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#### **EZEKIEL EXPLORATIONS LIMITED**

Geology, Geochemistry and Geophysics

Report on the

G NORTH PROPERTY

Cariboo Mining Division

# GEOLOGICAL BRANCH ASSESSMENT REPORT

April 1985

. 1985	1		CHAIMS	A. Troup, P.Eng. J.C. Freeze, B.Sc. V.J. Rublee, B.Sc.
Claim	Name	Units	Record No.	Anniversary
GNorth	1 1	12	3310	April 7
GN	2	20	3311	April 7
GN	3	20	3312	April 7
GN	4	10	3313	April 7
GN	6	20	3315	April 7
GN	6 7	20	3316	April 7
GN	8	20	3317	April 7
GN	9	20	3318	April 7
GN	12	20	3321	April 7
GN	14	20	3323	April 7
GN	16	20	3965	August 26
GN	17	20	3966	August 26
GN	18	20	4067	September 30
GN	19	6	5877	March 19

Location: 54°56' N. Lat., 123°18' W. Long. Owner: Ezekiel Explorations Ltd. Operator: Ezekiel Explorations Ltd. Consultant: A. Troup, P.Eng., Archean Engineering Ltd. Project Geologist: J.C. Freeze, B.Sc., Mark Management Ltd. Geologist: V.J. Rublee, B.Sc., Mark Management Ltd.



## EZEKIEL EXPLORATIONS LTD. Geology, Geochemistry and Geophysics Report on the G NORTH PROPERTY Cariboo Mining Division NTS 93J/14

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#### SUMMARY

The G North Property is a gold prospect located in north-central British Columbia. During the 1984 field season, airborne VLF and magnetic surveys, heavy mineral, silt, soil and rock sampling, ground VLF-EM surveys and geologic mapping were carried out to locate zones of potential gold mineralization.

The results of the 1984 programme show gold values of up to 0.044 oz/t in a sheared cataclastic limestone in the LS2 grid area. Anomalous copper, molybdenum, lead, zinc and silver values were found in silts and 'B' horizon soil samples in this area. Anomalous gold, copper, molybdenum, arsenic, zinc and silver values were found in silt samples on Bonnington and Garnet Red Creeks. These should be investigated further but due to the depth of overburden will require sophisticated geophysical techniques.

Additional geophysics and diamond drilling is recommended.

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## G NORTH PROPERTY Cariboo Mining Division

#### 1. INTRODUCTION

The G North property is a gold prospect located 48 km southwest of Mackenzie in north-central British Columbia. The property was staked following a regional geochemical survey undertaken by the A.T. Syndicate in 1980. Ezekiel Explorations Ltd. optioned the property from the A.T. Syndicate in 1981.

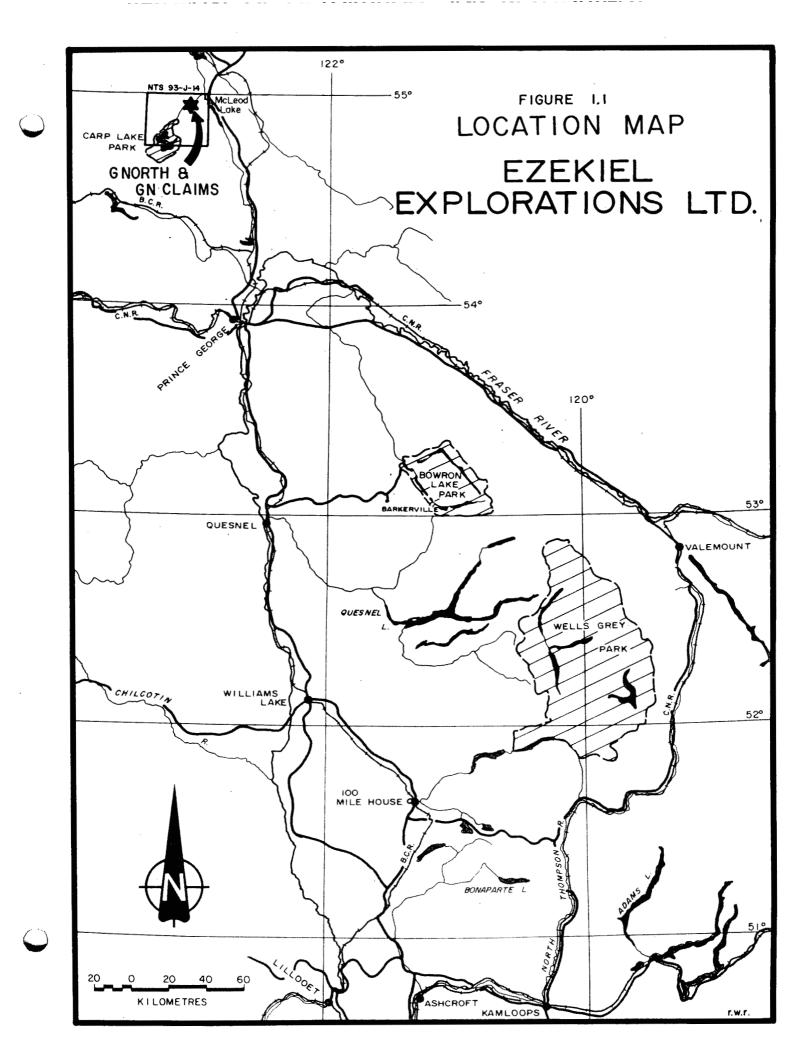
Field work, consisting of geological, geochemical and geophysical surveys, was carried out by a four-person crew working from fly camps on the property from July 28 to August 31, 1984. The purpose of this work was to locate airborne conductors on the ground and investigate their potential for gold mineralization.

Field work was supervised by Mark Management geologist, V.J. Rublee under the supervision of project geologist, J.C. Freeze, also of Mark Management Ltd. and A.G. Troup, P.Eng. of Archean Engineering Ltd.

#### 1.1 Location and Access

The G North property is located on the McDougall River 48 km southwest of Mackenzie in the Cariboo Mining Division of north-central British Columbia (Figure 1.1). The claims cover an area of  $90^2$  km and are centred at  $54^{\circ}$  56'N and  $123^{\circ}$  18'W.

Access to the property is by helicopter from Mackenzie or Prince George. A good gravel road running from McLeod Lake to Carp Lake Provincial Park intersects the southeast corner of the property. The McLeod River situated between this road and the property presently restricts use of this road for access. A heavily overgrown road also comes in from McLeod Lake and runs through the northern portion of the claim area. This road has seen little use since its construction in the early 1930's and would require several days of clearing by bulldozer to make it passable.



#### 1.2 Physiography

The property is located on the Nechako Plateau, just west of the Rocky Mountain Trench. Much of the claim area lies on glacially deposited material in an area of low topographic relief. Maximum relief is about 1500 ft (457 m); the highest elevation on the property is 4150 ft (1265 m). Drumlins and eskers striking northeast are abundant on the eastern half of the property. Most of the property is drained by the McDougall River which flows into the McLeod River on the eastern edge of the property. Numerous small creeks flow north-northwest and northeast across the property into the McDougall River. A few shallow, swampy lakes present in the southeast and southwest corners of the property are the result of glaciation and beaver activity.

Much of the claim area is covered with buckbrush and second growth. Only the eastern portion of the property is bush free. Thick growths of alder, devil's club and wild rose are found along many of the creeks. Trees are small to medium sized, consisting of fir, spruce, balsam and pine.

#### 1.3 Claim Information

The claims are all located within the Cariboo Mining Division and consist of 14 modified grid claims (248 units, Figure 1.2). Claim information is listed in Table 1.1.

Mineral claims G NORTH 1 and GN 2-15 were staked by Mark Management Ltd. for the A.T. Syndicate and then optioned to Ezekiel Explorations Ltd. GN 16-19 were later staked by Ezekiel Explorations Ltd.

## TABLE 1.1

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## CLAIMS STATUS

'Claim	Name	Units	Record No.	Expiry Date
G NOR	TH 1	20	3310	April 7, 1987
GN	2	20	3311	April 7, 1987
GN	3	20	3312	April 7, 1987
GN	4	20	3313	April 7, 1987
GN	6	20	3315	April 7, 1987
GN	7	20	3316	April 7, 1987
GN	8	20	3317	April 7, 1987
GN	9	20	3318	April 7, 1987
GN	12	20	3321	April 7, 1987
GN	14	20	3323	April 7, 1987
GN	16	20	3965	August 26, 1987
GN	17	20	3966	August 26, 1987
GN	18	20	4067	September 30, 1987
GN	19	6	5877	March 19, 1989

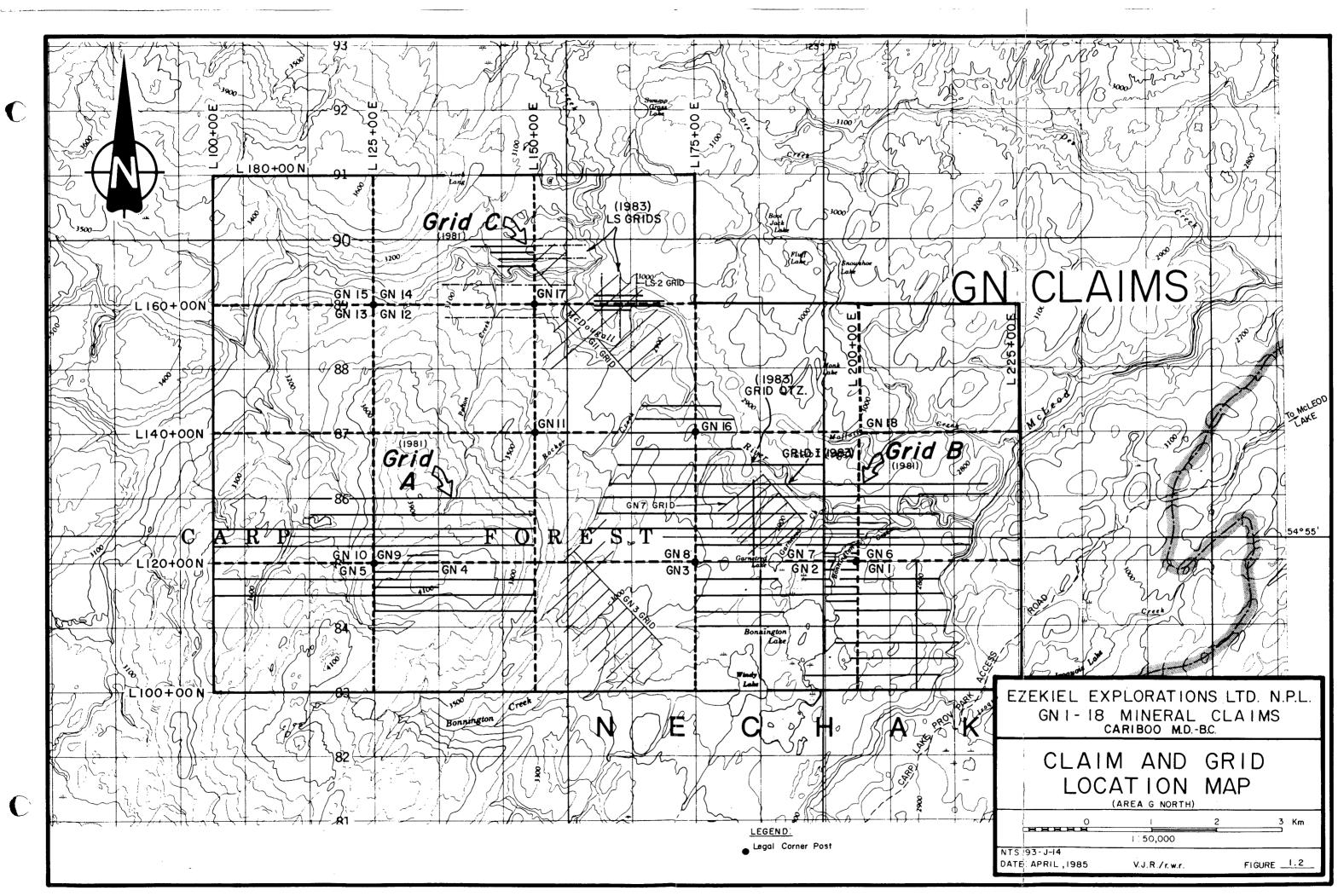
#### 1.4 History

In 1933 and 1934, the McDougall River area was extensively worked by Cariboo Northern Development Co. Ltd. and Northern Reef Gold Mines Ltd. These two companies held much of the mineralized ground east of the Reed Creek - McDougall River confluence. In 1933, Cariboo Northern Development tested their property and obtained encouraging results. The company manager reported that several low gravel benches ran as high as \$3.15 per yard (1933) with yardage ranging from 2 to 13 yards.

Fourteen random surface samples taken from zones other than quartz veins assayed as much as \$3.60 (1933) per ton in gold with all the concentrates carrying assayable platinum concentrations.

In 1934, Northern Reef Gold Mines continued the work begun by Cariboo. Additional work included the construction of a 16-mile (26 km) tractor trail from McLeod Lake, ditch and dam construction, and underground workings. A 52-foot adit with a 28-foot winze at the end of it was driven in 10 feet above the river. These underground workings were done over a large quartz showing which outcrops close to the north bank of the river. Placer testing was carried out in 1934 at four points adjacent to the river with results averaging \$1.87 (1934) per cubic yard. Hydraulic mining started early in 1935 but the operation was apparently short-lived, since only a small amount of ground was worked.

The property was explored by Ezekiel Explorations Ltd. in 1981 and 1983. During these periods, heavy mineral sampling, reconnaissance (1:50,000) and detailed (1:10,000) geological mapping, detailed rock and soil sampling and detailed VLF EM-16 surveys were carried out over the property to delineate areas of potential gold mineralization.



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#### 1.5 Work Done by Ezekiel in 1984

The following field work was completed on the G North property by Ezekiel Explorations Ltd. during the period July 28 to August 31, 1984:

- An airborne VLF and magnetometer survey was carried out over the property (See Questor Report, July 1984, for details).
- 2. Detailed heavy mineral and stream sediment (silt) sampling was carried out along McDougall River and its tributaries and all creeks in the vicinity of airborne conductors to further locate and define favourable areas for gold mineralization on the property.
- Detailed EM-16 surveys were carried out on five grids over the property to locate and define on the ground, conductors picked up by the Questor airborne VLF and magnetometer survey.
- 4. Detailed soil sampling was carried out at 25m intervals over conductors delineated by the ground EM16 surveys on two of the five established grids, GN3 and LS2.
- 5. Rock samples were taken along Bonnington Creek and analysed for Cu, Pb, Zn, Mo, and As as recommended in the 1983 report.
- 6. Detailed geological mapping in the vicinity of a strong conductor and subsequent detailed rock chip and channel sampling was carried out on the LS2 grid.

#### **2.** GEOLOGY

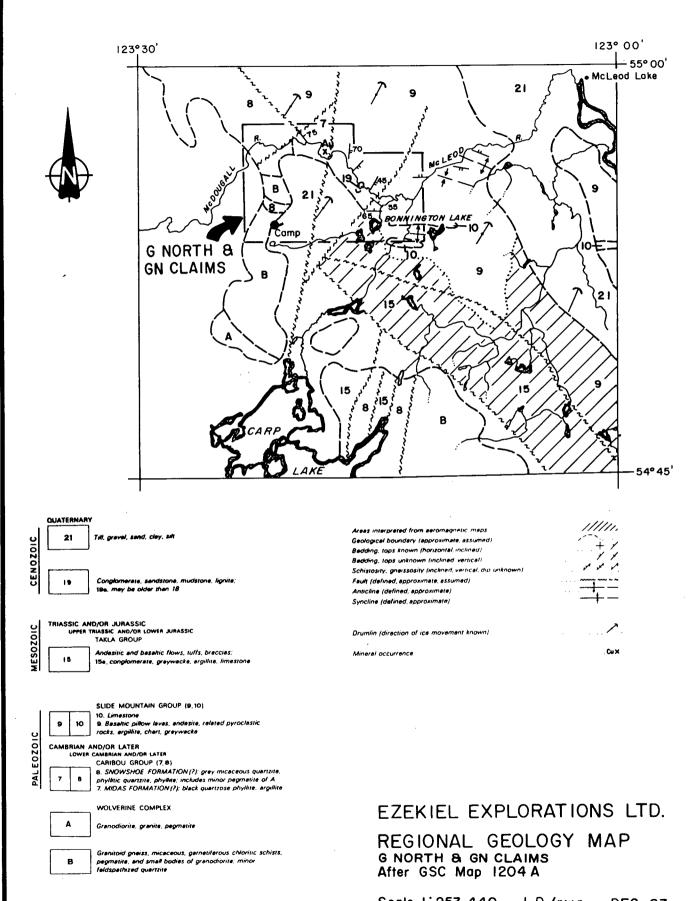
#### 2.1 General Geology

Geologic mapping of this area was undertaken in 1946 by Armstrong, Tipper and Hoadley of the Geological Survey of Canada. The work was completed by Tipper in 1961 and the data was compiled as map 1204A (Figure 2.1). This map shows the claims to be underlain by a variety of lithologies. The western third of the property is underlain by rocks of the Wolverine Metamorphic Complex of unknown age, while the eastern third of the property is underlain by Triassic-Jurassic Takla Group volcanics and Mississippian Slide Mountain Group sediments. The centre of the property is till covered and devoid of outcrop.

In 1981, reconnaissance mapping of the entire property was carried out at a scale of 1:50,000. Detailed mapping at a scale of 1:10,000 was also carried out along river cuts over the eastern end of the property. Mapping was hindered by a thick blanket of Quaternary till and gravel that covers most of the area. Over much of the property rock exposures occur only on ridge tops and along river and creek bottoms. In 1983, detailed mapping at a scale of 1:1,000 was carried out along the McDougall River to delineate faults, shear zones and silicified areas which may be the controlling factors for gold mineralization on the property. In 1984, geologic mapping was carried out on all grids where bedrock is exposed. A detailed map was produced at a 1:100 scale of the LS2 grid area.

#### 2.2 Property Geology

The Wolverine Metamorphic Complex outcrops over much of the western third of the property. This unit is comprised of granitoid gneiss, garnetiferous gneiss, micaceous garnetiferous schist, pegmatite and quartzite. Large and often angular blocks of granodiorite float are found in many locations but are not seen in outcrop.



Scale 1: 253,440 L.D./r.w.r. DEC.,83

FIGURE 2.1

NTS 93-J-14

Many of the gneisses and schists are mafic rich approaching amphibolite. Garnets found in the gneisses and schists are of the almandine type and occur as euhedral crystals up to 1 cm in size. Depletion haloes are sometimes seen around the garnets. All schists and gneisses are well foliated with the exception of the granitoid gneiss where the foliation is often masked by the granite texture. The foliation may be locally contorted but generally strikes northeast and dips steeply to the east. Four sets of quartz veins are found in the gneisses. Three are pre-metamorphism and have been deformed by shearing and folding. The fourth is post-metamorphism and lacks deformation. Veins of this set strike 020° and dip 60° W.

The Wolverine Metamorphic Complex was previously believed to be overlain by the Slide Mountain Group sediments, with the Takla Group volcanics thrust faulted over the sediments. Since the contacts observed between the sediments and the volcanics appear to be gradational and not thrust faulted, it is probable that the previously named Slide Mountain Group sediments are actually a part of the Slocan - King Salmon Group. To the south, the Slocan - King Salmon Group is found immediately beneath the Takla Group volcanics. It is likely that it could extend northwards on to the G North property rather than pinching out as shown on G.S.C. Map 1204A.

The sediments and volcanics appear to have been deposited as a continuous sequence as observed in river cuts along the McDougall The Slocan - King Salmon Group rocks are comprised of River. limestone, argillite, siltstone, silty conglomerate and mudstone. The argillite is a black, pyritiferous and locally graphitic rock often exposed as loose broken slabs and faces. The siltstones and mudstones are a competent, often laminated rock varying in colour from dark grey to light green. The Takla volcanics are a monotonous sequence of olive green andesites and are generally unaltered and unweathered. The andesites are locally tuffaceous and appear interlaminated with the siltstone or mudstone. Occasionally, these rocks display rusty spots and where cut by quartz and calcite veinlets may be stained rusty brown.

This sequence of rocks has undergone several intrusive episodes, resulting in andesite to rhyolite to felsic intrusive dykes crosscutting all rock types on the property. Multiple fracturing, faulting and shearing events accompany the intrusive episodes.

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Rusty quartz, quartz-calcite and calcite veins are found crosscutting all the sedimentary rocks. The veins display no preferred orientation but usually follow two of the three local fracture directions. The calcite is usually milk white but occasionally is stained rusty brown. It frequently appears as euhedral crystals lining fracture walls or as a matrix surrounding brecciated rock fragments along faults and shear zones.

An outcrop of foliated cataclastic limestone was found proximal to the northwest-southeast trending VLF conductor on the LS2 grid. The limestone shows pervasive iron staining and strong foliation which parallels the conductor (135°). A mylonitic fabric observed in thin section suggests that the limestone has been sheared. The outcrop stops at a small dried up creek. A one inch crust of iron-manganese oxide occurs in the creek bed for 100 metres to the north and 100 metres to the south of the exposure. A well defined siliceous and phyllic alteration zone occurs in the eastern half of the limestone, towards the aforementioned creek.

#### 2.3 Mineralization

Pyrite is the most common sulphide found on the G North property. It occurs as fine disseminations in almost all rock types and as blebs and cubes upto 1.5 cm in the siltstone and argillite units. Two one metre wide quartz veins were encountered in different locations on the property. One contained pyrite, malachite and chalcopyrite; the other had abundant pyrite as smears, fracture-fillings and radiating crystals (marcasite ?), as well as minor malachite, chalcopyrite and bornite.

Varying amounts of gold were obtained in a number of panned concentrates taken along the eastern six km of the McDougall River and along Bonnington Creek. Although much of the gold is very fine, most of the coarse pieces are wiry or angular suggesting a local source.

Low gold and silver values were obtained from the cataclastic limestone, from quartz veining in graphitic argillite and from a chloritic andesite, all in the vicinity of the LS2 grid.

#### 3. GEOCHEMISTRY

#### 3.1 Heavy Mineral Concentrate Sampling

#### 3.1.1 Sampling, Sample Preparation and Analytical Procedures

In order to further delineate areas of anomalous gold and other metal values, detailed heavy mineral sampling was carried out along McDougall River and tributaries draining into it. Heavy mineral concentrates were also collected from creeks draining VLF grids GN3, LS2, GN7, B, and GN11 (Map 3.1). A total of 58 heavy mineral samples were collected during the survey but 25 of these were analysed as silts in the Lab and are therefore treated as silts in the results. To ensure truly representative results, 50-100 kg samples were taken at 250 metre spacings. These samples were then sieved to minus 10 mesh, the coarse fraction discarded and the remaining fine fraction panned down to approximately 0.5 kg. The concentrates were placed in numbered kraft envelopes and sent to Chemex Labs Ltd. in North Vancouver for analysis.

In the laboratory, the samples were further concentrated by heavy liquid separation and magnetic mineral separation. The non-magnetic fraction was crushed to minus 200 mesh and analysed for gold by atomic absorption. Samples were also analysed for 24 elements using the ICP-AES analytical technique.

#### 3.1.2 Presentation and Discussion of Results

Too few samples were analysed to allow meaningful results by statistical analysis. Sample locations are shown on Map 3.1. Sample results are shown on Maps 3.1 to 3.1.3 at a scale of 1:20,000.

Inspection of the results shows a very high gold value (140,000 ppb) on McDougall Creek topographically below a strong east-west trending VLF conductor found on the LS2 grid. Visible gold was found in most of the panned concentrates from Bonnington Creek but due to a lab error these samples were analysed as silts.

Copper, molybdenum, lead and zinc values all show background concentrations.

#### 3.2 Silt Sampling

#### 3.2.1 Sampling and Sampling Procedures

Silt sampling was carried out at 250 metre intervals along the McDougall River and tributaries draining into the McDougall. Silt sampling was also carried out at 250 metre intervals along creeks draining the five VLF grids. A total of 92 silt samples were collected.

#### 3.2.2 Sample Preparation and Analytical Procedures

All silt samples were collected from the low velocity flow regime within creeks and were sent to Chemex Labs Ltd. in North Vancouver for analysis.

In the laboratory, samples were oven dried at approximately  $60^{\circ}$ C. The dried samples were sieved to minus 80 mesh and the coarse fraction was analysed for the elements copper, lead, zinc, molybdenum, arsenic, silver and gold by atomic absorption after digestion with hot concentrated nitric and hydrochloric acids.

#### 3.2.3 Treatment and Presentation of Results

In assessing the silt geochemical results, graphical statistical methods were used to separate background from anomalous metal concentration. Threshold and anomalous levels were determined at the mean plus two standard deviations (x+2s) and the mean plus three standard deviations (x+3s), respectively, from log probability plots prepared for each element. This data is given in Table 3.2.

TABLE 3.2										
Mean,	Mean, threshold and anomalous metal values in silt samples									
ELEMENT	N	MEAN	1 (x)	THRESH	OLD (x+2s)	ANOMALO	DUS (x+3s)			
Cu	57	20	ppm	85	ppm	175	ppm			
Мо	49	1.6	ppm	4.5	ppm	8	ppm			
Pb	49	12	ppm	22	ppm	30	ppm			
Zn	57	76	ppm	135	ppm	180	ppm			
Ag	49	.2	ppm	.6	ppm	.8	ppm			
As	57	26	ppm	60	ppm	100	ppm			
Au	92	<10	ppb	20	ppb	50	ppb			

### 3.2.4 Discussion of Results

Anomalous gold concentrations were found in a silt sample from Reed Creek and in a sample from the McDougall River approximately 800 metres down stream from Reed Creek.

A strong copper-molybdenum-lead-zinc-silver anomaly occurs on the small creek draining the LS2 grid. A weak zinc anomaly extends downstream from the strong anomaly. Silver values are anomalous along the entire creek. One weak gold anomaly occurs along the creek.

On Bonnington Creek a copper-molybdenum-arsenic-zinc-silver-gold anomaly occurs 500 metres above the confluence with the McDougall River. Anomalous gold concentrations occur in the three samples from just above type confluence to 140 metres above it.

On Garnet Red Creek and on the small tributary to the north-west, gold concentrations are anomalous in most samples.

#### 3.3 Soil Sampling

#### 3.3.1 Sampling, Sample Preparation and Analytical Procedures

Detailed soil sampling was carried out over two of the five VLF survey grids, GN3 and LS2. Samples were collected at 25 metre intervals over conductors. A total of 97 'B' horizon soil samples were taken. Sample locations are shown on Maps 3.3.1 and 3.3.2. All samples were placed in numbered kraft envelopes and shipped to Chemex Labs Ltd. in North Vancouver for analysis.

In the laboratory, samples were oven-dried at approximately 60° C and sieved to minus 80 mesh. The coarse fraction was then discarded and the minus 80 fraction analysed for copper, molydenum, lead, zinc, arsenic and gold by atomic absorption.

#### 3.3.2 Treatment and Discussion of Results

In order to interpret the results, graphical statistical methods were used to separate background from anomalous metal concentration. Threshold levels were determined at the mean plus two standard deviations (x+2s) and anomalous levels at the mean plus three standard deviations (x+3s) from log probability plots prepared for each element. This data is given in Table 3.3.

Mean, threshold and anomalous metal values in soil samples									
ELEMENT	N	MEAN (x)	THRESH	OLD (x+2s)	ANOMALO	OUS (x+3s)			
Cu	153	18 ppm	48	ppm	84	ppm			
Ag	153	.ll ppm	.54	ppm	1.2	ppm			
Мо	153	l ppm	3	ppm	4	ppm			
Pb	153	7 ppm	14	ppm	9	ppm			
Zn	153	62 ppm	117	ppm	160	ppm			
As	153	2.5 ppm	10	ppm	20	ppm			
Au	153	10 ppb	20	ppb	50	ppb			

TABLE 3.3

#### 3.3.3 Discussion of Results

On the LS2 grid a large zinc-silver-copper anomaly occurs over the southeastern portion of the grid. A small copper-lead-zinc anomaly occurs in the centre of the grid. At the north end of the grid a silver anomaly occurs peripheral (to the north) to a zinc anomaly. All of these anomalies occur in the vicinity of VLF conductors but are not directly coincident. Scattered gold values are found over the argillites in this area.

On the GN3 grid an arsenic-silver anomaly occurs over the north portion of the grid. A copper-lead anomaly coincides with a VLF conductor at 4SW on Line 8NW. A gold-zinc anomaly with spotty anomalous molybdenum and lead values occur peripheral to the copperlead anomaly. Spotty anomalous gold values coincide with VLF conductors. Small zinc anomalies coincide with VLF conductors at 6SW on Line 8NW and 6+75SW on Line 2SE. A copper-molybdenum anomaly coincides with a VLF conductor at 1+50SW on Line 0.

#### 3.4 Rock Sampling

#### 3.4.1 Sampling and Sample Treatment

Rock chip samples were collected from three main areas considered to be potential sources for gold found in panned concentrates.

In the Bonnington Creek area andesites and argillites containing quartz carbonate veins, graphite and disseminated pyrite and pyrrhotite were chip sampled.

In the LS2 grid area a foliated cataclastic limestone proximal to a strong VLF conductor was mapped in detail and channel sampled. A graphitic argillite and chloritic andesite located at line LS11 and 12 at 5 to 6S were also sampled. A total of 28 such samples were taken.

Samples were placed in numbered plastic bags and the sample site indicated by orange flagging bearing the corresponding number. The samples were shipped to Chemex Labs Ltd. in North Vancouver for analysis. In the laboratory, the samples were put through primary and secondary jaw crushers and a tertiary cone crusher. A sub-sample of approximately 250 gm was then pulverized in a rotary pulverizer. Pulp for precious metal analysis was screened to minus 100 mesh and examined for metallics. The pulp was then fire assayed for gold and silver and assayed for copper, molybdenum, lead and zinc.

#### 3.4.2 Presentation and Discussion of Results

Assay results, locations and descriptions of samples are given in Table 3.4 and on Map 3.4. Results show gold values ranging from trace to 0.044 oz/ton. The best values are associated with the sheared cataclastic limestone. Silver values range from trace to 0.16 oz/ton. Copper, molybdenum, lead and zinc values do not rise above trace levels. Gold values of up to 0.01 oz/ton were obtrained from quartz veining in graphitic argilites and 0.018 oz.ton in chloritic andesites. Both of these were collected along the McDougall River due south of the cataclastic limestone.

No outcrop was found in the vicinity of the geochemical anomalies in silts on Bonnington Creek.

## TABLE 3.4

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# Locations, Descriptions and Assay Results of Rock Chip Samples

			(*	8)			0z/!	Ion	
						NAA	F	A	
Sample	Location	Cu	Мо	Pb	Zn	As	Ag	Au	Description
3101	Bonnington Cræk	0.01	<0.001	<0.01	0.01	0.007	0.16	<0.003	Andesite w/dis Py+Po 1%
3102	11	<0.01	<0.001	<0.01	<0.01	0.001	0.16	<0.003	Qtz-carb vein in graph Arg
3103	11	<0.01	<0.001	<0.01	0.01	0.003	0.16	<0.003	Slst/Mdst-Int frctr-l% Py graph in frctr
3104	п	<0.01	<0.001	<0.01	0.01	0.002	0.16	<0.003	Plag-Hb P And sl calc+Silic
3105	n	<0.01	<0.001	<0.01	0.02	0.003	0.10	<0.003	1-2% dis Py Grphtc shr zone in metased4m wide. dis Py 1-
3106	11	<0.01	<0.001	<0.01	<0.01	0.001	0.16	<0.003	2% Calcite Stkwk in Andesite- FeO24m wide
3107	Π	<0.01	<0.001	<0.01	<0.01	0.001	0.12	<0.003	Qtz-carb vein in graph Arg
3108	"	<0.01	<0.001	<0.01	0.01	<0.001	0.14	<0.003	Qtz-carb vein in And3m wide
3109	n	<0.01	<0.001	<0.01	0.01	0.001	0.16	<0.003	Conglomerate- 1-2% Py blebs+ dis-2m wide
3110	ls5 0+60S	<0.01	-	0.03	0.03		0.01	<0.003	Calc qtzite- pyritic Qtz- calc strngrs

## TABLE 3.4 Continued

# Locations, Descriptions and Assay Results of Rock Chip Samples

		-	(8)			<u>Oz/</u> 1	<u>l'on</u>	
					<u>NAA</u>	<u>F7</u>	Ī	
Iccation	 (1)	 Mo	Ph		Δς		 A11	Description
hocación	<u>Cu</u>	<u> </u>	<u>10</u>		<u></u>	69	<u>mu</u>	Deberiperon
ls5 0+60s	<0.01	-	0.01	0.01	-	0.10	0.016	Silic Limest-
								Ga bleb in Qtz
								vein+dis
LS2 Grid	<0.01	-	<0.01	0.01	-	0.12	0.008	Float-graph Arg
								- Pyr Qtz vein
91	<0.01	-	<0.01	0.02		0.01	0.012	Graph Arg-Py 2%
								foliated
11	<0.01	-	<0.01	0.01		0.01	<0.003	Mudstone
, ,	<0.01	-	<0.01	0.01	-	0.04	<0.003	Silic lime-
								stone
<b>11</b>	<0.01	-	<0.01	<0.01	-	0.04	0.006	Silic lime-
								stone
11	<0.01	-	<0.01	0.01	-	0.08	<0.003	Mylonite
								chlorite alt
11	<0.01	-	<0.01	0.02	-	0.01	0.008	Foliated cata-
								clastic limest
n	<0.01	-	<0.01	0.02		0.05	0.008	Cataclastic
								limestone
n	<0.01	-	<0.01	0.01	-	0.01	0.016	Cataclastic
								limestone
11	<0.01	-	<0.01	0.01	_	0.01	<0.003	Cataclastic
								limestone Fe
								stained
	LS2 Grid " " " " " " " " " " " " " " " " " " "	LS5 0+60S <0.01 LS2 Grid <0.01 " <0.01 " <0.01 " <0.01 " <0.01 " <0.01 " <0.01 " <0.01	Location       Cu       Mo         LS5 0+60S $<0.01$ -         LS2 Grid $<0.01$ -         " $<0.01$ -         " $<0.01$ -         " $<0.01$ -         " $<0.01$ -         " $<0.01$ -         " $<0.01$ -         " $<0.01$ -         " $<0.01$ -         " $<0.01$ -         " $<0.01$ -         " $<0.01$ -         " $<0.01$ -	LS5 0+60S $<0.01$ - 0.01 LS2 Grid $<0.01$ - $<0.01$ " $<0.01$ - $<0.01$	$\begin{array}{c ccc} \underline{Location} & \underline{Cu} & \underline{Mo} & \underline{Pb} & \underline{Zn} \\ \\ LS5 0+60S & <0.01 & - & 0.01 & 0.01 \\ \\ LS2 Grid & <0.01 & - & <0.01 & 0.01 \\ & & <0.01 & - & <0.01 & 0.02 \\ & & <0.01 & - & <0.01 & 0.01 \\ & & <0.01 & - & <0.01 & 0.01 \\ & & <0.01 & - & <0.01 & 0.01 \\ & & <0.01 & - & <0.01 & 0.02 \\ & & & <0.01 & - & <0.01 & 0.02 \\ & & & <0.01 & - & <0.01 & 0.02 \\ & & & <0.01 & - & <0.01 & 0.02 \\ & & & <0.01 & - & <0.01 & 0.01 \end{array}$	NAA         Location       Cu       Mo       Pb       Zn       As         LS5 0+60S $<0.01$ - $0.01$ $0.01$ -         LS2 Grid $<0.01$ - $<0.01$ $0.01$ -         " $<0.01$ - $<0.01$ $0.02$ -         " $<0.01$ - $<0.01$ $0.02$ -         " $<0.01$ - $<0.01$ $0.02$ -         " $<0.01$ - $<0.01$ $0.01$ -         " $<0.01$ - $<0.01$ $0.01$ -         " $<0.01$ - $<0.01$ $0.01$ -         " $<0.01$ - $<0.01$ $0.02$ -         " $<0.01$ - $<0.01$ $0.02$ -         " $<0.01$ - $<0.01$ $0.02$ -         " $<0.01$ - $<0.01$ $0.02$ -         " $<0.01$ - $<0.01$ $0.01$ -	$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	$\begin{array}{c ccccccccccccccccccccccccccccccccccc$

## TABLE 3.4 Continued

# Locations, Descriptions and Assay Results of Rock Chip Samples

			(	8)			<u>(</u>	)z/]	lon	
						NAA		<u>F7</u>	Ī	
Sample	Location	<u>Cu</u>	Mo	Pb	Zn	As	Ac	Ŧ	Au	Description
3122	"	<0.01	-	<0.01	0.01	-	0.	.01	<0.003	Silic lime stone Fe stained
3123	11	<0.01	-	<0.01	0.01	-	0.	.02	<0.003	Limestone Fe stained
3124	**	<0.01	-	<0.01	0.01	-	0.	.06	0.044	Cataclastic limestone Fe stained
3125	H	<0.01	-	<0.01	0.01	-	0.	.03	0.016	Cataclastic limestone Fe stained
3126	LS11 5+00	<0.01	-	<0.01	0.01	-	0.	.12	0.008	Slst/mdst-
3127	LS12E5+60S	<0.01	-	<0.01	0.01	-	0.	.15	0.010	Qtz vning in graph Arg- Py 2%
3128	17	<0.01	-	<0.01	0.01	-	0.	.08		Chloritic And - dis Py calc- Ep strngrs

#### 4. GEOPHYSICS

#### 4.1 VLF Survey

#### 4.1.1 Instrument and Survey Techniques

A Geonics EM-16 unit was used to carry out detailed surveys over five Three new grids were established around northwest-southeast grids. trending base lines to delineate airborne VLF conductors. Two old grids, Grid B (1981) and LS2 (1983) were extended. Grid B consists of east-west lines and Grid LS2 consists of north-south lines. Submarine transmitting stations in Seattle, Washington ('NLK' 24.8 kHz), Maine ('NAA' 17.8 kHz) and Annapolis, Maryland ('NSS' 21.4 kHz) were used. In- phase and quadrature readings were taken every 20 metres in a northerly or westerly direction to insure that south and east dips were indicated as negative readings. The in-phase dip angle readings were later reduced by the Fraser filter method (Fraser, 1969) to allow contouring of the data. Due to the orientation of the oblique grids and the receiving direction of the submarine transmissions, in-phase readings were filtered from southwest to northeast for Seattle data and from northeast to southwest for Maine and Annapolis data.

A total of 35 line kilometres were surveyed over the five grids: GN3, GN7, GN11, B, and LS2. All survey lines were established using Topolite hip chains and Silva Ranger compasses. Stations were marked with labelled orange flagging tape.

#### 4.2 Presentation and Discussion of Results

Results of the survey are shown on Maps 4.1 to 4.5 which show dip angle and filtered dip angle results over the five grids. The filtered inphase readings have been contoured at 10% intervals.

Over the GN3 grid eleven southwest-northeast lines were run using station 'NLK' (Seattle). The lines were spaced 200 metres apart and covered a total of 12.7 line kilometres. The results show a series of

north-south to northwest-southeast trending conductors with Fraser filtered values up to +50. These conductors coincide with anomalous gold values in 'B' horizon soils of up to 190 ppb.

The GN7 grid, Garnet Red Creek area, consists of six southwestnortheast trending lines spaced 200 metres apart. Readings were taken using station 'NSS' (Annapolis) over a total of 6 line kilometres. Only one conductor with filtered values of up to +26 was outlined. Overburden in this area is too deep (over 50 metres) for the EM-16 to penetrate.

The GN11 grid consists of nine southwest-northeast trending lines spaced 200 to 800 metres apart. Station 'NLK' (Seattle) was used to to cover 7.3 line kilometres. Overburden appears to be too deep for the EM-16 to penetrate in this area as well.

The 'LS2' grid was extended to the east. These lines run in a northsouth direction using station 'NSS' (Maryland) and 'NAA' (Maine). In 1981, east-west trending VLF lines were run in this area, but no strong conductors were picked up. In 1983 three north-south trending lines picked up a strong east-west trending conductor with Fraser filtered values of up to +73. The 1984 survey extended this conductor 500 metres. Geological investigation of the conductor discovered a silicified cataclastic limestone which appears to have been sheared. Gold values of up to 0.044 oz/ton were obtained from this outcrop.

The B grid, Bonnington Creek area, was originally surveyed in 1981. In 1984 intermediate lines were put in to disprove the north-south contouring of Fraser filter values. Station 'NLK' (Seattle) was used. Most conductors in this area appear to be caused by topographic relief.

#### 5. CONCLUSIONS

The results of the 1984 programme suggest that the G North property is a significant gold prospect. The most important findings of the programme may be summarized as follows:

- Anomalous gold, copper, molybdenum, arsenic, zinc and silver values were found in silt samples from Bonnington Creek. No outcrop could be found in this area.
- 2. Gold assay values from rock chip samples suggest that chloritic andesites and quartz stockwork in graphitic argillites of the Midas Formation may contain economic gold mineralization, especially in the vicinity of the old Gold Reef camp (LS2 grid area).
- 3. A strong VLF-EM conductor and anomalous silver, copper, molybdenum and zinc values in silts and soils in the area of Gold Reef (LS2 grid) coincide with a sheared cataclastic limestone carrying gold values of up to 0.044 oz/ton. This suggests that gold mineralization may be structurally controlled in shear zones within the Midas and/or Slide Formations.
- 4. 'B' horizon soil sample results in the GN3 area show spotty anomalous gold values coincident with VLF conductors. High gold values in soils are associated with the argillites over the LS2 conductor.

#### 7. RECOMMENDATIONS

Additional exploration consisting of VLF-EM surveys and trenching or diamond drilling is recommended for the property as outlined below.

- The sheared cataclastic limestone in the LS2 grid area should be investigated further. Geophysics, possibly an IP survey should be carried out to delineate the extension of this shear zone. Once extended this zone should be diamond drilled.
- The Bonnington Creek Garnet Red area should be investigated further. Due to the depth of overburden in this area special geophysical techniques are required. Pulse EM might locate a conductive body if it exists in the area.
- 3. The airborne mag survey shows that anomalous gold values in silts collected in 1984 and HMC samples from previous years occur within an area of low magnetics. This should be investigated further.

Respectfully submitted

. c. frege

J.C. Freeze, B.Sc.

V.J. Rub Sc. A.G.

#### REFERENCES

- Armstrong, J.E., Tipper, H.W., and Hoadley, J.W., 1946, Muller, J.E. and Tipper, H.W., 1961; Geology, McLeod Lake, British Columbia: Geological Survey of Canada, Map 1204A, scale 1:253,440.
- British Columbia Minister of Mines Annual Reports, 1933; McLeod River Area: p.Al00-Al04.
- British Columbia Minister of Mines Annual Reports, 1934; McLeod River Area: p.Cl3-Cl6.
- Fraser, D.C., 1969; Contouring of VLF-EM Data: Geophysics, v.34, No.6, p.958-967.
- Montgomery, J.H., 1981; McDougall River Gold Prospects: Engineers Report.
- Taylor, B., 1973; The Geology, Geochemistry and Ground Magnetics of the NICK Claims: Engineers Report.
- Wong, C. and Troup, A.G., 1981: Geology, Geochemistry and Geophysics of the G North Property: Engineers Report.

## STATEMENT OF QUALIFICATIONS

A.G. TROUP, P.ENG.

#### ACADEMIC

1967	B.Sc. Geology	McMaster University, Ontario
1969	M.Sc. Geochemistry	McMaster University, Ontario
PRACTICAL		
1981 -	3605 Creery Ave. West Vancouver, B.C	Consulting Geologist with Archean Engineering Ltd.
1977 - 1980	Geological Survey of Malaysia	Project Manager on a CIDA supported mineral explora- tion survey over peninsular Malaysia.
1969 - 1977	Rio Tinto Canadian Exploration Ltd. Vancouver, B.C.	Geologist involved in all aspects of mineral explora- tion in B.C., the Yukon and N.W.T.
1968	McMaster University Dept. of Geology Hamilton, Ontario	M.Sc. thesis work. Reconnaissance mapping and geochemical study, Lake Shubenicadia area, Nova Scotia.
1967 (summer)	Canex Aerial Exploration Ltd. Toronto, Ontario	Geologist in charge of detailed mapping and reconnaissance geochemical program in Gaspe, Quebec
1966 (summer)	Mcmaster University Dept. of Geology Hamilton, Ontario	Detailed and reconnaissance mapping in Northern Ontario.
1965 (summer)	International Nickel Co. of Canada Thompson, Manitoba	Detailed mapping in the Thompson area, Manitoba.
1964 (summer)	Geological Survey of Canada Ottawa, Ontario	Regional geochemical survey in the Keno Hill area, Yukon.

## STATEMENT OF QUALIFICATIONS

J.C. FREEZE (nee RIDLEY), B.SC.

### Academic

1978	B.A. Geography	University of Western Ontario	
1981	B.Sc. Geology	University of British Columbia	
Practical			
1981 - Present	Mark Management Ltd. Vancouver, B.C.	Project Geologist. Involved with geological, geochemical and geophysical aspects of precious metals exploration in B.C.	
1980 - 1981	Utah Mines Vancouver, B.C.	Temporary Summer and part- time Winter Geologist in Charge of mapping and diamond drilling of a coal property in N.E. B.C. logging of rotary drilling chip samples on another coal property in N.E. B.C.	
1979	Utah Mines Vancouver, B.C.	Temporary Summer. Recon- naissance and detailed mapping, logging of diamond drill core on coal proper- ties in N.E. B.C.	

#### <u>COST STATEMENT</u> <u>EZEKIEL EXPLORATION LTD.</u> <u>G NORTH CLAIMS</u> <u>30 MAY - 5 NOVEMBER 1984</u> <u>GEOLOGY, GEOCHEMISTRY AND GEOPHYSICS</u>

#### GENERAL COSTS

Food and Accommodation 7 persons, 163 Mandays @ \$23.21		\$ 3,784.04
Fuel		593.08
Shipping and Postage		117.30
Supplies		2,914.89
<u>Helicopter</u> Capital, 28Jul-31Aug, 12.8hrs @ \$452.99		5,798.32
Field Telephone Service		182.75
Repairs		891.93
Greyhound Bus, 1 Fare		48.20
Rental Equipment Ezekiel SBX-11A, 37 days @ \$11 Mark 4wd Bronco, 37 days @ \$43 Airways 4wd Blazer, 24-25May, 24-25Jul, 16-20Aug 9 days @ \$30 Ezekiel Camp Equipment, 163 mandays @ \$6 Cabat's Trailer, 26-29Jul U-Haul Trailer, 30-31Aug	\$ 407.00 1,591.00 270.00 978.00 100.30 77.38	3,423.68
<u>Consultant Fees</u> Archean Engineering		2,969.50
Field Project Preparation		2,698.27
Report Preparation	5,174.00	
TOTAL GENERAL COSTS		\$28,595.96 =======

## AIRBORNE GEOPHYSICS COST

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Questor Surveys Limited	\$18,428.75
GEOLOGICAL SURVEY COST	
<u>Salaries and Wages</u> 5 persons, 12 mandays @ \$79.17	\$ 949.99
Benefits @ 20%	190.00
General Costs Apportioned 12/148 x \$28,595.96	<u>2,318.59</u>
TOTAL GEOLOGICAL SURVEY COST	\$ 3,458.58 =======
GEOCHEMICAL SURVEY COST	
<u>Salaries and Wages</u> 7 persons, 68 mandays @ \$76.80	\$ 5,222.67
Benefits @ 20%	1,044.53
Assays and Analyses       - Chemex Labs         Supplies       \$ 110.00         101 soil for Cu, Mo, Pb, Zn, As, Au @ \$13.65       1,378.65         8 Silt for Cu, Zn, As, Au @ \$11.85       94.80         74 Silt for Cu, Pb, Zn, Ag, Au @ \$8.93       660.70         25 Silt for Cu, Mo, Pb, Zn, Ag, As, Au @ \$27.85       696.25         47 HMC for Au @ \$17.79       836.25         50 HMC for 24-Element ICP @ \$13       650.00         25 HMC for Cu, Mo, Pb, An, Ag, As, Au @ \$14.55       363.75         19 Rock for Cu, Pb, Zn, Ag, Au @ \$30.75       584.25         2 Rock for Cu, Mo, Pb, Zn, As, Au @ \$16.70       33.40         9 Rock for Cu, Mo, Pb, Zn, As, Ag, Au @ \$44.75       402.75	5,810.55
General Costs Apportioned 68/148 x \$28,595.96	
TOTAL GEOCHEMICAL SURVEY COST	<u>13,138.68</u> \$25,216.43
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# GROUND GEOPHYSICAL SURVEY COST

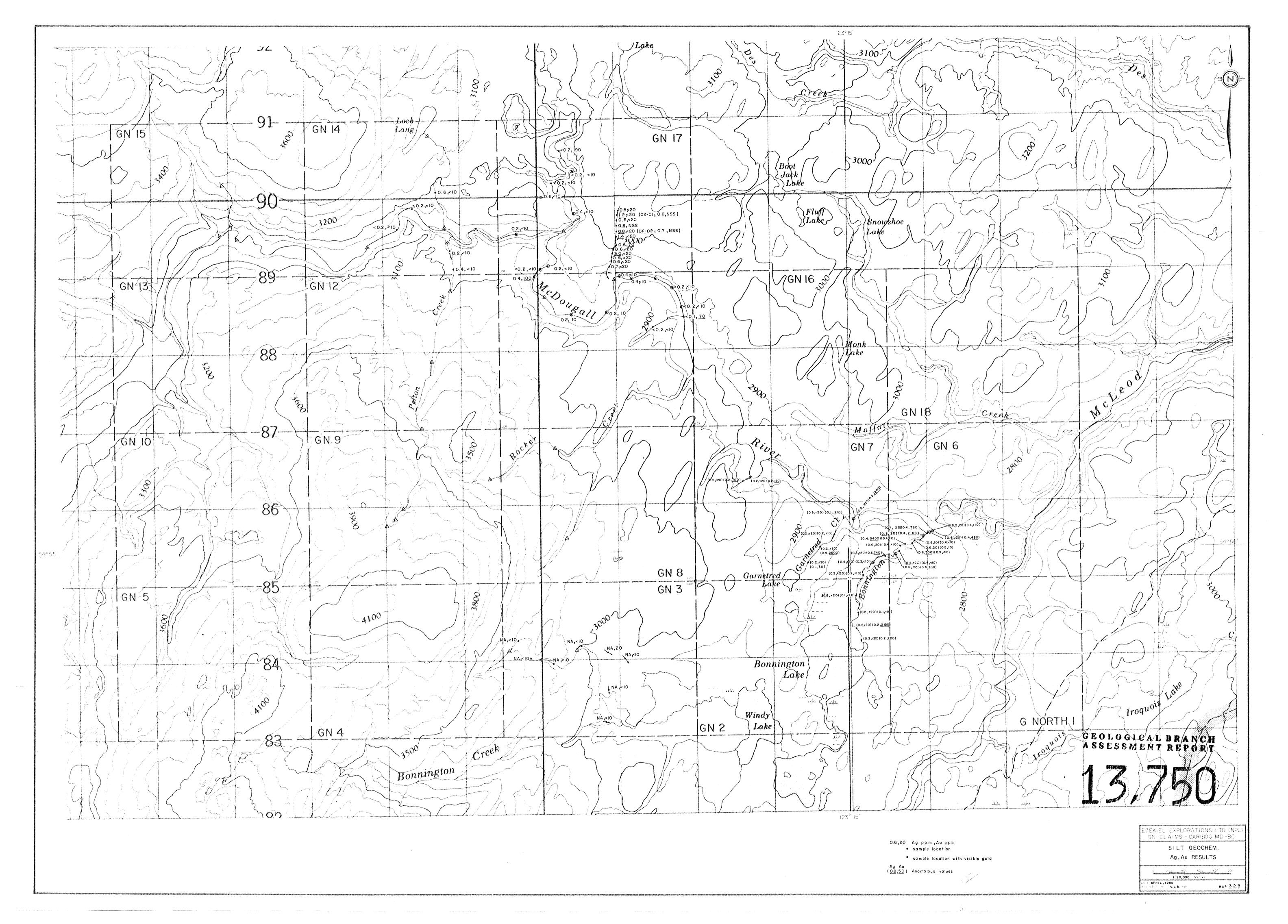
<u>Salaries and Wages</u> 6 persons, 68 mandays @ \$87.69	\$ 5,962.92
Benefits @ 20%	1.157.84
Equipment Rental 2 Geonics EM-16, 25Jul-31Aug, 38days @ \$27	2,052.00
General Costs Apportioned 68/148 x \$28,595.96	13,138.68
TOTAL GEOPHYSICAL SURVEY COST	\$22,311.44

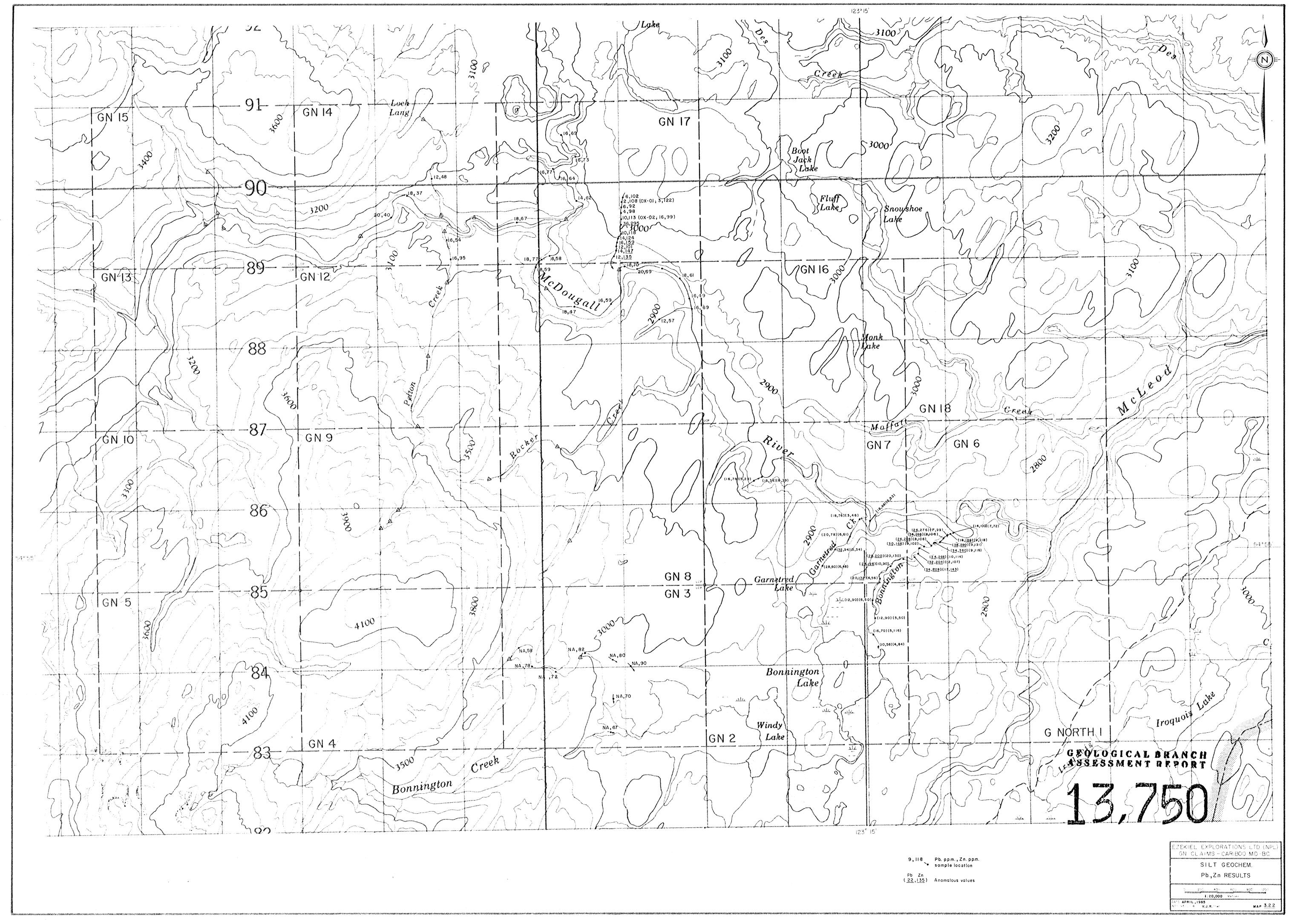
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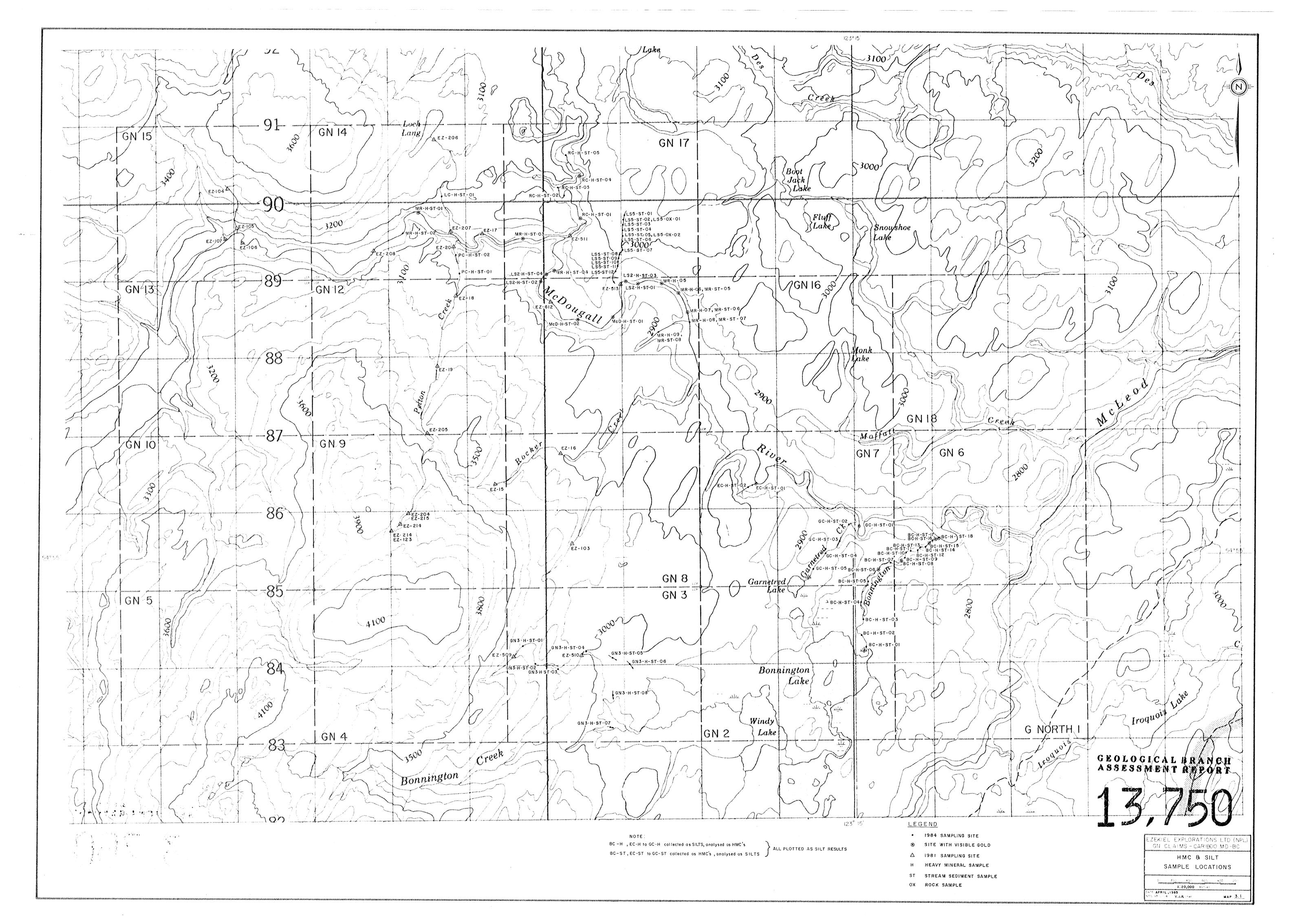
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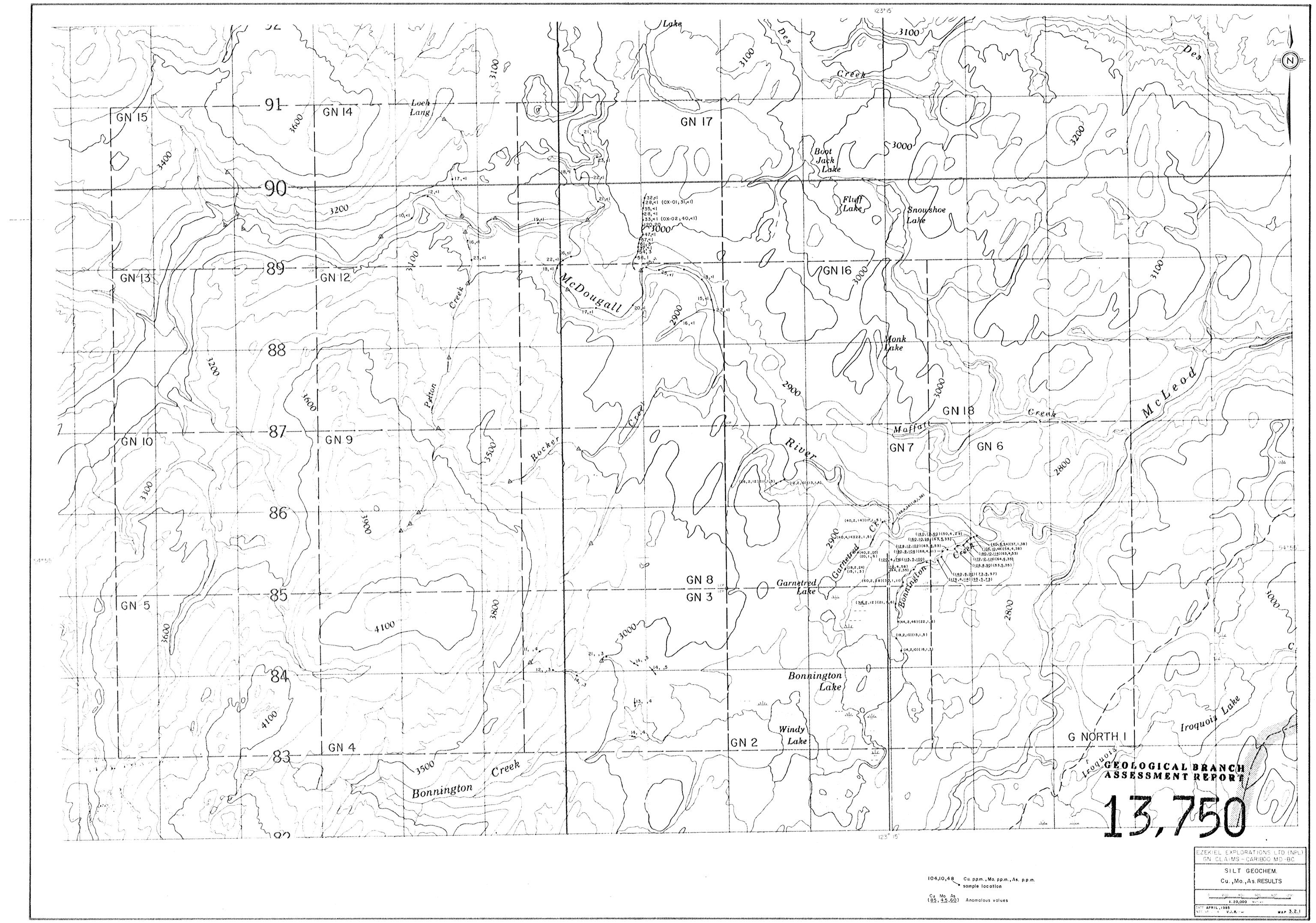
GRAND TOTAL 1984 SURVEYS

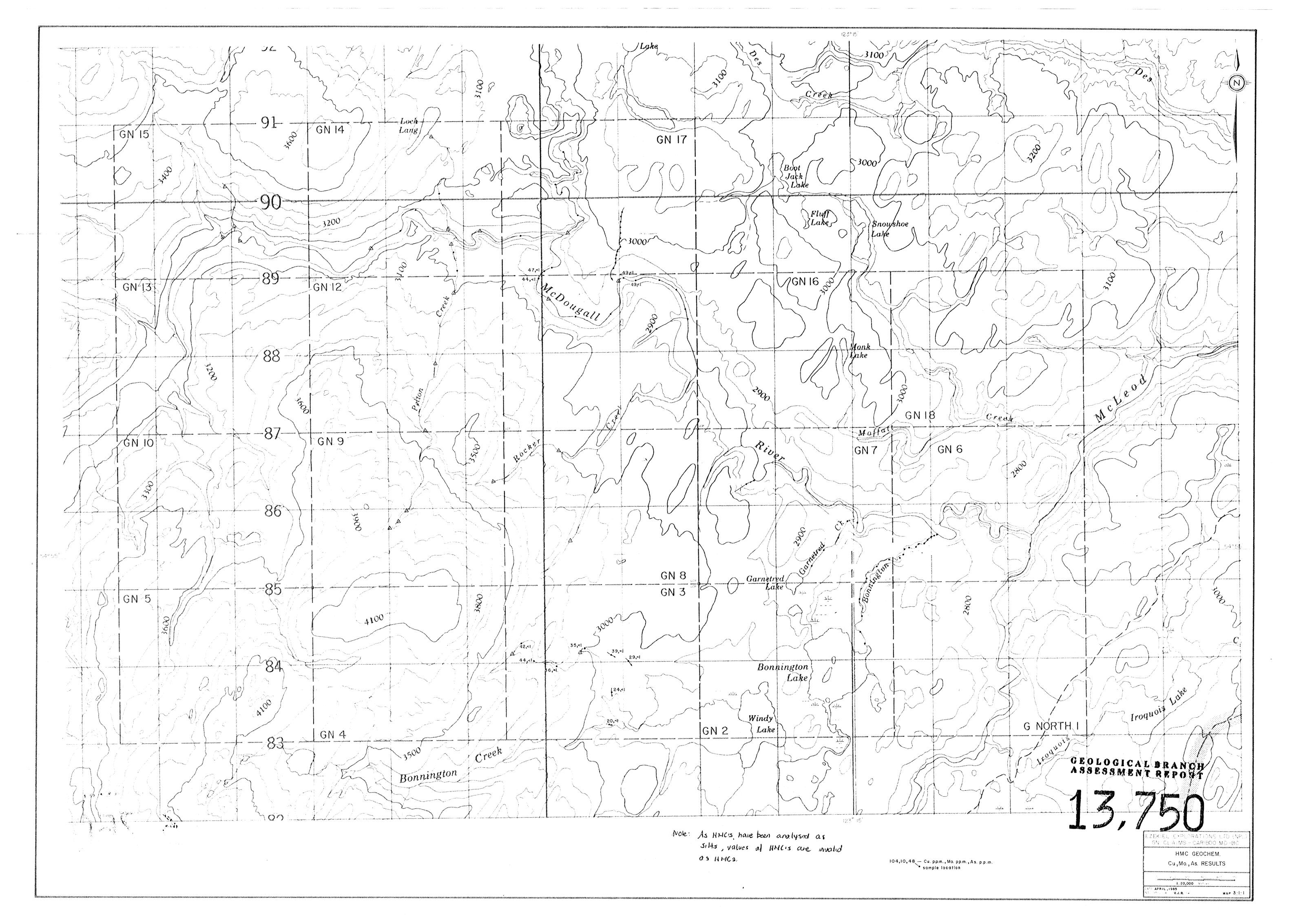
		=========		=========
\$ 3,458.58	\$ 25,216.43	\$ 22,311.44	\$ 18,428.75	\$69,415.20
<u>Geological</u>	<u>Geochemical</u>	<u>Ground</u> Geophysical	<u>Airborne</u> Geophysical	TOTAL

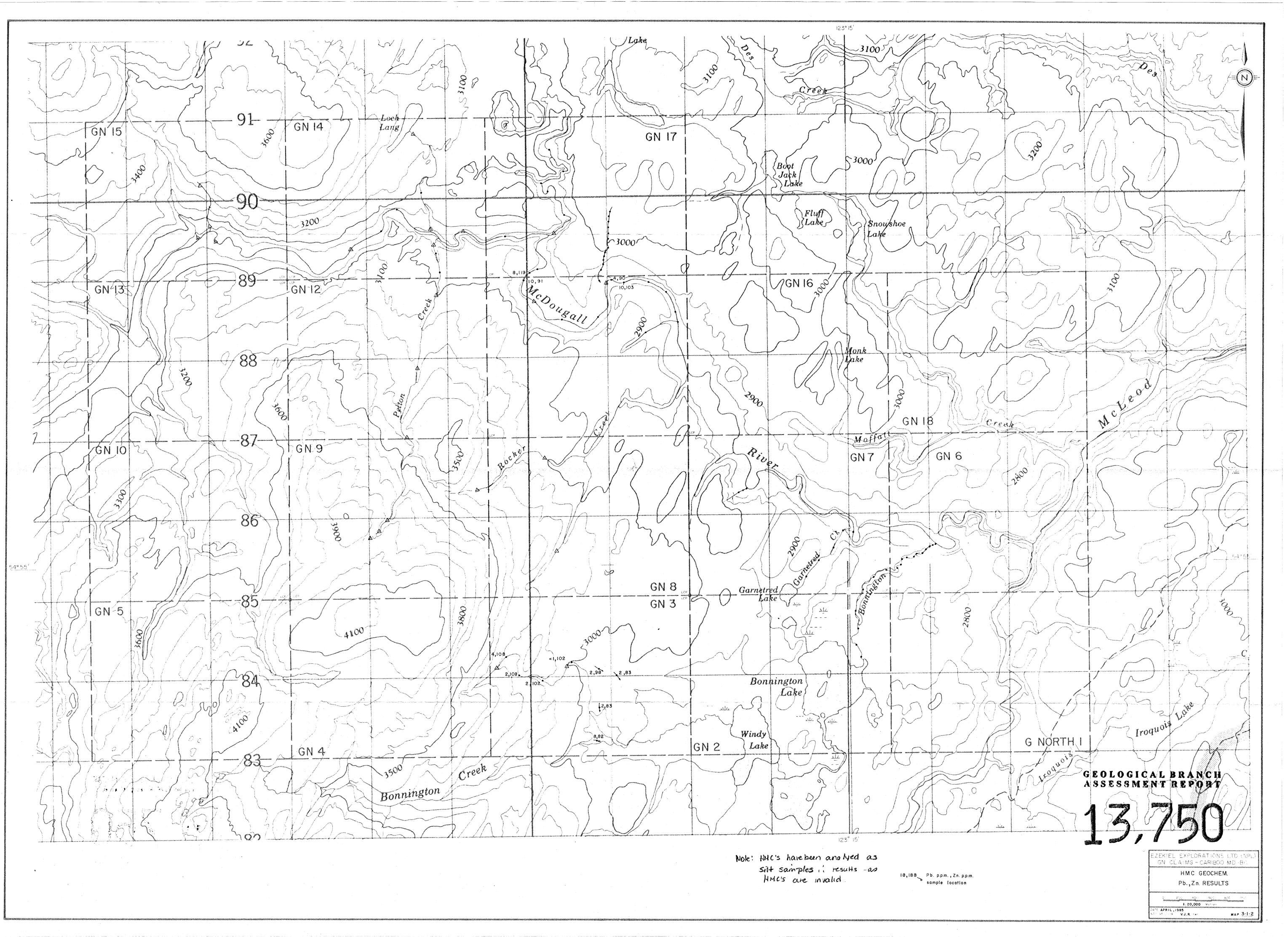


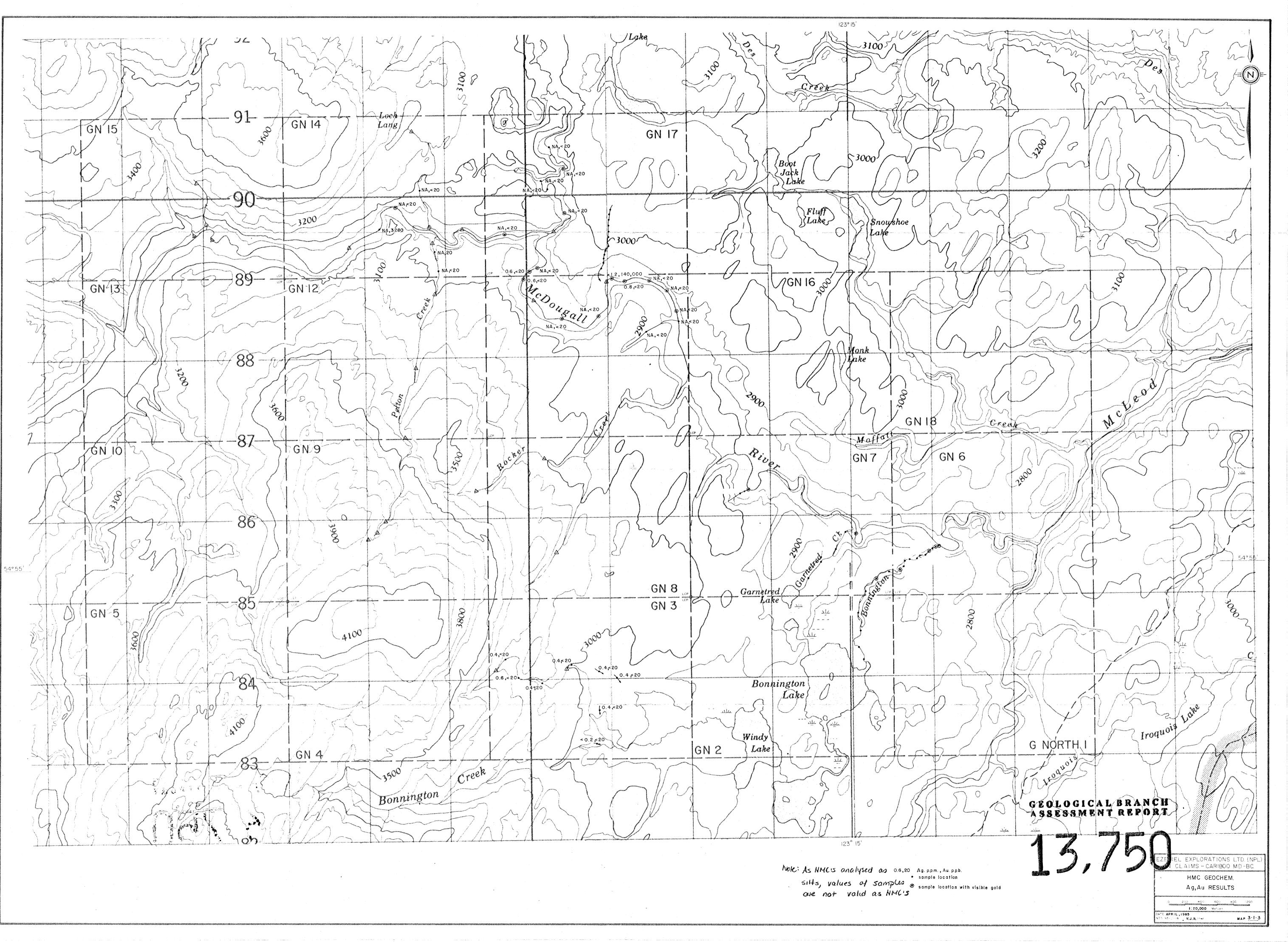


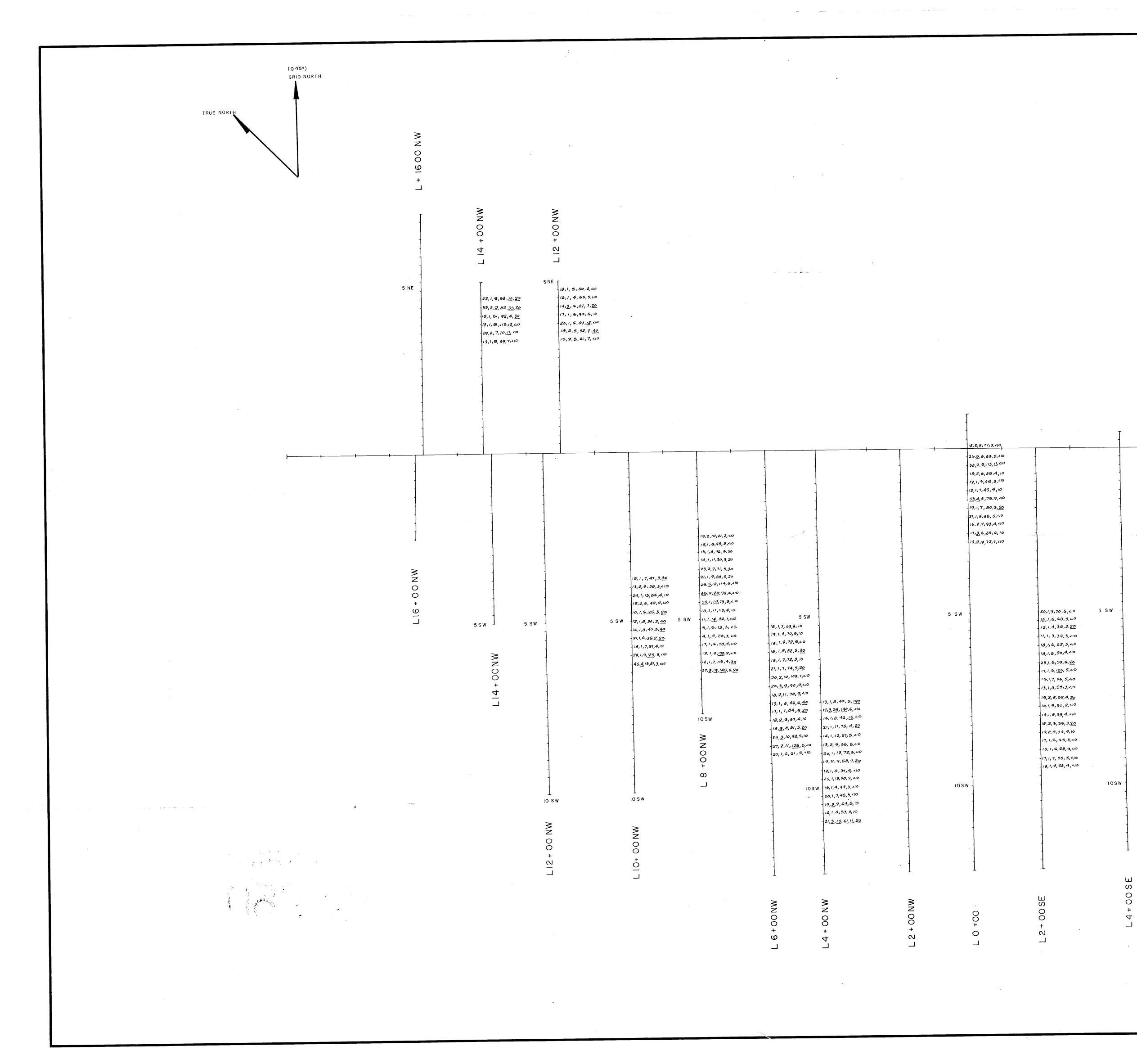












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LEGEND: \_\_\_\_\_\_\_ppm\_\_\_ppb \_\_\_\_\_\_ppm\_\_\_ppb Cu,Mo,Pb,Zn,As,Au RESULTS

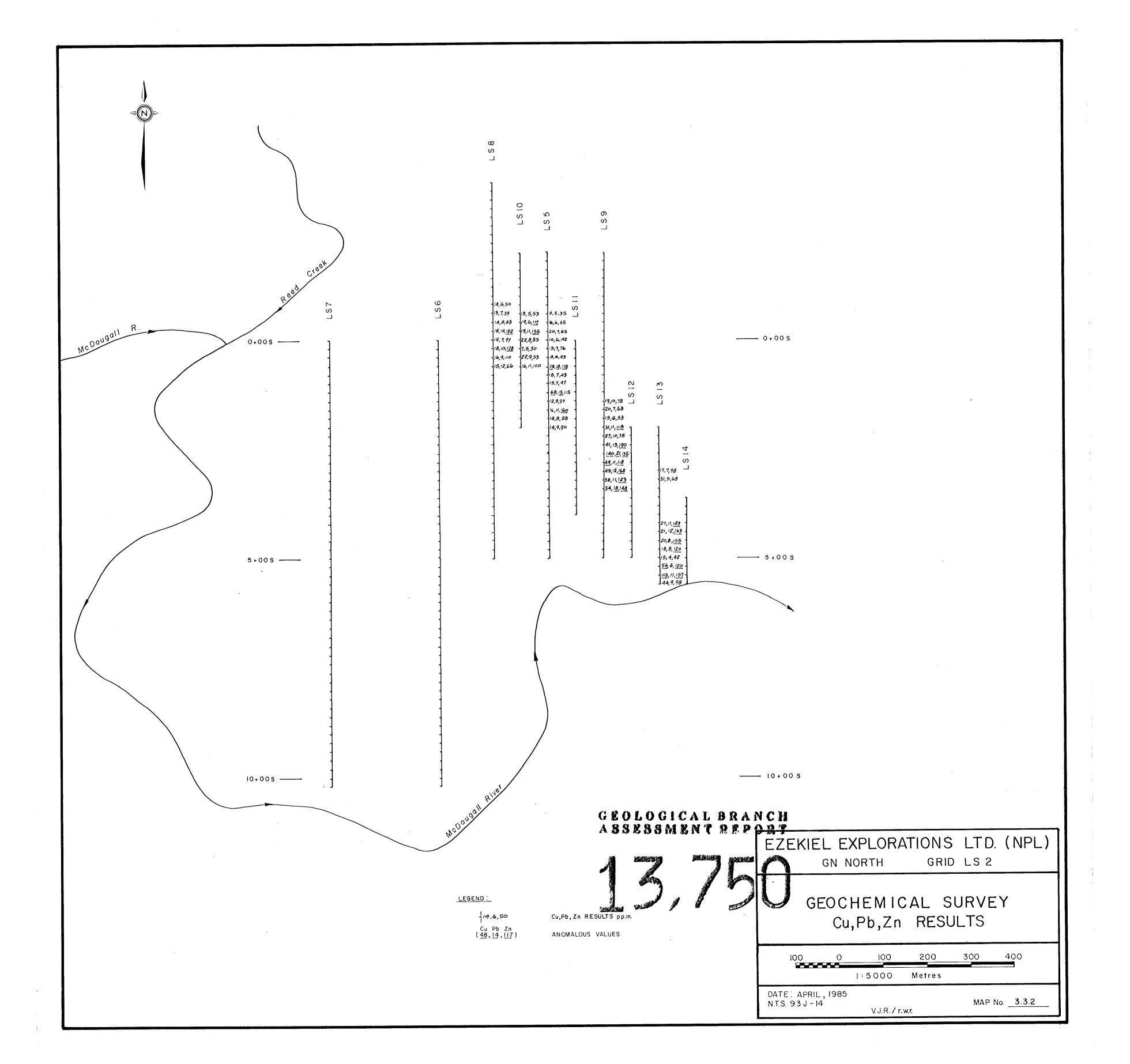
(<u>48,3,14,117,10,20</u>) ANOMALOUS VALUES

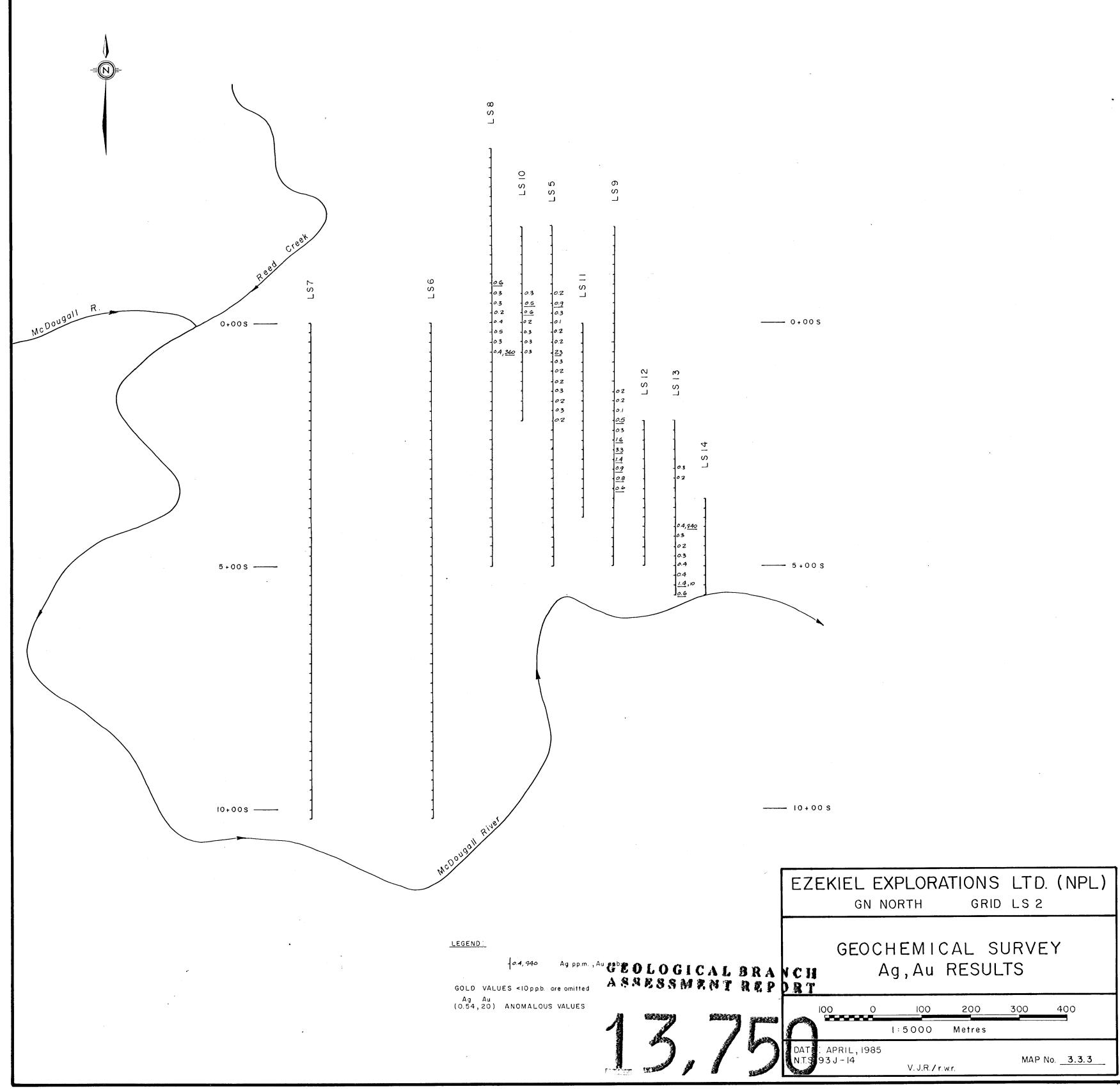
GEOLOGICAL BRANCH A88E88MENT REPORT

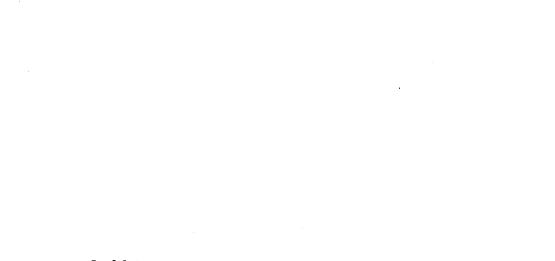
MAP No. 3.3.1

EZEKIEL EXPLORATIONS LTD. (NPL) GN CLAIMS GRID GN-3 GEOCHEMICAL SURVEY

DATE: APRIL, 1985 NTS 93J-14 V.J.R./r.w.r.

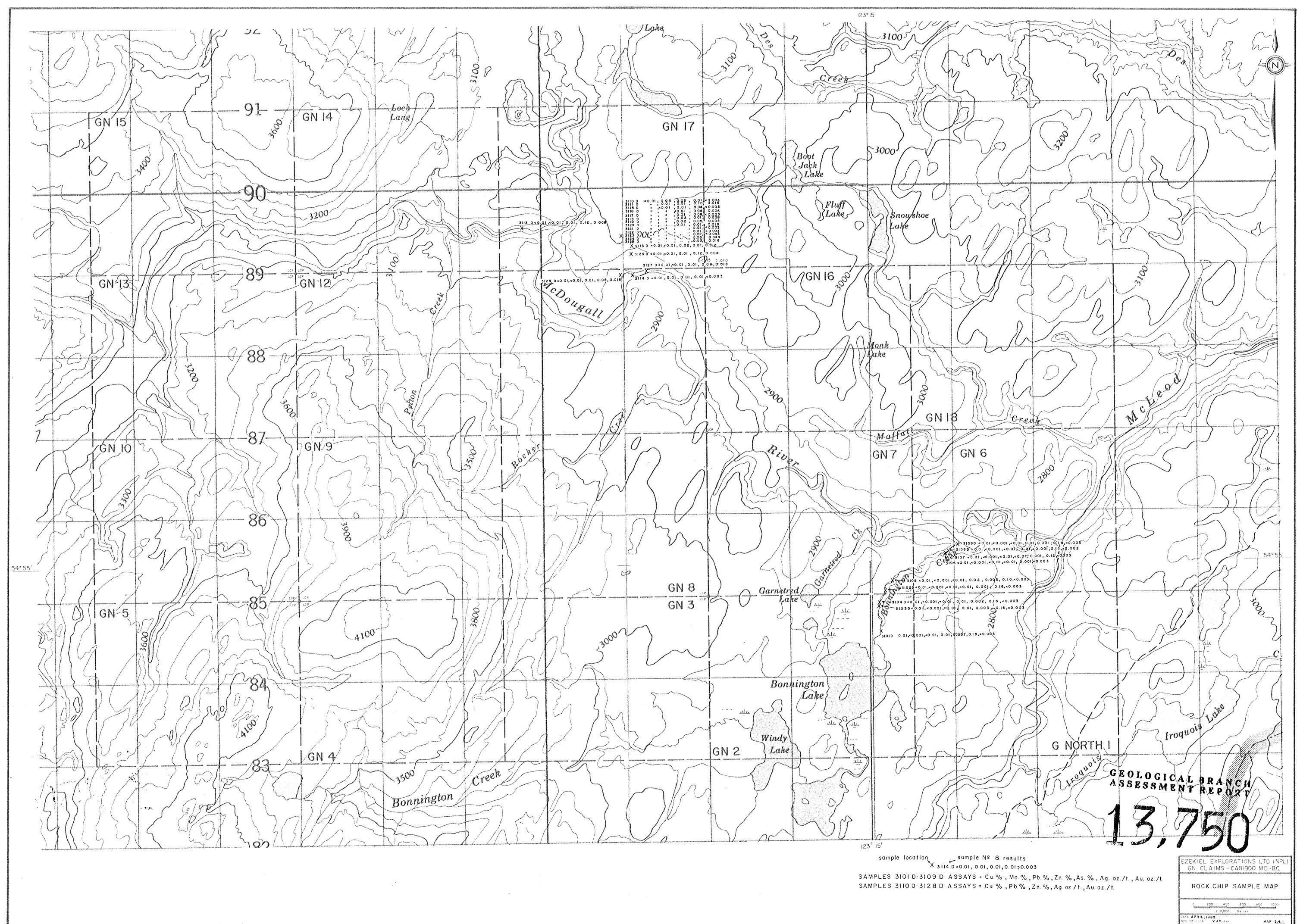








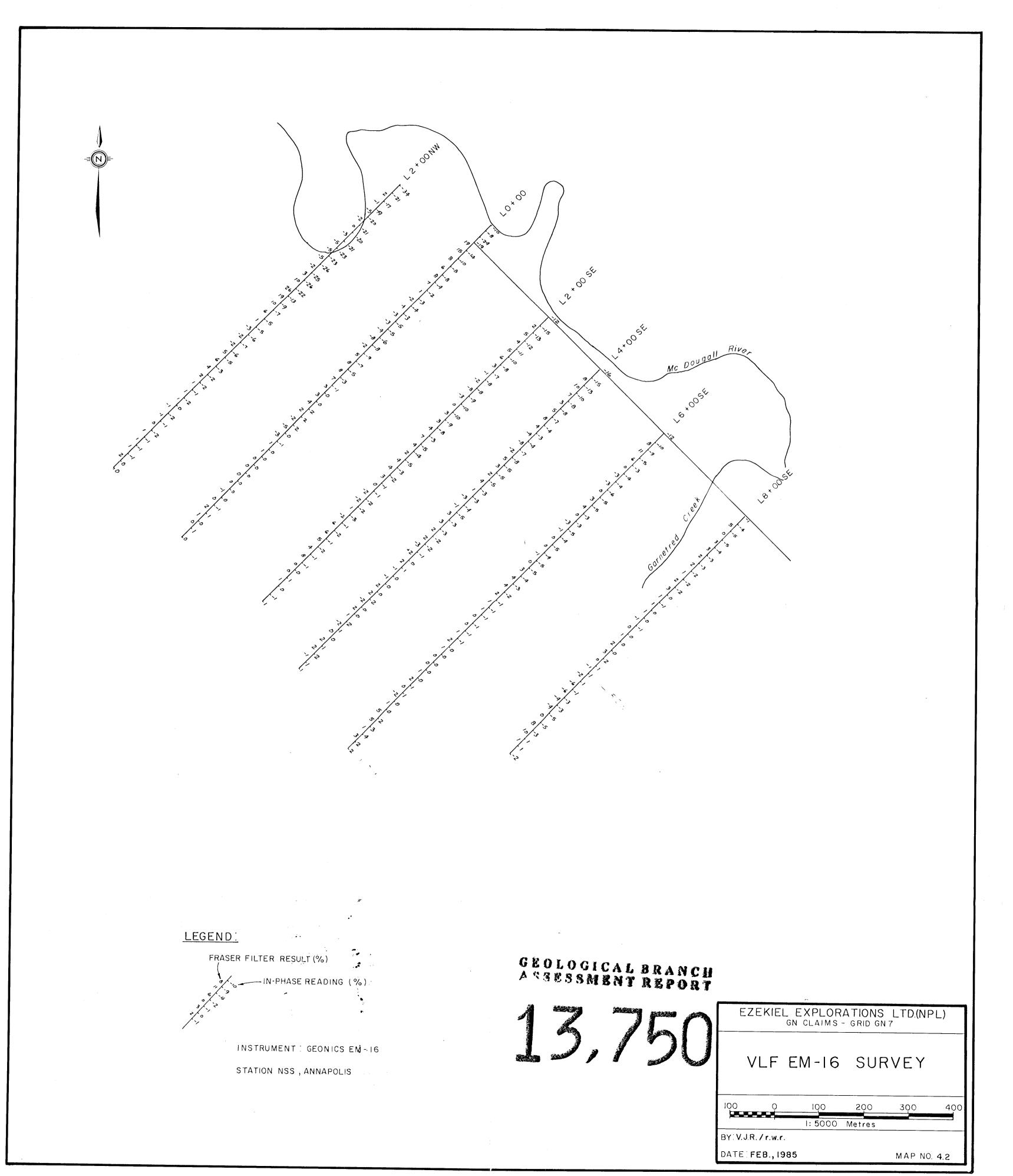




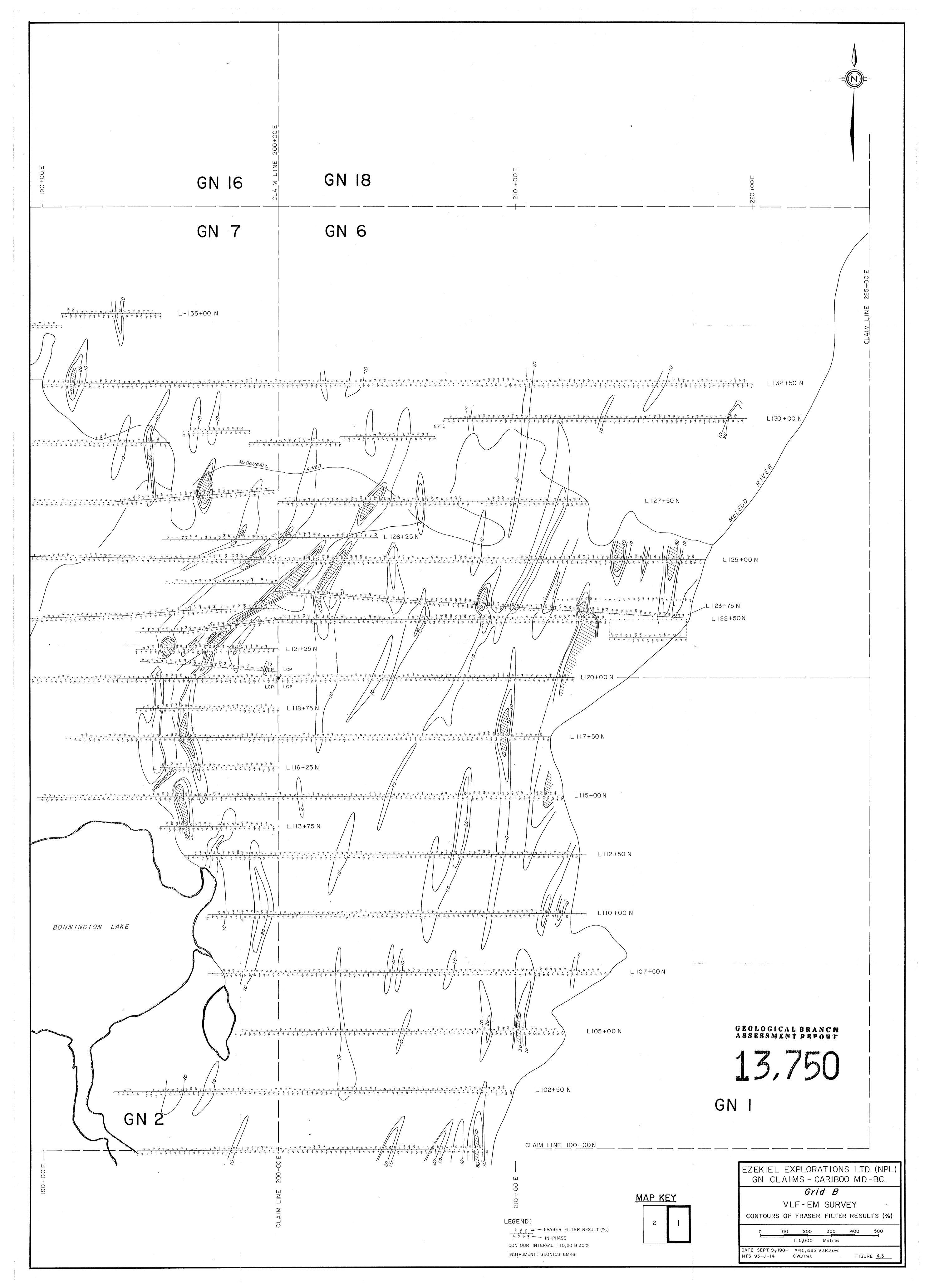


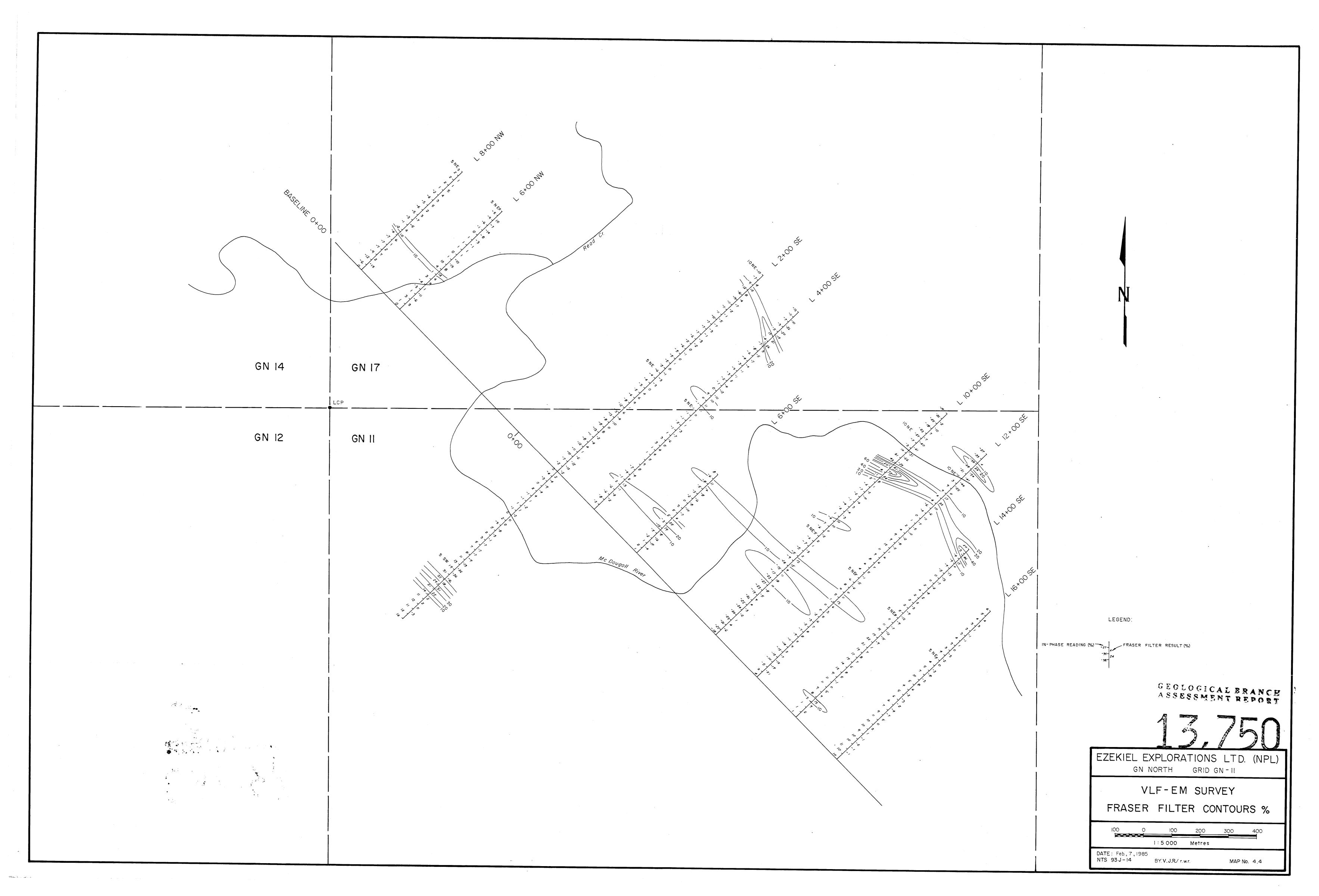
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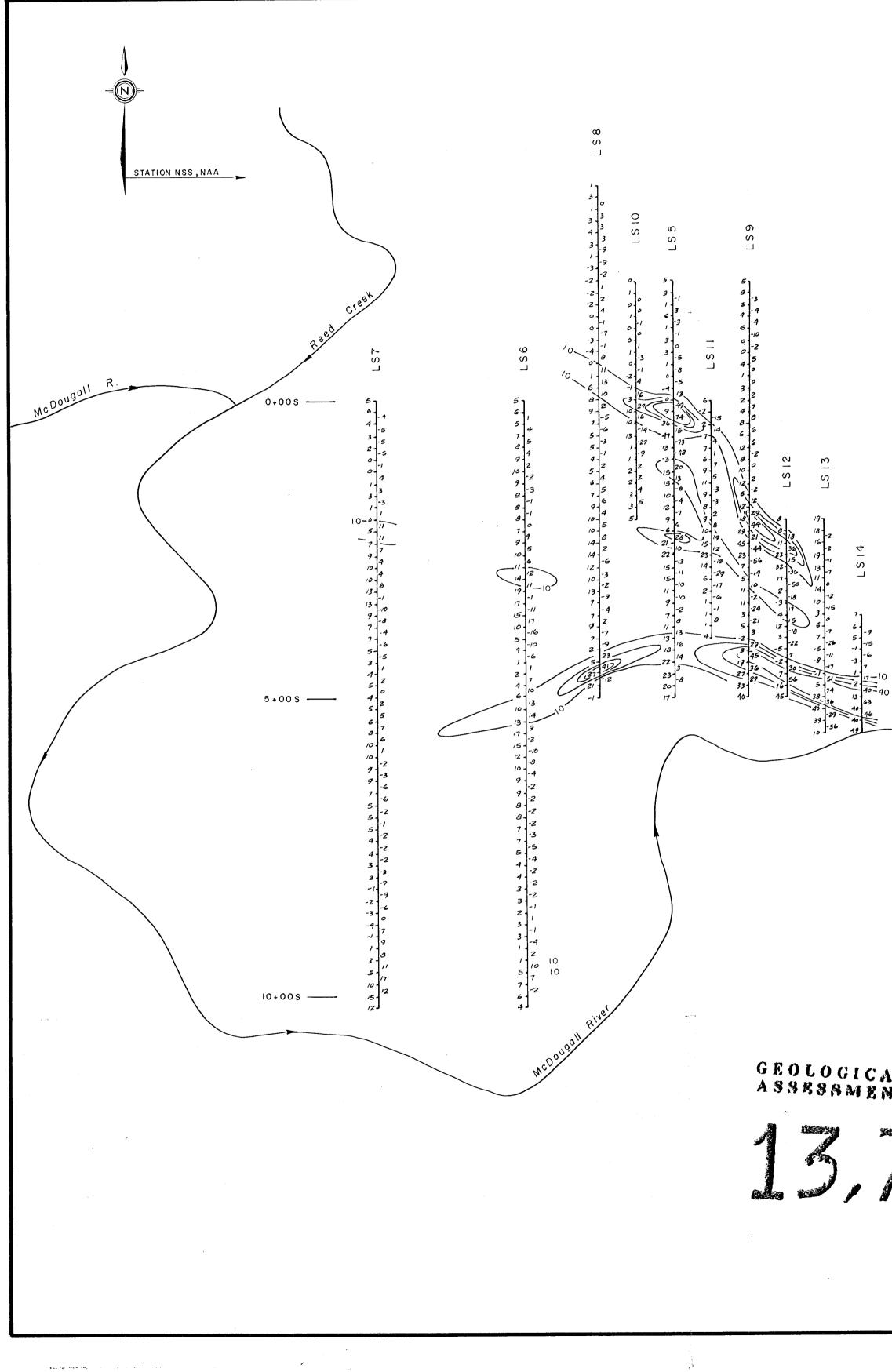
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----- 0+00s LEGEND: INPHASE READING (%) FRASER FILTER RESULT (%) CONTOUR INTERVAL = 10% INSTRUMENT : GEONICS EM-16 ----- 10+00 S GEOLOGICAL BR. KIEL EXPLORATIONS LTD. (NPL) GRID LS 2 GN NORTH Section 4 VLF-EM SURVEY 100 0 100 200 300 400 1:5000 Metres DATE : APR., 1985 N.T.S. 93 J - 14 MAP No. 4.5 V.J.R. 🖌 r.w.r.

Γ.							
	SAMPI		C u %	РЬ %	Zn %	Ag(fa) oz/t	Au(fa) oz/t
	3110	D	<0.0I	0.03	0.03	0.01	<0.003
	3111	D		0.01	0.01	0.10	0.016
	3115	D		<0.01	10.01	0.04	<0.003
	3116	D	14	11	<0.01	0.04	0.006
	3117	D	11	18	0.01	0.08	< 0.003
	3118	D	14	14	0 0 2	0.01	0.008
	3119	D	11	н	0.02	0.05	0.008
	3120	D		a.	0.01	10.0	0.016
	3121	D	18	14	18	0.01	<0.003
	3122	D		и	u.	0.01	< 0.00 3
	3123	D	Ð	14	-11	0.02	< 0.003
	3124	D	н	44		0.06	0.044
	3125	D		11	18	0.03	0.016

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## LEGEND

ATTITUDE OF SILICIC & PHYLLIC ALTERATION CONTACT STRIKE & DIP OF FRACTURES STRIKE & DIP OF FOLIATIONS 50 VERGENCE STRUCTURE OBSERVED IN QUARTZ STRINGER ALTERATION CONTACT THROUGH CATACLASTIC LIMESTONE 1 APPROXIMATE EXTENT OF OUTCROP AS3116. HAND SAMPLE LOCATION ---- CHANNEL SAMPLE LOCATION - 2 metre intervals AS 3122 AS 3123 generative Constants . · · 

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