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REPORT ON  
GEOLOGICAL, GEOCHEMICAL, MAGNETOMETER  
AND  
VERY LOW FREQUENCY - ELECTROMAGNETIC SURVEYS  
CONDUCTED ON THE RICH ROCK 1 AND 2  
MINERALS CLAIMS  
VERNON MINING DIVISION  
N.T.S. 82E/15E

49° 53' N LATITUDE AND 118° 32' W LONGITUDE

OWNER OF CLAIMS: F. NESBITT

OPERATOR: MOHAWK OIL CO. LTD.

AUTHOR: M.W. WALDNER

DATE: April 6, 1983

GEOLOGICAL BRANCH  
ASSESSMENT REPORT

11,136

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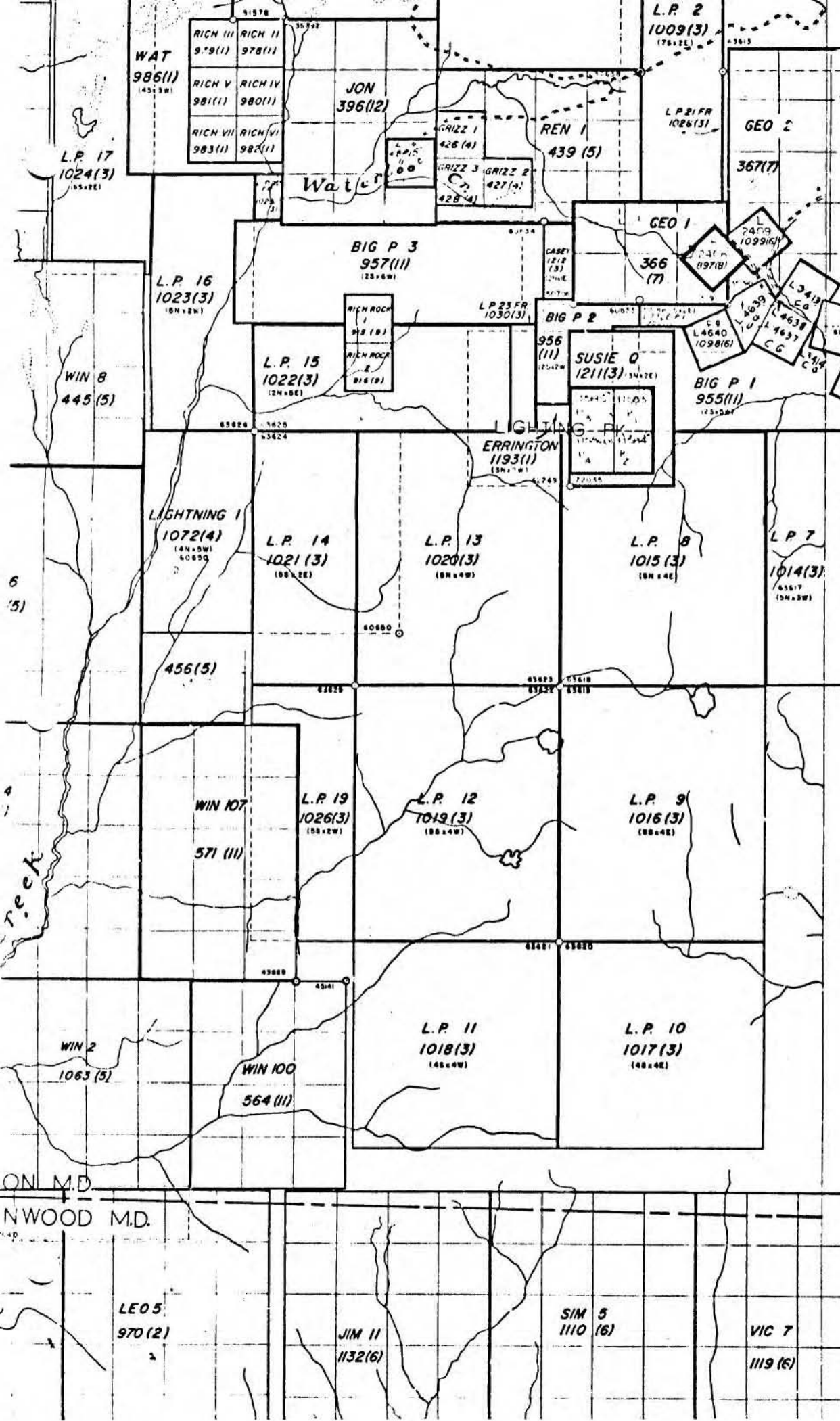
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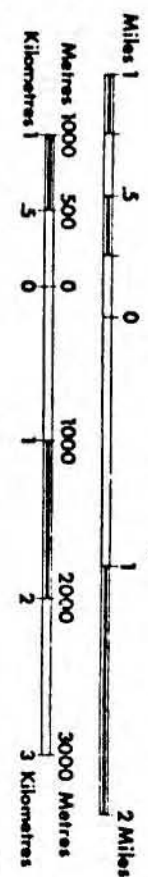
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LEGEND

- CROWN-GRANTED MINERAL CLAIM
- REVERTED C.G. MINERAL CLAIM
- FORFEITED MINERAL CLAIM
- VERIFIED LEGAL CORNER POST
- LEGAL SURVEY
- LEGAL CORNER POST & TAG NUMBER



Province of British Columbia  
 Ministry of Energy, Mines and Petroleum Resources

NTS 82E/15E



Fig 1, 2

TO EAST SEE MAP 82E/16W

LEGAL  
 THER 1  
 CONCET  
 DATE

## INTRODUCTION

Exploration on the Rich Rock 1 and 2 mineral claims during the 1982 field season included geological mapping, geochemical soil sampling, a VLF-EM survey and a magnetic survey. Previous work on the property has included bulldozer and hand trenching and limited sampling of these trenches.

## LOCATION AND ACCESS

The claims are located in the Monashee Mountains of British Columbia off the northwestern slope of Lightning Peak, map sheet N.T.S. 82E/15E, latitude  $49^{\circ} 53' N$  and longitude  $118^{\circ} 32' W$ .

Access to the property is via a four-wheel-drive road which joins Highway 6 approximately 110 kilometers southeast of Vernon. This four-wheel-drive road accesses the Lightning Peak area and passes along the northern flank of the Peak.

## PHYSIOGRAPHY

The topography slopes towards the northwest from an elevation of 2,020 metres a.s.l. in the southeastern corner of the property to about 1,880 metres a.s.l. in the northwestern corner of the property. The slope is moderate to gentle and fairly uniform. A north flowing minor stream drainage flows through the northeastern corner of the property.

The claims are forested with sub-alpine stands of fir and spruce. The slope

is not closely forested. There are abundant grassy areas and rock outcrop. Overburden cover does not appear to be thick probably averaging less than 5 metres. Rock outcrops occur over about 35 to 40 percent of the claims.

MINING PROPERTY

The property is currently under option to Mohawk Oil Co. Ltd. for Messrs. F. and J. Nesbitt, the owners of the two claims. Only a limited amount of trenching and sampling has been done on the property prior to 1982. 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 Mine approximately 2.5 kilometers northwest of the property. The rocks which host the lead, zinc, silver mineralization at the Waterloo Mine occur on the Rich Rock 1 and 2 claims.

The property consists of two - two post mineral claims;

<u>CLAIM</u>	<u>RECORD NUMBER</u>	<u>MONTH OF RECORD</u>
Rich Rock 1	915	September
Rich Rock 2	<del>915</del> 916	September

SUMMARY

The two-two post claims comprising the property were mapped and surveyed on a scale of 1:2500. The geological mapping included study of rock outcrops on the geochemical and geophysical grid and plotting of the geological structures

and rock types. The geological interpretations employed the outcrop mapping, magnetic data, VLF-EM data and aerial photographs.

The geochemical, geophysical, and geological survey grid included ten lines, each approximately 450 metres long for a total of about 4.5 line kilometers. These lines were flagged and chained for control for the surveys conducted on the property.

The VLF-EM dip angle readings were taken at 15 metre intervals along the flagged lines. Magnetic readings were taken at about 15 metre intervals on the same grid lines and soil samples collected at 50 metre intervals. A total of 87 soil samples were collected.

Location of the chain and compass flagged grid lines were assisted using a theodolite and E.D.M. survey instrument. Approximately 5 days were spent establishing the grid locations and the claims locations employing the theodolite and E.D.M. The claims were tied to topographic features and legal survey points in the vicinity.

Access to the property required some improvement. The access road about 5 kilometres from the property required some "curduroy" work and bulldozer work. A portion of the total work spent improving the road has been charged against the property.

#### GENERAL GEOLOGY

The entire property was mapped along the grid lines on a scale of 1:2500

(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 greywacke, tuffs, limestone and paragneiss. These rocks host the lead, zinc, silver mineralizations at the nearby Waterloo Mine. The Anarchist Group rocks form a roof pendant in the Lightning Peak area and are intruded by Cretaceous (?) Valhallå 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 mapped on 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 phenocrysts of 1 to 2 cm in length. The mafic mineral is usually biotite which composes about 10 percent of the rock. The remainder of the rock is composed generally of about 30 percent quartz, 30 percent plagioclase and 30 percent orthoclase although these compositions do vary depending upon the rock type.

The Anarchist Group rocks which occur generally in the northeastern portion and along the eastern boundary of the property are composed of minor 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 property are primarily the metamorphosed andesitic lavas. As illustrated on the geology map a narrow band of limestone is interpreted to occur in the northeastern area in contact with a small intrusive inlier.

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 and these dykes are probably related to the batholithic intrusives (i.e. the Nelson Intrusions).

#### STRUCTURAL GEOLOGY

Only one northerly trending fault has been intercepted to occur on the property. A small northeast striking fault was mapped as intersecting the major fault. Various VLF-EM dip angles "cross-overs" are apparent in the southwestern segment of the property. Lack of geological information and uniform topography observed on aerial photographs made correlation of much of the VLF-EM data with possible geological structures unreliable.

#### ECONOMIC GEOLOGY

The only sulphide mineralization observed in outcrop was observed in the trenched area in the central eastern part of the property. The pyrite and pyrrhotite mineralization observed was in an area of intense oxidation of the bedrock and soil horizons. However, even though no economic mineralization was



discovered there is potential for discovering economic silver, gold, lead or zinc mineralization on the claims. This type of mineralization occurs in the Lightning Peak area generally hosted in the Anarchist Group Rocks in close proximity to the intrusive contact. Coincident geochemical and geophysical anomalies occur along the northwest trending metavolcanic - intrusive rock contact in the northwestern sector of the property. This region of the claims, within the Anarchist Group Rocks near the Nelson Intrusive Rock contact may host contact metamorphic, vein or massive sulphide type mineralization. The geochemical results and mineralization typical of the area indicate the possible existence of economic quantities of ruby-silver, native silver, gold, galena, sphalerite and possibly minor tetrahedrite.

The exploration to-date has only been of a reconnaissance type therefore more detailed exploration will be required in order to better estimate the economic potential of the property. The present interpreted economic potential does indicate the need for more detailed exploration in the vicinity of the northwest trending contact area in the northwestern sector of the claims.

#### GEOCHEMISTRY

The geochemical soil survey was conducted on the grid lines approximately 125 metres apart. Soil samples were taken along these lines at about 50 metre intervals. The grid lines were established as flagged lines only. All results were plotted in parts per million on 1:2500 scale base maps.

A total of 87 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 analysed 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 values 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 1:2500. The data treatment has included contouring 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. The number of samples taken on the property were not considered adequate to develop statistically significant data. Therefore the statistics presented on Table I are 250 soil samples collected from a property nearby in the same geological

environment.

INTERPRETATION OF GEOCHEMISTRY

The zinc soil geochemistry is illustrated on drawing no. 3. A very strong northwesterly trending zinc anomaly occurs near the middle of line 1+50N, the western end of line 2+50N and the western boundary of the claim between lines 2+50N and 3+50N. This anomaly is approximately 350 metres long. Anomalous values are considered to be zinc values greater than 100 p.p.m. The highest soil value in this anomalous trend is 312 p.p.m. This value corresponds with a subtle magnetic dipole (see drawing no. 10). There is an excellent correlation between the anomalous zinc values and the Anarchist Group - Intrusive rock contact. The anomaly appears to be related to the metamorphic rocks but is close to the intrusive contact. This zinc anomaly also corresponds almost exactly with lead and arsenic anomalies. This could indicate the presence of galena, sphalerite, silver, gold mineralization.

The lead soil geochemical assay results are illustrated on drawing no. 2. The soil geochemistry background lead values are approximately the same over the metamorphic and intrusive rocks on the property. A very strong lead soil anomaly, corresponding with strong zinc and arsenic anomalies, occurs within the Anarchist Group Rocks near the intrusive contact in the northwestern part of the property. It may be that the difference in physical and chemical dispersion for lead, arsenic and zinc results in the lead anomaly occurring slightly downslope from the zinc and arsenic anomalies. This is evident on line 1+50N when comparing the geochemistry of the three elements.

TABLE I - GEOCHEMICAL PARAMETERS

<u>Parameter</u>	<u>Anarchist Group</u>						<u>Intrusive Rocks</u>					
	<u>Rocks (PPM)</u>						<u>(NELSON INTRUSIVES) (P.P.M.)</u>					
	<u>Pb</u>	<u>Zn</u>	<u>Ag</u>	<u>Cu</u>	<u>As</u>	<u>Sb</u>	<u>Pb</u>	<u>Zn</u>	<u>Ag</u>	<u>Cu</u>	<u>As</u>	<u>Sb</u>
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 silver soil geochemical results are illustrated on drawing no. 4. A solitary, anomalous silver value occurs on the extreme east end of line 4+50N. This anomaly does not correlate with any other elements analyzed and no geological explanation for the anomaly has been ascertained. A silver anomaly is evident trending northwesterly through the middle of line 2+50N and 1+50N. This anomaly is at least 120 metres long and is sub-parallel and slightly downslope from the neighbouring lead, zinc and arsenic anomalies. This relationship of the physical locations of these four elements may be partly the result of unique dispersion patterns and/or metal zoning of lead, zinc, silver and arsenic. There is a coincidence of the anomalous silver value in the middle of line 1+50N with a strong antimony and lead anomaly plus a subtle magnetic dipole. This is also an area of extreme VLF-EM dip angle relief (approximately 29° for Annapolis). This could indicate the presence of argentiferous galena and "ruby-silver" mineralization.

The copper soil geochemistry values are plotted and contoured on drawing no. 7. The copper values are generally low. There are some subanomalous areas but no copper anomalies. There may be some significance to the correspondence of a subanomalous area with the anomalous silver values on the middle-eastern sector of line 2+50N. This could indicate the presence of tetrahedrite mineralization. Tetrahedrite is a common accessory mineral in the Waterloo Mine ore zone.

Arsenic determinations, illustrated on drawing no. 5, were performed to use as a "pathfinder element" to discover possible existence of gold or proustite mineralization. A strong arsenic anomaly (328 ppm) corresponds with a 312 ppm zinc anomaly on line 1+50N. This anomaly also corresponds with a magnetic

dipole (magnetic relief about 500 gammas). The arsenic anomaly trends northwesterly apparently near the metamorphic igneous rock contact to the extreme western side of the property on line 1+50N. Along this western boundary of the property between line 2+50N and 3+50N the arsenic anomalies correspond with anomalous zinc and lead values.

The antimony soil geochemical results are illustrated on drawing no. 6. There is an apparent north to northwest trending antimony anomaly running through the centre of line 1+50N. This strong antimony anomaly (21 ppm) on line 1+54N corresponds exactly with a 312 ppm lead anomaly, a 1.3 ppm silver anomaly, and a subtle magnetic dipole. There is also a subtle VLF-EM dip "cross-over" immediately west of this anomaly. This anomaly also corresponds with an area of extreme VLF-EM dip angle relief. (See Annapolis VLF-EM data drawing no. 8). The excellent correlation of geochemical, and geophysical anomalies in an area of favourable geology indicates the possible existence of galena, pyrargyrite and possibly other silver minerals near the centre of line 1+50N in the vicinity of these coincident anomalies.

In conclusion, some general statements regarding the soil geochemistry can be made:

1. There is a significant zone of lead, silver, zinc, arsenic and antimony geochemical anomalies approximately 400 metres long within the Anarchist Group rocks near the intrusive contact in the northwest sector of the property.
2. Although the anomalous zone occurs near the igneous rock contact it



appears that the Anarchist Group rocks are the probable source for mineralization related to these anomalies. Therefore the statistics for determining anomalous values were related to the Anarchist Group Rocks rather than the Nelson Intrusives.

3. The silver anomaly on the extreme east end of line 4+50N is considered extraneous.

### GEOPHYSICS

A VLF-EM survey was conducted on the property. The instrumentation and theory of VLF-EM surveys are described in Appendix I. Dip angle readings were taken at 15 metre intervals along the sample grid lines flagged across the property. The strength data was found to be of limited use and was not collected. Dip angle measurements were collected for the Hawaiian (23.4 KHz) and Annapolis, M.D. (21.4 KHz) transmitters. The Fraser filtered and unfiltered (Null) data for Annapolis and Hawaii are presented on drawings 8 and 9 respectively. The filtered dip angle data has been presented in profile form on these same drawings. The primary value of the VLF-EM survey data was found to be in establishing rock contacts. There was some limited value in the structural geological interpretation, however, lack of rock exposure, detailed geological mapping and uniform terrain observed on the aerial photos, resulted in many of the VLF-EM dip "cross-overs" remaining unexplained. This is especially true in the southern half of the property which is primarily underlain by intrusive rocks. There are several "cross-overs" which may relate to economic mineralization. There is one Hawaii "cross-over" on the western end of line 2+50N and three Annapolis "cross-overs" on the central and western part of the



same line. There is also a subtle "cross-over" and extreme dip angle relief related to lead, arsenic, silver geochem. anomalies in the centre of line 1+50N.

The theory and instrumentation of magnetic surveys is outlined in Appendix II. A magnetic survey, using a Scintrex Model MP-2 precession magnetometer, was conducted on the flagged grid lines. Readings were taken about every 15 metres along the 10 grid lines totalling about 4.5 kilometers of line. The magnetic readings were plotted in gammas on the attached map (drawing no. 10) and the data contoured at 100 gamma intervals. The property generally displays low to moderate magnetic relief. Intrusives rocks which underly most of the southern two-thirds of the property exhibited magnetic responses in the 57,700 to 57,800 gamma range while the Anarchist Group meta-volcanic rocks generally responded in the 57,650 to 57,750 gammas range. A northwest trending magnetic low along the intrusive-metamorphic rock contact, within the Anarchist Rocks, may be partially related to the contact and partially to possible economic gold, silver, lead and/or zinc mineralization. A magnetic dipole occurs on line 1+50N within the Anarchist Group rocks coincident with a strong zinc, arsenic anomaly. This dipole may be in response to a magnetic mineral (magnetite or pyrrhotite) related to sphalerite-silver mineralization. A subtle magnetic dipole occurs east of the main dipole on line 1+50N and coincides with a subtle VLF-EM dip "cross-over" and a lead, silver antimony anomaly. This also could be the response of a magnetic mineral associated with galena, sphalerite, ruby-silver mineralization.

CONCLUSIONS AND RECOMMENDATIONS

The Rich Rock I and II mineral claims are generally underlain by intrusive rocks, probably Nelson Intrusives, in the southwestern two-thirds of the property and by metamorphosed volcanic Anarchist Group Rocks in the northeastern and eastern sectors. There is the potential for galena, sphalerite, native silver, ruby-silver, gold and perhaps tetrahedrite occurrences on the property. There is a northwest trending zone of lead, zinc, arsenic, antimony and silver anomalies underlain by Anarchist Group Rocks near the contact with the Nelson Intrusives contact in the central-northwestern part of the property. It is postulated that these anomalies could indicate the presence of contact metamorphic, vein or massive sulphide type galena, sphalerite, silver, gold mineralization.

It is recommended that:

1. A detailed geochemical, geological, VLF-EM and magnetic survey be conducted in the anomalous contact area in the central-northwest sector of the property.
2. More sophisticated geophysical methods such as induced polarization or "shoot-lock" EM, be tried to pin-point drilling targets.
3. Diamond drill and trench several of the areas where coincident VLF-EM, magnetic and geochemical anomalies exist. (i.e. central area of line 1+50N.)

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, 1983

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.

APPENDIX I (cont'd)

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 instrument 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 begin to precess around the earth's magnetic field and eventually re-align with it. This precession induces 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.

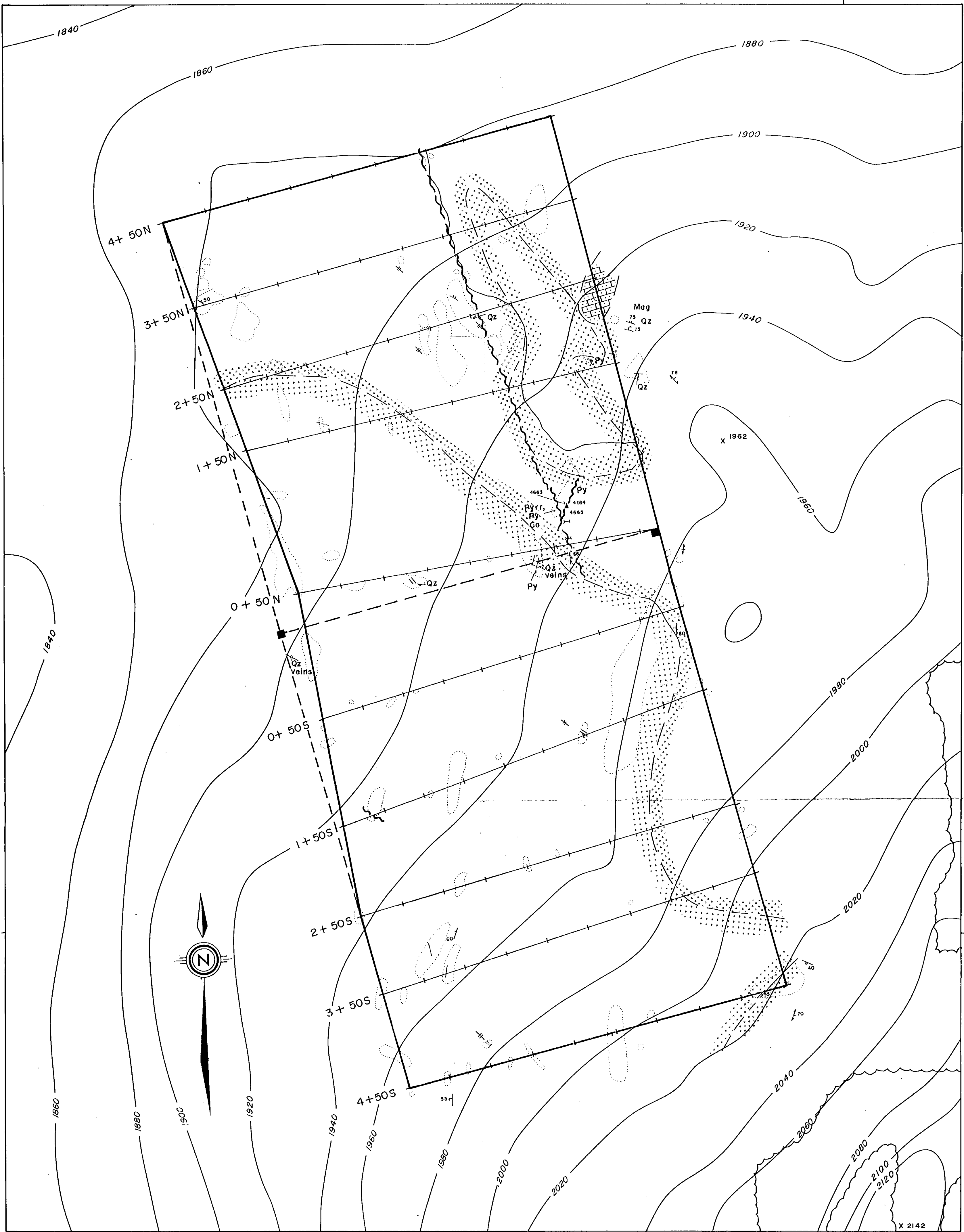


APPENDIX III

Itemized Cost Statement - Rich Claims

<u>PERSONNEL</u>	<u>DUTIES/ POSITION</u>	<u>DAYS WORKED</u>	<u>PAY SCALE</u>	<u>TOTAL COST</u>
K. Lyons	VLF-EM Geophysics Assist.	4	\$85/day	\$ 340.00
C. Nagati	Geologist	3	\$95/day	285.00
B. Callaghan	Project Geologist	12	\$110/day	1,320.00
K. Lindstrom	Geological Assist	2	\$80/day	160.00
M. Waldner	Chief Geologist	5	\$225/day	1,125.00
B. Timler	Geol. Assist.	2	\$85/day	170.00
S. Maltby	Geological Tech	9	\$90/day	810.00
D. Newton	Geol. Tech.	4	\$90/day	360.00
H Mah	Geol. Assist.	5	\$80/day	400.00
W. Kirkman	Geophysicist	5	\$95/day	<u>475.00</u>
		Total		\$ 5,445.00

<u>ITEM</u>	<u>RATE</u>	<u>TASK COMPLETED</u>	<u>TOTAL</u>
Room, Board	\$30/man/day	41 man days	\$ 1,050.00
D-6 Bulldozer & operator	\$56/hr	13 hours	728.00
Camp Mobilization & demobilization	20% of total cost		1,414.54
Materials & Supplies	Exploration Equipment, Drafting Supplies, etc.		350.00
Drafting	\$12/hr	48 hrs. drafting	576.00
VLF-EM	\$15/day	2 days rental	30.00
Magnetometer	\$25/day	2 days rental	50.00
4X4 crew cabs pickups	\$35/day	8 days	280.00
Geochem Soil Samples	\$8.50/sample	87 samples assayed For Ag, Zn, Pb, As, Sb, Cu	739.50
EDM Survey Instruments	\$25/day	5 days	125.00
Rock Sample	\$33/Sample	3 Samples assayed for Au, Ag, Pb, Zn, Cu	99.00
Freight		shipping rock & soil samples (bus)	18.00
			<hr/>
			\$ 5,640.04
Report Prep. (M. Waldner - 5 days + typing & copying)			<u>1,350.00</u>
		Total	<u>6,990.04</u>
		Grand total	<u><u>\$12,435.04</u></u>



**LEGEND**

- 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, graywacke, porphyries, andesitic lava, breccia, recrystallized limy tuffs.
- Limestone.
- ROAD**
- NO VEGETATION**
- SLIDE AREA**
- GEOCHEM SOIL TRAVERSE** 10+00N
- GEOCHEM SILT TRAVERSE**
- MARSH**
- ROCK GEOCHEM. SAMPLE**
- DIRECTION OF GLACIATION**
- FAULT (approximate) (inferred)**
- CONTACT (approximate) (inferred)**
- BEDDING (inclined, vertical, unknown)**
- FOLIATION (inclined, vertical, unknown)**
- FRACTURES (inclined, vertical, unknown)**
- TRENCH**
- PIT**
- OUTCROP**



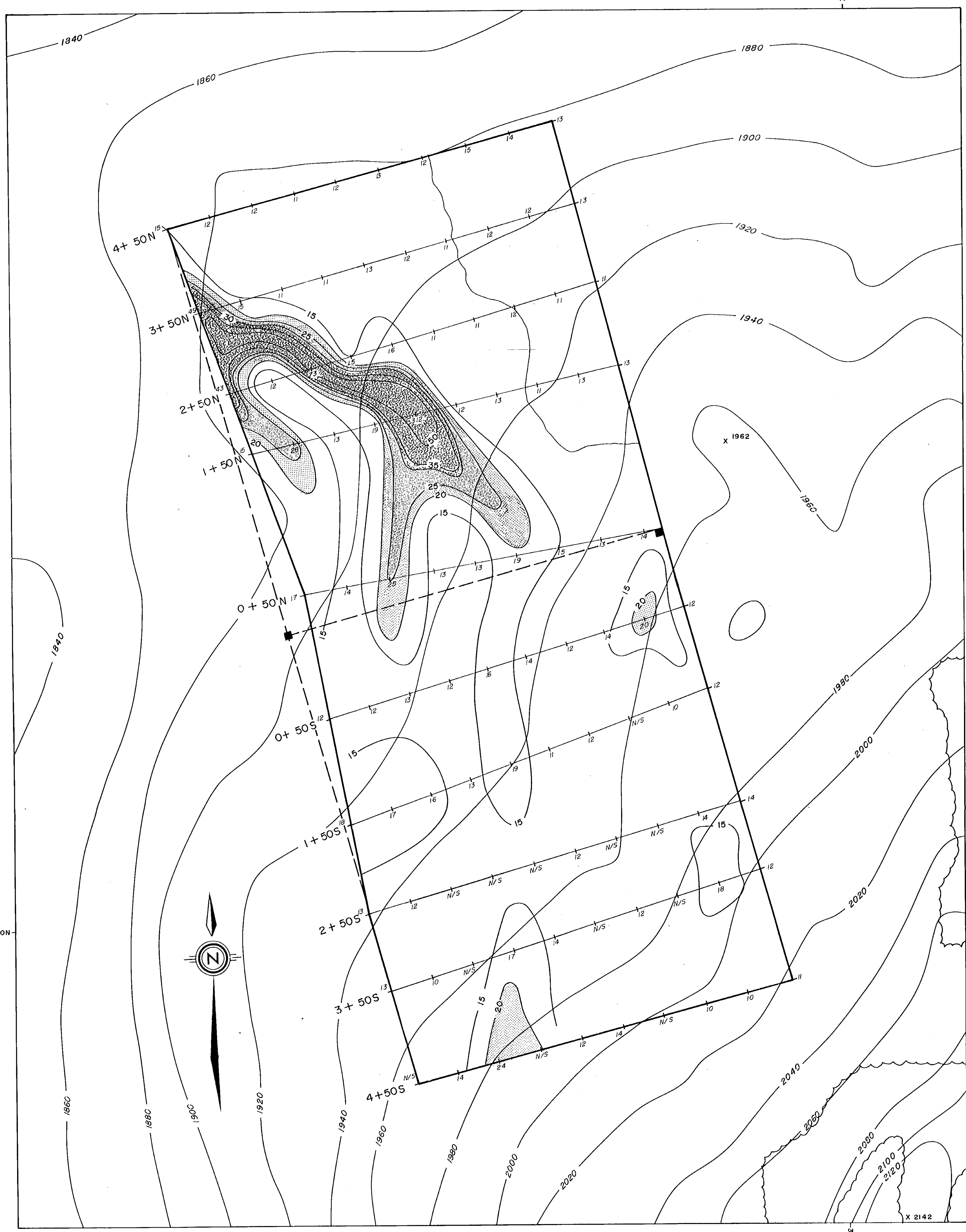
GEOLOGICAL BRANCH  
ASSESSMENT REPORT

**11,136**

<b>MOHAWK OIL COMPANY LTD.</b>			
<b>LIGHTNING PEAK AREA</b>			
<b>RICH ROCK GEOLOGY</b>			
DRAWN BY	SCALE	DATE	DRAWING NO.
M. LETILLY	1:2,500	MARCH, 1983	1

- Qz QUARTZ
- Peg PEGMATITE
- Grt GARNET
- Apl APLITE
- Calc CALCITE
- Hem HEMATITE
- Mag MAGNETITE
- Pyrr PYRRHOTITE
- Sph SPHALERITE
- Ga GALENA
- Py Pyrite
- Cpy CHALCOPYRITE

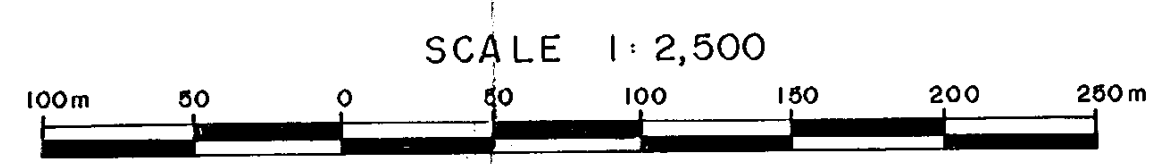
390,000 E



5,526,400 N

5,526,400 N

390,000 E



SCALE 1:2,500

GEOLOGICAL BRANCH  
ASSESSMENT REPORT

# 11,136

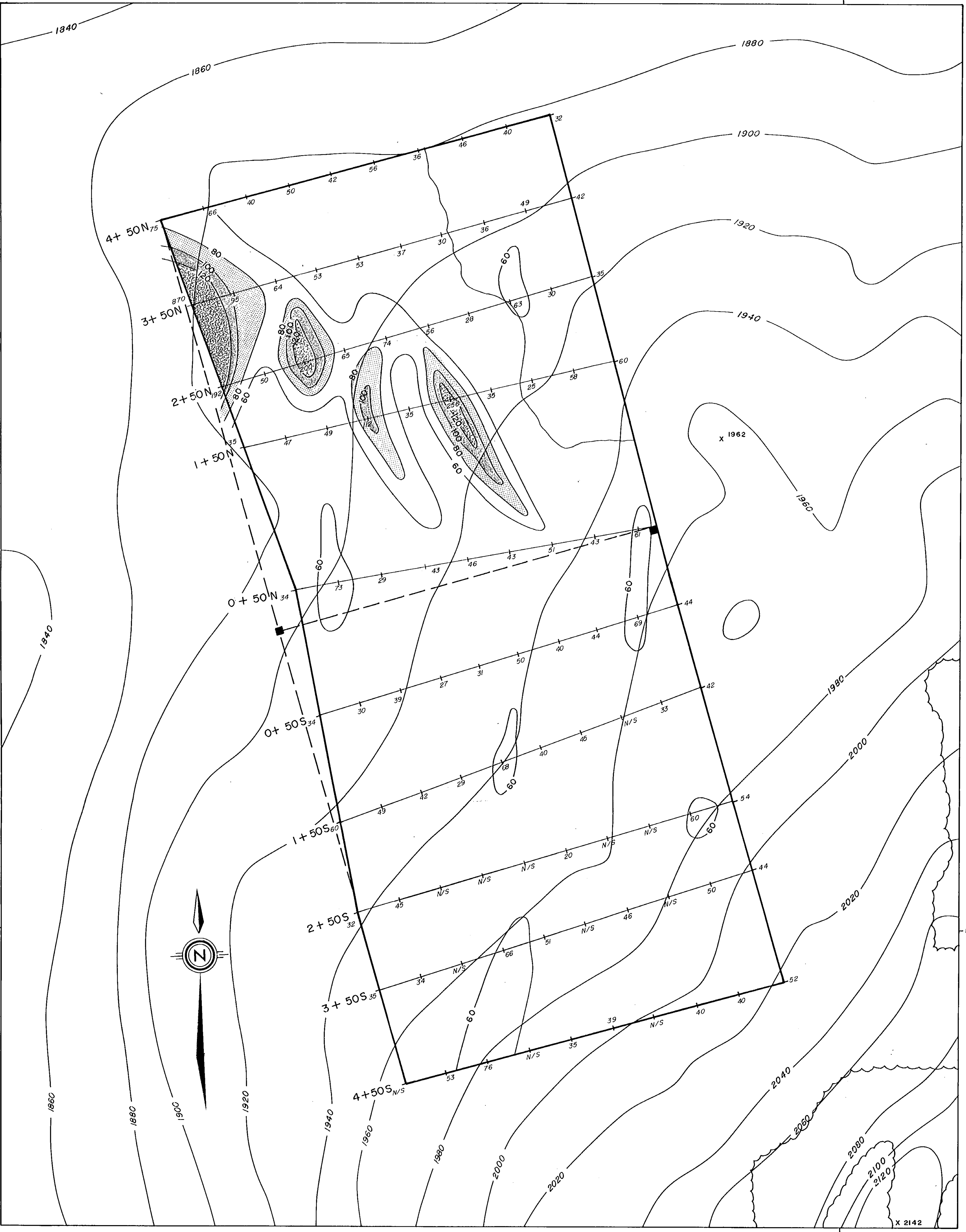
## LEGEND

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

- SOIL SAMPLE GRID LINE (values in ppm)
- CONTOUR LINE (ppm)
- TOPOGRAPHIC CONTOUR
- ROAD

<b>MOHAWK OIL COMPANY LTD.</b>			
<b>LIGHTNING PEAK AREA</b>			
<b>RICH ROCK</b>			
<b>LEAD SOIL GEOCHEM</b>			
DRAWN BY	SCALE	DATE	DRAWING NO.
M. LETILLY	1:2,500	MARCH, 1983	2

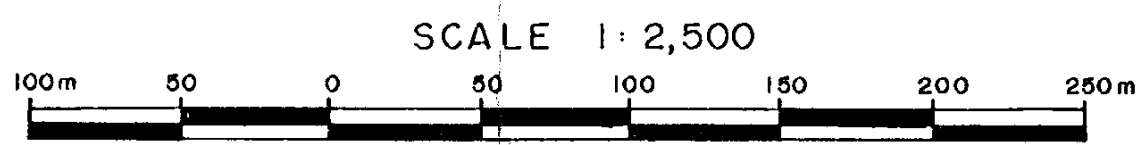
390,000 E



5,526,400 N

5,526,400 N

390,000 E



GEOLOGICAL BRANCH  
ASSESSMENT REPORT

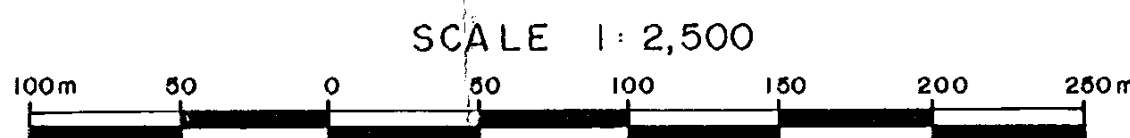
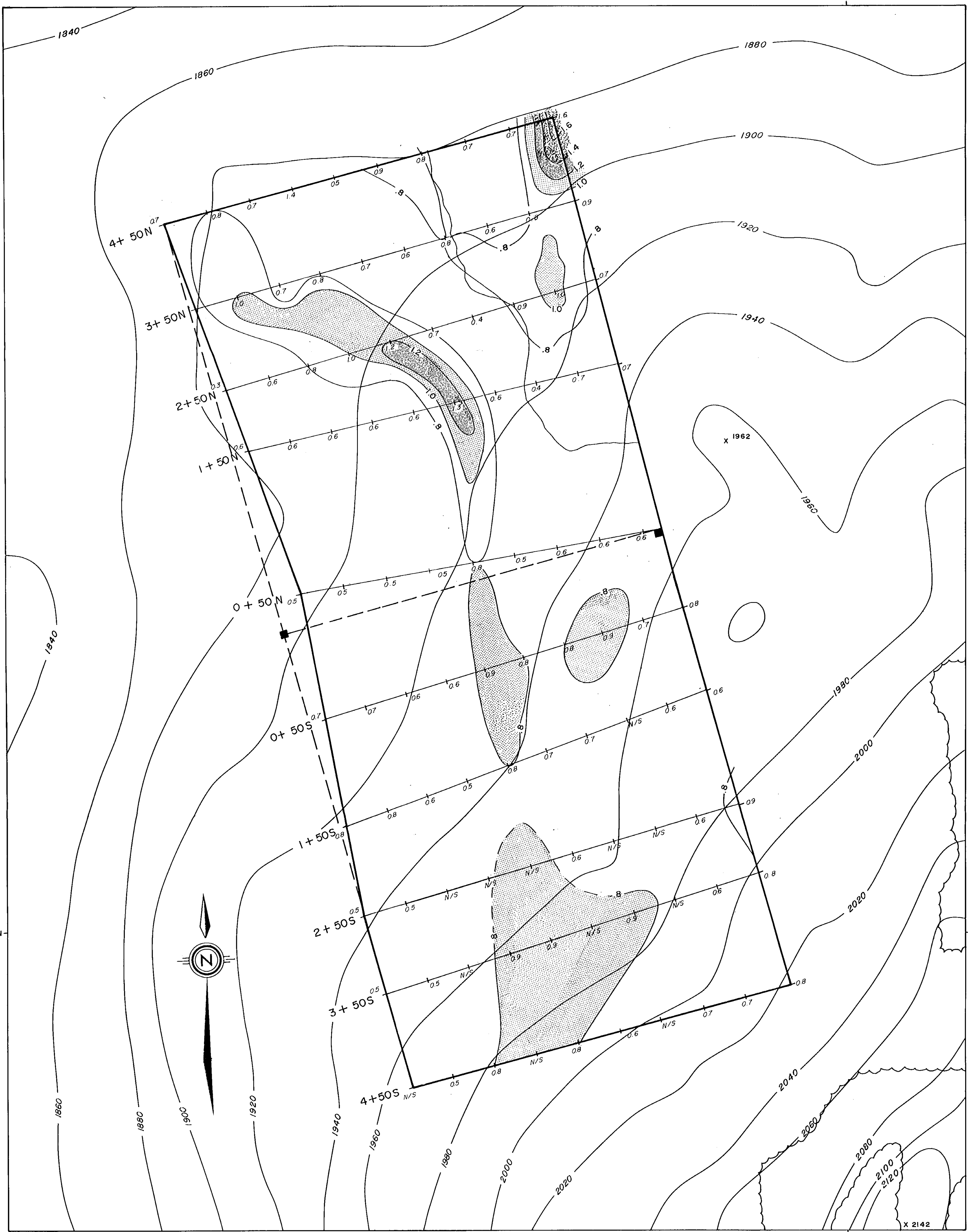
# 11,136

## LEGEND

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

MOHAWK OIL COMPANY LTD.			
LIGHTNING PEAK AREA			
RICH ROCK			
ZINC SOIL GEOCHEM			
DRAWN BY	SCALE	DATE	DRAWING NO.
M. LETILLY	1:2,500	MARCH, 1983	3





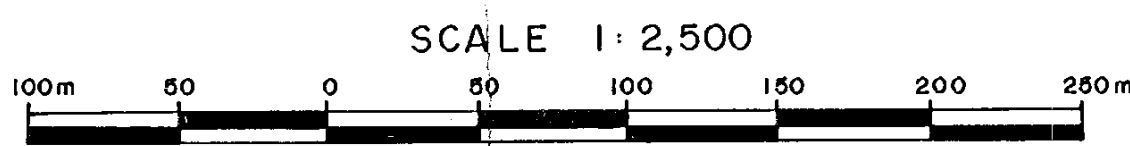
GEOLOGICAL BRANCH  
ASSESSMENT REPORT

11,136

LEGEND

- |                   |  |                            |                                       |  |
|-------------------|--|----------------------------|---------------------------------------|--|
| SUBANOMALOUS      |  | ANARCHIST GROUP INTRUSIVES | SOIL SAMPLE GRID LINE (values in ppm) |  |
| ANOMALOUS         |  | ANARCHIST GROUP INTRUSIVES | CONTOUR LINE (ppm)                    |  |
| 2ND ORDER ANOMALY |  | ANARCHIST GROUP INTRUSIVES | TOPOGRAPHIC CONTOUR                   |  |
|                   |  |                            | ROAD                                  |  |

MOHAWK OIL COMPANY LTD.			
LIGHTNING PEAK AREA			
RICH ROCK			
SILVER SOIL GEOCHEM			
DRAWN BY	SCALE	DATE	DRAWING NO.
M. LETILLY	1:2,500	MARCH, 1983	4



GEOLOGICAL BRANCH  
ASSESSMENT REPORT

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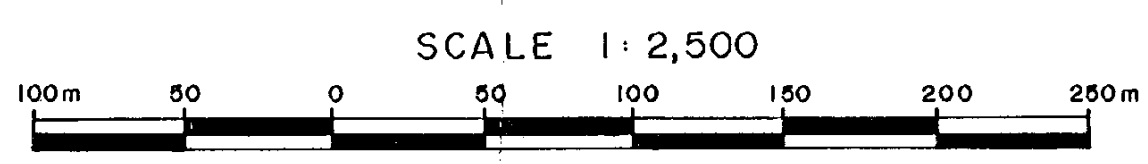
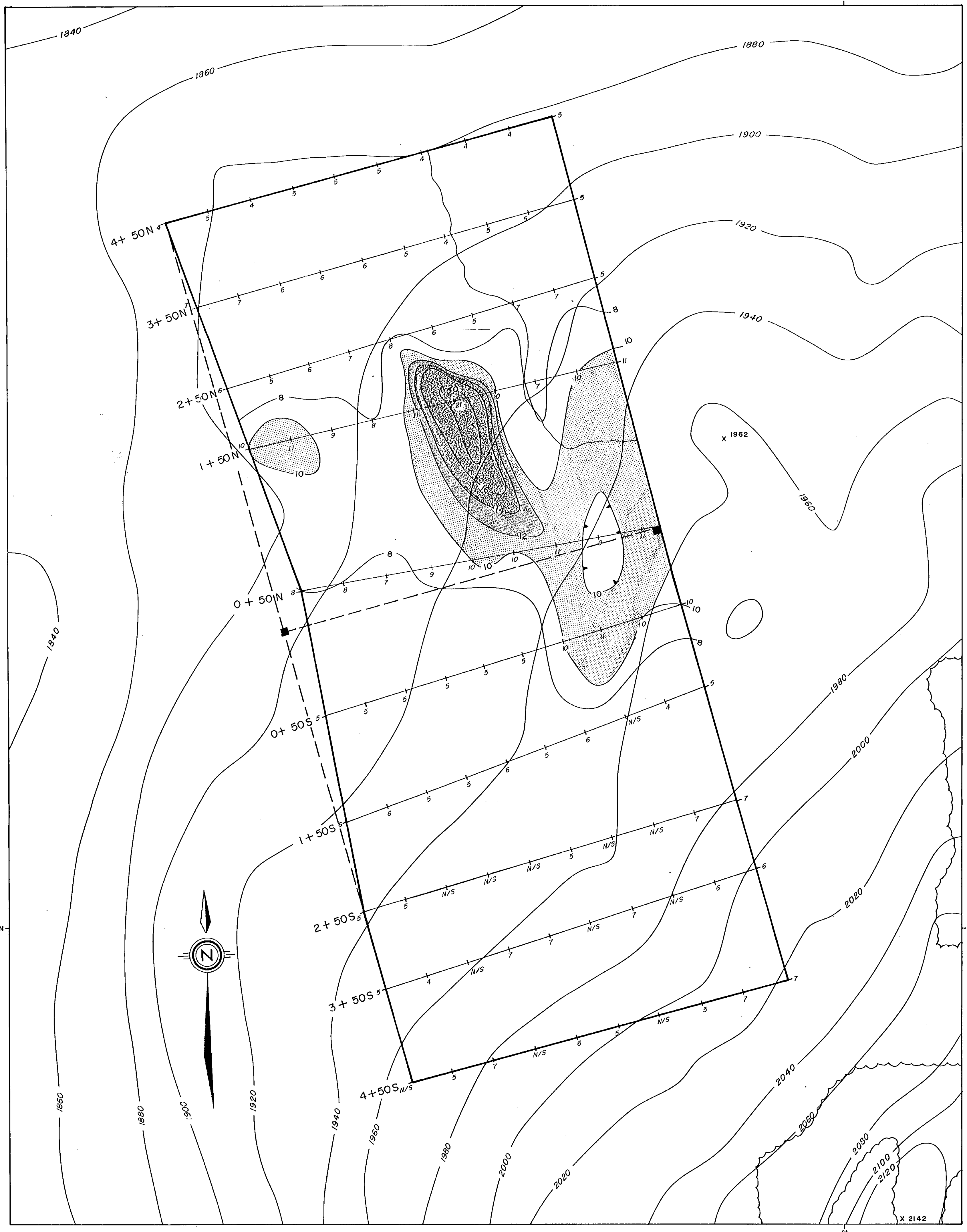
LEGEND

- |                   |  |                            |                                       |  |
|-------------------|--|----------------------------|---------------------------------------|--|
| SUBANOMALOUS      |  | ANARCHIST GROUP INTRUSIVES | SOIL SAMPLE GRID LINE (values in ppm) |  |
| ANOMALOUS         |  | ANARCHIST GROUP INTRUSIVES | CONTOUR LINE (ppm)                    |  |
| 2ND ORDER ANOMALY |  | ANARCHIST GROUP INTRUSIVES | TOPOGRAPHIC CONTOUR                   |  |
|                   |  |                            | ROAD                                  |  |

MOHAWK OIL COMPANY LTD.			
LIGHTNING PEAK AREA			
RICH ROCK			
ARSENIC SOIL GEOCHEM			
DRAWN BY	SCALE	DATE	DRAWING NO.
M. LETILLY	1:2,500	MARCH, 1983	5



390,000 E



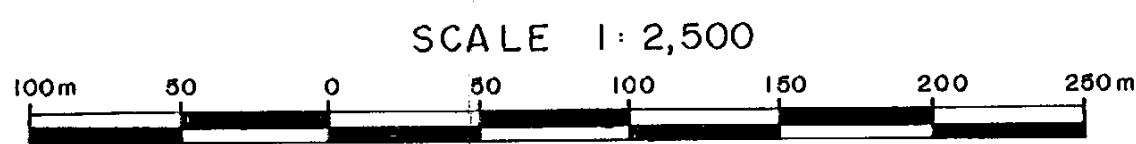
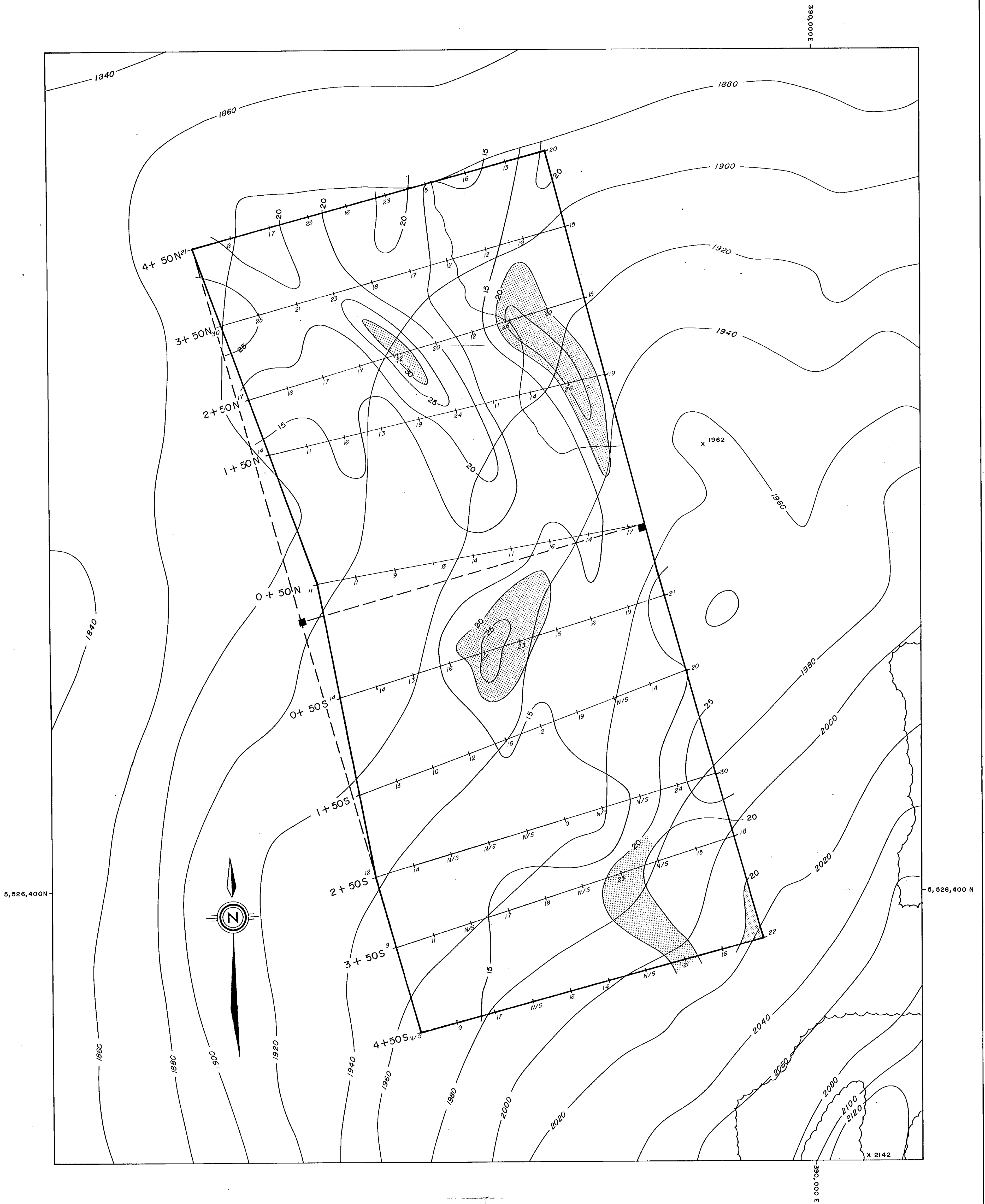
GEOLOGICAL BRANCH  
ASSESSMENT REPORT

# 11,136

## LEGEND

- |                   |  |                               |  |  |
|-------------------|--|-------------------------------|--|--|
| SUBANOMALOUS      |  | ANARCHIST GROUP<br>INTRUSIVES | SOIL SAMPLE GRID LINE<br>(values in ppm) |  |
| ANOMALOUS         |  | ANARCHIST GROUP<br>INTRUSIVES | CONTOUR LINE (ppm)                       |  |
| 2ND ORDER ANOMALY |  | ANARCHIST GROUP<br>INTRUSIVES | TOPOGRAPHIC CONTOUR                      |  |
|                   |  |                               | ROAD                                     |  |

MOHAWK OIL COMPANY LTD.			
LIGHTNING-PEAK AREA			
RICH ROCK			
ANTIMONY SOIL GEOCHEM			
DRAWN BY	SCALE	DATE	DRAWING NO.
M. LETILLY	1:2,500	MARCH, 1983	6



GEOLOGICAL BRANCH  
ASSESSMENT REPORT

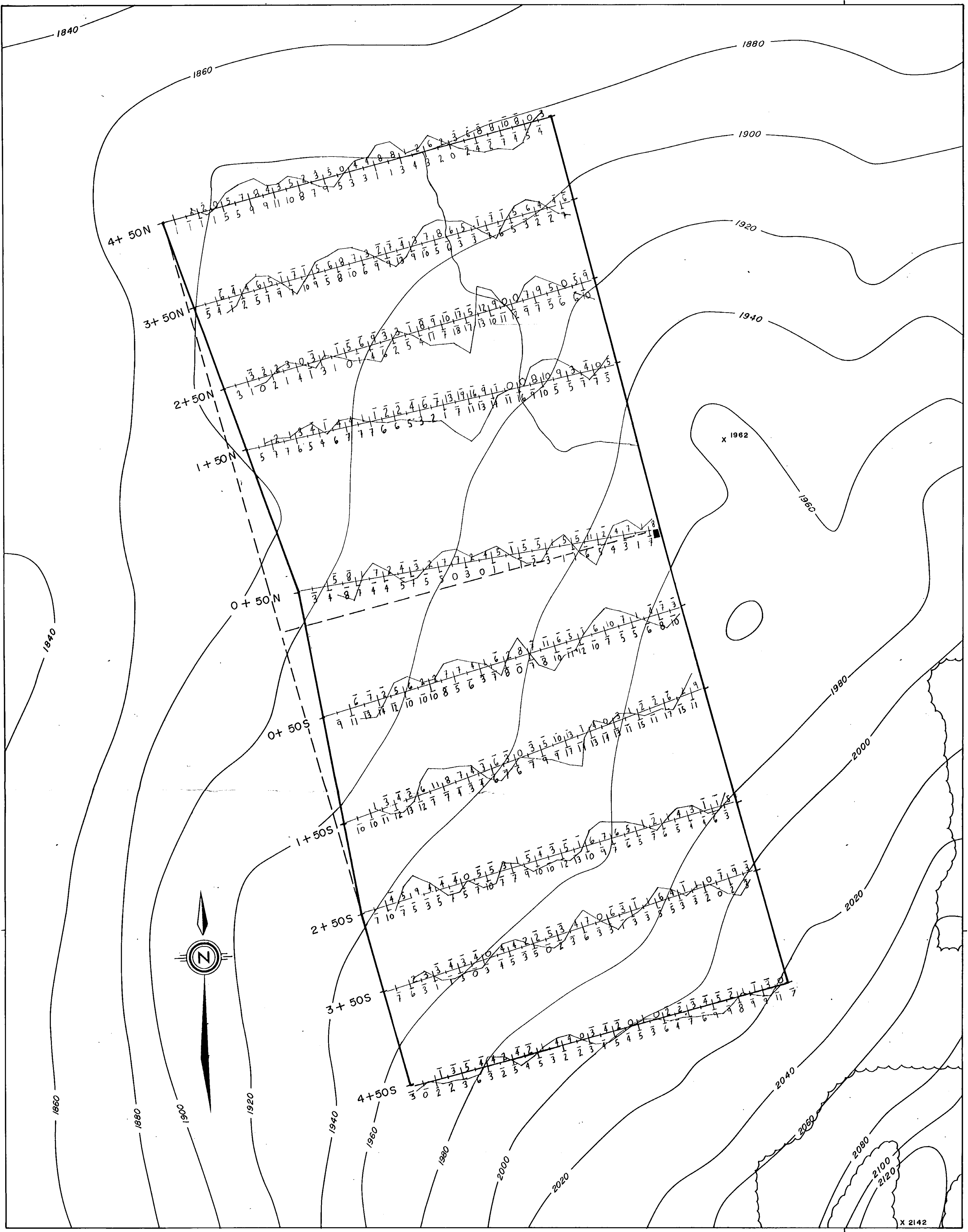
11,136

LEGEND

- |                   |  |                            |                                       |  |
|-------------------|--|----------------------------|---------------------------------------|--|
| SUBANOMALOUS      |  | ANARCHIST GROUP INTRUSIVES | SOIL SAMPLE GRID LINE (values in ppm) |  |
| ANOMALOUS         |  | ANARCHIST GROUP INTRUSIVES | CONTOUR LINE (ppm)                    |  |
| 2ND ORDER ANOMALY |  | ANARCHIST GROUP INTRUSIVES | TOPOGRAPHIC CONTOUR                   |  |
|                   |  |                            | ROAD                                  |  |

MOHAWK OIL COMPANY LTD.			
LIGHTNING PEAK AREA			
RICH ROCK COPPER SOIL GEOCHEM			
DRAWN BY	SCALE	DATE	DRAWING NO.
M. LETILLY	1:2,500	MARCH, 1983	7

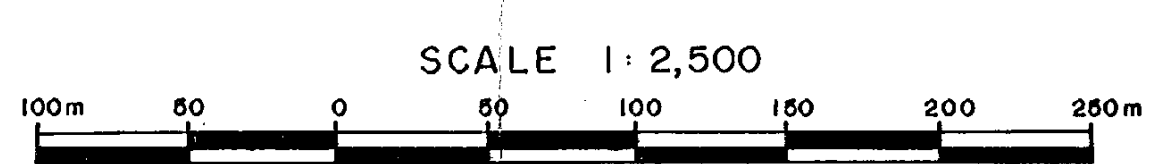
390,000 E



5,526,400 N

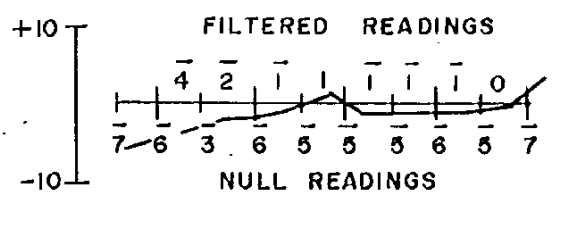
5,526,400 N

390,000 E



### LEGEND

DIP ANGLE PROFILE: 1 CM. = 10°

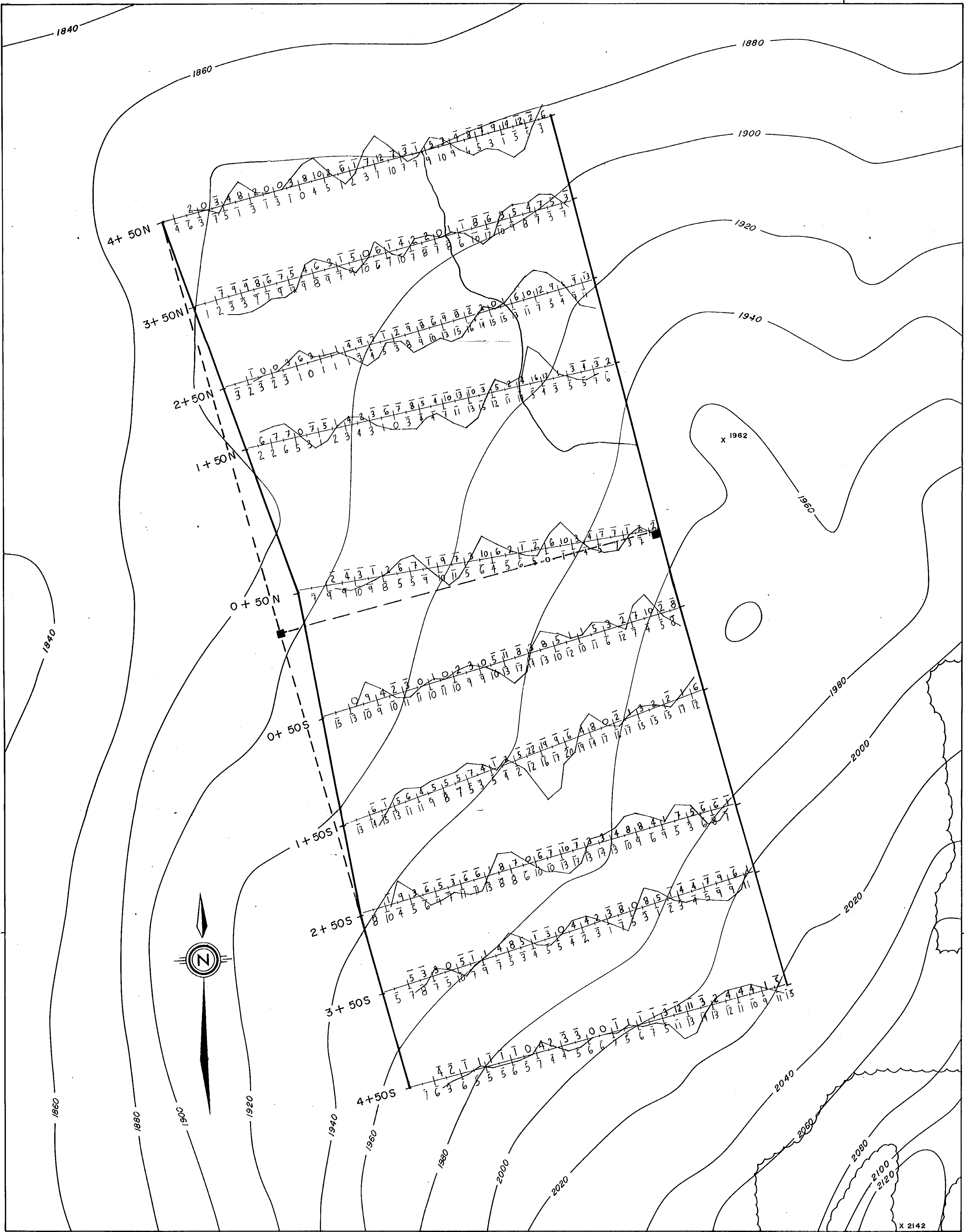


ANNAPOLIS FREQUENCY 21.4 KHz

GEOLOGICAL BRANCH  
ASSESSMENT REPORT

# 11,136

MOHAWK OIL COMPANY LTD.			
LIGHTNING PEAK AREA			
RICH ROCK			
VLF-EM DIP ANGLES			
ANNAPOLIS			
DRAWN BY	SCALE	DATE	DRAWING NO.
M. LETILLY	1:2,500	MARCH, 1983	8

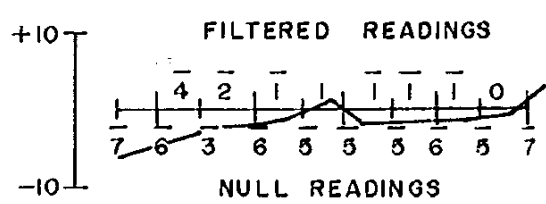


SCALE 1:2,500



**LEGEND**

DIP ANGLE PROFILE: 1 CM. = 10°



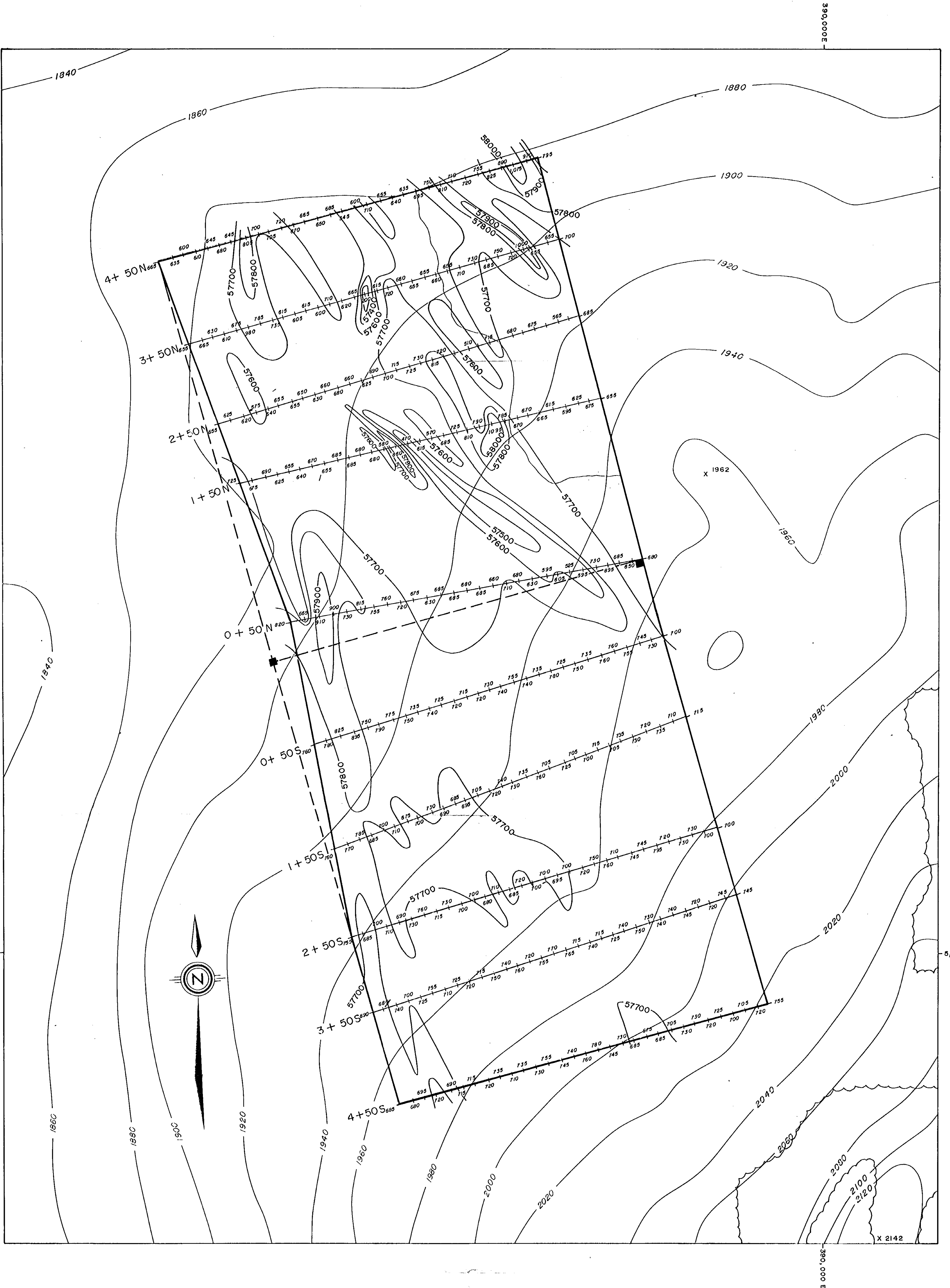
HAWAII FREQUENCY 23.4 KHz

GEOLOGICAL BRANCH  
ASSESSMENT REPORT

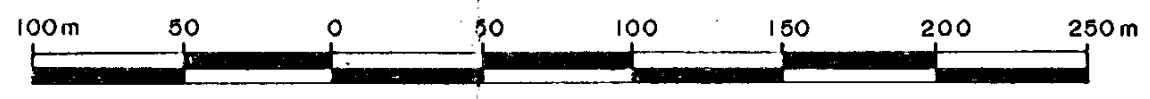
**11,136**

MOHAWK OIL COMPANY LTD.			
LIGHTNING PEAK AREA			
RICH ROCK			
VLF-EM DIP ANGLES			
HAWAII			
DRAWN BY	SCALE	DATE	DRAWING NO.
M. LETILLY	1:2,500	MARCH, 1983	9





SCALE 1:2,500



LEGEND

- Magnetic Contour — 58000 —
- Magnetic Grid Reading (Gammas)  $\begin{matrix} 720 & 730 & 740 \\ | & | & | \\ 710 & 720 & 730 \end{matrix}$
- Topographical Contour (Meters A.S.L.) — 1540 —
- Road - - - - -
- Clearing or Swamp

GEOLOGICAL BRANCH  
ASSESSMENT REPORT

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MOHAWK OIL COMPANY LTD.  
LIGHTNING PEAK AREA

RICH ROCK  
MAGNETIC SURVEY

DRAWN BY	SCALE	DATE	DRAWING NO.
M. LETILLY	1:2,500	MARCH, 1983	10