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ST. JOE CANADA INC.

FINAL REPORT FOR OMEP APPLICATION
OM83-3-JV-205

GEOLOGY, VLF-EM, MAGNETOMETER SURVEYS
AND
DIAMOND DRILLING

MANITOU LAKES AREA, NORTHWESTERN ONTARIO

TORONTO, JANUARY 1985



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Table of Contents

<u>Part I</u>	<u>Page</u>
I Introduction	1
II Property Description, Location and Access	2
III History of the Property	5
 <u>Part II</u>	
IV Diamond Drilling	7
(i) Drill Results	7
V Geophysical Surveys	12
(i) Magnetometer Results	13
(ii) VLF-EM Results	13
VI Geological Surveys	14
(i) Reliance - North Grid Geology	14
(ii) Frenchman Island - North Section Geology & Rock Geochemistry	15
(iii) Goldrock Geology and Rock Geochemistry	16
VII Recommendations	21
VIII References	23
IX Certificate	24

Appendices

- Appendix A Drill Logs R84-04-11 inclusive (in accompanying folder)
F84-01
- Appendix B Laboratory Result Sheets for Rock
Geochemistry
- Appendix C Diamond Drill Core and Sludge Assays
- Appendix D Magnetometer Specifications
- Appendix E Description of the VLF-EM System

Tables

- Table 1 Statistical Summary of Diamond Drill Data
- Table 2 Table of Formations
- Table 3 Statistical Summary of Goldrock Mineralized Zones

	<u>Figures</u>	<u>Page</u>
Figure 1	General Location of the Manitou Lake-Goldrock Property	2
Figure 2	Manitou Lake-Goldrock Claim Map	3
Figure 3	Location of Exploration Programs Completed Under OMEP Project OM83-3-C-65	4

	<u>Plans</u>
Plan 1	D.D.H. R84-04 Longitudinal Section
Plan 2	D.D.H. R84-05 Longitudinal Section
Plan 3	D.D.H. R84-06 Longitudinal Section
Plan 4	D.D.H. R84-07 Longitudinal Section
Plan 5	D.D.H. R84-08 Longitudinal Section
Plan 6	D.D.H. R84-09 Longitudinal Section
Plan 7	D.D.H. R84-10 Longitudinal Section
Plan 8	D.D.H. R84-11 Longitudinal Section
Plan 9	D.D.H. F84-01 Longitudinal Section
Plan 10	Generalized Diamond Drill Plan Section (L2+00S - L14+00S; D.D.H. R84-01-10 inclusive)
Plan 11	Magnetic Survey - Contours of Total Intensity - South Sheet
Plan 12	Magnetic Survey - Contours of Total Intensity - North Sheet
Plan 13	VLF-EM Survey - Profiles of In-Phase and Quadrature Components South Sheet
Plan 14	VLF-EM Survey - Profiles of In-Phase and Quadrature Components North Sheet
Plan 15	Electromagnetic Fraser Filtered In-Phase Contour Map - South Sheet
Plan 16	Electromagnetic Fraser Filtered In-Phase Contour Map - North Sheet
Plan 17	Reliance Property, North Grid - Bedrock Geology
Plan 18	Frenchman Island, North Section - Geology and Rock Geochemistry
Plan 19	Goldrock Geology and Rock Geochemistry - South Sheet
Plan 20	Goldrock Geology and Rock Geochemistry - North Sheet

PART I

I INTRODUCTION

This report will describe the geology of the Goldrock claim area and the results obtained from VLF-EM and magnetometer surveys and diamond drilling completed by St. Joe Canada Inc. on a 215 claim property in the Manitou Lake area under OMEP project OM83-3-JV-205 from Nov. 1, 1983 to October 31, 1984. Between July 5, 1983 and January 27, 1984 including the period in which the diamond drilling was carried out a joint venture between St. Joe Canada Inc. and Geddes Resources Ltd. was in effect. This joint venture was terminated on January 27, 1984 and subsequent work during the period of designation was carried out by St. Joe Canada Inc.

The 215 claim property, known as the MANITOU LAKE property is held under option by St. Joe Canada from M. Woitowicz of Dryden, Ontario.

II Property-Description, Location and Access

The MANITOU LAKE property consists of 215 contiguous mining claims in the Manitou Lake region of northwestern Ontario, 45 km south of Dryden, Ontario. The property is within NTS Quadrangle 52F/7 and the claims are recorded on Lower Manitou Lake claim map G-2683, Harper Lake claim map G-2584 and the Boyer Lake claim map G-2572. (see Figures 1 and 2).

Access to the property is afforded by float and/or ski equipped aircraft provided by Swanair Ltd. of Dryden, Ontario.

Two subsidiary routes originate from Hwy. 812; a narrow 5 mile trail passable in winter follows along the northshore of Kabagukski (Mud) Lake terminating at the Goldrock (Manitou Landing) townsite; a 10 mile all weather lumber road connects the northern end of Upper Manitou Lake at Jonas (Bell) Lake to Hwy 812. This road has not been used in recent years and is in poor repair particularly within 1.5 miles of Jonas Lake.

Accommodation is available during spring, summer and fall months at Camp Baribeau located on Trafalgar Bay; at the Manitou Lake Lodge located at the Goldrock townsite and Green Island Lodge which is situated at the northern end of the Manitou Straits stretch.

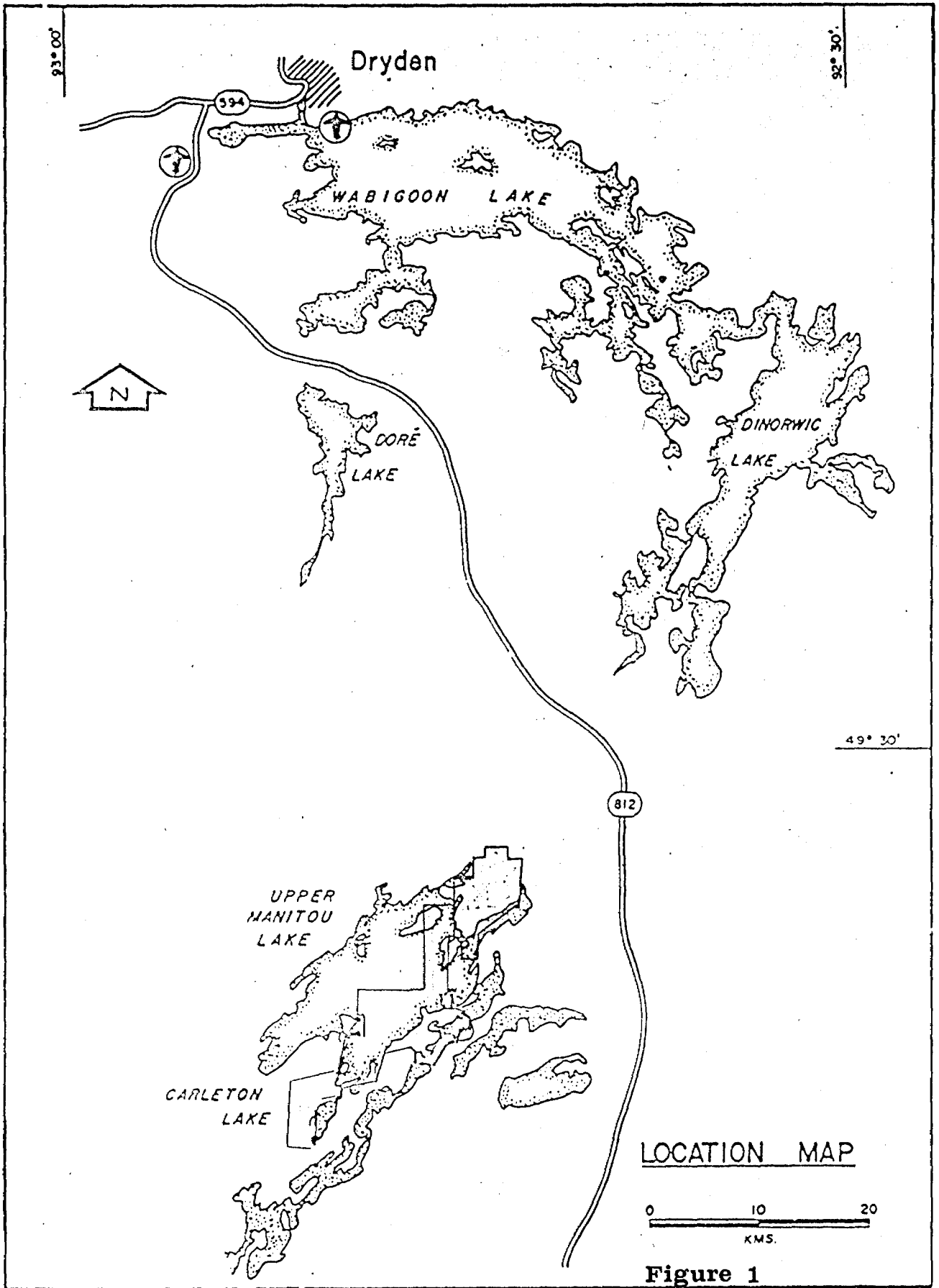


Figure 1

III History of the Property

1899-1937: Seven exploration shafts were sunk on a prominent shear covered by the RELIANCE CLAIM GROUP, west of Carleton Lake. Work is believed to have been carried out by the Manitou Lake Gold Mining Co. and the Dryden Gold Corp. No records of this work are available except for a brief mention of work in this area in the O.D.M. Annuals for these years.

Prospectors found at least three quartz veins on Frenchman Island. Test pits traced the main vein located on the southeast part of the island for 160m. (525 ft). Minor drilling tested the middle and southeast sections of the vein.

During this period most mining activity was concentrated close to the northern end of Trafalgar Bay from which the settlement of Goldrock was established. Of the numerous occurrences and prospects near Goldrock only three came into production, those being the Big Master Mine (1902-1905 and again in 1942-1943) the Laurentain Mine (1906-1909) and the Elora (or Jubilee) Mine (1936-37).

A shaft was sunk 27m (89 ft) into a felsic pyroclastic shear zone. The shaft is located on the northwest shore of Manitou Straits (cl#59045) opposite the entrance to Mosher Bay. The Oxford shaft was sunk (30m depth) about 400m south of Sharpe Lake, little is known about the development of the Oxford prospect.

1970: Freeport Canadian Exploration completed an airborne EM survey which included a portion of Trafalgar Bay. The company identified seven conductive zones which were recommended as ground targets. The majority of anomalies are medium strength, fair conductivity anomalies within a mixed volcanic sequence.

1972: The whole of Frenchman Island was included in a ten (10) claim group staked by prospector James McNeil.

1980: The Ontario government sponsored a Tridem Airborne Survey over the Manitou Lake area. No significant E.M. anomalies were identified.

Beth Canada Mining Co. carried out mapping, humus and rock sampling, magnetometer and VLF-EM surveys on Frenchman Island. The humus survey outlined shear zones containing quartz-carbonate vein material. The VLF-EM and magnetics surveys also outlined

several shear zones and the mag survey delineated the granodiorite porphyry intrusion.

1981: A part of the Goldrock claims was included in an eight claim group staked by R. Cone. The property was drilled (presently cl#740279) in 1981. The hole intersected chlorite schist and intermediate pyroclastics rocks containing minor sulphides.

1982: The RELIANCE and FRENCHMAN ISLAND claim groups were optioned by St. Joe Canada Inc. from M. Witowicz of Dryden, Ontario. The following was carried out by St. Joe prior to the commencement of the period of designation for OMEP project OM83-3-C-65.

- July, August 1982: Linecutting, geological mapping, prospecting, magnetometer and humus geochemical surveys over the Reliance claims and Frenchman Island.
- September, 1982: Waterborne I.P. and Seismic surveys conducted by Hardy (1978) Associates Ltd.
- September, October 1982: Nine diamond drill holes on Frenchman Island totalling 864m.
Two diamond drill holes on the Reliance grid totalling 168m.
- March, 1983: Detailed I.P. and magnetometer surveys on the Reliance grid completed by Claridge-Larose Geophysics Ltd.

The following work was completed during the Period of Designation under OMEP application OM83-3-C-65. (see Final Report for OMEP Application OM83-3-C-65).

- July - August, 1983: Linecutting, humus sampling and Max-Min (HLEM) and magnetometer surveys over an extended Reliance grid.
- October 1983: The initial stages of a diamond drill program on the Reliance grid. Three holes were completed totalling 398m.

IV Diamond Drilling

The completion of the drill program carried out under OMEP project OM83-3-JV-205 consisted of eight holes totalling 866m. (2,841 ft.) of NQ-3 core completed on the Reliance grid between November 1-14, 1983, and one hole totalling 102m. (335 ft.) of NQ-3 core completed on November 16 on the Frenchman Island "A" Zone. The diamond drilling initiated the "First Programme" under the St. Joe Canada Inc./Geddes Resources Joint Venture Agreement, dated June 30, 1983. The reader should refer to the Final Report OM83-3-C-65 for results of the first three holes of the program completed between October 25-31, 1983.

The main purpose of the program was to test the gold potential of the main Reliance shear following the discovery of a moderate to strong continuous chargeability anomaly outlined by the March 1983 I.P. survey. In addition one hole each was used to test the gold potential of: (i) a subparallel chargeability zone east of the Reliance shear; (ii) a quartz-carbonate vein system hosted within a prominent shear zone northwest of the main zone; (iii) a pyritized quartz-carbonate-tourmaline shear zone on Frenchman Island.

The holes were drilled by St. Lambert Drilling Ltd. of Valleyfield, Quebec using a JKS 300 unitized skid mounted drill. Core diameter (NQ-3) is 4.5cm (1.76 in.). Core recovery averaged better than 95 percent. Drilling proceeded at a rate of 62m. per day including moves.

A total of 166 core samples (numbers 169-300 incl., 401-434 incl.) were submitted to Swastika Laboratories for gold, copper, zinc and silver analyses. The total number of determinations for each element include 166 gold, 40 silver, 32 copper, and 30 zinc. A total of 57 sludge samples (RS 17-63 incl., FS 64-73 incl.) were collected from the altered, mineralized zones and analyzed for gold (refer to Appendix C).

(i) Drill Results

Plans 1 to 9 inclusive show the main lithological features, core and sludge geochemistry and any mineralization that was encountered in the nine holes. Plan 10 shows the generalized drill hole geology in plan section. Table 1 summarizes the drill data.

TABLE 1

<u>HOLE NO.</u>	<u>LOCATION</u>	<u>ANGLE</u>	<u>AZIMUTH</u>	<u>LENGTH</u>	<u>INTERVAL</u>	<u>ROCK TYPE</u>	<u>MINERALIZATION</u>
R84-04	L6+00S 0+50E	-60	97°	129m	2 - 39m 39-45 45-100 100.8-103.5 103.5-117.9 117.9-129	Fragmental Pillow Basalt Chlorite-Carbonate Schist Fragmental Pillow Basalt Feldspar Porphyry Pillow Basalt Feldspar Porphyry	1.71g/t Au over 0.5m between 43.5-44m or 0.95 g/t Au over 1m between 43.5-44.5m
R84-05	L7+00S 0+60E	-60	100°	108m	4-11.5m 11.5-16.7 16.7-40.3 40.3-46.18 46.18-54.42 54.42-55.7 58.85-108	Fragmental Pillow Basalt Gabbroic Basalt Fragmental Pillow Basalt Chlorite Schist Feldspar Porphyry Chlorite-Carbonate-Sericite Schist Mottled Gabbroic Basalt	0.52 g/t over 0.5m between 54.4-54.9m
R84-06	L7+50S 0+40E	-45	98°	90m	3-8.3m 8.3-8.9 8.9-13.1 13.1-16.4 16.4-24.3 24.3-36.4 36.4-46.9 46.9-90	Fragmental Pillow Basalt Feldspar Porphyry Gabbroic Basalts Carbonate-Chlorite-Limonite Schist Feldspar Porphyry Sheared, Altered Basalts Massive Basalt Flows Gabbro/Gabbroic Basalt Flows	45 ppb Au over 1m between 24.3-25.3m
R84-07	L10+00S 0+75E	-45	98°	99m	3-34.96m 34.96-45.24 45.24-91.45 91.45-97.8 97.8-99	Fragmental Pillow Basalt Chlorite-Carbonate-Biotite Schist Carb. Altered/Stockworked Basalt Flows Feldspar Porphyry Foliated, Carbonate Altered Basalt Flows	Nil

<u>HOLE NO.</u>	<u>LOCATION</u>	<u>ANGLE</u>	<u>AZIMUTH</u>	<u>LENGTH</u>	<u>INTERVAL</u>	<u>ROCK TYPE</u>	<u>MINERALIZATION</u>
R84-08	L14+00S 0+20W	-45	100°	170m	5.35-6.1m 6.1-36.8 36.8-39.9 39.9-46.1 46.1-103.95 103.95- 113.95 113.95-115.2 115.2-120.2 120.2-135 135-170	Feldspar Porphyry Carbonate Altered Basalt Flows Chlorite, Carbonate, Biotite Schist Massive Basalt Flows Mottled Gabbroic Basalt Feldspar Porphyry Carbonate Altered/Fragmental Pillow Basalt Silicified, Chlorite, Carbonate Quartz Schist Massive Basalts Flows Massive Gabbroic Basalts	50 ppb Au over 1m between 116-117m
R84-09	L14+00S 3+15E	-60	98°	120m	2-22.6m 22.6-30.67 30.67-34.2 34.2-38.45 38.45-98.5 98.5-120	Carbonate Altered Pillowed Basalt Flows Biotite/Carbonate/Chlorite Schist Gabbroic Basalt Massive Basalt Flows Foliated Carbonate Altered Pillowed Basalts to Chlorite/ Carbonate/Quartz Schist Gabbroic Basalts	10ppb Au over 1m between 23-24m
R84-10	L2+00S 0+65E	-55	98°	93m	2.4-66.4m 66.4-69.95 69.95-77.9 77.9-81.5 81.5-84 84-93	Fragmental Pillowed to Massive Basalt Flows Foliated Basalts to Chlorite/Carbonate/ Biotite Schist Feldspar Porphyry Chlorite/Carbonate/Biotite Schist to Foliated Basalts Carbonate Altered Basalt Flows Mottled Basalt Flows	up to 3.36 g/t Au over 1m between 79-80m or 2.13 g/t Au over 2.2m between 77.8-80m.

<u>HOLE NO.</u>	<u>LOCATION</u>	<u>ANGLE</u>	<u>AZIMUTH</u>	<u>LENGTH</u>	<u>INTERVAL</u>	<u>ROCK TYPE</u>	<u>MINERALIZATION</u>
R84-11	4+20N 1+89W	-50	110°	57m	2-25.2m 25.2-31.8 31.8-43.05 43.05-44.9 44.9-57	Porphyritic Gabbro Foliated Gabbro to Chlorite/Carbonate/ Quartz Schist Feldspar Porphyry Chlorite/Carbonate/Quartz/ Sericite Schist to Foliated Basalts Porphyritic Basalt Flow	30 ppb Au over 1m between 31-32m
F84-01	2+90N 2+50E	-45	140 °	102m	3-33.6m 33.6-47.44 47.44-49.95 49.95-51.1 51.1-52.15 52.15-72.5 72.5-81 81-98.8 98.8-102	Chlorite/Biotite/Quartz Schist Heterolithic Lapilli Tuff Rhyolite Flow Segregation Biotite/Quartz Schist Rhyolite Flow Segregation Epidotized Ash, Lapilli Tuff Welded/Autobrecciated Flow Heterolithic Lapilli Tuff with dense ash segregations Welded Airfall Tuff (Ignimbrite) with granodiorite inclusions	0.76 g/t Au over 1m between 28-29m; 0.36 g/t Au over 2m between 61-63m; 0.57 g/t Au over 1m between 75-76m.

The main rock type intersected was dark green, variably foliated to locally schisted, carbonated, massive basalt flows showing pillowed and gabbroic phases. The basalts are altered and schisted along the contacts with narrow, discontinuous porphyry units. These porphyries have been interpreted as being either subvolcanic sills or offshoots of the nearby Carleton Lake stock. These units clearly intrude the metavolcanic rocks and are spatially related to the main Reliance shear zone. Their emplacement probably postdates the shearing event.

The pyritic chlorite-carbonate-quartz±sericite schist associated with the porphyries likely explains the moderate to strong I.P. anomalies along the zone.

The first two holes of the drill program (see Final Report OM83-3-C-65) tested the I.P. anomaly along the zone in the vicinity of shafts two and five where mineralized material from the dumps returned economic gold values. Hole R84-01 intersected sheared gabbroic basalt which returned 0.52g/t Au over 1 meter. Samples taken from an 8.7 meter intersection of quartz vein material with inclusions of pyritic chlorite-carbonate-sericite schist near the hanging wall contact with a well defined porphyry unit (traced for 400 meters between L2+00S-L6+00S, see Plan 10) in hole R84-02 contained 2.88 g/t Au over 1 meter or 2.04 g/t Au over 2.2 meters with low base metal values. (i.e. 460 ppm Zn, 92 ppm Cu). Gold values ranged from 0.05 g/t Au to 1.71 g/t Au over narrow widths in holes R84-03-06 inclusive. The anomalous values are associated with chlorite-carbonate schist near porphyry contacts.

The most disappointing results came from holes R84-07 and R84-08. These holes were positioned to test the I.P. anomaly at the southern end of the grid in the vicinity of shafts six and seven. Core samples of pervasive but weakly pyritized schistose sections in these holes contain from nil to 50 ppb Au. Equally negative gold values were encountered (nil to 10 ppb Au) in hole R84-09, which drilled into the second, parallel chargeability zone on L14+00S at 3+15E; and in hole R84-11 (nil to 30 ppb Au) which tested the quartz-ankerite vein/shear zone at 4+20N/1+89W.

However, gold mineralization does increase in tenure in the most northerly holes where high concentrations (i.e. 3.36 g/t Au over 1m in hole R84-10) of pyrite are hosted within the footwall schist and quartz vein material in contact with porphyry along the main Reliance shear.

It would appear the well mineralized, sulphidic schist and quartz vein material seen on the dumps either bottoms out at shallow depths below the shafts or is present in the form of discontinuous, steeply dipping lenses, pods or shoots.

At this time St. Joe should; a) strongly downgrade the gold potential of the Reliance shear at the southern end of the grid (i.e. L10+00s-L14+00s); b) investigate east-west structures cross-cutting the northerly trending Reliance shear as possible loci for gold mineralization; c) evaluate the northern extension of the shear zone north of hole R84-10, on strike with the Twentieth Century Mine.

F84-01 drilled on Frenchman Island was positioned northwest of the 1982 (F82-01) drill hole and much closer to the target zone. This area of Frenchman Island referred to as "Zone A" returned very anomalous to economic gold values in rock and humus samples during 1982 follow-up work.

The drill hole intersected a graded sequence of coarse to fine grained, densely packed, heterolithic, altered lapilli tuff (tuff breccia) and fine grained, green coloured ash tuff with narrow intervening rhyolitic cherty flow units.

Economic gold mineralization in drill holes from Zone A remain elusive. Samples taken from a 30.6 meter wide section of carbonatized chlorite-quartz schist (sheared lapilli tuff) containing low sulphide content returned up to 0.76 g/t Au over 1 meter.

V Geophysical Surveys

Magnetometer and VLF-EM surveys were carried out between January 28th - March 18th 1984 on the Goldrock claims (see Figure 3). The data have been plotted on Plans 11-16 inclusive, located in the accompanying map case. The surveys were completed at a scale of 1:2500.

A baseline and two tie lines trending parallel to the regional strike of the rocks were established with pickets spaced 25m. apart. Grid lines were turned off the baseline at 100m and were cut, chained and picketed at 25m spacings. A total of 95 line km of grid was established by Pierre Ouellette Contracting of Amos Quebec. All lake pickets were removed from the ice following the geophysical program.

The VLF conductors and magnetic anomalies have been explained from geologic mapping and prospecting (refer to Section VI (iii), for details) carried out during the summer of 1984.

(i) Magnetometer Results (Plans 11 and 12)

The magnetic data indicate a belt of complex anomalies, which is labelled A, across the northern one-third of the survey area. This belt is characterized by single and multi-point spike anomalies that range in amplitude from 500 to 3,000 gammas. The anomalies are generated by narrow, steeply dipping, near-surface sources, which are bands and disseminations of magnetite within carbonated, schistose mafic metavolcanics. The Oxford Shaft gold working (see Plan 20) is located on the northeast edge of the (cl.#740289) property, and is on trend with the northern anomaly belt. Isolated magnetic anomalies in the southern and southeastern portions of the survey area are generated by concentrations of disseminated pyrrhotite within faulted blocks of massive to pillowed mafic flows. The area of low magnetic relief across the central portion of the survey area is underlain by relatively non-magnetic mafic pyroclastic rocks.

(ii) VLF-EM Results (See Plans 13-16)

The data indicate numerous anomalies in the survey area, these anomalies are difficult to resolve from the complex patterns on the In-phase/Quadrature profile map. In order to make the data easier to interpret, the In-phase VLF data have been filtered with the Fraser operator, which converts the measured cross-over anomalies to positive peaks. The filtered data are contoured with the highest contours outlining anomaly axes. The interpreted axes are plotted on the VLF-EM Fraser Filtered In-Phase contour maps (see Plans 15-16).

The filtered data reveal two prominent structural grains of the area, north 60 degrees east and due north. The northeast trending VLF anomalies have identified strongly sheared, weakly conductive (mineralized) structures. Geologic mapping has shown many of these structures to be sheared, weakly pyritized scarp sloped ridges bordering semi-dry alder swamp. The north trending VLF anomalies are explained by north trending faults which transect the mafic metavolcanic sequence on the south portion of the survey area.

The southwestern position of the Seattle transmitting station emphasizes the north 60 degrees east trending structures.

The northern shore of Trafalgar Bay coincides with a northeast trending VLF response which suggests either the presence of conductive lake sediments or a structurally controlled lakeshore.

One northeast trending anomaly closely parallels the magnetic anomaly belt, particularly from L21+00N, station 5+75W to L28+00N, station 4+37W and from L30+00N, station 3+12W to L32+00N, station 2+62W.

A second strong anomaly runs from L30+00N, station 5+75W to L32+00N, station 5+12W. These anomalies are generated by weakly mineralized shear zones within magnetite bearing carbonatized mafic flows that may be related to gold mineralization at the Oxford shaft.

VI Geological Surveys

(i) Reliance - North Grid Geology (Plan 17)

Concomittant with the diamond drill program a mapping survey was completed over the Reliance north grid extension (L0+00N - L12+00N) between November 1-12, 1983.

The Reliance "North Grid" is underlain by the Blanchard Lake Group basalts. These rocks occupy the tightly folded east limb of the Manitou Anticline and unconformably underlie the Upper Manitou Lake Group. They have been intruded by the Carleton Lake granodiorite stock which includes most of the shoreline of Carleton Lake located about 800 meters southeast of the survey area.

The mapping survey subdivided the mafic metavolcanics into seven categories based on a combination of texture, structure and mineralogy.

A mixed assemblage of dark green, medium to fine grained massive and pillowed basalts with a number of brecciated and coarse grained flow units were recognized along the east portion of the grid. These rocks were traced to L9+00N, station 1+50E where they swing off the map area in a more east northeast trend. Minor amounts of pyroclastic rocks (lapilli tuff-tuff breccia) are interbedded with the mafic flow rocks. These rocks show variable schistosity between 35° and 50° and dip 70°SE. The pillows are elliptical and oblate in shape occasionally showing 2-3cm wide carbonate rich selvages. Pillow tops face about 110°SE.

Massive, coarse to medium grained gabbroic basalts which are locally porphyritic and in some places weakly to moderately magnetic were mapped across the central portion of the grid from 2+50N, station 1+70W - north of the small unnamed lake to L10+00N, station 2+00E in the vicinity of a wide beaver dam.

The gabbroic unit is cut by two prominent, parallel shear zones north of the small lake. The West shear was mapped from 3+25N to 4+50N and measures up to 8 meters wide. The zone consists of white, barren looking quartz veins cutting carbonate-chlorite schist. The schistosity varies from 20°-40° and dips between 60°-80°SE. The East shear was traced along the edge of a swamp for 100 meters between 4+10N, station 2+25W and 5+10N, station 2+20W. The zone is characteristic of a fault gouge, consisting of brecciated quartz, chlorite and ankerite cement. The zone contains trace sulphides. The gold potential of this zone was tested with one drill hole, R84-11 (refer to drill results IV [i]).

Less spectacular sheared outcrops of gabbroic basalts were identified near the transition with finer grained flows in the vicinity of L7+00N, station 2+50W and along the baseline between 7+50N and 8+30N.

A small granodiorite body intrudes the unit near 9+25N, station 0+60E at the edge of a small beaver dam. This could be an offshoot of the nearby Carleton Lake stock.

The north portion of the grid is underlain by relatively monotonous, fine grained, blocky to angular fractured massive mafic flows which are weakly magnetic, carbonate weathered and strike between 60°-75° and dip vertically to 70°SE. The topography at the north end of the grid is quite rugged as the rocks form precipitous cliffs from L7+00N, station 3+25W to L12+00N, station 1+50E. Shearing is minor, localized near the contact with the gabbroic basalts particularly on L10+00N between the baseline and 0+60W.

(ii) Frenchman Island - North Section Geology and
Rock Geochemistry (Plan 18)

A terse mapping and rock sampling survey was conducted over the north section of Frenchman Island between June 10-12, 1984, just prior to mapping the Goldrock property (see figure 3).

A total of 33 rock samples (Numbers 953-985, see Appendix B) were collected and submitted to Swastika Laboratories for gold analysis. In addition, four rock samples were submitted for whole rock analysis (Numbers 953-956).

The north tip of Frenchman Island is underlain by grey-green coloured, foliated to schistose, coarse grained pyroclastic rocks (lapilli tuff and tuff breccia) showing minor interbeds of fine grained ash tuff. For the most part the ash tuff is sheared and altered to chlorite schist. These rocks trend between 45°-55° and dip 70°SE.

A narrow lens of microgranodiorite porphyry was identified near the baseline from L10+00N to 10+43N. The porphyry is in sharp contact with the pyroclastic rocks. The porphyry is light grey coloured, medium to fine grained, variably foliated and flecked with small blebs of chlorite. Chlorite schist containing ankerite and up to 15 per cent pyrite as well as radial quartz filled fractures were observed around the margin of the porphyry intrusion.

The pyroclastic rocks are cut by a prominent northwest-southeast trending fault. Numerous subparallel shear zones are seen on the large peninsula, emanating at oblique angles from this fault structure.

The shear zones consist of complex, mineralized quartz-carbonate veins containing pyrite and minor tourmaline in silicified ash-lapilli tuff. A chip sample collected at 11+20N, station 0+42W from one of the shear zones on the peninsula returned 3.63 g/t Au over 1 meter.

(iii) Goldrock Geology and Rock Geochemistry (Plans 19 and 20)

The survey was carried out between June 10 - July 30, 1984.

A total of 356 rock samples were collected and submitted to Swastika Laboratories for gold analysis (see Appendix B).

Data from the geology and rock geochemistry survey have been plotted on Plans 19 and 20. Table 3 summarizes Goldrock's mineralized zones. The survey was completed at scale of 1:2500.

The following classification lists the rocks found on the claims area.

Table 2

Table of Formations

Felsic Hypabyssal Rocks:

- a. Aplite
- b. Granite, Granodiorite, Qtz. Diorite
- c. Quartz Feldspar Porphyry
- d. Felsite, Carbonatized Felsite, Sheared Felsite

intrusive contact

Mafic Intrusive Rocks:

- a. Gabbro

intrusive contact

Felsic Metavolcanics:

- a. Med. to Fine Grained Dacite to Rhyodacite

Intermediate Metavolcanics:

- a. Med. to Fine Grained Andesite, Dacite
- b. Fine Lapilli-Ash Tuff, Crystal Tuff, Tuff Breccia
- c. Lapilli Tuff to Agglomerate
- d. Chlorite Schist, Chlorite Carbonate Schist, Chl./carb./Ser. Schist

Mafic Volcanics:

- a. Med. to fine Grained Basalt, Andesite
- b. Coarse to Med. Grained Basalt, Andesite
- c. Coarse Grained Basalt (Gabbroic)
- d. Pillowed, Porphyritic, Vesicular Basalt
- e. Porphyritic, Glomeroporphyritic Basalt
- f. Brecciated, Flow Brecciated Basalt, Andesite
- g. Chlorite Schist, Chlorite Carbonate Schist
- h. Lapilli Tuff to Agglomerate
- i. Fine Lapilli-Ash Tuff, Crystal Tuff, Tuff Breccia

Approximately two-thirds of the Goldrock claims are underlain by volcanic rocks of the Upper Manitou Lake Group comprising felsic to mafic pyroclastics and massive to pillowed

mafic flows of Archean Age. Massive to schistose porphyritic and pillowed mafic flows of the Pincher Lake Group underlie the northern 30% of the property.

The inferred contact between the mafic pyroclastic and schistose mafic flow units is assumed to represent the geologic boundary between the Upper Manitou Lake and Pincher Lake Groups as interpreted by Blackburn (1981).

The Pincher Lake Group volcanic rocks have been subdivided into two categories based on textural and structural criteria (i) massive, porphyritic and pillowed mafic flows and (ii) schistose mafic flows.

The majority of rocks in the first category are typically dark green, massive, medium to fine grained heterogeneous rocks with pillowed, porphyritic and flow brecciated phases observed west of Sharpe Lake. Minor amounts of pale grey, red weathering, conchoidally fractured rhyo-dacite (possibly altered, silicified basalt) occur cutting the unit at shallow angles. Structural measurements show these rocks range in strike between N35°E to N50°E, dip vertically to steeply southeast. Top determinations indicate the rocks face north-northwest suggesting the sequence has been overturned.

The second category is a distinctly mappable unit consisting of strongly schistose (banded to laminated) carbonatized, magnetite bearing mafic flows. They strike between N40°E and N50°E and dip steeply to the southeast. These rocks are cut by many narrow, discontinuous (in part concordant and in part discordant) felsite units which for the most part show sharp contact (intrusive) relationships with the volcanic stratigraphy. These units crosscut lithological and fault boundaries. They are highly internally variable, ranging from aplitic to granodioritic and are occasionally pyritic, carbonated and quartz veined within shear zones. According to Blackburn (1981) they may represent shallow level sills or flows coeval with volcanism but they may also be a product of late stage felsic volcanism emplaced along zones of weakness within the stratigraphic sequence.

The magnetite bearing mafic flows explain the strong magnetic expression identified during the winter 1984 geophysical survey. Magnetite occurs as fine disseminations but where the rocks have been strongly sheared, form paper thin to 2cm wide

Table 3 - Statistical Summary of Goldrock Mineralized Zones

NAME	DESCRIPTION	GEOPHYSICAL EXPRESSION	GOLD ASSAYS	
			(G/T)	
Trafalgar Bay Zone	2 veined zones, (i) a subparallel (19m x 0.7m) quartz (24 °) vein cutting highly fissile chlorite schist; (ii) tensional gash quartz veins (45-70 °) in a strongly silicified, pyritic shear; hosted by mafic volcanic rocks at a fault contact with intermediate tuffs; exposed by 1 pit and 4 trenches.	flank of a magnetic high	Grab 5.8	Chip/Channel 4.8/lm
McEdna Shaft Zone	quartz veins cutting chlorite-carb-sericite + muscovite schist; near mafic flow/tuff contact; subparallel to schistosity; stringer and disseminated sulphides, exposed by one shaft (13.5m deep) 4 trenches and 1 pit.	direct correlation with a magnetic low, flanking VLF anomaly	54.8	3.4/lm
Oxford Shaft	Quartz-carbonate (70m x 2m) stockworks hosted by chlorite-sericite ± magnetite schist (mafic pyroclastics; exposed by 1 shaft (30m deep); chalcopryrite tourmaline are identified, erratic sulphide distribution.	coincident magnetic high	0.68	1/lm
Lunchbox Bay Zone	pink altered, silicified, concordant shear zone within intermediate pyroclastic rocks; variably oriented crosscutting and parallel quartz stockworks; finely disseminated, uniformly distributed sulphides.	none identified	0.86	1.3/2m
Pincher Creek Zone	quartz-carbonate veins and sulphides within sheared mafic pyroclastic rocks; the zone parallels regional schistosity (50 °), spatially associated with a felsite unit, exposed by one shallow pit.	none identified	3.4	3.2/lm
Peninsula Zone	quartz veined/stockworked, silicified pink altered schist-hosted within intermediate tuffs, zone parallels schistosity.	coincident magnetic high flanking VLF anomaly	0.49	0.7/5m

layers with concentrations up to 10 percent. Magnetite may be the result of metamorphism and deformation of iron rich tholeiitic basalts.

The Upper Manitou Lake Group volcanic rocks have been classified into three categories, (i) felsic to intermediate pyroclastic rocks, (ii) mafic pyroclastic rocks, and (iii) massive to pillowed mafic flows.

Felsic to intermediate pyroclastics outcrop along the north end of Trafalgar Bay opposite the Goldrock township, on the peninsula that projects southwestward from the east shore of Trafalgar Bay, and on the peninsula between Jonas (Bell) Lake and Red Rock Narrows. These rocks are predominantly intermediate (dacitic to andesitic) in composition, containing predominantly light coloured felsic clasts which vary from a few mm. (lapilli) to 10cm (tuff-breccia) in size. Intense shearing has deformed many of the pyroclastic rocks, altering them to a salmon pink coloured sericite-carbonate-chlorite schist. In some places the clasts are hardly recognizable making it difficult to distinguish sheared pyroclastic rocks from sheared, carbonated felsite units. These rocks pass gradationally across strike into mafic pyroclastics and come into fault contact with massive to pillowed mafic flows.

Mafic pyroclastics form a group of linear, steep sided outcrops across the central portion of the property. They strike about N45°E and dip steeply southward. These rocks are similar to the felsic to intermediate pyroclastics except that the stretched, buff coloured clasts are embedded in a fine grained, dark green tuffaceous matrix.

Massive to pillowed mafic flows outcrop along the shore of Trafalgar Bay and continue across the property until they terminate against a north trending fault about 300m east of the northwest shore of Upper Manitou Lake. The rocks are typically massive basaltic flows and chlorite schist with minor pillowed phases. Four northerly trending faults transect the mafic rocks and offset their contacts with the pyroclastics. These faults show dextral horizontal movement.

Anomalous gold mineralization is contained within strong shear zones associated with pervasive quartz-carbonate alteration predominantly hosted within pyroclastic rocks. A number of minerals accompany the alteration pattern, the most important in relative order of abundance being carbonate, quartz, chlorite,

sericite, pyrite, tourmaline, magnetite and fushite. Trace amounts of chalcopyrite, pyrrhotite and galena occur in the alteration zones. Carbonate occurs as a pervasive red-brown to cream coloured weathering stain whereas silicification manifests itself as quartz veins, stringers and complex stockworks. Pyrite is ubiquitous within the alteration zones but is rarely observed in concentrations greater than 5 percent.

For the most part shearing tends to parallel, (i.e. Pincher Creek Zone, Lunchbox Bay Zone, Oxford Shaft Zone) stratigraphy. According to Blackburn (1976) this may be due to mechanical contrast between units suggesting gold mineralization is genetically related to volcanism and that its final emplacement has been modified by shearing and/or faulting. This theory may be supported by the fact a number of the "important" shear zones on the property are situated near the contacts of contrasting lithological units, notably the transition between pyroclastics and mafic flow sequences. In addition to the apparent stratiform nature of mineralization, some zones including the Trafalgar Bay Zone and the McEdna Shaft Zone are likely influenced by northerly trending fault structures.

VII Recommendations

Geological, geophysical and geochemical surveys completed during 1984 in the Goldrock area have outlined several strongly altered shear zones returning values up to 54.89 g/t Au in rock samples.

The untested portion of the Reliance shear zone is known to continue for 1,300 meters to the north. The zone has been outlined by favourable geology, magnetic anomalies and anomalous gold and arsenic values in humus samples (see FINAL REPORT OM83-03-C-65).

Frenchman Island covers a favourable geologic environment characterized by very anomalous gold values obtained in rock and humus samples from altered shear zones intersecting the island.

Additional diamond drilling (3000 m) will be conducted to delimit gold mineralization along the most prospective shear zones in the Goldrock area, at the north end of Frenchman Island as well as the northern extension of the main Reliance shear.

Geochemical and geophysical surveys will be completed over geologically favourable, unexplored areas on the Manitou Lake Property.

Dated at Toronto
This day of , 1985.

Kevin W. Leonard
Project Geologist

VIII

References

Blackburn C.E.

1974:

Upper Manitou Lake Area, District of Kenora; Ontario Div. Mines, Prelim. Map P961, scale 1 inch to $\frac{1}{4}$ mile (1:15840). Geology 1973.

1976:

Geology of the Lower Manitou-Uphill Lake Area, District of Kenora; Ontario Div. Mines; Geoscience Report 142, 81p. Accompanied by Map 2320, scale 1 inch to $\frac{1}{2}$ mile (1:31680).

1979:

Geology of the Upper Manitou Lake Area, District of Kenora; Ontario Div. Mines, OGS Report 189, 74p. Accompanied by Map 2409, scale 1 inch to $\frac{1}{2}$ mile.

ODM-GSC

1961:

Upper Manitou Lake, Kenora District, Ontario; Ontario Dept. Mines - Geol. Surv. Canada, Aeromagnetic Map 1153G, scale 1 inch to 1 mile (1:63360). Survey 1961.

1980:

Manitou-Stormy Lakes Area, District of Kenora; O.G.S.; Geophysical/Geochemical Series, Map 80464 Scale 1:20,000. Survey and Compilation, November, December 1979 and January, February 1980.

IX

CERTIFICATE

I, Kevin Leonard, of the City of Burlington, Province of Ontario, do hereby certify that:

1. I reside at 886 Tanager Avenue, Burlington, Ontario.
2. I have worked as a geologist for the last 6 years.
3. I am a graduate of McMaster University with an Honours Degree (1978) in Geology.
4. I am a member of the Prospectors and Developers Assoc. of the Canadian Institute of Mining and Metallurgy, and of the Geological Association of Canada.
5. The diamond drilling, geological mapping and geophysical surveys were done under my supervision. I have written this OMEP report.


Kevin Leonard

DATED AT TORONTO THIS 4th day of Feb., 1985.



52F07NW0011 63.4413 HARPER LAKE

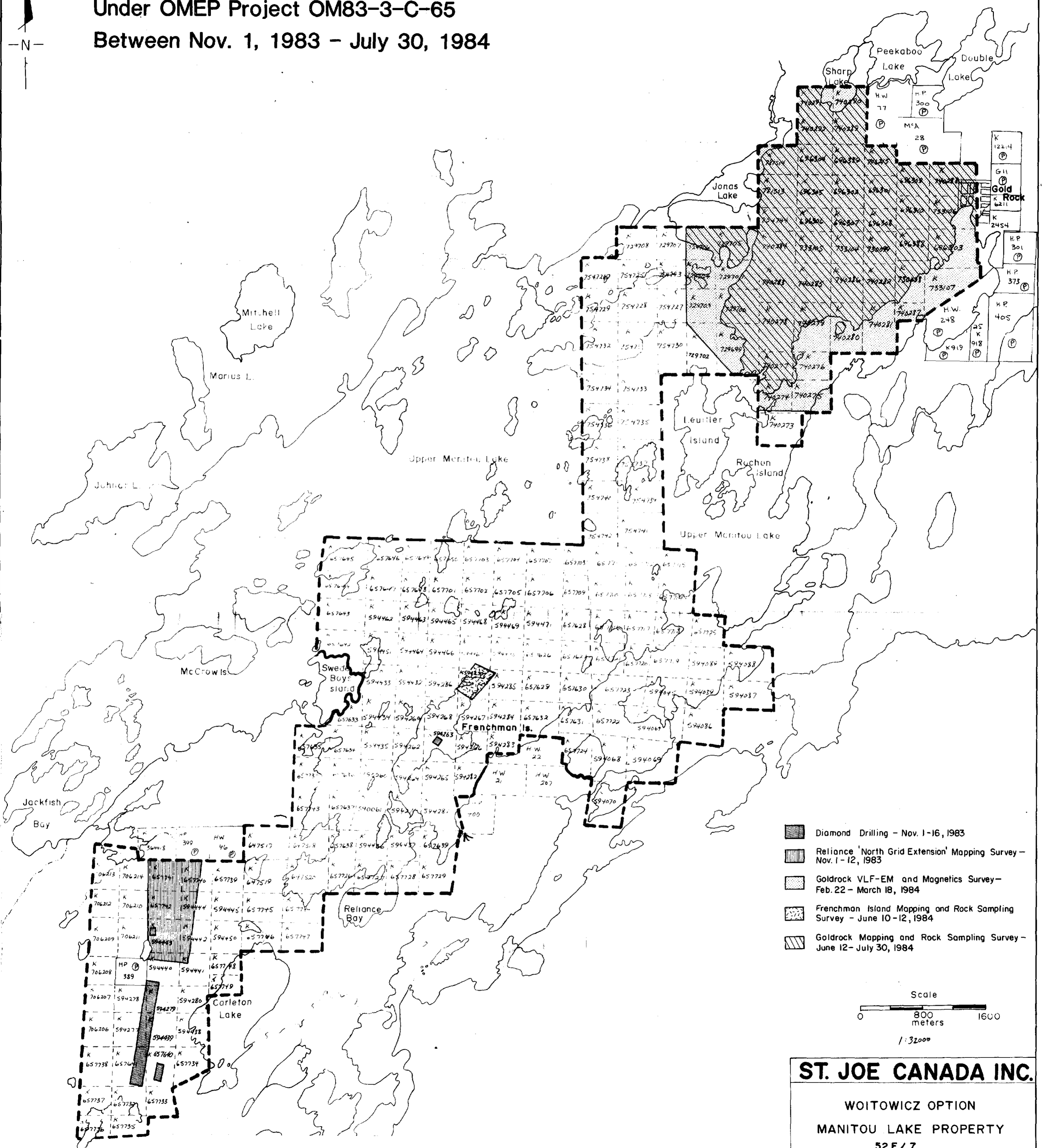
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OM 83-3-JV-205

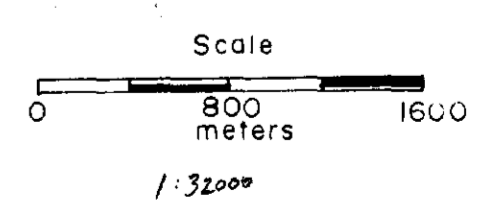
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- ① D.D.H # R84-04 to R84-11
+ FR-84-01 → see 2.7682
- ② Assay certificates → Rock Geochem
→ see 2.7648
- ③ D.D. Assays → 2.7682

Location of Exploration Programs Completed
 Under OMEP Project OM83-3-C-65
 Between Nov. 1, 1983 - July 30, 1984



- Diamond Drilling - Nov. 1-16, 1983
- Reliance 'North Grid Extension' Mapping Survey - Nov. 1-12, 1983
- Goldrock VLF-EM and Magnetics Survey - Feb. 22 - March 18, 1984
- Frenchman Island Mapping and Rock Sampling Survey - June 10-12, 1984
- Goldrock Mapping and Rock Sampling Survey - June 12- July 30, 1984

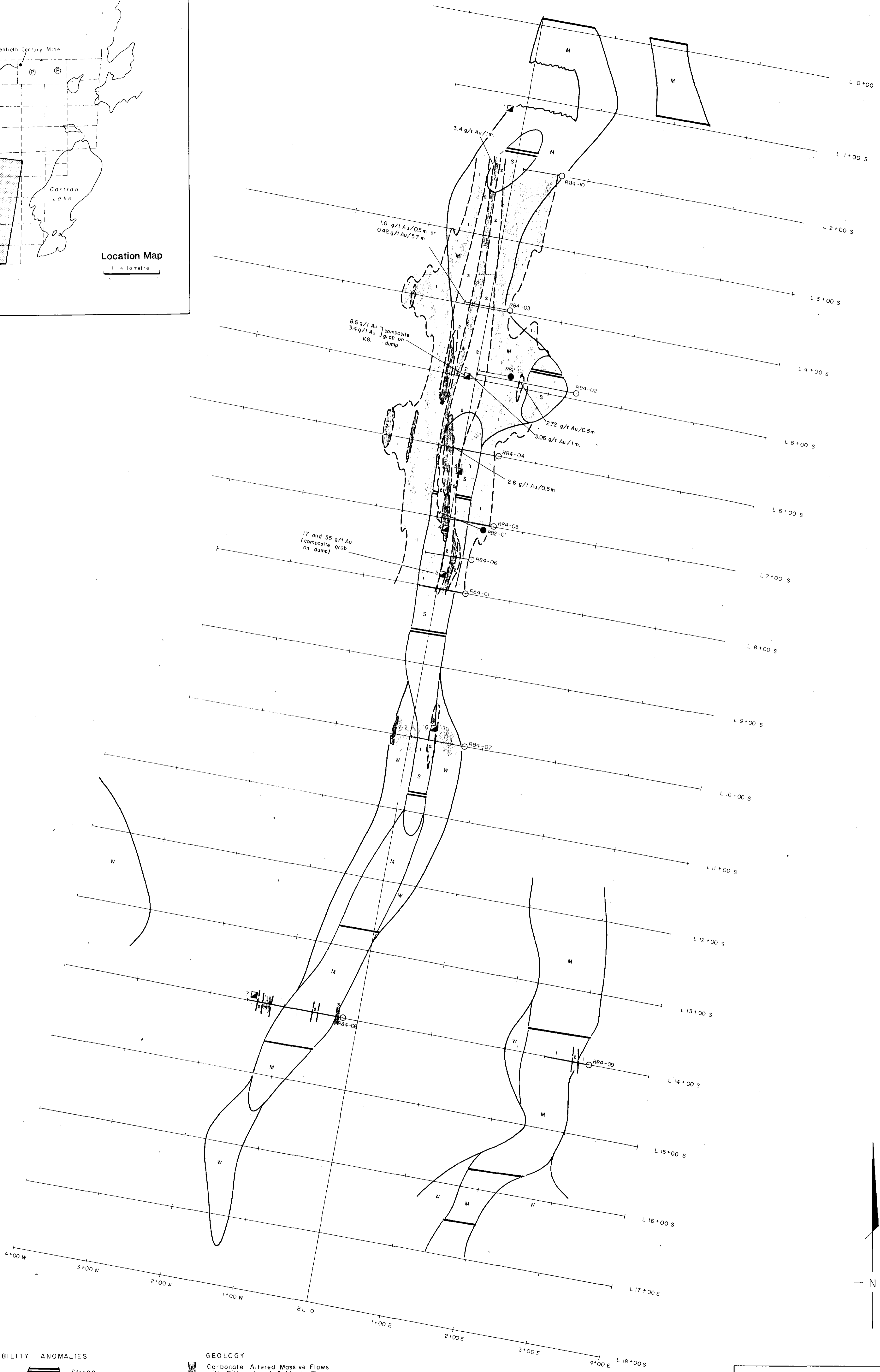
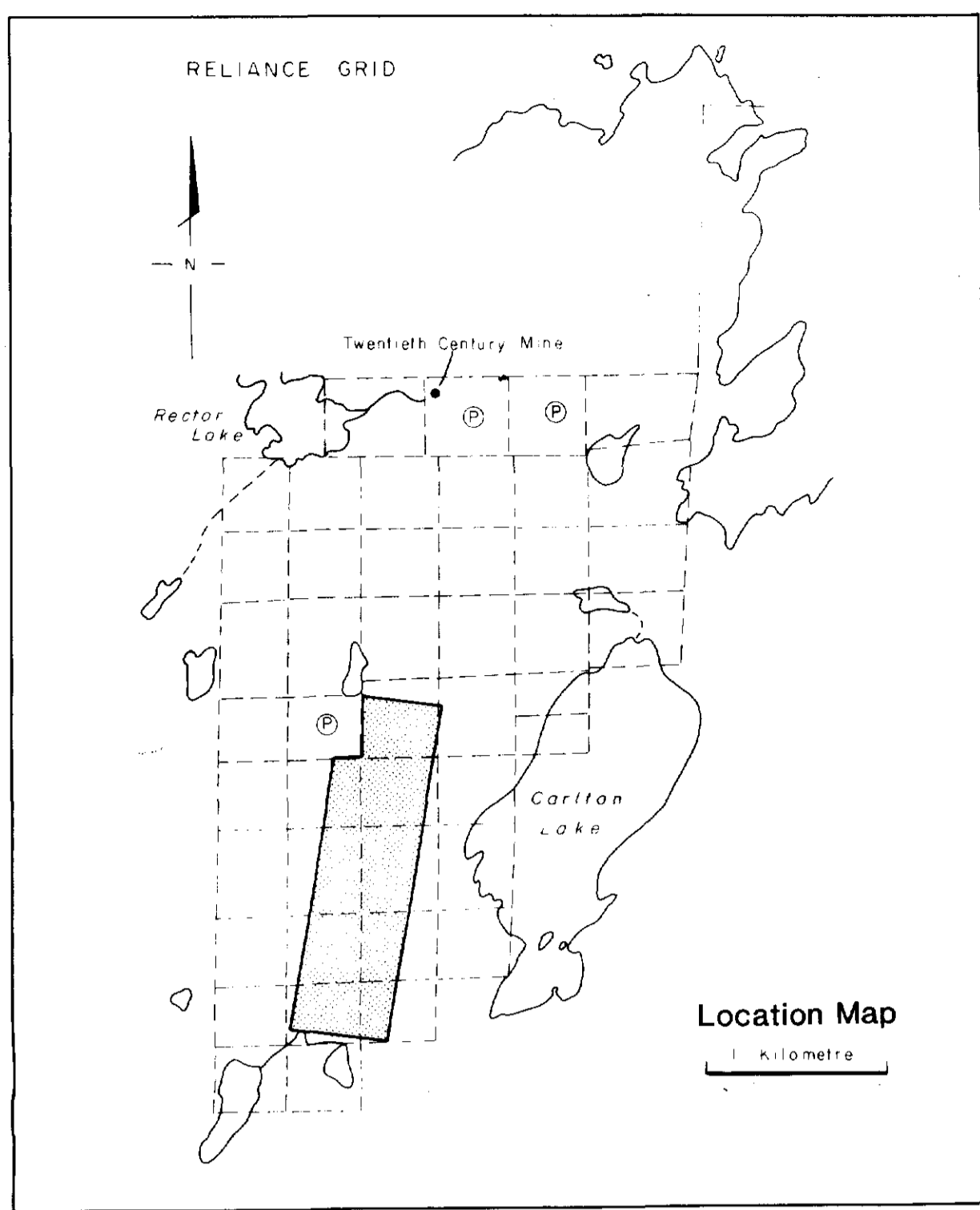


ST. JOE CANADA INC.

WOITOWICZ OPTION
 MANITOU LAKE PROPERTY
 52 F / 7

Northwestern Ontario





LEGEND

I.P. - CHARGEABILITY ANOMALIES

S Zone of Strong Response

M Zone of Moderate Response

W Zone of Weak Response

Strong

Moderate

Weak

I.P. Zone Boundary

● 1982 Diamond Drill Hole

○ 1983 Diamond Drill Hole

▣ Shaft

GEOLOGY

Carbonate Altered Massive Flows with Pillowed and Gabbroic Phases

Chlorite - Carbonate ± Sericite ± Quartz Schist

Feldspar Porphyry

Geological Boundary

63,4413

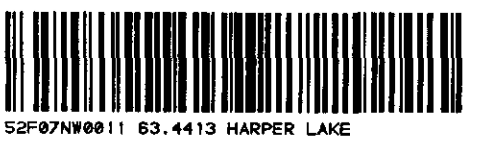
St. Joe Canada Inc.

Woitowicz Option
Reliance Grid

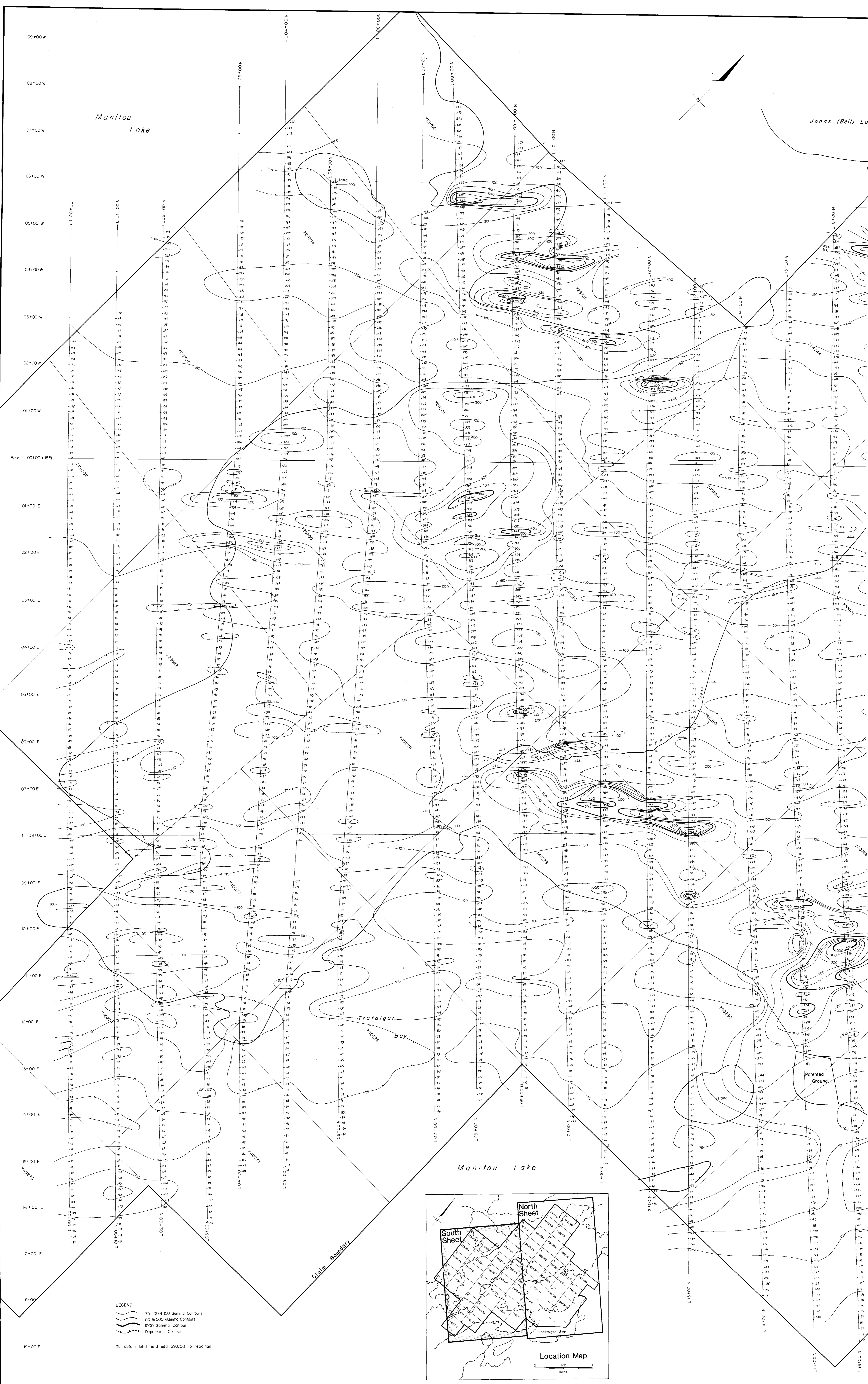
GENERALIZED DIAMOND DRILL
GEOLOGY PLAN SECTION

metres 50 0 50 100 150 200

Drilled Oct 25 - Nov 13/83	Scale 1:2500	N.T.S. 52 F/7
Approved by K. Leonard	Drafted by: J.M. & Associates Ltd. Drawing & Cartographic Services	Plan No. 10



Kevin Leonard



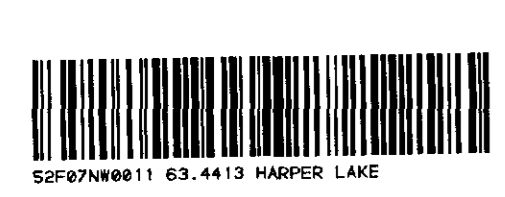
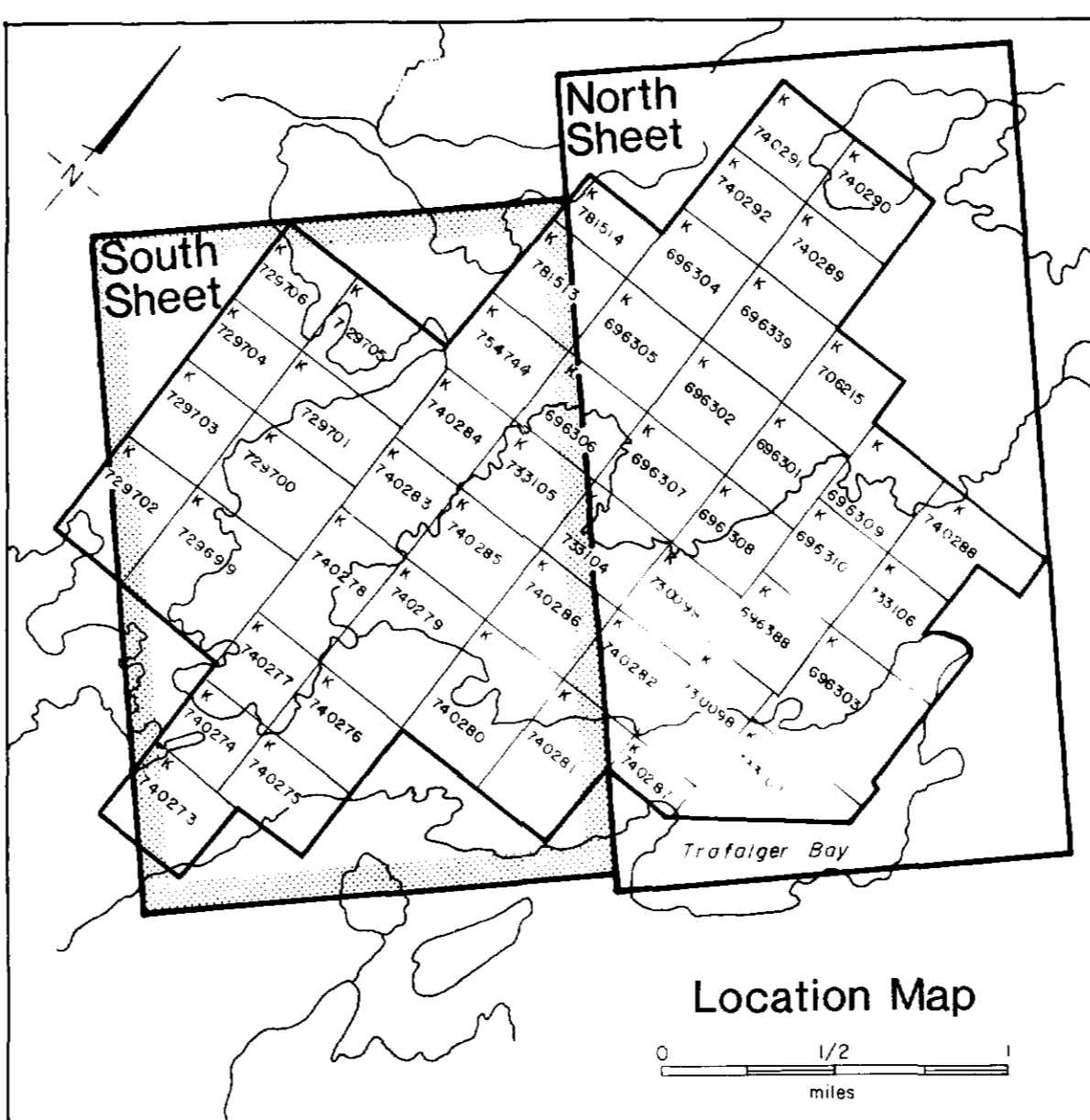
Manitou Lake

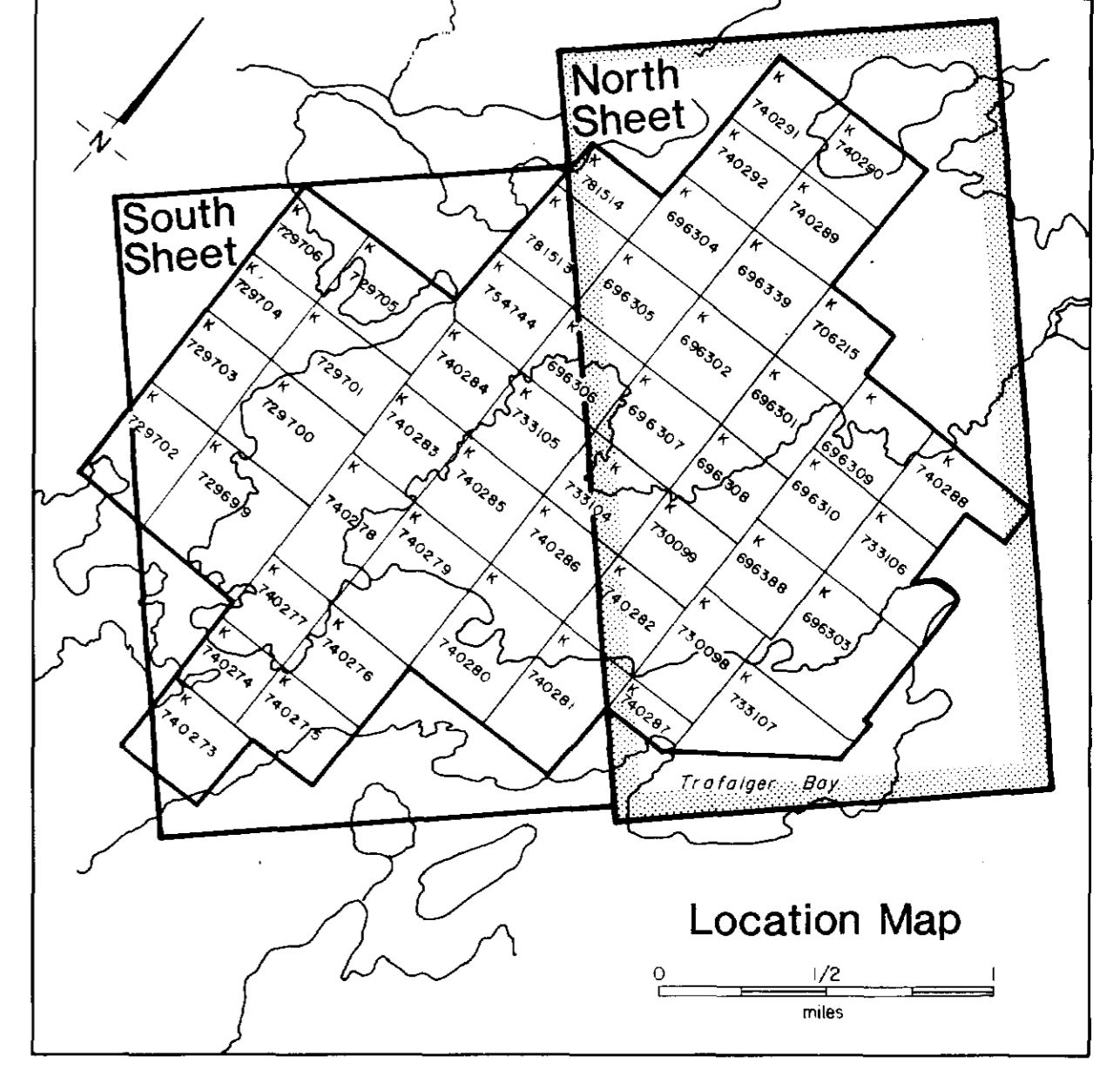
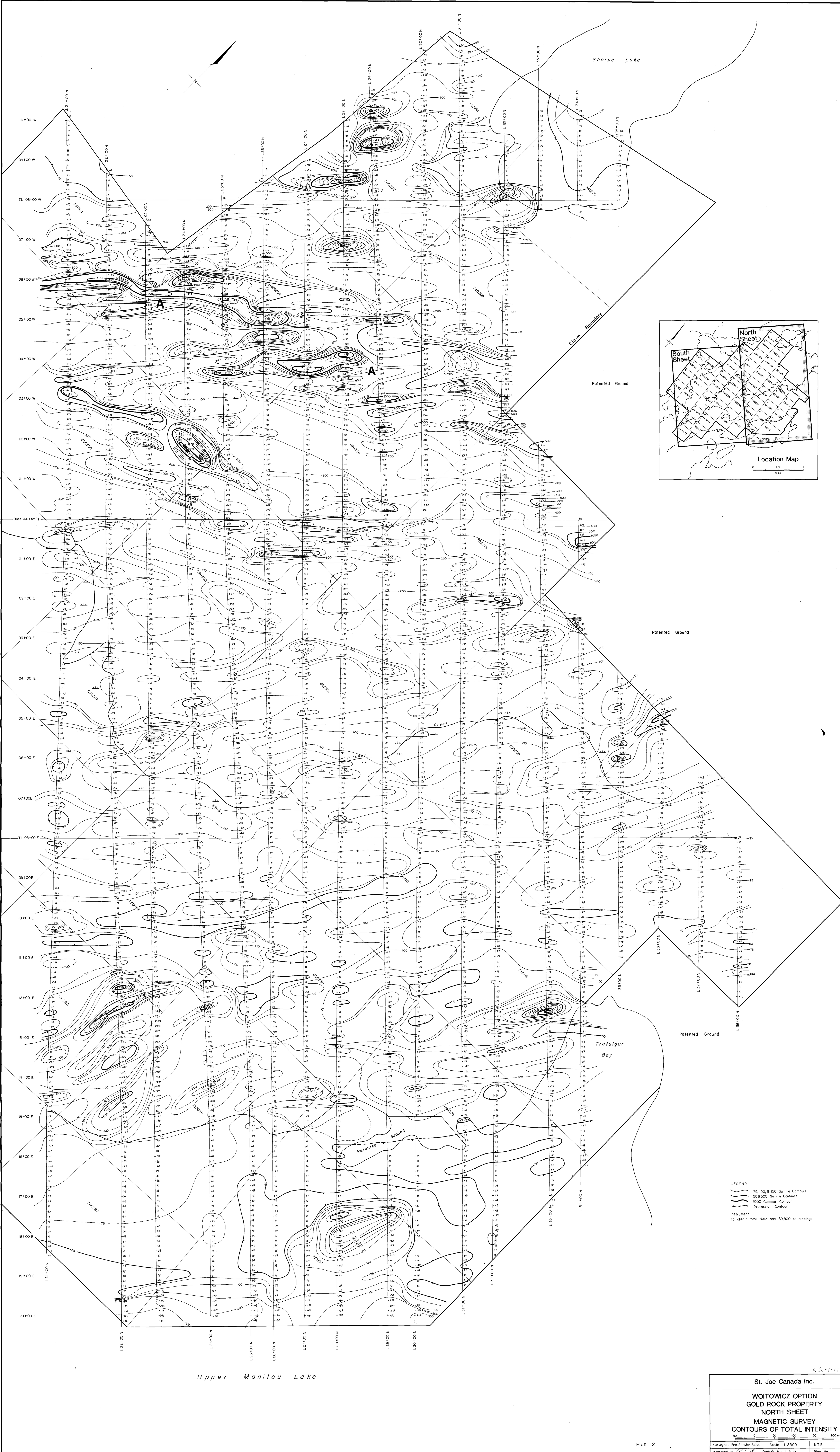
Jonas (Bell) La

Manitou Lake

LEGEND
 75, 100 & 150 Gamma Contours
 50 & 500 Gamma Contours
 1000 Gamma Contour
 Depression Contour

To obtain total field add 59,800 to readings



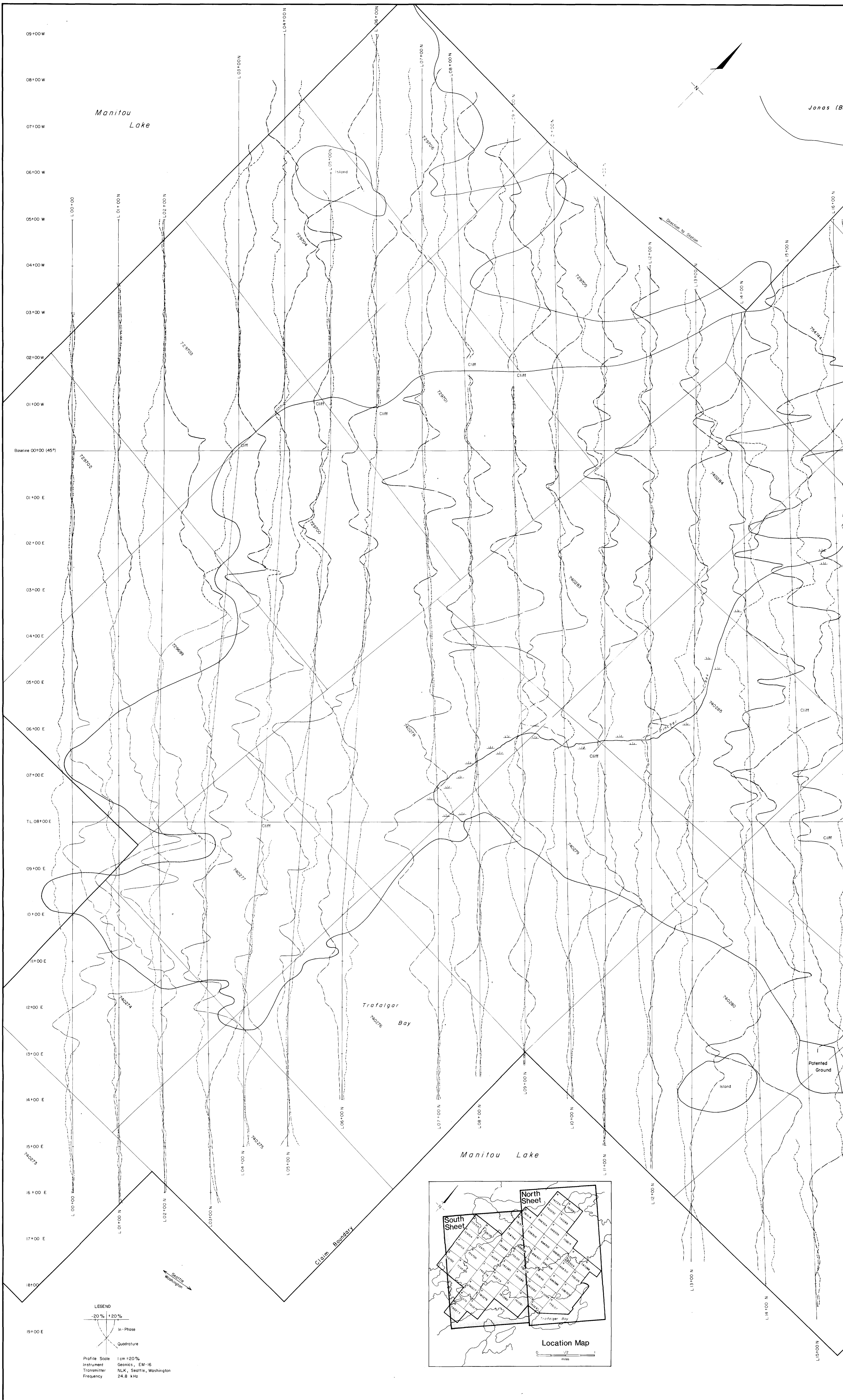


LEGEND
 75, 100, 150 Gamma Contours
 500, 550 Gamma Contours
 1000 Gamma Contour
 Depression Contour
 Instrument :
 To obtain total field add 59,800 to readings

63-4413

St. Joe Canada Inc.
 WOITOWICZ OPTION
 GOLD ROCK PROPERTY
 NORTH SHEET
 MAGNETIC SURVEY
 CONTOURS OF TOTAL INTENSITY

Scale: 1:2500
 N.T.S.
 Surveyed: Feb. 24-Mar 19/64
 Approved by: J. Mack
 Plan No.



LEGEND

-20% | 20%

In-Phase

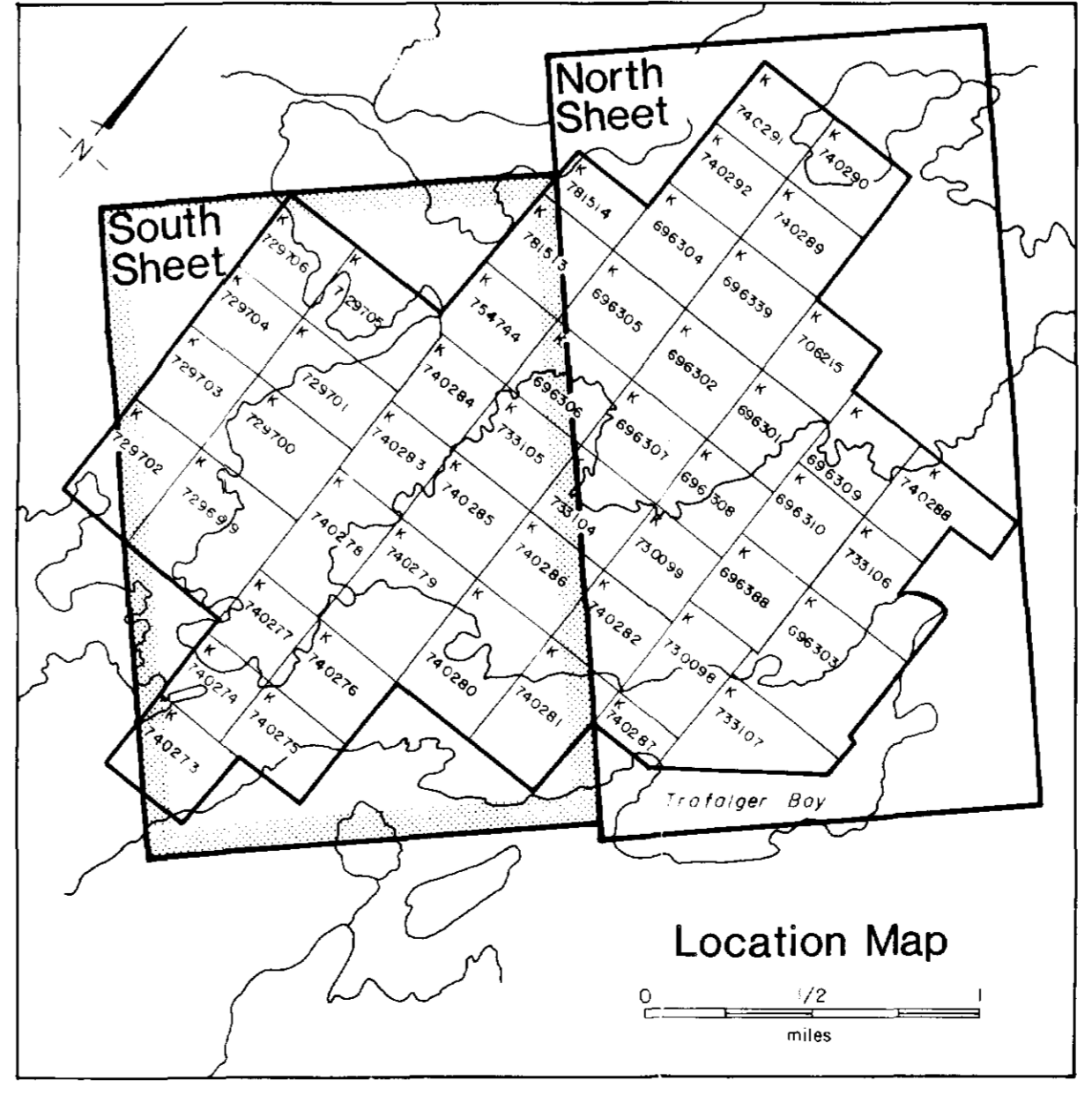
Quadrature

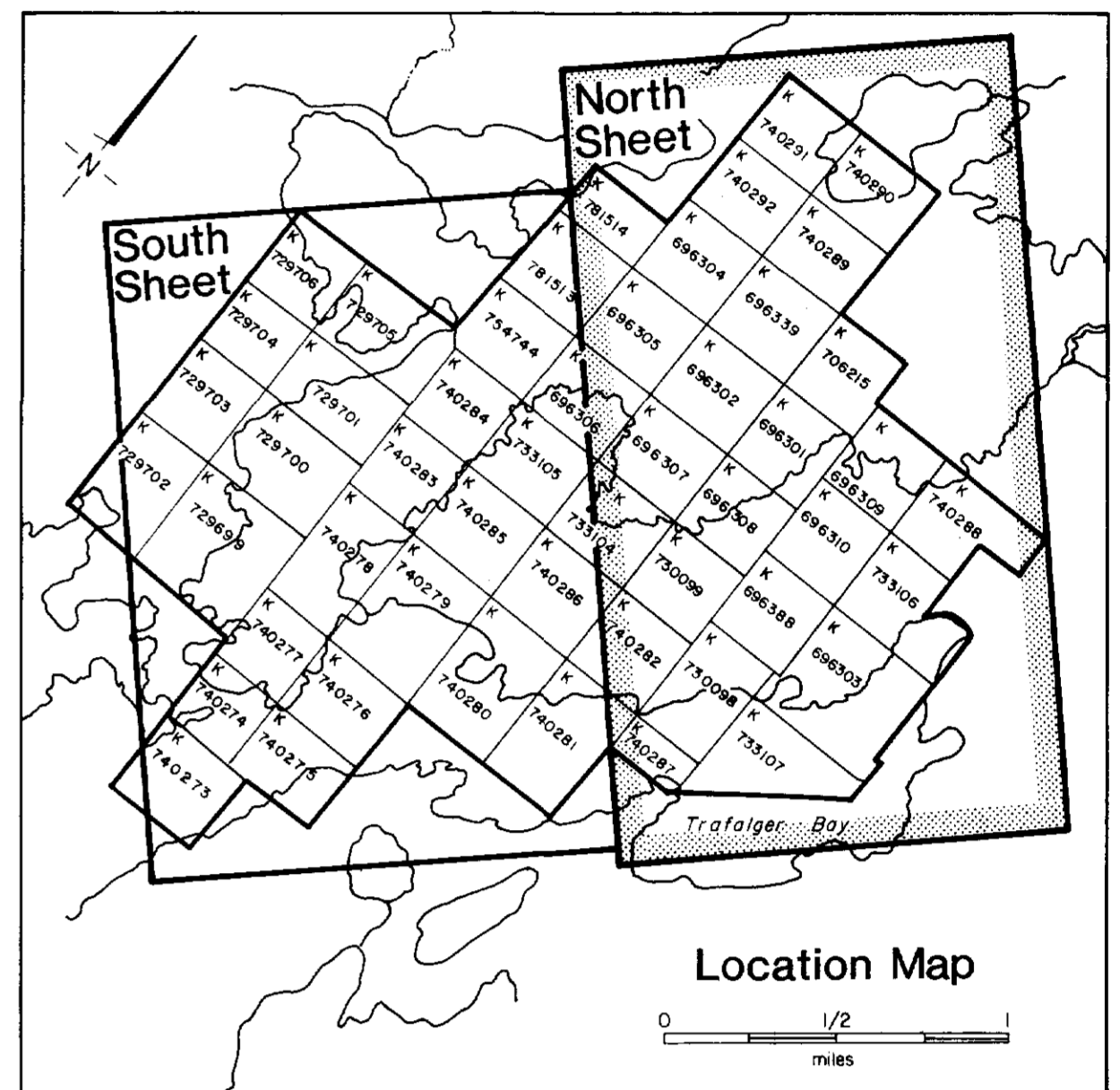
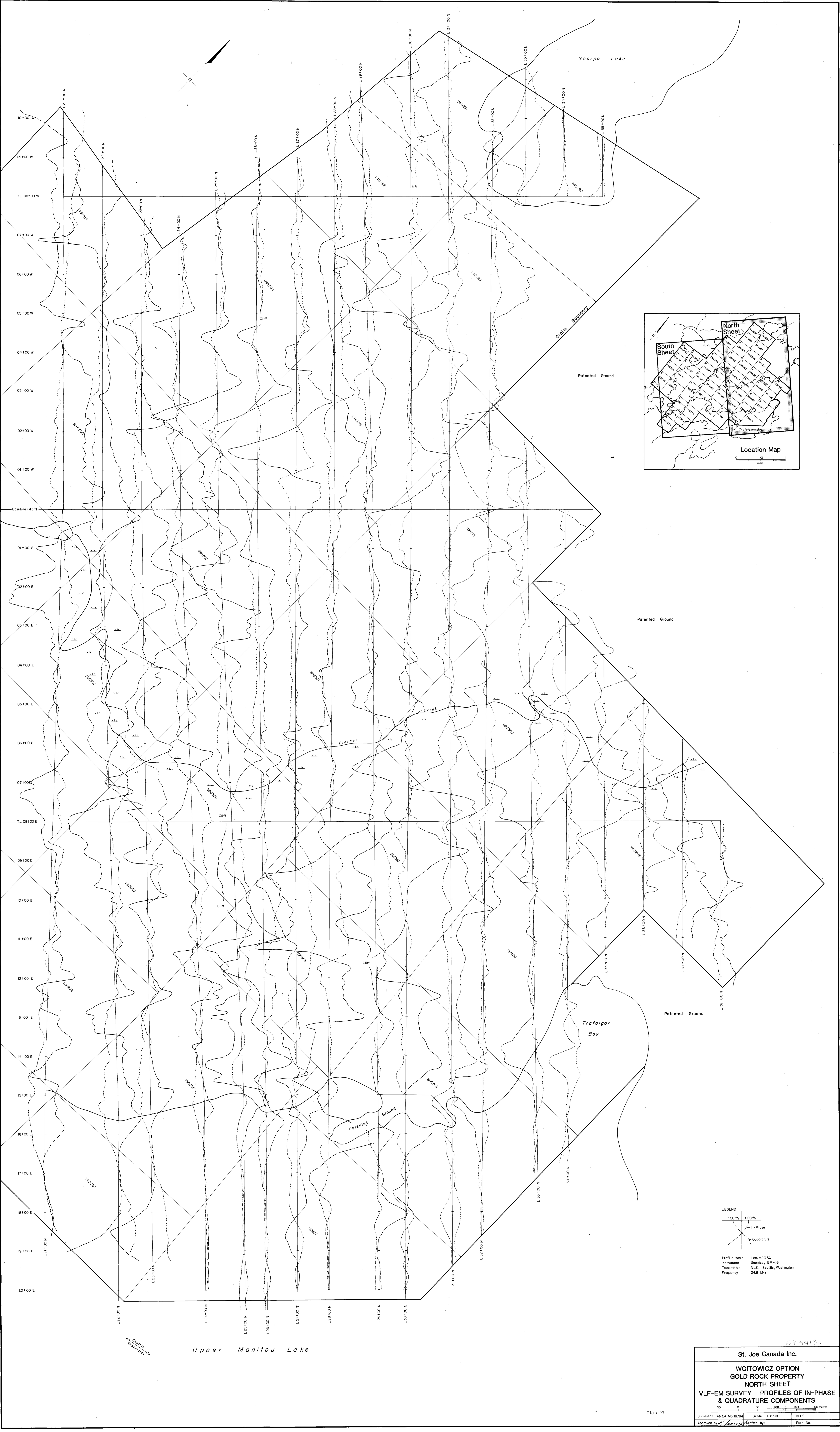
Profile Scale 1 cm = 20%

Instrument Geonics, EM-16

Transmitter NLK, Seattle, Washington

Frequency 24.8 kHz





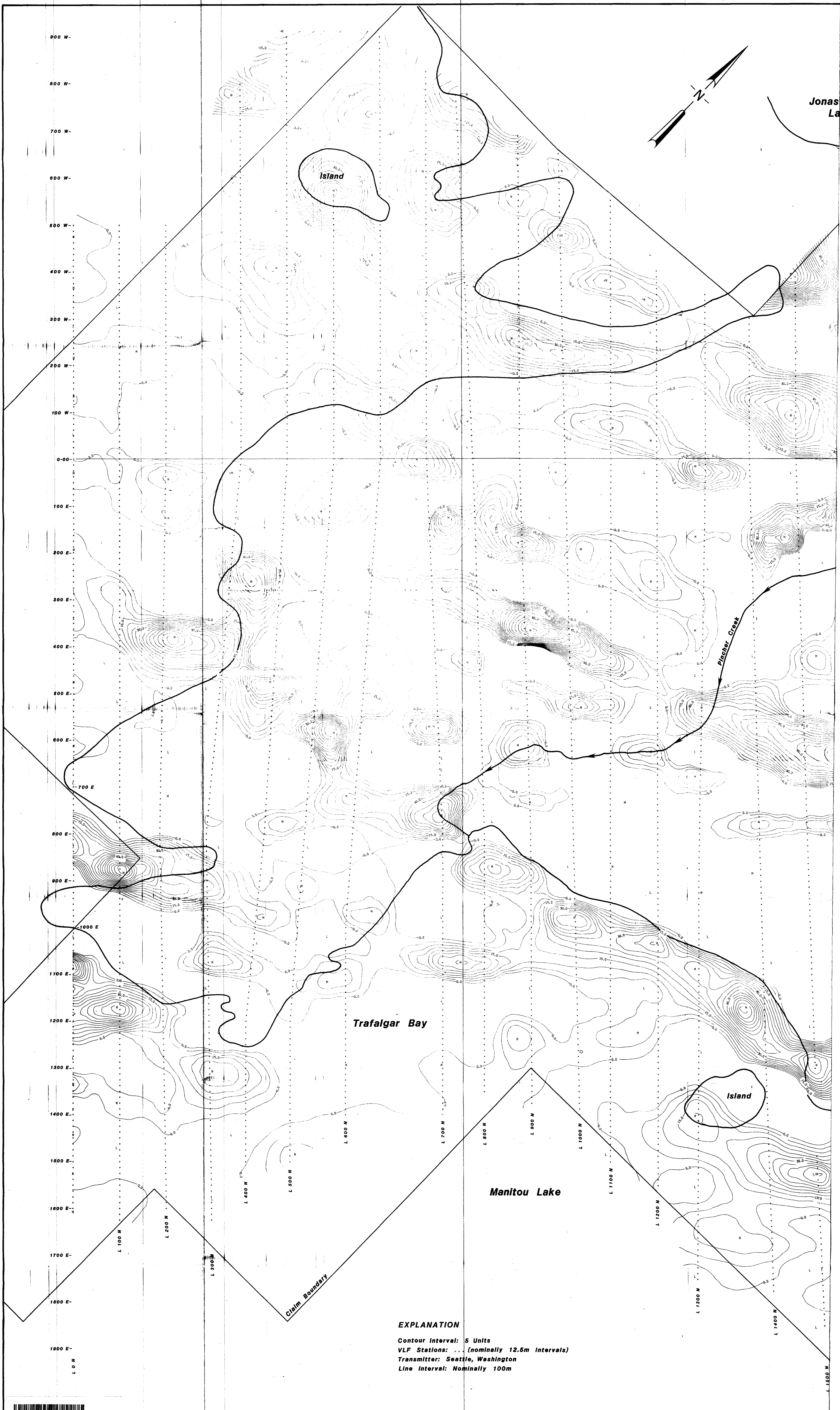
LEGEND
 -20% +20%
 — In-Phase
 - Quadrature
 Profile scale 1 cm = 20%
 Instrument Geonics, EM-16
 Transmitter NLK, Seattle, Washington
 Frequency 248 kHz

68-44130

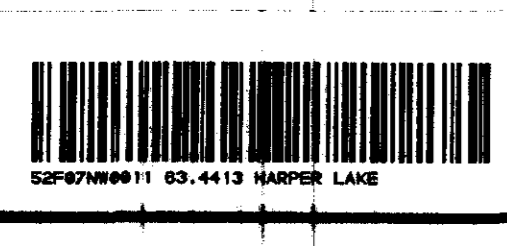
St. Joe Canada Inc.
WOITOWICZ OPTION
GOLD ROCK PROPERTY
NORTH SHEET
VLF-EM SURVEY - PROFILES OF IN-PHASE
& QUADRATURE COMPONENTS

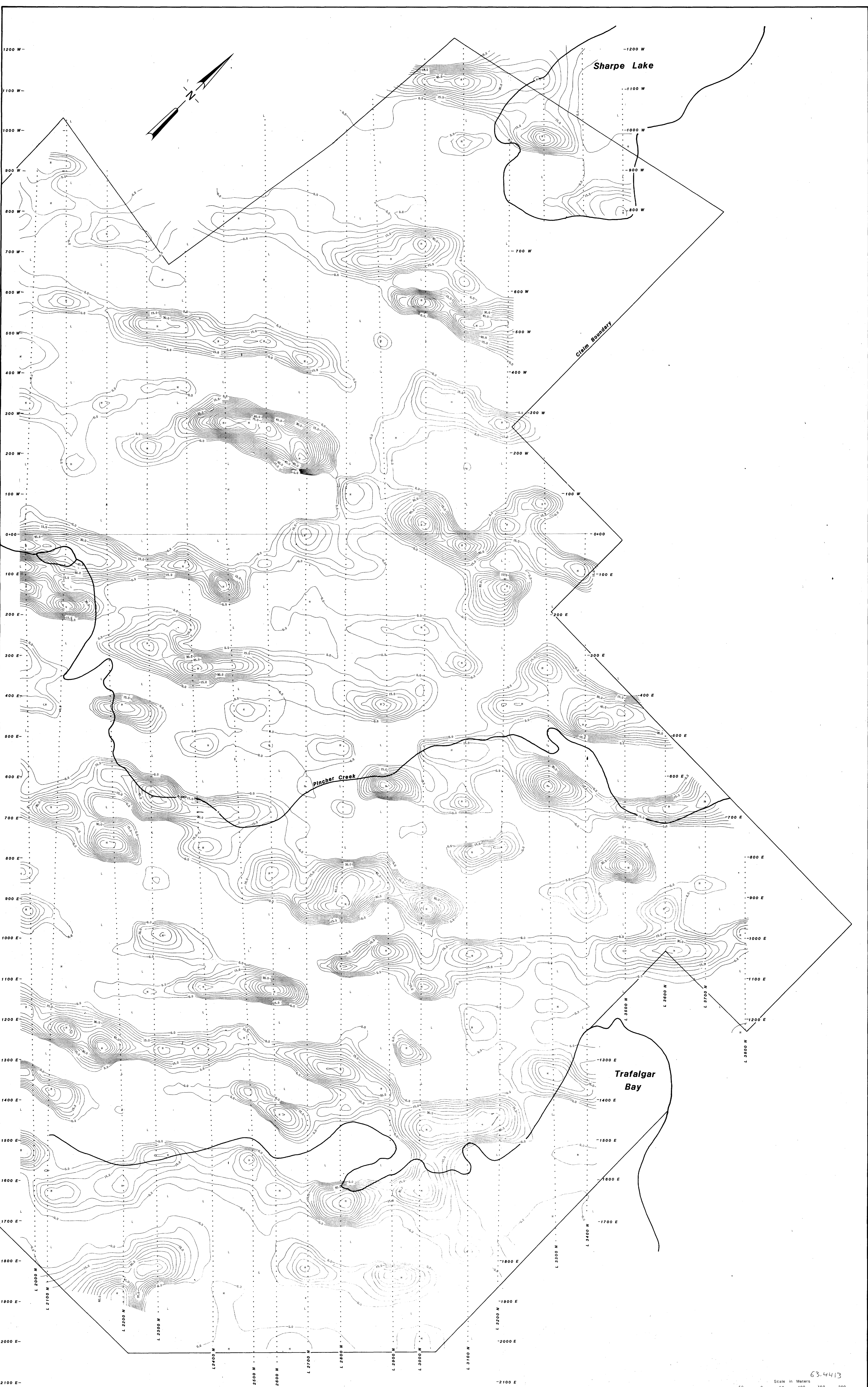
Plan 14

Surveyed Feb-24-Mar-18/84 Approved by <i>[Signature]</i>	Scale 1:2500 N.T.S. Plan No.
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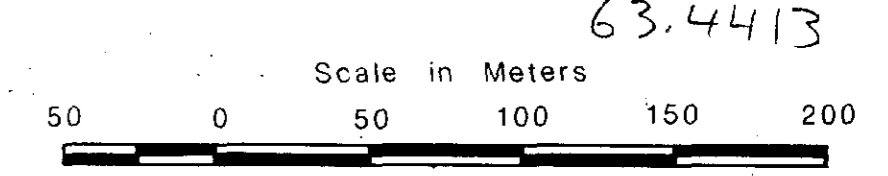


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 VLF Stations: ... (nominally 12.5m Intervals)
 Transmitter: Seattle, Washington
 Line Interval: Nominally 100m





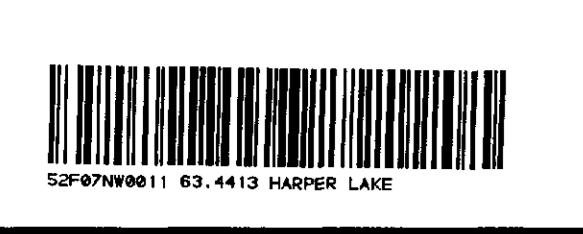
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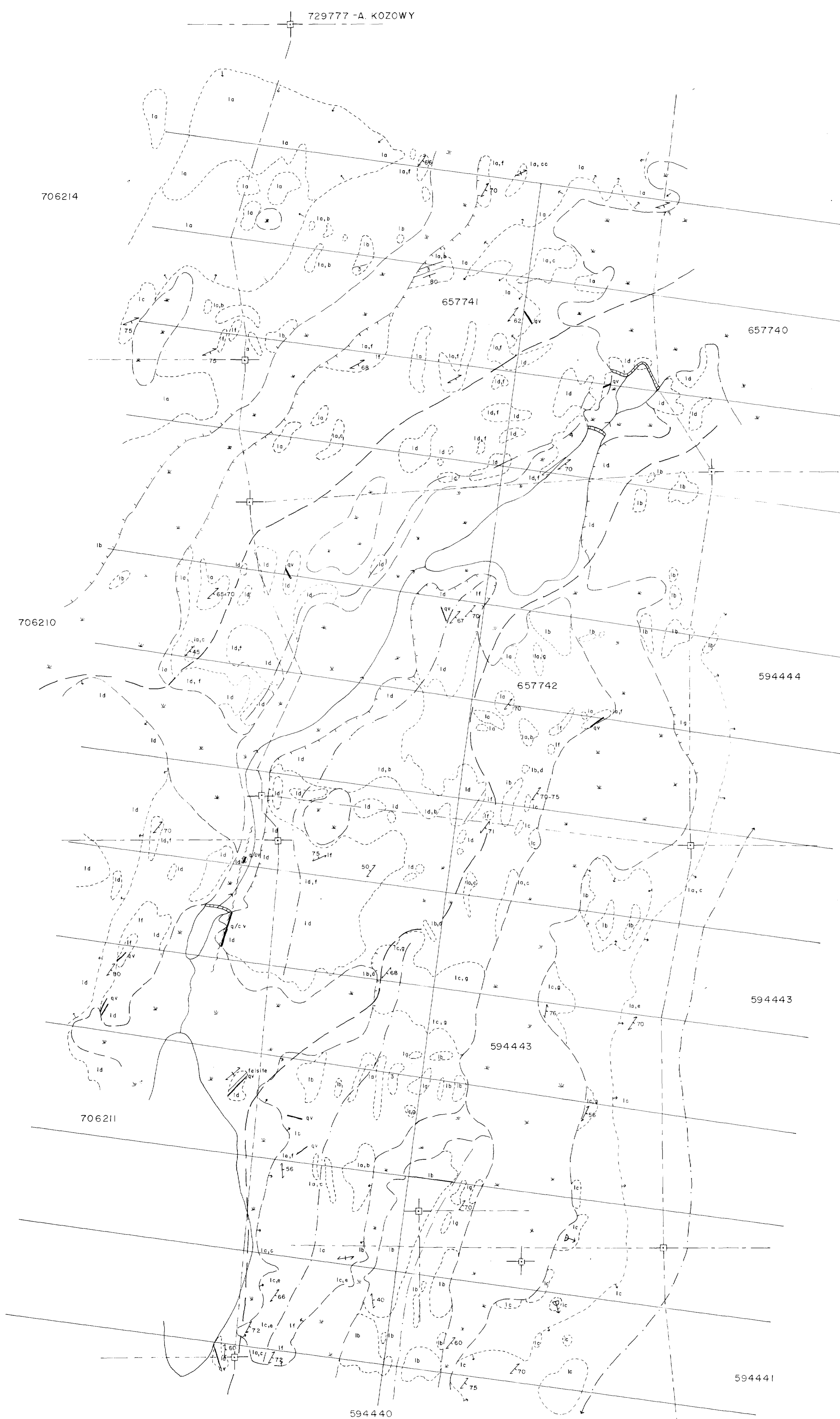


EXPLANATION
 Contour Interval: 5 Units
 VLF Stations: ... (nominally 12.5m intervals)
 Transmitter: Seattle, Washington
 Line Interval: Nominally 100m

Upper Manitou Lake

ST. JOE CANADA INC.	
WOITOWICZ OPTION GOLD ROCK PROPERTY NORTH SHEET	
VLF ELECTROMAGNETIC SURVEY FRASER FILTERED IN-PHASE CONTOURS	
Plan 16	Date: May 1984
Scale: 1:2500	<i>Levin Lomax</i>





LEGEND

Pelvic Intrusive Rocks:

4 Qtz. Monzonite, Granodiorite

3 Qtz./Feld. Porphyry, Feld. Porphyry, Pelitic

Intrusive Contact

Mafic Metavolcanic Rocks:

1a Med. to Fine Grained Basalt

1b Coarse Grained Basalt (mottled Gabbroic Basalt)

1c Pillowed Basalt, Fragmental Pillow Basalt

1d Porphyritic Gabbroic Basalts (Feldspar Phenocrysts)

1e Brecciated, Flow Brecciated Basalt

1f Chlorite/Carbonate schist (locally minor Bio. Ser.)

1g Basaltic Lapilli Cuff - Agglomerate

SYMBOLS

+ Grid Lines

~ Lake Shore

~ Swamp

~ Beaver Dam

~ Creek; Flow Direction

~ Base of Hill

~ Ridge Crest

~ Claim Line

~ Claim Post

~ Boundary of Rock Outcrop

~ Geologic Boundary - Interpreted

~ Geologic boundary - Defined

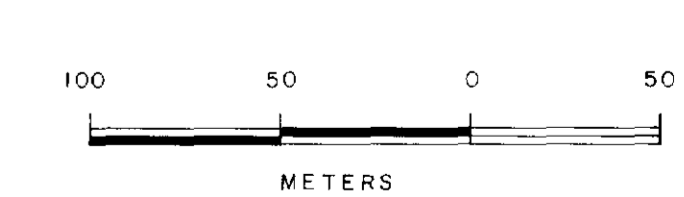
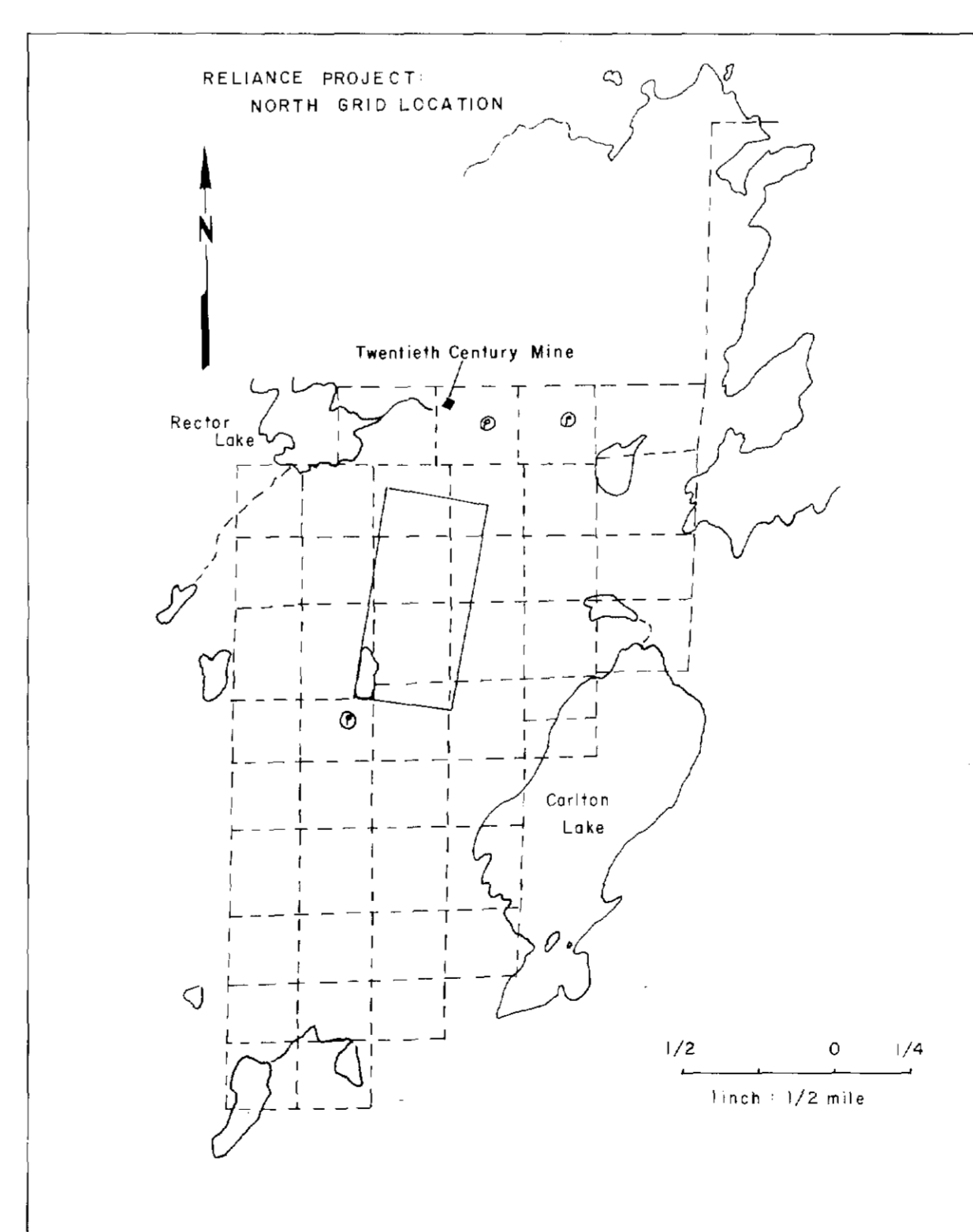
~ Shear

~ Quartz Vein

~ Strike and Dip of Flows

~ Strike and Dip of Schistosity - Inclined, Vertical

~ Flow Dip Direction as Determined by Pillow Tops

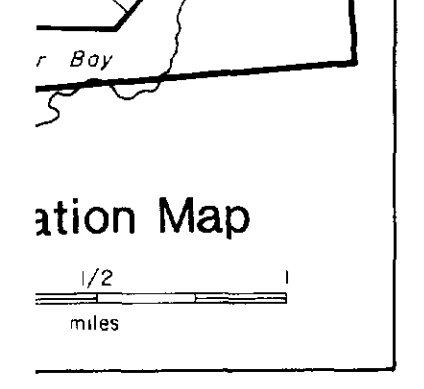
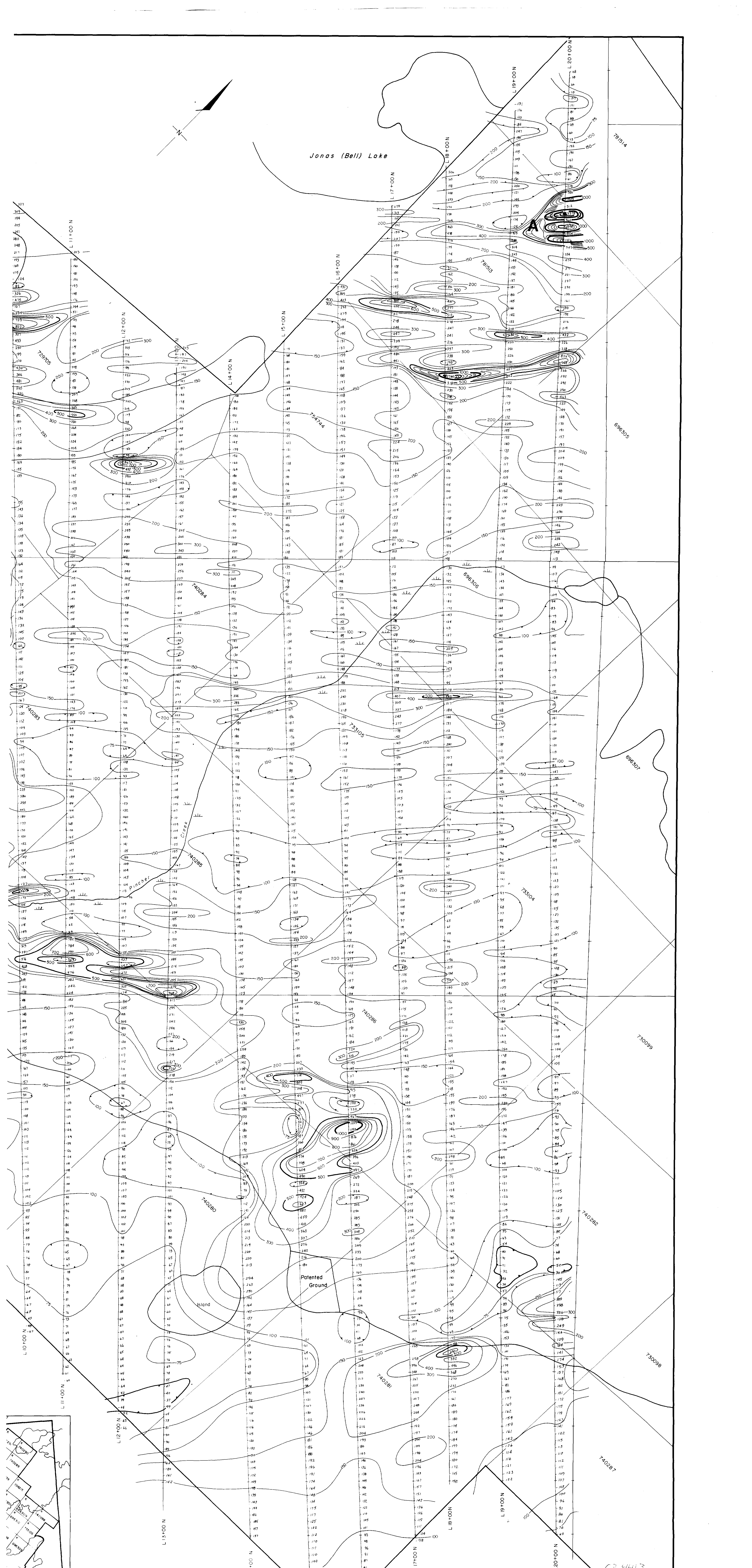


ST JOE CANADA INC.

RELIANCE PROPERTY
NORTH GRID
BEDROCK GEOLOGY

Kevin Leonard
Plan 17

DATE: Oct, Nov, 1983	SCALE: 1:2000	COMPILED: D.S. RIDDELL
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ation Map
1/2
miles

St. Joe Canada Inc.

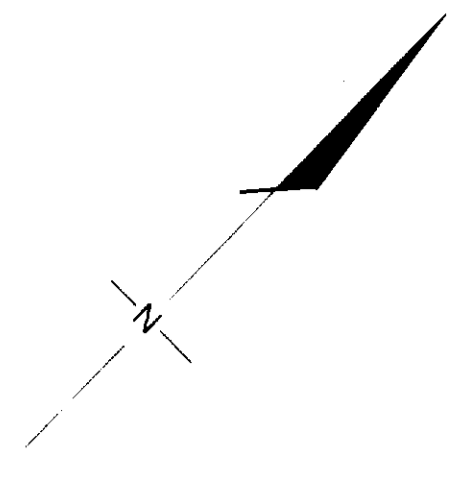
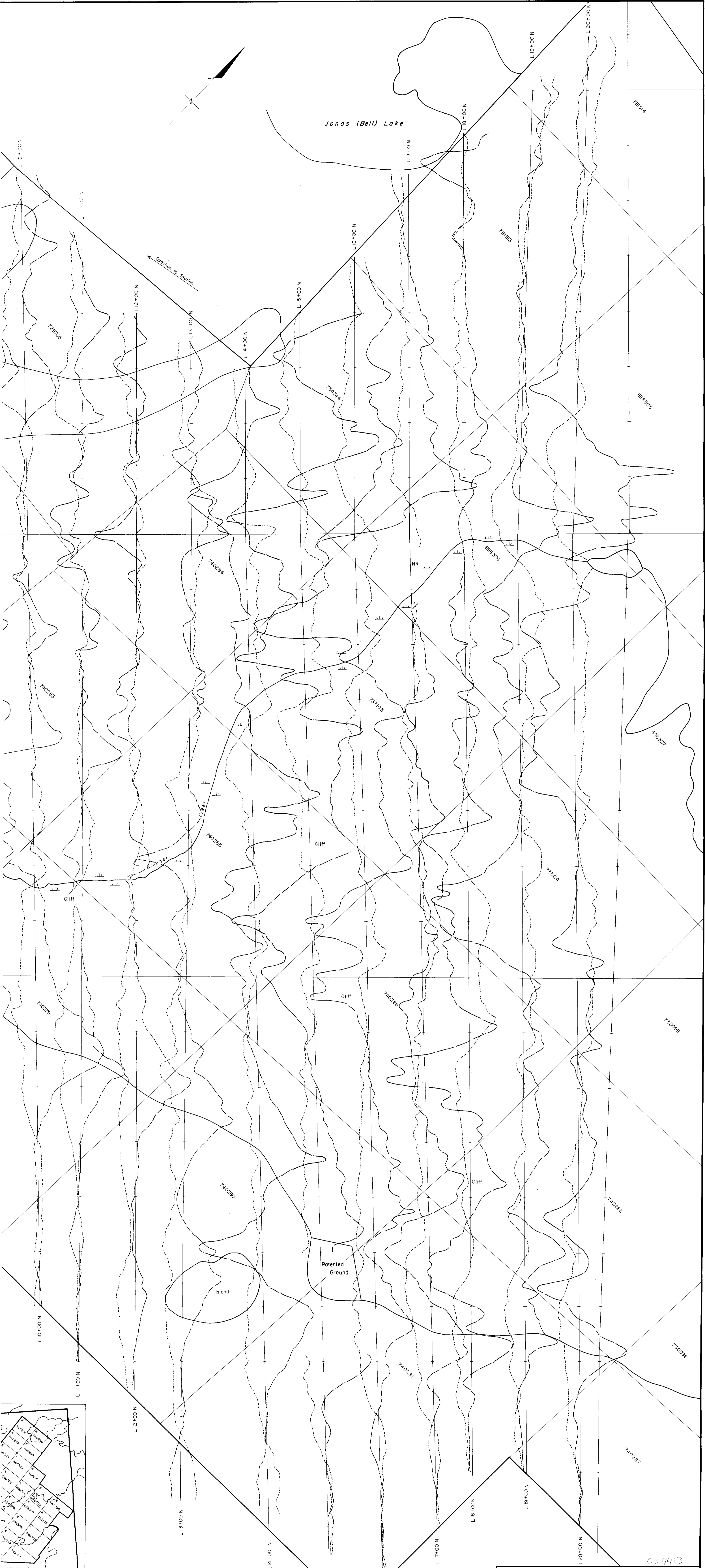
**WOITOWICZ OPTION
GOLD ROCK PROPERTY
SOUTH SHEET**

**MAGNETIC SURVEY
CONTOURS OF TOTAL INTENSITY**

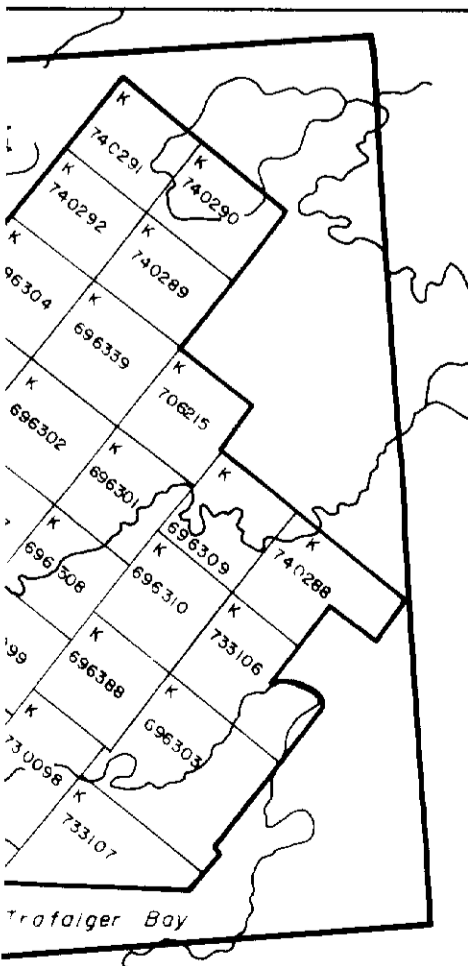
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Surveyed: Feb 24-Mar 18/84	Scale: 1:2500	NTS
Approved by: <i>[Signature]</i>	Drafted by: J. Meek	Plan No.

63.4413



Direction to Station



Location Map

Jonas (Bell) Lake

Cliff

Cliff

Cliff

Patented Ground

Island

NR

St. Joe Canada Inc.

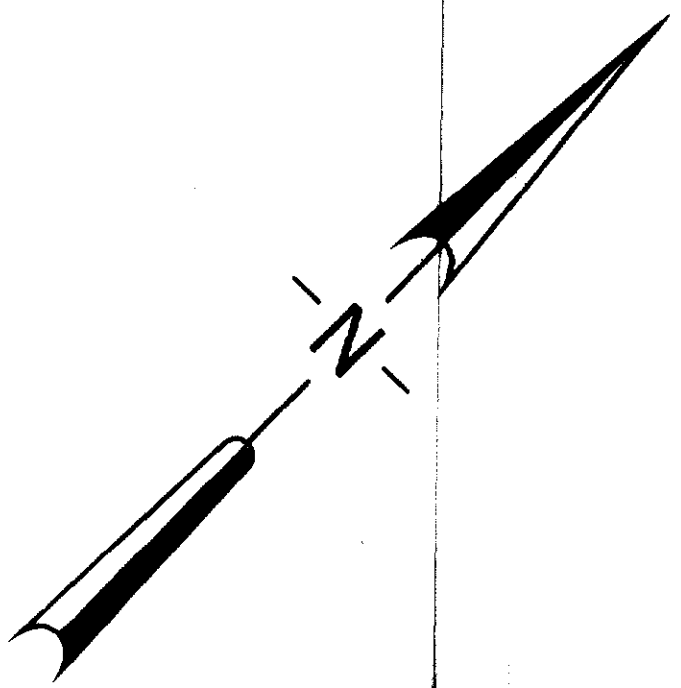
**WOITOWICZ OPTION
GOLD ROCK PROPERTY
SOUTH SHEET**

**VLF-EM SURVEY - PROFILES OF IN-PHASE
& QUADRATURE COMPONENTS**

50 100 150 200 metres

Surveyed: Feb 24 - Mar 18/84 Scale: 1:2500 NTS

Approved by: [Signature] Drafted by: [Signature] Plan No.



Jonas (Bell) Lake

900 W
800 W
700 W
600 W
500 W
400 W
300 W
200 W
100 W
0-00
100 E
200 E
300 E
400 E
500 E
600 E
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1200 E
1300 E
1400 E
1500 E
1600 E
1700 E
1800 E
2000 E

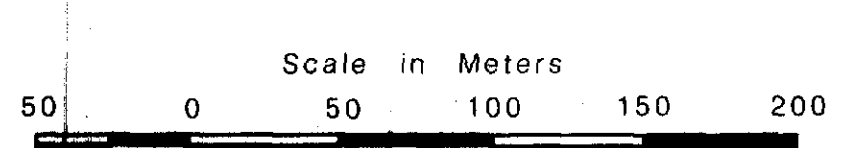
Pincher Creek

Island

ou Lake

5m Intervals)

L 900 N
L 1000 N
L 1100 N
L 1200 N
L 1300 N
L 1400 N
L 1500 N
L 1600 N
L 1700 N
L 1800 N
L 1900 N



ST. JOE CANADA INC.		
WOITOWICZ OPTION GOLD ROCK PROPERTY SOUTH SHEET		
VLF ELECTROMAGNETIC SURVEY FRASER FILTERED IN-PHASE CONTOURS		
Plan 15	Date: May 1984	<i>K. Leonard</i>
	Scale: 1:2500	

63,4413