Cost Statement - Rich Claims

PERSONNEL	DUTIES/ POSITION	DAYS WORKED	PAY SCALE	TOTAL COST
K. Lyons	VLF-EM Geophysics Assist.	4	$85/day	$ 340.00
C. Nagati	Geol & Geoch Geologist	3	$95/day	285.00
W. Kirkman	Magnetometer Geophysist	8	$95/day	760.00
D. Newton	Geochem/Surevey Geological Tech.	1	$90/day	90.00
S. Maltby	Geochem/Survey Geological Tech	4	$90/day	360.00
K. Lindstrom	Geochem/Geology Geological Assist	3	$80/day	240.00
T. Bartkiewicz	Geoch/Geol Geological Assist	5	$85/day	425.00
B. Timler	Geochem/Geology Geological Assist	2	$85/day	170.00
M. Waldner	Supervision & Report Prep. Chief Geologist	7	$225/day	1,575.00
B. Callaghan	Supervision Project Geologist	3	$110/day	330.00
		Total		$ 4,575.00

ITEM	RATE	TASK	COMPLETED	TOTAL
Room, Board Camp	$30/man/day	Field	35 man days	$ 1,050.00
Camp Mobilization & demobilization	20% of total cost			1,414.54
Materials Supplies Exploration Equipment, Drafting Supplies, etc.				500.00

APPENDIX III (cont'd)

ITEM	RATE	TASK	COMPLETED	TOTAL
VLF-EM	$15/day	2 days survey		30.00
Magnetometer	$25/day	6 days survey		150.00
4X4 crew cabs pickups	$35/day	5 days		175.00
Geochem Soil Samples	$8.50/sample	Pb, Zn, Ag, Cn, Sb, As determination 249 samples		2,116.50
E.D.M. Survey Int.	$25/day	1 day surveying & tieing claims		25.00
Freight charges		shipping soil samples (bus)		40.00
Report preparation and typing				500.00
Copying		Xerox, etc.		50.00
Map preparation & draughting	56.5 hrs @ $12/hr			678.00
		Total		6,729.04
		Grand total		$11,304.04

APPENDIX IV – VLF-EM Dip Measurements (Degrees) 26

Date: Aug 25/82
Weather: Sun
Claim: Rich I

Line		Hawaii Unfiltered	Hawaii Filtered	Annapolis Unfiltered	Annapolis Filtered
15+00N	15+00E			+1	
	14+85			+2	
	14+70			+1	1
	14+55			+4	-2
	14+40			+3	-4
	14+25			+2	0
	14+10			0	5
	13+95			-1	6
	13+80			-2	5
	13+65			+2	-1
	13+50			+4	-9
	13+35			+3	-7
	13+20			+2	1
	13+05			+1	4
	12+90			-1	5
	12+75	/		+1	3
	12+60			+1	-2
	12+45			0	-1
	12+30			-3	5
	12+15			+4	0

		Annapolis unFiltered	Annapolis Filtered
			-10
15+00N	12+00 E	3	-3
	11+85	+1	7
	11+70	-1	4
	11+55	+1	-5
	11+40	+4	-9
	11+25	+5	0
	11+10	0	8
	10+95	+1	3
	10+80	+1	2
	10+65	-2	7
	10+50	-3	3
	10+35	-1	-1
	10+20	-3	0
	10+05	-1	-4
	9+90	+1	-6
	9+75	+1	-1
	9+60	0	-1
	9+45	+3	-3
	9+30	+1	1
	9+15	+1	3
	9+00	+0	-4
	8+85	+3	-7
	8+70	+2	7
	8+55	-3	9

		Annapolis UnFiltered	Annapolis Filtered
15+00N	8+40 E	+2	-8
	8+25	+5	-13
	8+10	+7	-7
	7+95	+4	1
	[illegible]	+5	5
	7+65	+1	5
	7+50	+1	7
	7+35	-1	6
	7+20	+3	0
	7+05	-2	-1
	6+90	+1	3
	6+75	+2	-2
	6+60	+1	-1
	6+45	+3	-1
	6+30	+5	-5
	6+15	+2	-3
	6+00	0	6
	5+85	+1	6
	5+70	-1	2
	5+55	+1	1
	5+40	+5	-6
	5+25	+4	-9
	5+10	+7	-5
	4+95	+7	-6

(3.)

		(A)	
[illegible]	4+80E	+8	-3
	4+65	[illegible]	3
	4+50	+6	3
	4+35	+5	4
	4+20	+3	7
	4+05	+1	7
	3+90	0	4
	3+75	0	2
	3+60	-1	2
	3+45	-1	1
	3+30	-1	0
	3+15	-1	2
	3+00	-3	3
	2+85	-2	-3
	2+70	+1	-5
	2+55	-1	3
	2+40	-3	6
	2+25	-3	0
	2+10	-1	-4
	1+95	-1	-2
	1+80	-1	1
	1+65	-2	1
	1+50	-1	-1
	1+35	-1	-1

		(A)		
15+00W	1+20W	-1	0	
	1+05	-1	1	
	0+90	-2	1	
	0+75	+1	1	
	0+60	-3	5	
	0+45	-3	3	
	0+30	-2	0	
	0+15	-4	0	
	0+00	-1		
	15+15E	+3		1
	15+30	+1		1
	15+45	+4		3
	15+60	+3		4
	15+75	+6		4
	15+90	+5		0
	16+05	+4		-2
	16+20	+5		0
	16+35	+4		0
	16+50	+5		2
	16+65	+6		5
	16+80	+8		4
	16+95	+7		

(4)

	Δ)		0	
17+10	+7		-3	
17+25	+5		-5	
17+40	+4		-2	
17+55	+6		2	
17+70	+5		-2	
17+85	+3		-9	
18+00	-1		-12	
18+15	-3		-5	
18+30	0		4	7
18+45	0 -3	0 -8 -7		
18+90	~~-5~~		-2	
17+05	-5		0	
19+20	-5		2	
19+35	-3		5	
19+50	-2		7	
19+65	+1		6	
19+80	0		3	
19+95	+2		3	
20+10	+2			

18+75	-3
18+60	-3
18+45	

(5)

Date Aug 2?/82
Weather Sun
Claim Arch I

Line		Hawaii Unfiltered	Hawaii Filtered	Annapolis Unfiltered	Annapolis Filtered
5+00N	0+00E	+8		+2	
	0+15E	+6	13	+1	1
	0+30	-1	[illegible]	+3	4
	0+45	+2	-12	-1	2
	0+60	+6	-8	+1	2
	0+75	+7	4	-1	4
	0+90	+6	10	-1	4
	1+05	+3	15	-3	8
	1+20	0	14	-3	11
	1+35	-6	5	-9	5
	1+50	-5	0	-8	1
	1+65	-6	0	-9	0
	1+80	-5	0	-9	-4
	1+95	-6	1	-8	-9
	2+10	-5	-3	-6	-9
	2+25	-7	-6	-2	-3
	2+40	-1	6	-3	1
	2+55	-5	12	-2	5
	2+70	-9	2	-4	5
	2+85	-9	-10	-6	-2
	3+00	-7	-14	-5	-8
	3+15	-1	-6	-3	-9

Line		Hawaii Unfiltered	Hawaii Filtered	Annapolis Unfiltered	Annapolis Filtered
3+00N	3+30	-1	-2	0	-3
	3+45	-1	-5	+1	-1
	3+60	+1	-5	-1	-3
	3+75	+2	-3	+3	-3
	3+90	+3	-3	0	-8
	4+05	+3	-6	+5	-4
	4+20	+5	-8	+6	-7
	4+35	+7	-6	+3	-7
	4+50	+9	2	+1	8
	4+65	+9	6	+1	10
	4+80	+5	13	-5	0
	4+95	+7	7	-3	-6
	5+10	+4	13	-1	-1
	5+25	+1	12	-1	6
	5+40	-3	5	-2	4
	5+55	-4	1	-6	-3
	5+70	-3	-3	-1	-6
	5+85	-5	-11	-4	-12
	6+00	+1	-9	+3	-8
	6+15	+2	-1	+4	1
	6+30	+3	3	+3	1

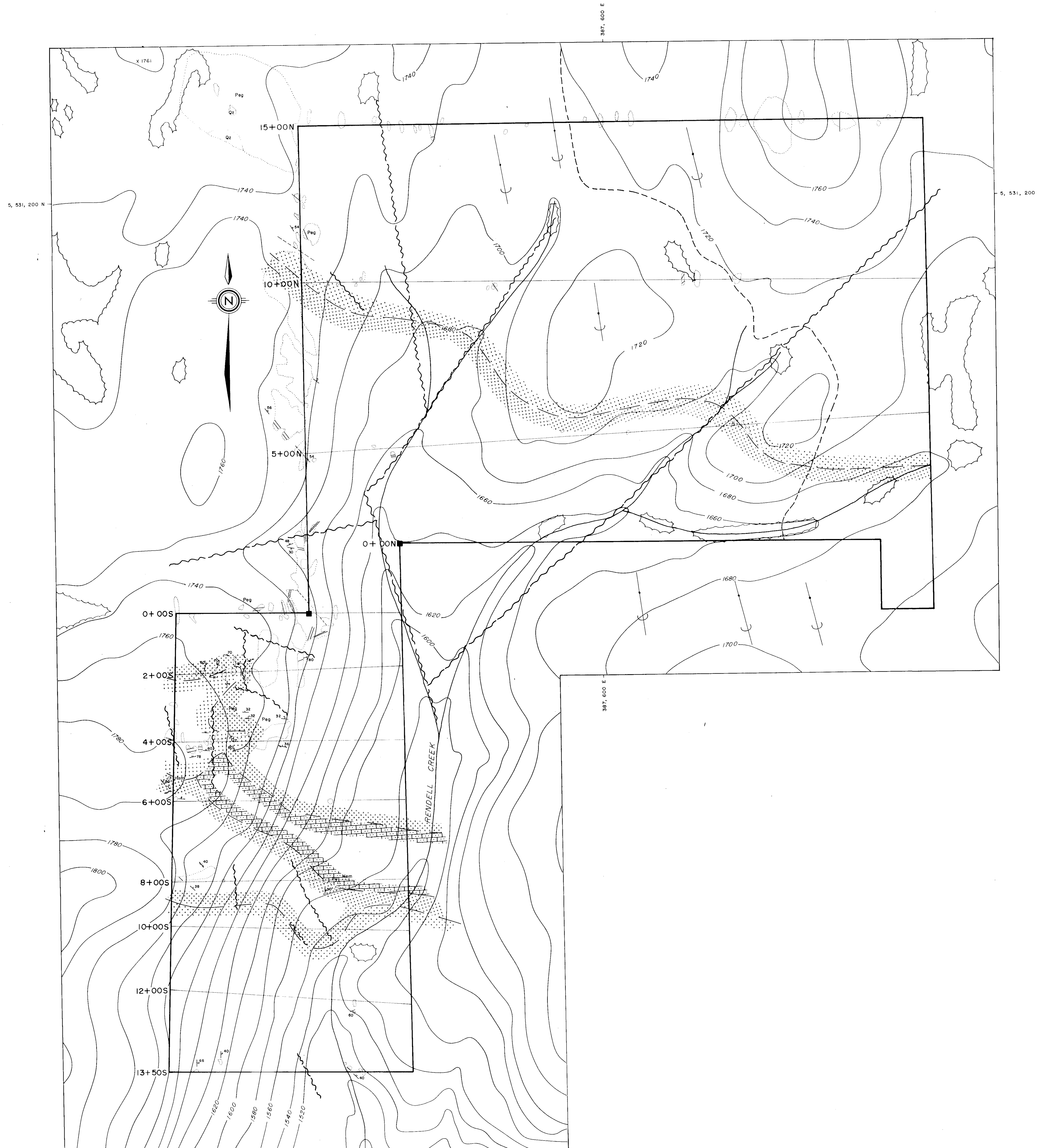
(6)

		H		A	
5+00N	6+45	+1	3	+3	1
	6+60	+1	3	+3	0
	6+75	0	1	+2	-4
	6+90	-1	-6	+1	-5
	7+05	+1	-9	+5	-5
	7+20	+4	-8	+6	-6
	7+35	+5	-6	+8	-5
	7+50	+8	-3	+9	-6
	7+65	+7	-5	+10	-7
	7+80	+9	-11	+13	-6
	7+95	+11	-13	+13	-7
	8+10	+16	-10	+16	-8
	8+25	+17	-6	+17	-4
	8+40	+20	3	+20	6
	8+55	+19	8	+17	8
	8+70	+15	1	+14	-1
	8+85	+16	-1	+15	-3
	9+00	+17	2	+17	1
	9+15	+15	1	+15	1
	9+30	+16	3	+16	3
	9+45	+15	10	+15	6
	9+60	+13	14	+13	7
	9+75	+8	6	+12	4
	9+90	+6	-3	+9	0

		H		A	
5+00[illegible]	10+05	+9	-2	+12	3
	10+20	+8	-3	+9	3
	10+35	+9	-6	+9	-1
	10+50	+11	-3	+9	-2
	10+65	+12	-7	+10	-5
	10+80	+11	-12	+10	-13
	10+95	+19	-3	+14	-12
	11+10	+16	-3	+19	-5
	11+25	+17	-8	+17	-3
	11+40	+21	5	+21	3
	11+55	+20	18	+18	9
	11+70	+13	16	+17	14
	11+85	+10	10	+13	15
	12+00	+7	4	+8	9
	12+15	+6	-3	+7	3
	12+30	+7	-4	+5	0
	12+45	+9	4	+7	2
	12+60	+8	14	+5	7
	12+75	+4	15	+5	11
	12+90	-1	8	0	6
	13+05	-2	3	-1	0
	13+20	-3	-1	0	-3
	13+35	-3	-4	-1	-2
	13+50	-1	-7	-3	-9

		(H)			
S100N	13+65	-1	-7	~~-8~~ -2	8
	13+80	+4	3	-5	-2
	13+95	+1	9	-2	-2
	14+10	-1	6	-3	1
	14+25	-3	3	-2	2
	14+40	-3	1	-4	2
	14+55	-4	-3	-3	-1
	14+70	-3	-3	-5	-5
	14+85	-1	2	-1	-2
	15+00	-3	2	-2	1
	15+15	-3	-2	-2	-3
	15+30	-3	-6	-2	-5
	15+45	-1	-11	+1	-1
	15+60	+1	-14	0	1
	15+75	+6	-12	0	-1
	15+90	+8	-7	0	0
	16+05	+11	[illegible] 2	+1	5
	16+20	+10	8	-1	3
	16+35	+9	9	-3	-2
	16+50	+4	5	0	2
	16+65	+6	7	-2	3
	16+80	+2	1	-3	-1
	16+95	+1	-7	-2	-1
	17+10	+6	-2	-2	-2

		(H)	F1	(A)	F1
S100N	17+25	+4	-1	-2	6
	17+40	+5	2	0	-7
	17+55	+6	11	+2	4
	17+70	+1	9	+3	12
	17+85	-1	4	-5	1
	18+00	-1	5	-2	-2
	18+15	-3	5	-1	6
	18+30	-4	3	-4	5
	18+45	-5	-1	-5	0
	18+60	-5	0	-5	-3
	18+75	-3	4	-4	0
	18+90	-7	0	-3	4
	19+05	-5		-6	
	19+20	-5		-5	
	19+35	[illegible]		[illegible]	
	19+50				
	19+65				
	19+80				
	19+95				
	20+00				



SCALE 1:5000

200m 100 0 100 200 300 400 500m

GEOLOGICAL BRANCH
ASSESSMENT REPORT

11,109

TERTIARY

CENOZOIC — KAMLOOPS GROUP: Basalt, olivine basalt, minor rhyolitic lava, and breccia.

CRETACEOUS

MESOZOIC — COAST INTRUSIONS: Valhalla Intrusions: granite, porphyritic granite. Nelson Intrusions: granodiorite, porphyritic granite, diorite, monzonite, quartz monzonite.

PERMIAN

PALEOZOIC — ANACHIST GROUP: Greenstone, greywacke, paragneiss, andesitic lava, breccia, recrystallized limy tuffs.

Limestone.

ROAD
NO VEGETATION
SLIDE AREA
GEOCHEM SOIL TRAVERSE 10+00N
GEOCHEM SILT TRAVERSE
MARSH
ROCK GEOCHEM. SAMPLE • 9999
DIRECTION OF GLACIATION

FAULT (approximate) (inferred)
CONTACT (approximate) (inferred)
BEDDING (inclined, vertical, unknown)
FOLIATION (inclined, vertical, unknown)
FRACTURES (inclined, vertical, unknown)
TRENCH
PIT
OUTCROP

Qz	QUARTZ
Peg	PEGMATITE
Grt	GARNET
Apl	APLITE
Cdlc	CALCITE
Hem	HEMATITE
Mag	MAGNETITE
Pyrr	PYRRHOTITE
Sph	SPHALERITE
Ga	GALENA
Br	BORNITE
Cpy	CHALCOPYRITE

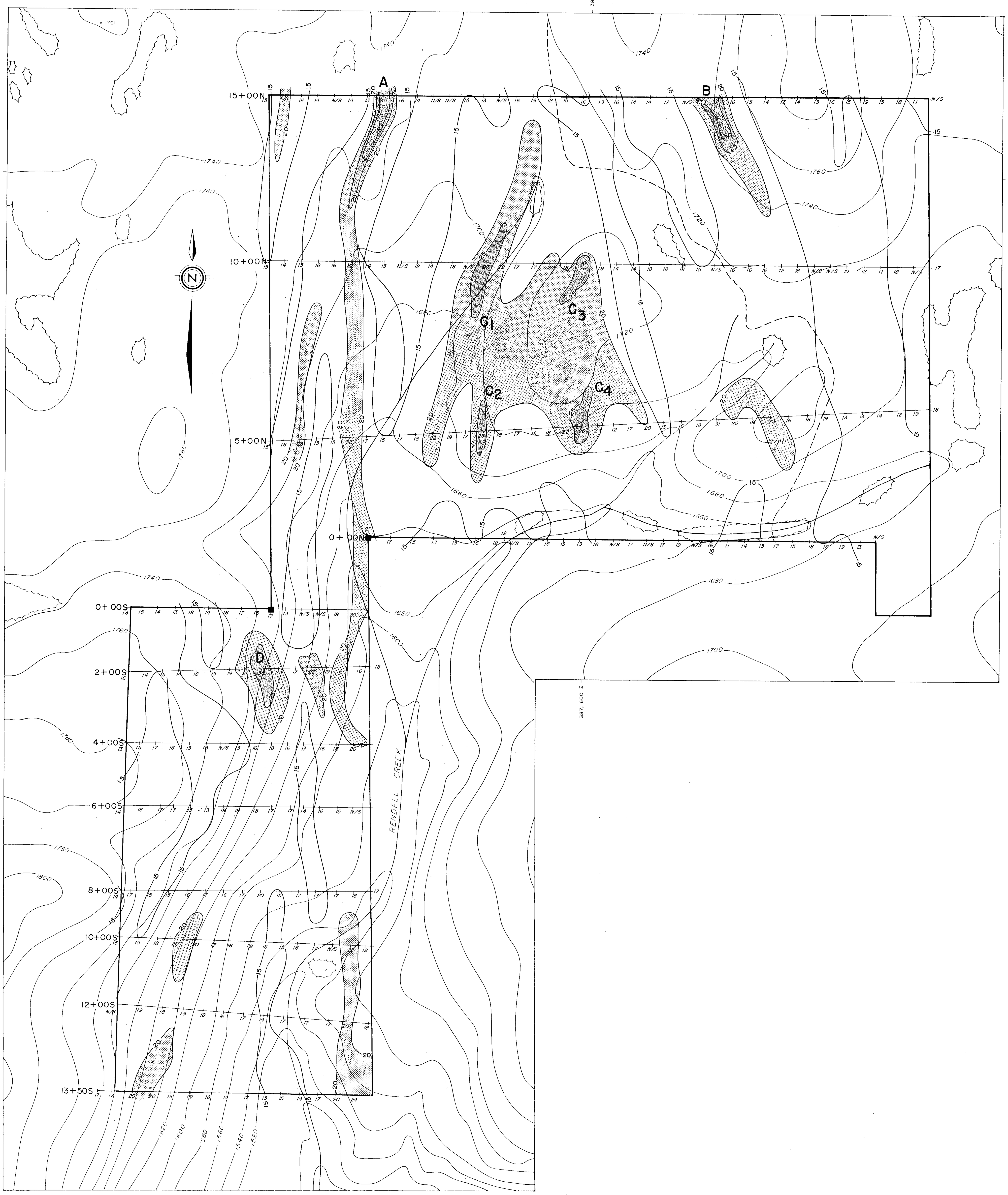
MOHAWK OIL COMPANY LTD.

LIGHTNING PEAK AREA

RICH I - VII

GEOLOGY MAP

DRAWN BY	SCALE	DATE	DRAWING NO.
M. LETILLY	1 : 5000	MARCH, 1983	NO. 1



SCALE 1 : 5000

200m 100 0 100 200 300 400 500m

GEOLOGICAL BRANCH
ASSESSMENT REPORT

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LEGEND

SUBANOMALOUS		ANARCHIST GROUP INTRUSIVES	SOIL SAMPLE GRID LINE (values in ppm)	6 9 2
ANOMALOUS		ANARCHIST GROUP INTRUSIVES	CONTOUR LINE (ppm)	60
2ND ORDER ANOMALY		ANARCHIST GROUP INTRUSIVES	TOPOGRAPHIC CONTOUR	1620
			ROAD	

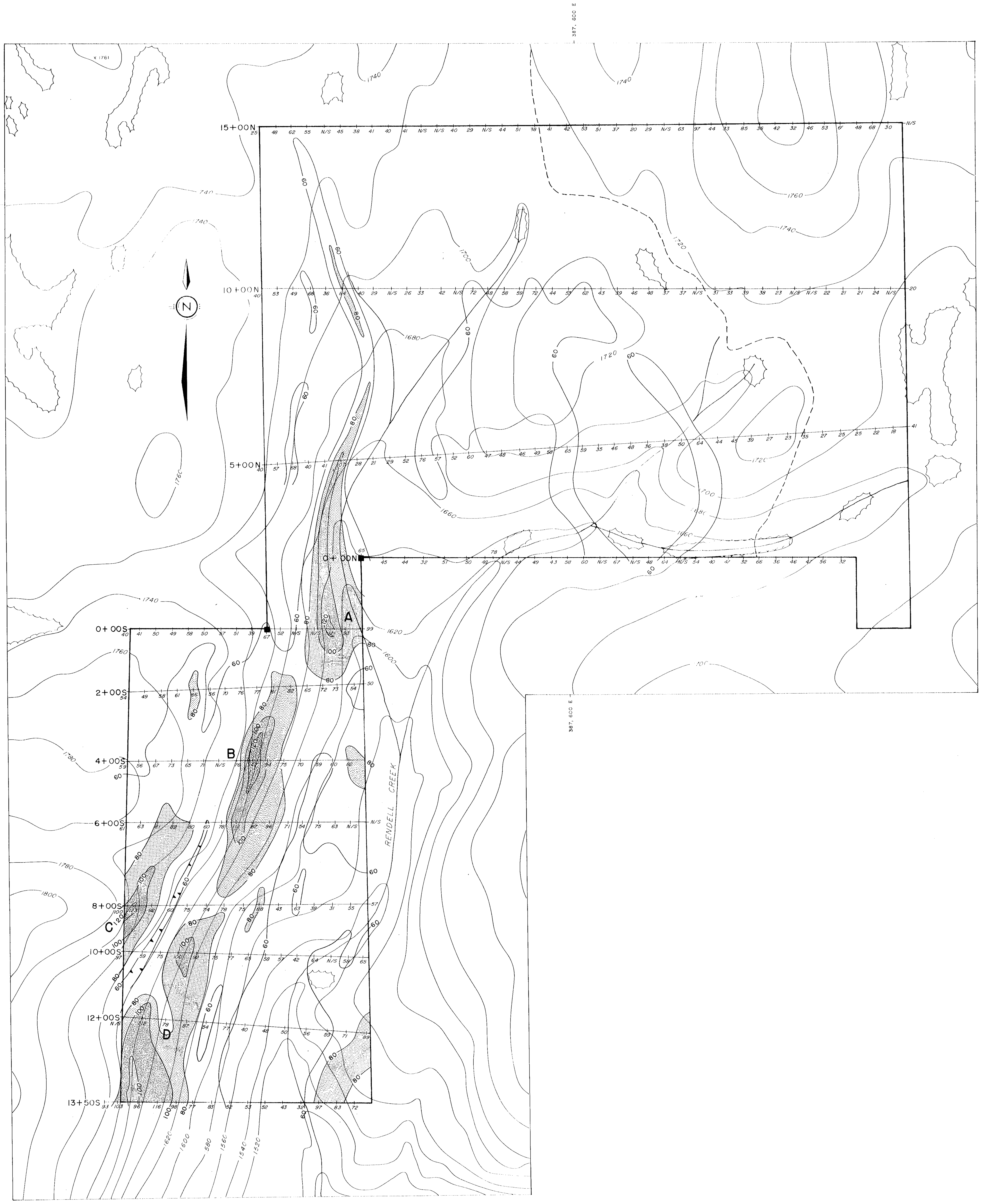
MOHAWK OIL COMPANY LTD.

LIGHTNING PEAK AREA

RICH I - VII

LEAD SOIL GEOCHEMISTRY

DRAWN BY	SCALE	DATE	DRAWING NO.
M. LETILLY	1 : 5000	MARCH, 1983	NO. 2



SCALE 1:5000

200m 100 0 100 200 300 400 500m

LEGEND

SUBANOMALOUS	ANARCHIST GROUP INTRUSIVES	SOIL SAMPLE GRID LINE (values in ppm)	6 9 2
ANOMALOUS	ANARCHIST GROUP INTRUSIVES	CONTOUR LINE (ppm)	60
2ND ORDER ANOMALY	ANARCHIST GROUP INTRUSIVES	TOPOGRAPHIC CONTOUR	1620
		ROAD	

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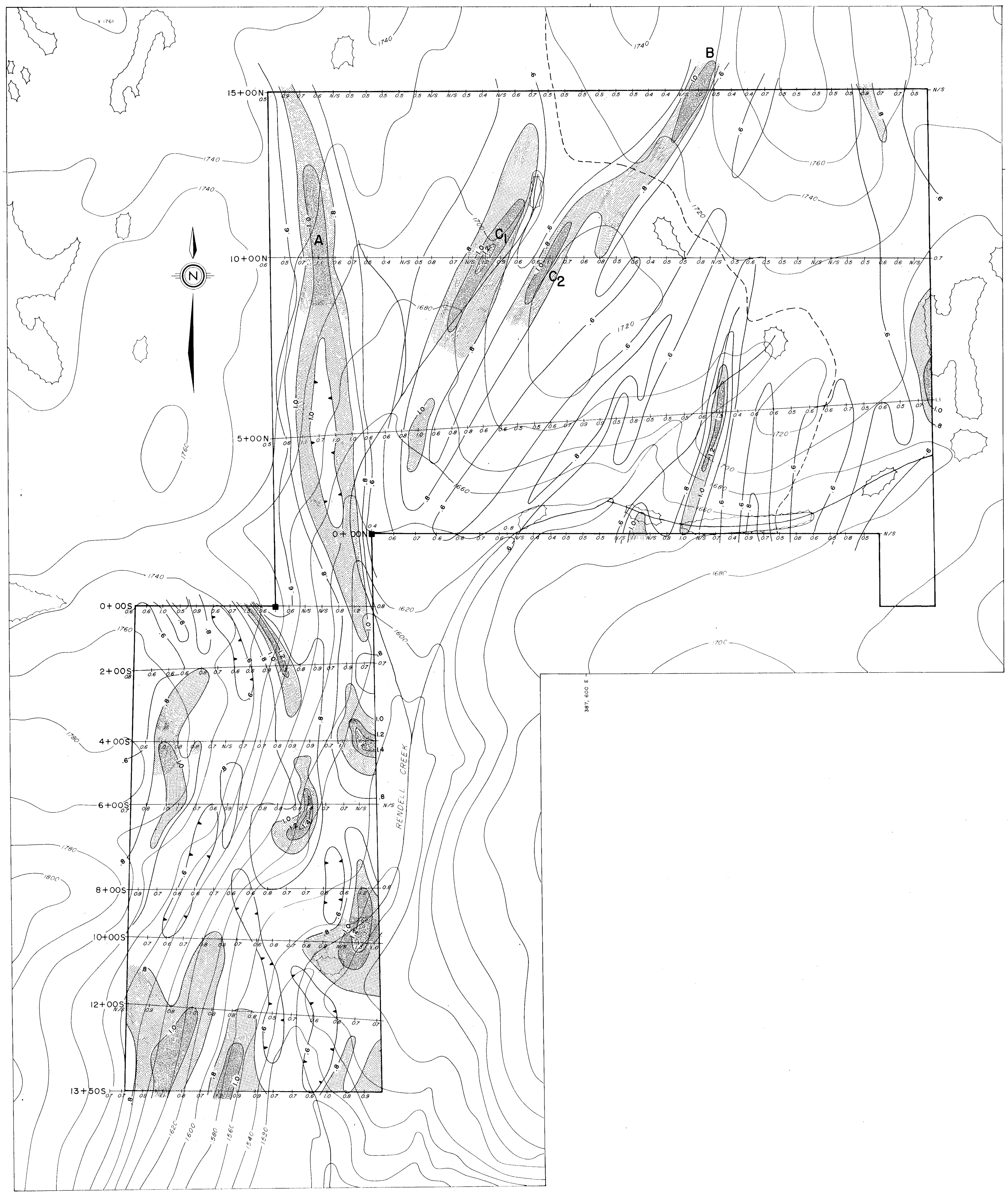
MOHAWK OIL COMPANY LTD.

LIGHTNING PEAK AREA

RICH I - VII

ZINC SOIL GEOCHEMISTRY

DRAWN BY	SCALE	DATE	DRAWING NO.
M. LETILLY	1:5000	MARCH, 1983	NO. 3



SCALE 1 : 5000

200m 100 0 100 200 300 400 500 m

GEOLOGICAL BRANCH ASSESSMENT REPORT

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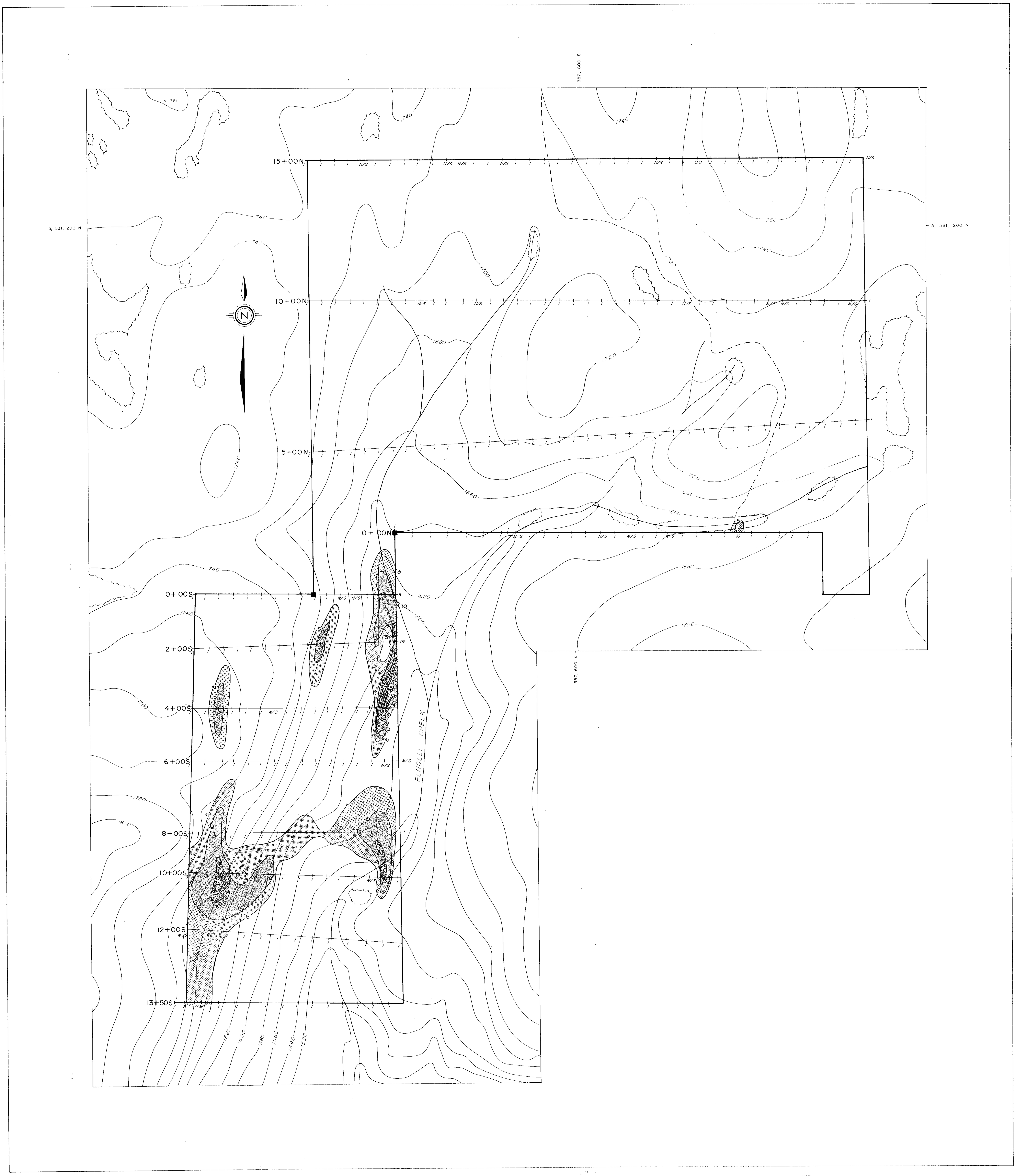
MOHAWK OIL COMPANY LTD.
LIGHTNING PEAK AREA
RICH I - VII
SILVER SOIL GEOCHEMISTRY

DRAWN BY	SCALE	DATE	DRAWING NO.
M. LETILLY	1 : 5000	MARCH, 1983	NO. 4

LEGEND

SUBANOMALOUS		ANARCHIST GROUP INTRUSIVES
ANOMALOUS		ANARCHIST GROUP INTRUSIVES
2ND ORDER ANOMALY		ANARCHIST GROUP INTRUSIVES

SOIL SAMPLE GRID LINE (values in ppm)	6 9 2
CONTOUR LINE (ppm)	—60—
TOPOGRAPHIC CONTOUR	—1620—
ROAD	- - - - -



SCALE 1:5000

200 m 100 0 100 200 300 400 500 m

GEOLOGICAL BRANCH
ASSESSMENT REPORT

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LEGEND

SUBANOMALOUS		ANARCHIST GROUP INTRUSIVES
ANOMALOUS		ANARCHIST GROUP INTRUSIVES
2ND ORDER ANOMALY		ANARCHIST GROUP INTRUSIVES

SOIL SAMPLE GRID LINE (values in ppm) — 6 9 2

CONTOUR LINE (ppm) — 60

TOPOGRAPHIC CONTOUR — 1620

ROAD — - - - -

MOHAWK OIL COMPANY LTD.

LIGHTNING PEAK AREA

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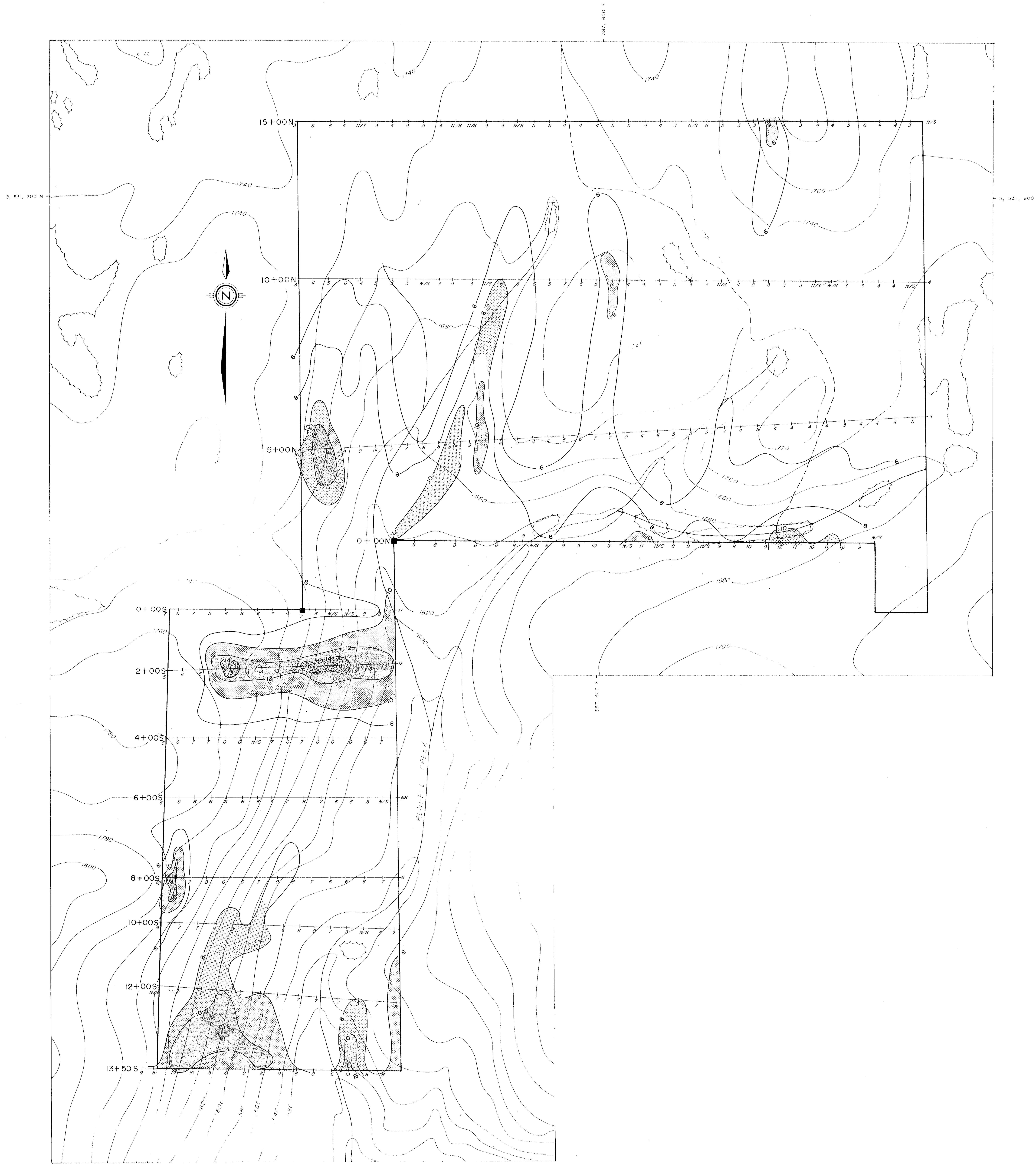
ARSENIC SOIL GEOCHEMISTRY

DRAWN BY	SCALE	DATE	DRAWING NO.
M. LETILLY	1:5000	MARCH, 1983	NO. 5



GEOLOGICAL BRANCH
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SCALE 1:5000

200m 100 0 100 200 300 400 500m

LEGEND

SUBANOMALOUS	ANARCHIST GROUP INTRUSIVES	SOIL SAMPLE GRID LINE (values in ppm)	6 9 2
ANOMALOUS	ANARCHIST GROUP INTRUSIVES	CONTOUR LINE (ppm)	60
2ND ORDER ANOMALY	ANARCHIST GROUP INTRUSIVES	TOPOGRAPHIC CONTOUR	1620
		ROAD	

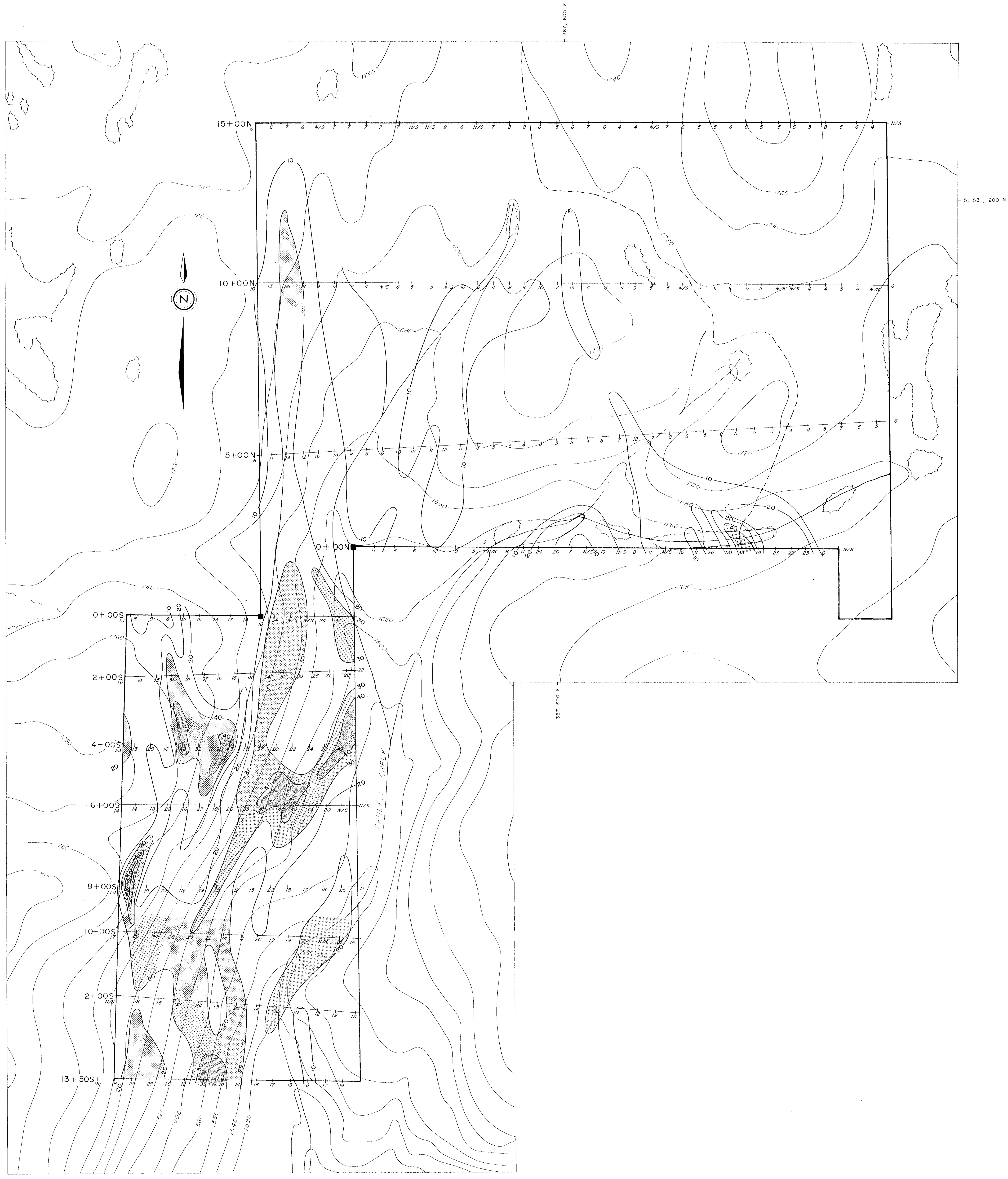
MOHAWK OIL COMPANY LTD.

LIGHTNING PEAK AREA

RICH I - VII

ANTIMONY SOIL GEOCHEMISTY

DRAWN BY	SCALE	DATE	DRAWING NO
M. LETILLY	1:5000	MARCH, 1983	NO. 6



SCALE 1:5000

200m 100 0 100 200 300 400 500m

GEOLOGICAL BRANCH
ASSESSMENT REPORT

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LEGEND

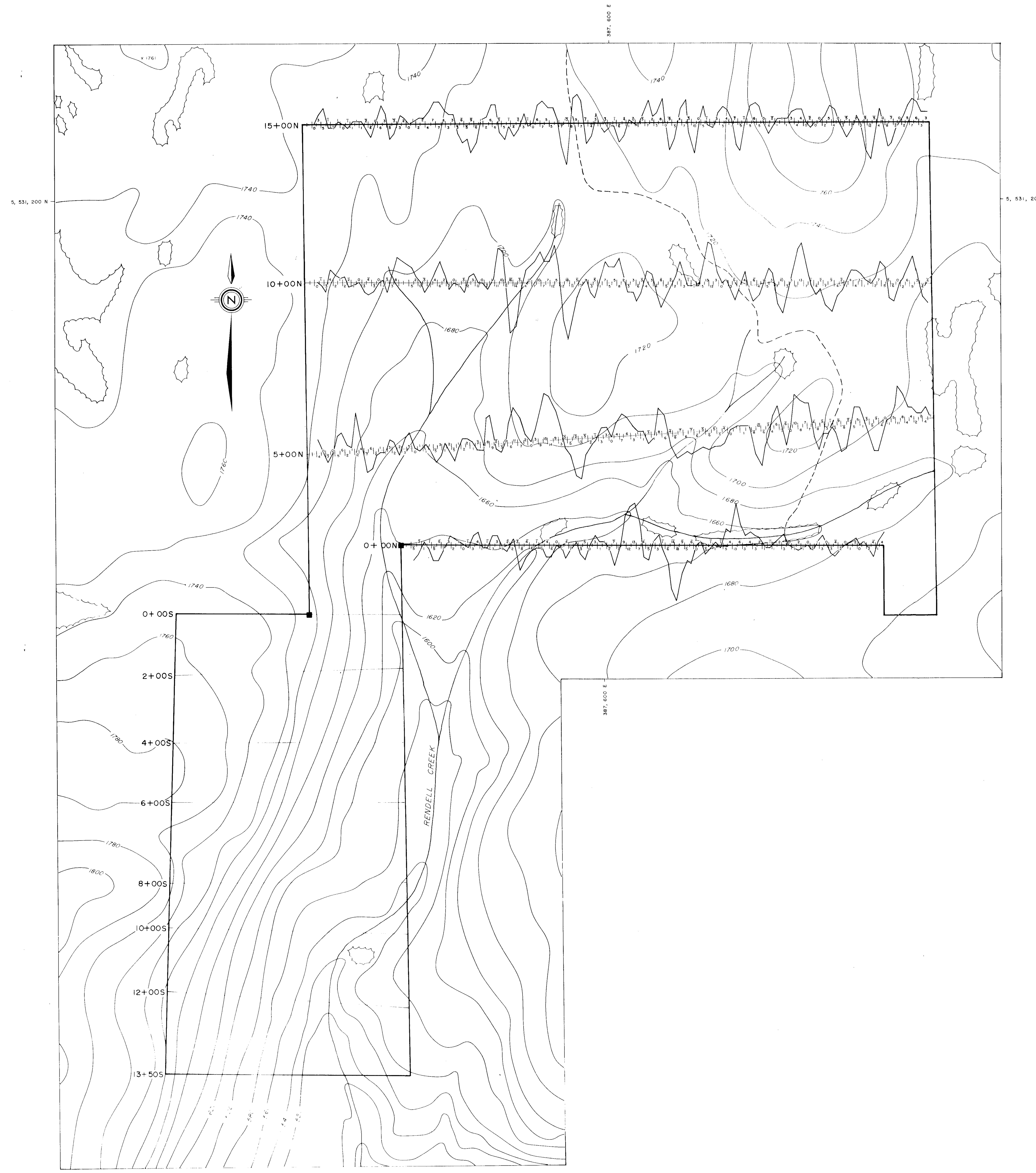
SUBANOMALOUS	ANARCHIST GROUP INTRUSIVES	SOIL SAMPLE GRID LINE (values in ppm)	6 9 2
ANOMALOUS	ANARCHIST GROUP INTRUSIVES	CONTOUR LINE (ppm)	60
2ND ORDER ANOMALY	ANARCHIST GROUP INTRUSIVES	TOPOGRAPHIC CONTOUR	1620
		ROAD	

MOHAWK OIL COMPANY LTD.
LIGHTNING PEAK AREA

RICH I - VII

COPPER SOIL GEOCHEMISTRY

DRAWN BY	SCALE	DATE	DRAWING NO
M. LETILLY	1:5000	MARCH, 1983	NO. 7



GEOLOGICAL BRANCH
ASSESSMENT REPORT

11,109

SCALE 1:5000

200m 100 0 100 200 300 400 500m

LEGEND

DIP ANGLE PROFILE 1 CM. = 5°

+5

-5

FRAZER FILTERED

ANNAPOLIS FREQUENCY = 21.4 KHz

MOHAWK OIL COMPANY LTD.

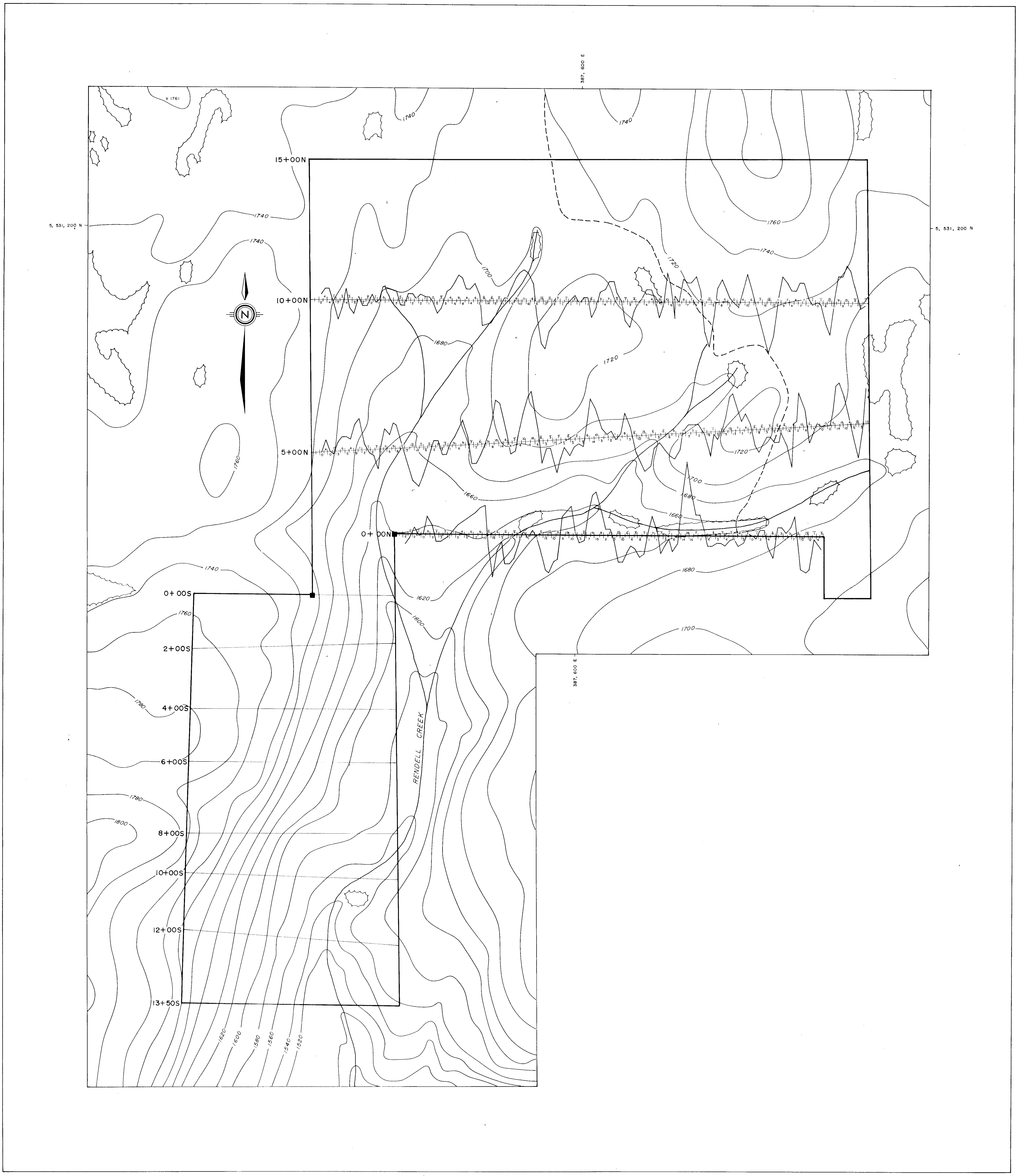
LIGHTNING PEAK AREA

RICH I - VII

VLF-EM DIP ANGLES

ANNAPOLIS

DRAWN BY	SCALE	DATE	DRAWING NO.
M. LETILLY	1:5000	MARCH, 1983	NO. 8



SCALE 1:5000

200m 100 0 100 200 300 400 500m

GEOLOGICAL BRANCH
ASSESSMENT REPORT

11,109

LEGEND

DIP ANGLE PROFILE 1 CM. = 5°

+5

−5

FRAZER FILTERED

HAWAII FREQUENCY = 23.4 KHz

MOHAWK OIL COMPANY LTD.

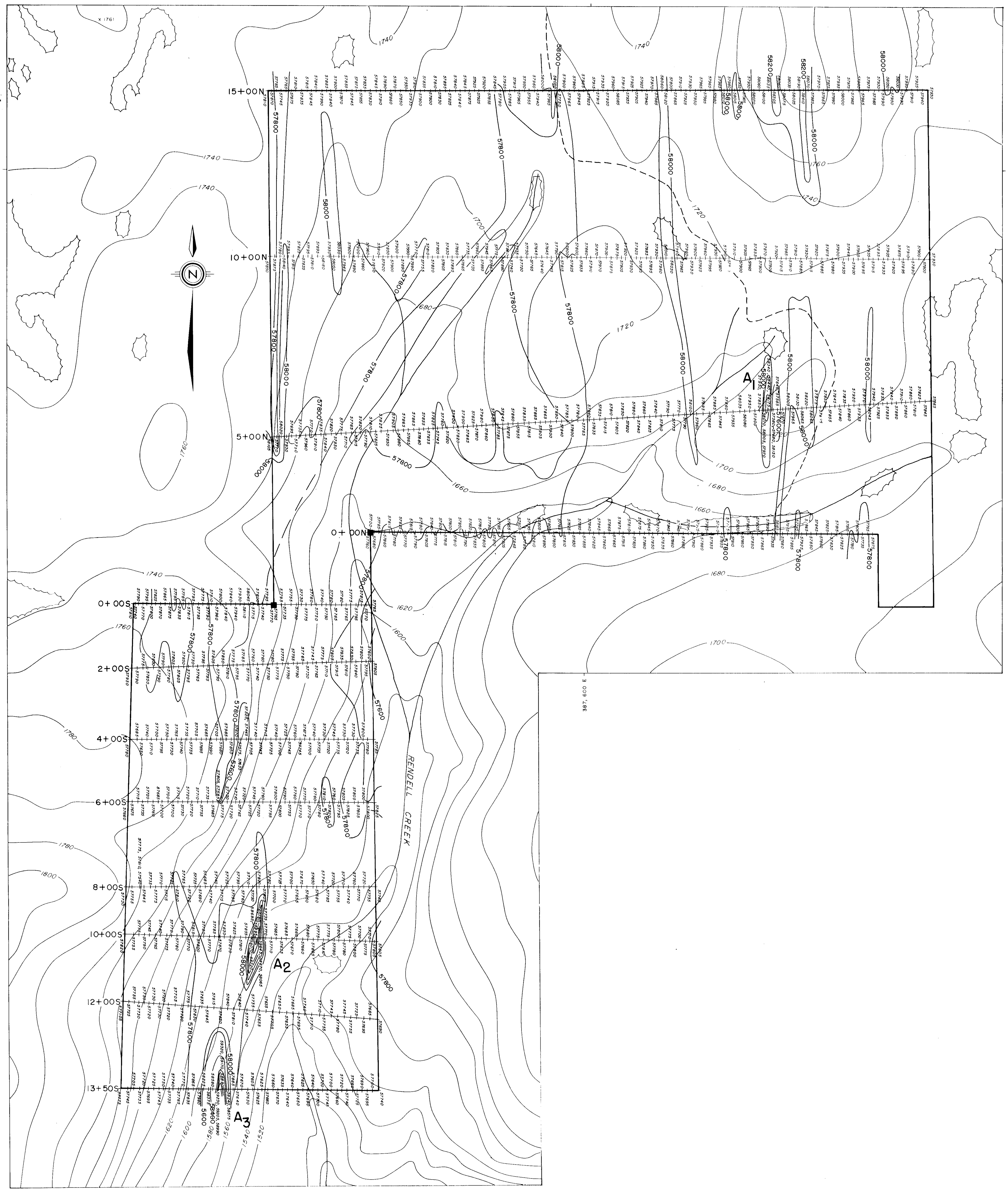
LIGHTNING PEAK AREA

RICH I - VII

VLF-EM DIP ANGLES

HAWAII

DRAWN BY	SCALE	DATE	DRAWING NO.
M. LETILLY	1:5000	MARCH, 1983	NO. 9



SCALE 1:5000

200m 100 0 100 200 300 400 500m

LEGEND

Magnetic Contour	58000
Magnetic Grid Reading (Gammas)	
Topographical Contour (Meters A.S.L.)	1540
Road	
Clearing or Swamp	

MOHAWK OIL COMPANY LTD.			
LIGHTNING PEAK AREA			
RICH I - VII			
MAGNETIC SURVEY			
DRAWN BY	SCALE	DATE	DRAWING NO.
M. LETILLY	1:5000	MARCH, 1983	NO. 10