

ASSESSMENT REPORT DESCRIBING
PRELIMINARY GEOLOGICAL, GEOPHYSICAL AND GEOCHEMICAL SURVEYS
OF PROSPECTING PERMITS 1164, 1165 AND 1166
BOUNDED BY
LONGITUDES 82°15' TO 83° AND LATITUDES 67° TO 67°15'
CARRIED OUT BETWEEN
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1. SUMMARY

An integrated mineral exploration program has been completed by Barringer Geoservices over part of the Melville Peninsula, NWT where Archean Penrhyn Group rocks locally host intense limonitic gossans. This report details the field investigations carried out between August 19 and September 15, 1989. Many of the gossans, areas of rusty weathering, and strong copper-nickel-zinc lake sediment geochemical anomalies are within exploration permits 1164, 1165, and 1166 currently held by Borealis Exploration. The field program confirmed the earlier geological concepts and proved numerous occurrences of widespread base metal mineralization in a geological environment similar to that hosting large, economic sulfide deposits elsewhere.

The occurrence of ultramafic rocks within the granite-gneiss correlates with the original intense magnetic anomaly and supports the presence of a larger ultramafic at depth. In addition, mafic intrusives occur as lenses and bodies within the metamorphic Penrhyn rocks and have been mapped at three of the six grids in the permit area. These occurrences of mafic and ultramafic rocks confirm the original concept and emphasize the Ni-Cu potential of the permit area.

Six targets within the permit area were selected for initial detailed evaluation based upon a combination of 1) anomalous lake sediment geochemistry, 2) interpretation of existing airborne magnetic and electromagnetic data, 3) examination of geological structure revealed by the processing of satellite imagery and air photo interpretation followed in the field by, 4) geological mapping and prospecting, 5) soil and rock geochemical sampling, and 6) ground electro-magnetic (GENIE) surveys. As a result of this integrated exploration a number of potential drill locations have been defined within these targets.

A separate report is being prepared referring to items 1), 2) and 3) above.

Within Grid 1, a strong Cu-Ni-Zn soil anomaly about 200 meters long displays a close spatial relationship to a gossan and a steeply dipping EM conductor. A mafic intrusive lens was noted in the adjacent marbles. The correlation of these parameters suggests the presence of a concealed base metal sulfide concentration within the high grade metamorphic rocks.

Although a gossan in Grid 2 is closely associated with a large soil Cu anomaly, the geophysical expression is ambiguous. However, the folding and shallow plunge to the east may indicate potential sulfides in depth to the east of the grid.

High Cu-Ni-Zn values, detected in sulfide mineralized sericite schist float from Grid 3 suggests that this rock type could be the source of some of the soil and lake sediment anomalies in the area. However, strong coincident northwest trending geochemical and geophysical anomalies in the southern part of Grid 3 are presently not explained and may relate to concentration along a structural zone. Mafic intrusive lenses were noted in the marble outcrops on the southern boundary of this grid.

A similar association between geology, geochemistry, and geophysics exists on Grid 4 where disseminated pyrite and pyrrhotite occur in various quartz-rich phases of a quartz-biotite schist. The relatively high nickel values suggest the presence of mafic rocks.

The geochemistry on Grid 5 shows higher nickel values throughout the sampled area correlating with a sulfide-bearing amphibolite body. A weak conductor crosses the area surveyed and may indicate a deeper massive sulfide body.

A narrow but strong gossan zone occurs on grid 6 associated with a strong conductor. The relatively high Ni and Zn values in the southwest section of this grid suggest the occurrence of mafic rocks.

Because the general exploration concepts and potential of the area have been verified by the work covered in this report it is recommended that a major, integrated exploration program be mounted in 1990. Geology and geochemistry should be combined with deep penetration geophysics, either from the air and/or on the ground and should be followed by drilling.

2. INTRODUCTION

Much of the south-central Melville Peninsula is underlain by folded metamorphic rocks of the Archean Penrhyn Group. Locally, these rocks often display areas of intense rusty weathering and also host small limonite gossans. Areas of rusty weathering and gossans are particularly common along a 20km belt of Penrhyn Group rocks located about 15km northwest of Freuchen Bay. Although disseminated pyrite and pyrrhotite are often spatially associated with spectacular surface iron staining, oxidation is essentially total within the main gossanous zones and sulfide minerals are rare.

High levels of Cu, Ni and Zn in bottom sediment from several lakes in the area near gossans suggest that concealed base metal sulfides may be more abundant below the zone of intense surface weathering. Exploration to date has consisted of surface mapping, prospecting, geochemistry, and geophysics. The initial emphasis

has been on areas selected from the integration of numerous parameters. This exploration has confirmed the surface evidence of sulfide concentrations in a geological environment similar to that which hosts major sulfide deposits such as those at Thompson, Manitoba and Broken Hill, Australia.

This report describes the results of exploration carried out between August 19th and September 12, 1989 by Barringer Geoservices over selected sections within three exploration permit areas, numbers 1164, 1165 and 1166. These permit areas, which enclose a number of gossans and geochemically anomalous lakes were granted to Borealis Exploration in 1989. Their location, shown in Figure 3.1 is located by longitudes 82°15' to 83° and by latitude 67°15'.

The first exploration objective was to ground truth anomalous airborne magnetic and electromagnetic anomalies, as well as structural features interpreted from airphotos and satellite images. This initial interpretation focussed on areas of anomalous lake sediment geochemistry. The initial field investigations were used to select six targets within the exploration permit areas and two other targets still within the Area of Mutual Interest.

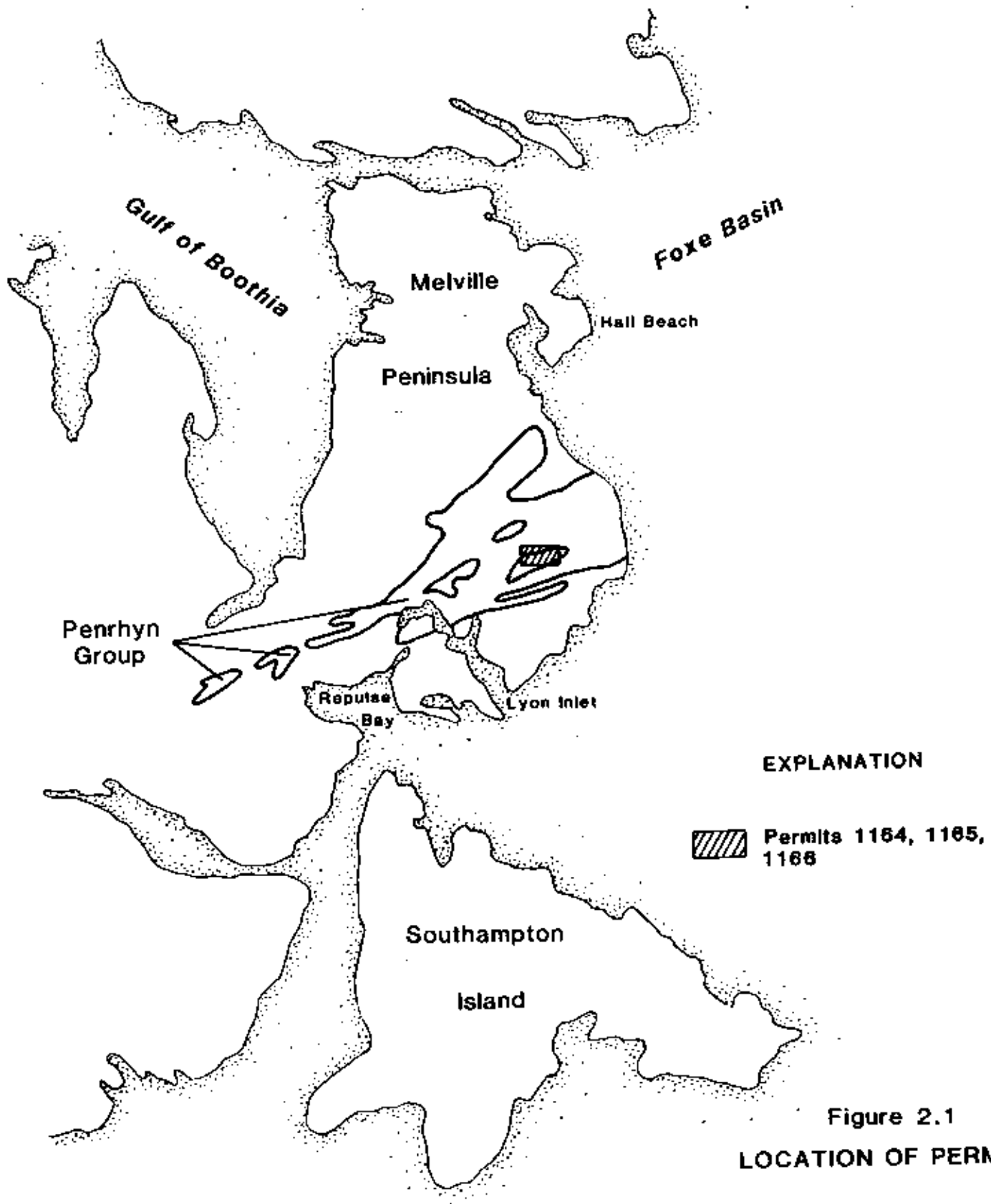


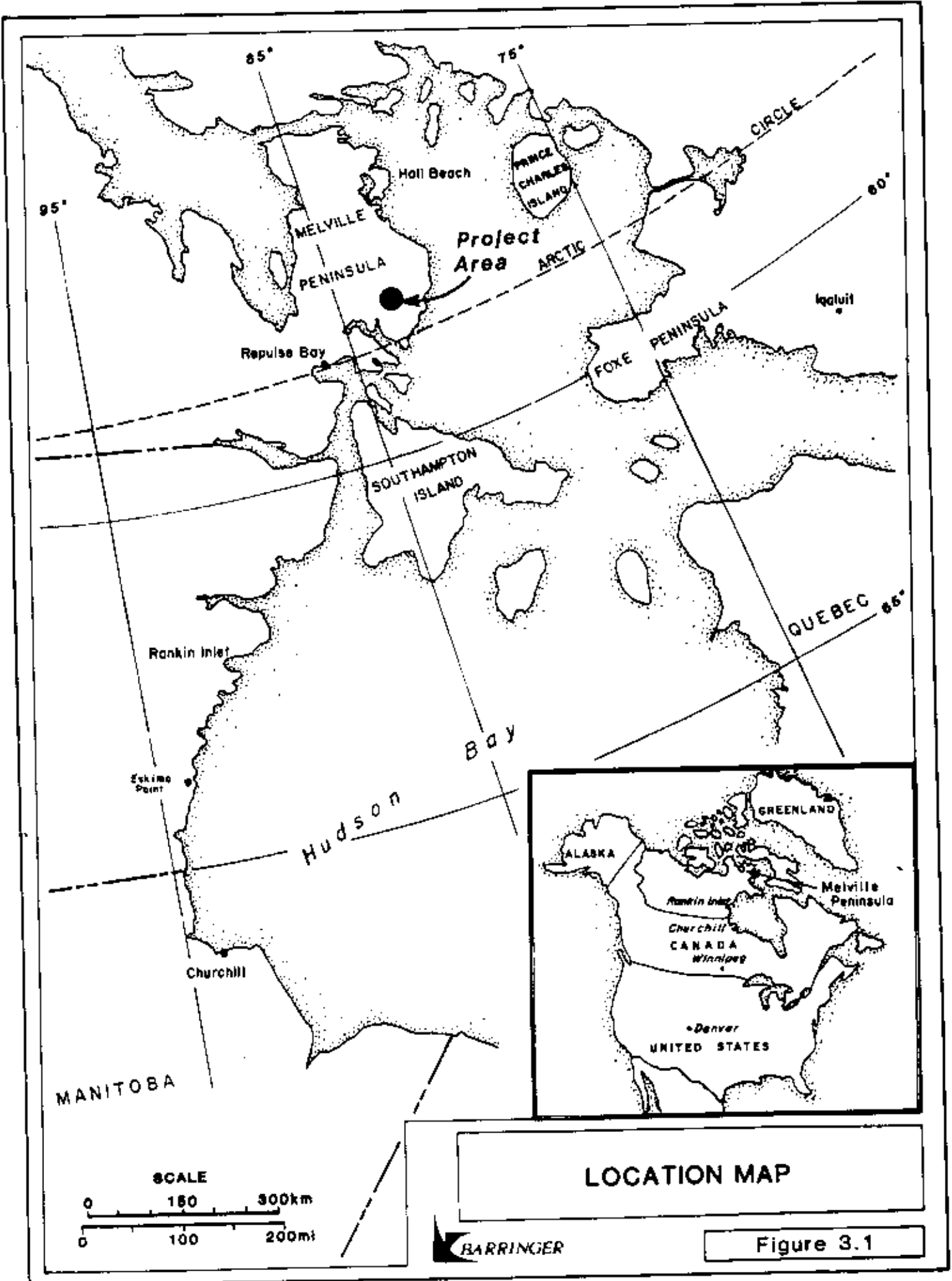
Figure 2.1
LOCATION OF PERMITS

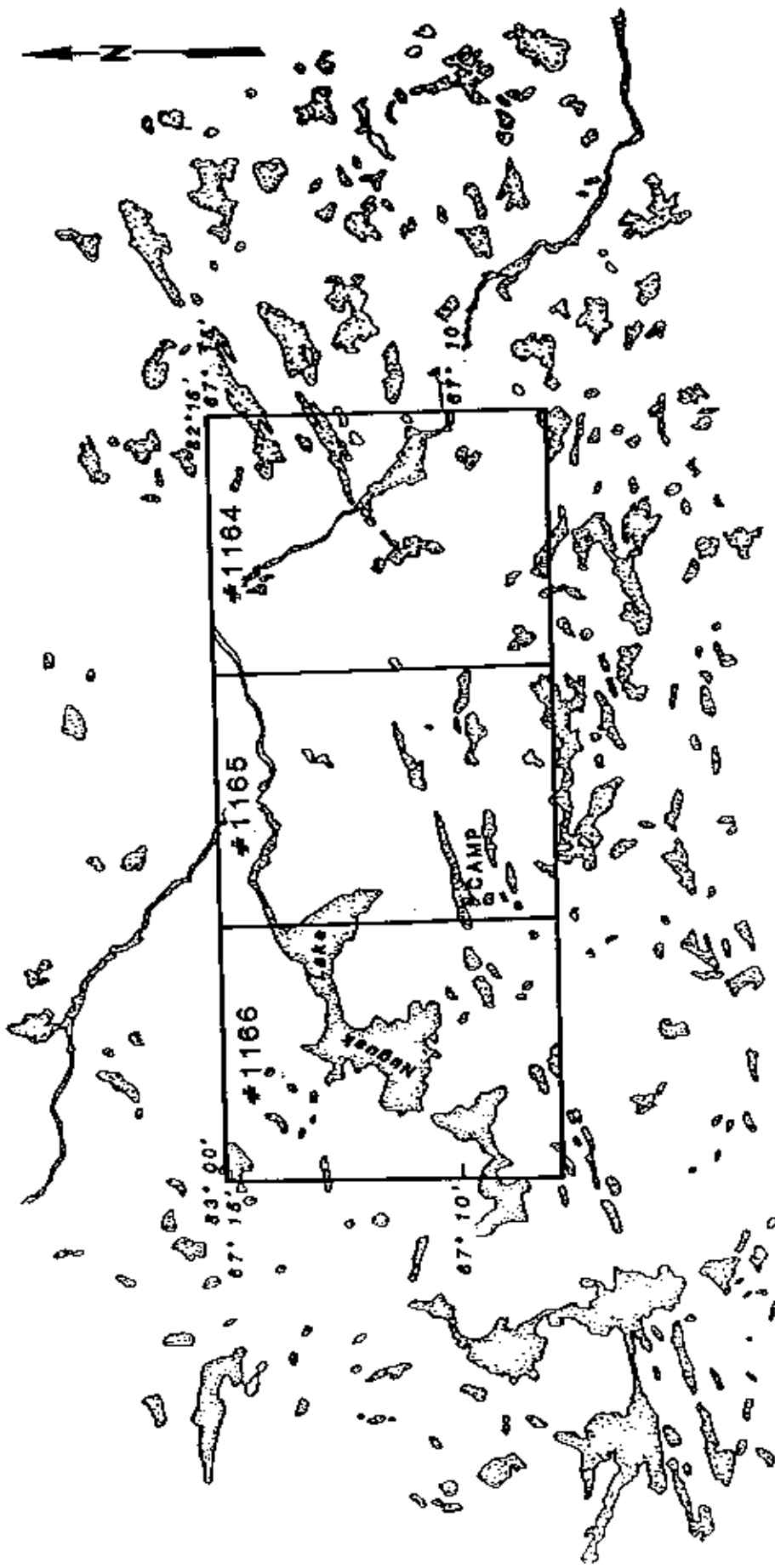
The second objective was to explore these targets by systematic geological mapping, geochemical sampling, and ground geophysical surveys in order to evaluate the economic potential and select drill targets as appropriate.

The report first describes the area and a brief history of exploration followed by the regional and local geology. The report then discusses the exploration approach and techniques used prior to a detailed description and discussion of results from each of the 6 grid areas explored in some detail. Conclusions and recommendations conclude the report. A statement of qualifications of the authors of the report and a list of personnel involved in the project are given in Appendix 1 and 2.

3. LOCATION AND ACCESS

The location of the project area is shown in Figure 3.1. The permit areas are 190km south of Hall Beach and 155km northeast of Repulse Bay. Frequent, scheduled flights from Yellowknife, Montreal, Quebec and from Churchill via Rankin Inlet service these hamlets. During the present exploration program, equipment, supplies and personnel were transported to a camp within permit area 1165 from Repulse Bay by Bell 206B helicopter, a float





LOCATION OF PERMITS

Figure 3.1a

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equipped Beaver aircraft and by a Twin Otter fitted with tundra wheels. The use of these three aircraft related to their availability and the shortness of the field time, before winter conditions prevailed. Early in the program a 200 meter long landing strip was established for Twin Otter flights on an esker about 19 kilometers northwest of the camp. Towards the end of the program as the ground became frozen a second strip about 10km due east of the camp was used. A single side band radio telephone was installed at the camp, but despite frequent attempts, communications were unsuccessful with this system possibly because of severe sun spot activity. However, radio contact on a local frequency to Repulse Bay was successful throughout the program.

4. EXPLORATION HISTORY

Geology of the Melville Peninsula including the permit areas and Area of Mutual Interest has been mapped at a scale of 1:506,880 by Heywood (1967). Sulfide bearing gossans were examined by Borealis in 1969 (Underhill, D. H., 1969) following an airborne radiometric survey, and in 1970 Aquitaine followed this up with more detailed airborne magnetic, electromagnetic and radiometric work supported by reconnaissance geological mapping (Fraser, 1970, Salat, 1972). The Aquitaine work concentrated on gossans in the Penrhyn Group and resulted in the evaluation of a group of 21 exploration permit areas. Airborne surveys over one of these

(SC 27) covered a portion of the present exploration permit areas. Apart from reconnaissance geology Aquitaine did no further work on this permit. They concentrated their more detailed investigation over the DUC Zone some 20 km to the northwest of camp. Encouraging results of ground geophysics (VLF and magnetics) and geochemical surveys over the DUC Zone were followed by diamond drilling which intersected up to 8% zinc in the form of sphalerite over a 1.2 meter intersection in diamond drill hole DUC 2. The sphalerite occurs in a feldspathized, graphite rich paragneiss associated with pyrrhotite and traces of chalcopyrite. Up to 0.3% Cu and 0.3% Ni were reported in the sulfide mineralized core.

In 1977, lake bottom sediment and waters collected by the Geological Survey of Canada (GSC) were analyzed for 12 metals including Co, Ni, Cu, Zn, As, Mo, Ag and Pb. The GSC survey, which covered much of the central Melville Peninsula, revealed several strong multi-element geochemical anomalies which stimulated exploration by Noranda/AGIP (Wark, J.M., 1980), Cominco (Delpierre, M.E.R., 1979), and Borealis (Petrie, J., 1985). Further examination of the lake sediment geochemical data resulted in the acquisition of permits 1164, 1165 and 1166 by Borealis in 1989.

5. LAND STATUS

Exploration permits 1164, 1165 and 1166 are presently held by Borealis and are valid until January 31, 1990.

6. TOPOGRAPHY AND LANDSCAPE

The exploration permit areas and Area of Mutual Interest are within the Melville Plateau, an undulating land surface at an average elevation of 300 meters ASL. Local relief reaches 50 meters and is greatest in areas underlain by less fractured rock types. Massive granite gneiss and marble form ridges whereas fractured, metasedimentary rocks form valleys. Large uplands of granitoid rocks are commonly covered by featureless felsenmeer. Regions underlain by Penrhyn Group rocks display northeast-southwest trending, ridge-and-valley topography which expresses differential erosion parallel to limbs of upright, gently plunging folds. Lakes are numerous and commonly have a boulder covered littoral margin surrounding a deeper central depression. Small streams flowing from these lakes drain into several major rivers (such as the Barrow River) which discharge east into the Foxe basin. White heather, grasses and mosses are the principal ground cover.

7. OVERBURDEN AND SOILS

The last ice sheet advanced from Baffin Island depositing a thin, intermittent till on bedrock. Large erratics are numerous on uplands and ridge crests where some bedrock is exposed. Till and gravel, boulder fields and meadows commonly conceal bedrock in the valleys. Shallow pits excavated in a boulder covered area reveal that the permafrost table can be as deep as 120cm below the land surface in mid-summer. The overburden exposed in these pits ranges from well sorted gravel to a fine sand matrix supporting subangular to angular, cobble sized clasts. Clast lithologies include both local and exotic rock types. The character of surface deposits examined plus the presence of eskers north of the Barrow River suggest an environment typical of ice sheet wasting. Pockets of fine textured overburden were deposited from bodies of melting, stagnant ice. Coarser material may indicate reworking of this material in subglacial channels. Presently the region is undergoing post glacial, isostatic rebound with uplift exceeding 100m.

Soils typically belong to the cryic temperature regime and are characterized by a thick, surface organic layer and an almost total absence of mineral horizon development above the permafrost table. There are three distinct soil domains. In the first, soil is almost completely absent or only exists in isolated pockets in boulder fields or exposed bedrock. In the second where surficial deposits are finer, boulders less numerous, and the land surface

has a gentle gradient, well drained soils predominate. Frost boils of varying size are common in this domain. In areas where rusty weathering of bedrock is common, areas of strong yellow soil occur and frost boils often contain an abundance of iron oxide coated rock fragments.

The third domain consists of organic soils which have formed in wetlands where free drainage has been restricted.

8. GEOLOGY

8.1 REGIONAL GEOLOGY

Archean and Aphebian metamorphic rocks underlie the permit areas and Area of Mutual Interest. Previous GSC mapping to the west of these areas has determined the oldest Archean rocks to belong to the Prince Albert Group. These rocks comprise plagioclase-hornblende-quartz paragneiss, quartz-magnetite-grunerite iron formation, and amphibolite. Granitoid gneisses, tentatively assigned an Archean age intrude the Prince Albert Group and are overlain by the Aphebian Penrhyn Group. Although the precise stratigraphic succession and original rock type has been concealed by folding and high-grade metamorphism, the Penrhyn Group has been described by the GSC as a sequence of quartzite, pelitic and psammitic gneiss, calcium-silicate

gneiss, marble and minor amphibolite. An orthoquartzite commonly forms the base of the sequence. Gossans and rusty weathering occur in schist and gneiss mainly close to the base of the sequence.

The total thickness of the Penrhyn Group has been estimated to be less than 2000 meters. However, the thickness is difficult to measure. Two major episodes of folding along east-northeast axes have produced broad, doubly plunging antiforms of basement with narrow, tight, synclinal infolds of Penrhyn Group rocks.

8.2 PERMIT GEOLOGY

Most of the geological data presented in this report has been generated through the combined efforts of Kennecott geologists B. Wakeman and R. Giraud, and H. Lahti and R. Lett of Barringer Geoservices. During the program, mapping focused on the southern parts of the areas covered by permits 1165 and 1166 where gossans and rusty weathering zones are most common. Further work will be essential to map geology in more detail in the eastern part of the area covered by permit 1165 and by permit 1164, as well as to unravel some of the structure overall.

Structure is dominated by an east-west trending synform which plunges to the east. The position of the synformal axis has been established by outcrop examination in the western part of the area covered by permit 1165. Further to the east, however, the axis has been located using airphoto structural analysis. On Plate 8.1, the oldest rocks displayed are granite and granodiorite gneisses (Unit 1) most probably of Archean age. These rocks, which underlie most of the northern half of the permits, are commonly massive and consist of alternating granitic and biotite-rich bands. Close to a ridge crest about 2km north of the camp, the granite gneiss contains magnetite which appears to be concentrated in narrow bands. A small inclusion or lens of dark green serpentine-crysotile rock is also present within the granite gneiss on the ridge immediately north of the camp, close to this magnetite-bearing gneiss. The extent and form of this ultramafic occurrence has not been established. Its location correlates with the intense airborne magnetic anomaly discussed in a previous report and tends to confirm the presence of an ultramafic intrusive at depth. Faulting with brecciated serpentine and gneissic material is also exposed at one locality in this area.

Along the northern limb of the fold the granite gneiss is succeeded by a biotite gneiss (Unit 2). This rock type is absent along the southern limb of the synform where the oldest

member of the Penrhyn Group appears to be a quartzite (Unit 3). This quartzite, also found along the northern limb of the fold, contains white- to rose colored massive quartz or "bull quartz". The quartzite unit is generally less than 50 meters thick and also locally contains scattered disseminated biotite and graphite. Although the unit forms a distinctive marker horizon where present, it is often discontinuous and may terminate abruptly.

Above the quartzite is a carbonate horizon (Unit 4) forming distinctive linear ridges parallel to the regional tectonic grain. Two varieties of carbonate rock have been identified. The most common type is a white crystalline-calcite marble comprising coarse calcite with minor diopside. Outcrop of this marble commonly develops thin exfoliation rinds. The second type consists of a green and white, diopside-calcite marble containing inclusions of white, crystalline-calcite marble. This marble may have gneissic foliation developed and often exhibits incoherent minor fold patterns. Both marble varieties can contain amphibolite inclusions and lenses with intrusive characteristics.

In the core of the syncline is an assemblage comprising biotite schist, biotite gneiss with minor granitic gneiss, amphibolite, and marble (Unit 5). This unit generally has well

developed schistosity and foliation and commonly contains quartz-rich zones and granite "pegmatite" lenses aligned roughly parallel to the schistosity. The origin of both these rock types is uncertain but is considered to be a metamorphic segregation product. Pods of white- and rose colored quartz are also common. Variations in lithology also include garnet-biotite schist and gneiss, quartz-biotite schist and sericite schist containing graphite and disseminated pyrite. Weathering of sulfides associated with the sericite schist and the metamorphic segregates is responsible for much of the wide spread rusty weathering. Scattered pyrite and pyrrhotite are also present in the garnet-biotite schist resulting in local surface iron staining. In addition, discrete areas of gossanous soil and oxidized rock fragments occur within this part of the sequence. These intense gossanous soil areas are located on a number of the grid targets, six of which were designated for the more detailed investigations carried out this summer.

A 100m long exposed unit of dark green-grey, hornblende-rich rock containing abundant pyrite and pyrrhotite with traces of chalcopyrite crops out close to the nose of the synform, plunging to the east. Diabase occurs at two localities and at one of these the dike cuts biotite gneiss and extends for 30m along strike. This dike is vertical and strikes 170° .

Complex geological structures are typical of the Foxe Fold Belt. Several, relatively-open anticlines and synclines can be identified within the synclinorium core. Superimposed on the open fold style are tighter, isoclinal folds. The marbles show the most intense deformation, and ptygmatic folding often develops.

The permit areas can be tentatively divided into two structural domains. The western domain partially covered by permit 1166 has structure most typical of the synclinorium. Frequent, local changes in foliation dip reflect the axial plane of the fold. This "disturbed zone" along the fold axis extends for several kilometers east of the synclinorium nose. Several northwest-trending faults, visible on airphotos and in some cases on the ground, cross the western domain. These faults appear to be dip-slip rather than strike-slip.

The eastern domain extending from permit area 1165 into 1164 displays a more complex style of folding. The fold axis appears to change direction locally and this may reflect displacement along west-northwest strike-slip faults. Several major northwest trending strike- and dip-slip faults are clearly revealed on airphotos. Precise structure of the eastern part of permit area 1165 is unclear and requires closer ground examination to establish relationships between rock types.

9. SURVEY TECHNIQUES

9.1 Geochemical Sampling, Sample Preparation, Analysis and Interpretation

A mixture of stream sediment, soil, nearshore lake sediment and rock samples were collected at selected sites throughout the permits. Sample locations were identified on airphoto overlays or topographic maps and flagged for future field identification. During later stages of the program seven surveyed grids were established and soil samples collected over most of these at 20m intervals along lines 30m apart. Where possible soil samples were collected from frost boil centers at depths between 5 to 10cm below the surface. The sediment and soil samples were dried at 50°C, sieved and the minus eighty mesh-size fraction analyzed for Cu, Ni, and Zn by hot nitric-perchloric acid digestion followed by atomic absorption spectrophotometry. Rocks were jaw crushed, pulverized and analyzed for Cu, Ni, and Zn by the same technique.

In the overall interpretation of the geochemical data from the soil grids the frequency histograms for each of the grid areas show some appreciable differences in the median values for Cu, Ni and Zn as well as in the anomalous ranges. The median value has been selected because of the small number of

samples collected in each grid area. The overall interpretations are preliminary as these variations can reflect bedrock changes, soil variations or mineralization. In this initial survey the soils are considered to be of local origin because of the small angular fragments but the true origin of some gravels and sand may be some distance up ice direction. However, there is ample evidence of accumulation of metal in depressions and whether this results from mechanical or chemical accumulation, the surface anomalies could be displaced some distance from bedrock source.

Using the median value for each element as a first approximation to the general content of metal in any grid area the geochemical variations in the grids are as follows:

<u>Metal</u>	<u>Grid 1</u>	<u>Grid 2</u>	<u>Grid 3</u>	<u>Grid 4</u>	<u>Grid 5</u>	<u>Grid 6</u>
Cu ppm	28	50	38	52	52	70
Ni ppm	25	17	25	42	42	20
Zn ppm	100	110	130	175	110	126

These data are generally duplicated in the anomalous ranges such that the higher the median value, the higher the anomalous values. As mentioned above the higher median value may reflect different rock formations, variation in soil type or mineralization. However the anomalous ranges selected are truly anomalous and have been interpreted as reflecting mineralization.

9.2 GEOPHYSICAL SURVEY METHODS

Six grids (as shown on Map 8.1) were surveyed by Barringer Geoservices personnel using a Scintrex IGS-2 system with EM-4 and MP-4 gradiometer sensors.

The gradiometer sensor arrived on site with a wiring problem which rendered it useless for the duration of the geophysical survey. Efforts to repair or replace the magnetometer were unsuccessful in the time available.

The IGS-2/EM4 system is named the "GENIE" which stands for Geometry Normalized In-phase Electromagnetics. For those familiar with Horizontal Loop results (e.g. Maxmin) they will note a close identity with GENIE profiles: a negative peak directly over the steeply dipping body position, flanked by positive shoulders of lesser amplitude. For a simple conductor the crossover points are approximately equal to the coil separation. Asymmetry of shoulders indicates dip, and shallow flat lying conductors give inverted signatures: a broad positive anomaly flanked by negative shoulders of lesser amplitude and width.

Although results appear similar to those of horizontal loop systems, there are major advantages to the GENIE system, namely little or no effect from topography and additionally much better

depth penetration. In resistive terrain, depth penetration approaches the coil separation rather than half the separation as with horizontal loop. Hence, in the present survey depth of penetration is probably somewhere between 60 to 80m.

The purpose of the EM-4 survey was to locate zones of high conductivity which may be associated with zones of alteration or mineralization at depth. The following three frequency pairs were transmitted during data acquisition in order to attempt to calculate dips, depths and conductance of targets:

3037.5/112.5 Hz

1012.5/112.5 Hz

337.5/112.5 Hz

At each station the amplitudes of the primary and secondary frequencies were measured by the EM-4 sensor and recorded in the IGS-2 console. A minimum of eight readings were recorded and averaged for each frequency pair transmitted. The electromagnetic data was extremely repeatable with consistent random standard deviations of less than one percent. The IGS-2 console was equipped with an internal noise spike detector which filtered out cultural electromagnetic transmissions such as radio waves or helicopter engine noise.

The ratio change of each frequency pair is calculated by the following equation:

$$\text{percent ratio} = (\text{amp}(V_s)/\text{amp}(V_p) - 1.) * 100.$$

where: amp(Vs) = the amplitude of the secondary frequency
(3037.5, 1012.5, 337.5 Hz)

amp(Vp) = the amplitude of the primary frequency
(112.5 Hz)

At the end of each day the survey data were transferred from the IGS-2 console to the field computer. Copies of the raw data were stored on diskette, the computer's hard disk, and on computer printouts.

A Panasonic Executive Partner personal computer was used in the field to download and prepare the data for profiling. Three profiles, one for each of the three frequency pairs, were generated for each line of the survey. The profiles displayed the amplitude of both the primary and secondary frequencies in an upper window, and the percent ratio of the two frequencies in the lower window. A. Webb, Barringer Geoservices' chief geophysicist, daily evaluated the profiles for data quality and repeatability. The profiles also aided in optimizing the field measurements as well as in the initial field geophysical interpretation of the survey grids.

Final data processing was performed at Barringer's Denver office on a Masscomp 5500 mainframe computer. The EM data were gridded using a minimum curvature gridding routine, and then contoured into map form. Contour maps of each frequency pair were produced for each of the seven grids, and profiles were generated for the two lines (100E, 150E) which extend to the south of Grid 1. Power spectra were calculated from the grids in order to determine each grid's spectral signature and noise content.

Because of the general complexity of the conductors within the grid areas surveyed, first vertical derivatives of the high-frequency pair were calculated. The purpose of this technique, carried out in the frequency domain, is to greatly improve resolution and thereby more precisely pin-point conductor axes for drilling.

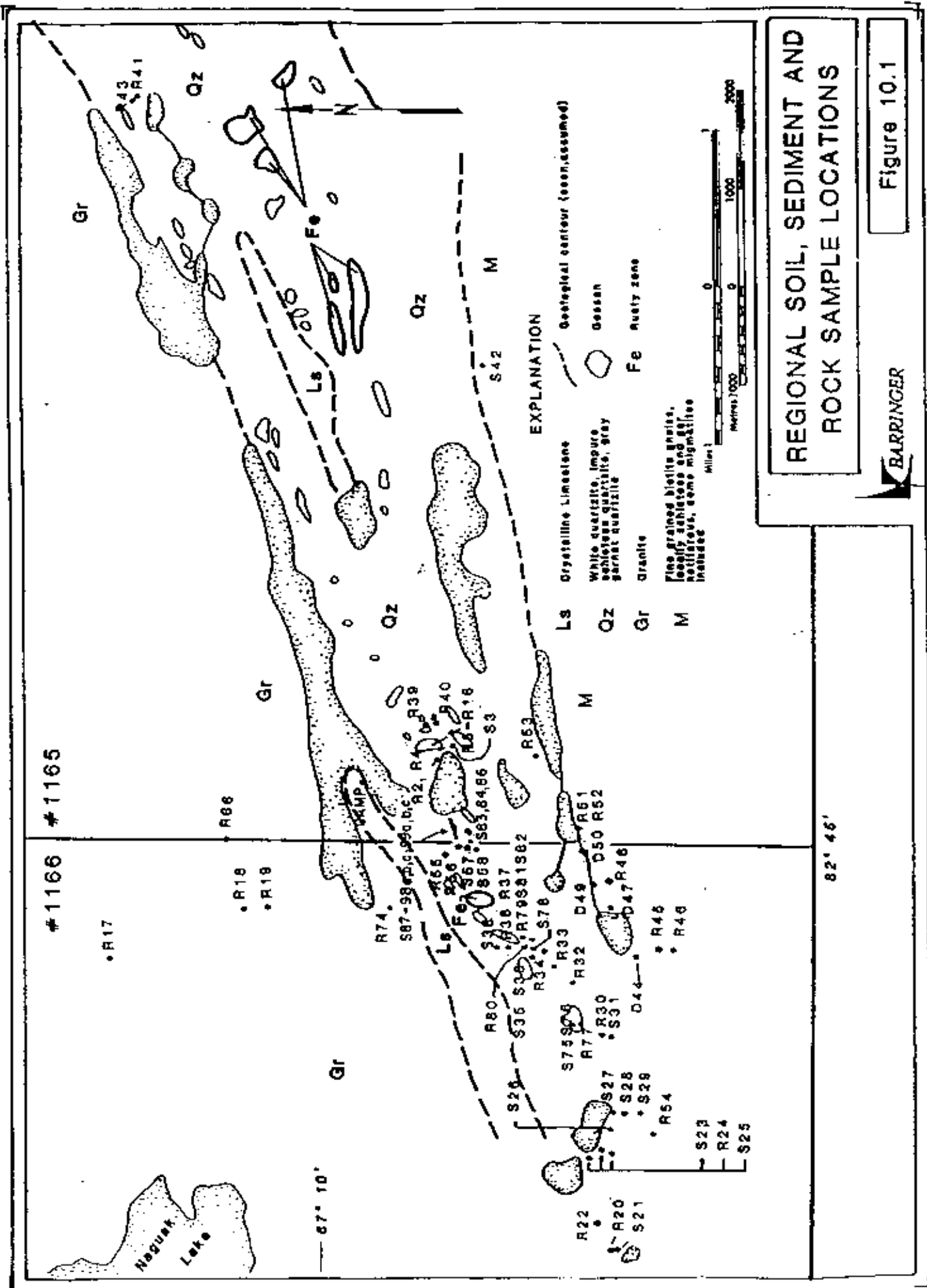
10. TARGET SELECTION

Six target areas were selected from within the permit areas based on criteria which included: the presence of gossan as distinct from rusty weathering, the presence of magnetic and/or electromagnetic anomalies (Aquitaine 1972 survey, GSC Airborne Magnetic data), presence of a lake sediment geochemical anomaly (GSC 1979), existence of acid (pH <4.5) water draining the area,

presence of faults, existence of favorable rock type for sulfide mineralization, and presence of visible sulfides in bedrock. Geochemical sampling necessary to initially evaluate all of the targets and prioritize was limited by available time. Consequently much of this initial rock, soil and sediment data only became available after the more detailed exploration had started. However, these preliminary data are presented here because they reveal several significant anomalies.

Sample locations are displayed in Figure 10.1 and corresponding Cu, Ni and Zn data are displayed in Figures 10.2, 10.3 and 10.4 respectively. The data in these figures have been separated into tables of results representing those individual traverses which lie within or close to the detailed grids discussed later. Result of all of the samples in Figure 10.1 - 10.4 are given in Appendix 3.

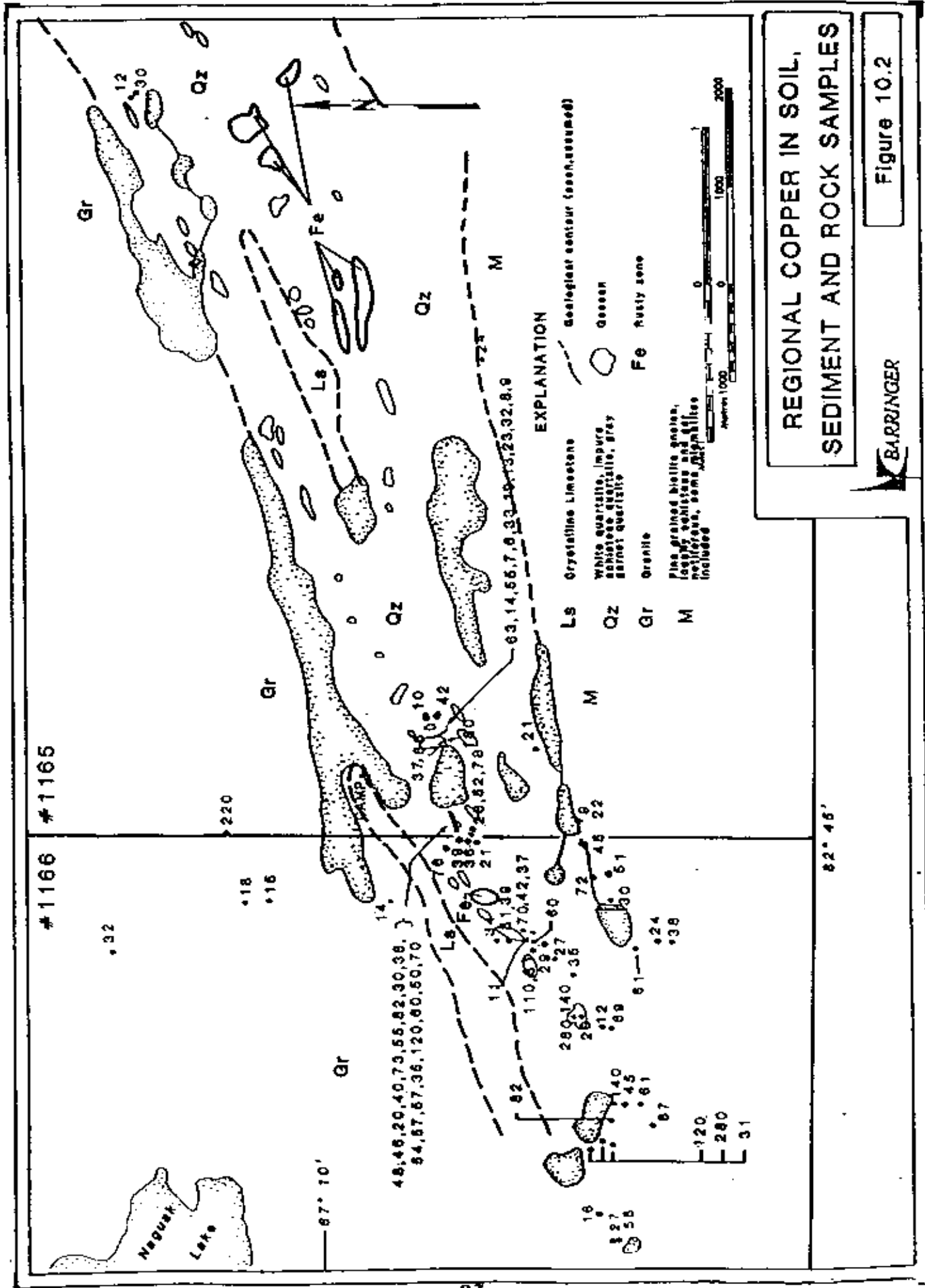
Table 10.1, lists the geochemical data for soils and rocks collected along a short traverse parallel to Grid 2, line 120E. These data reveal lower Cu and Ni, but increased Zn in yellow, iron stained soils close to pyrite-pyrrhotite bearing pegmatite and schist. Highest Cu levels are on line 90E to the west of the yellow stained zone and the highest Ni in "pegmatite". The high Ni value in pegmatite confirms our earlier suspicion that these pegmatites are not "intrusive" and probably result from metamorphic processes.



**REGIONAL SOIL, SEDIMENT AND
ROCK SAMPLE LOCATIONS**

Figure 10.1

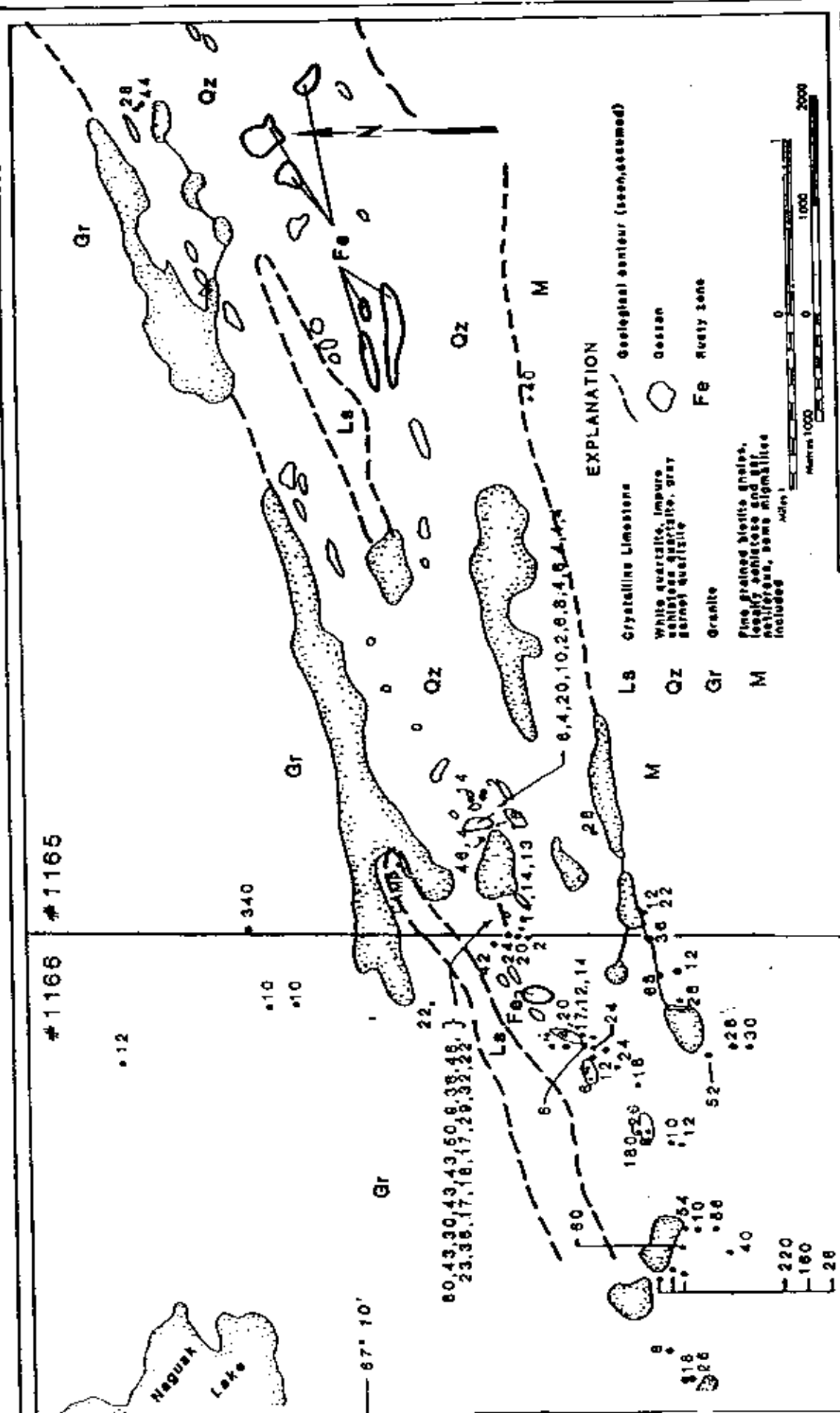
BARRINGER



REGIONAL COPPER IN SOIL,
SEDIMENT AND ROCK SAMPLES

Figure 10.2

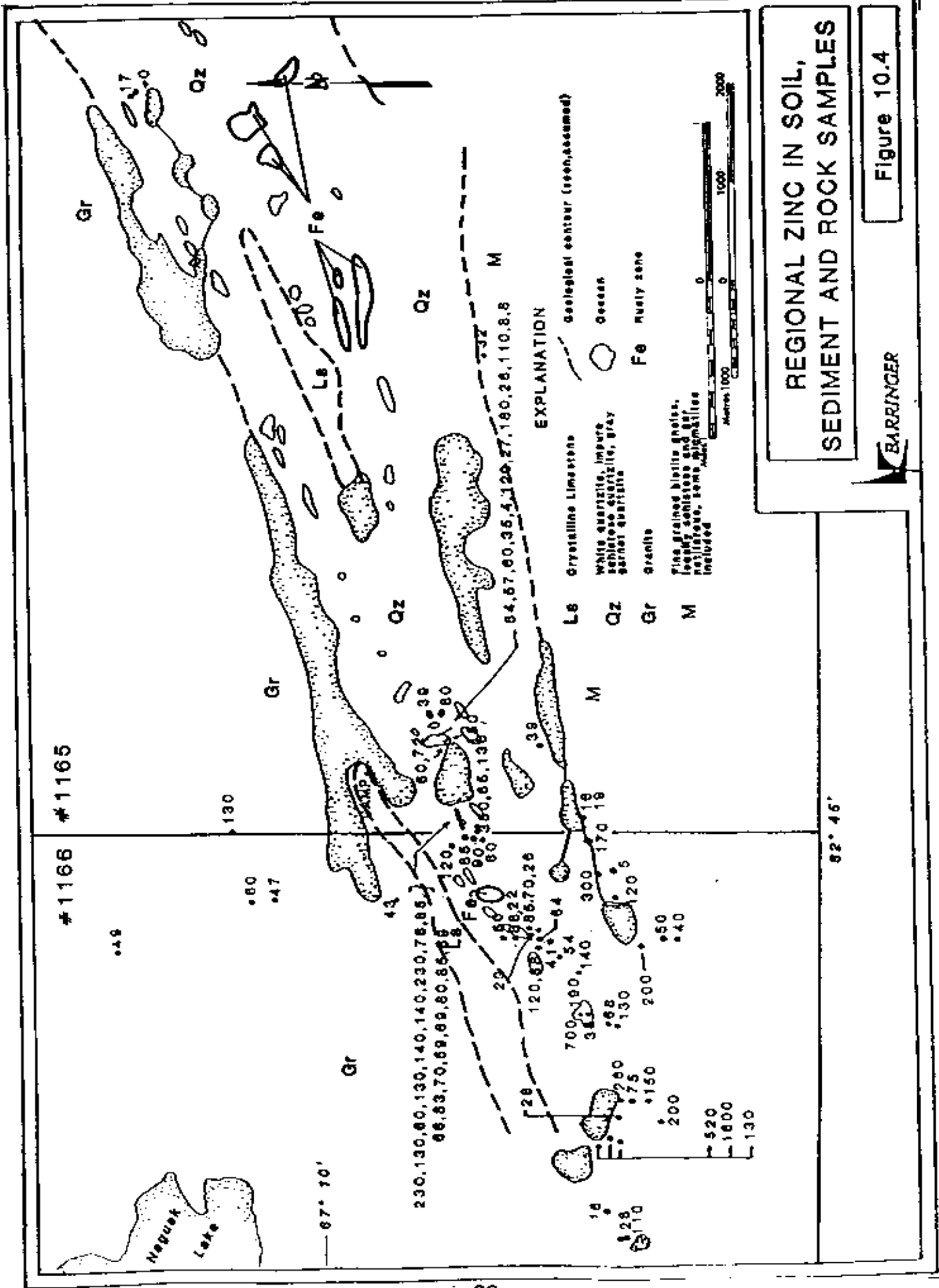
BARRINGER



**REGIONAL NICKEL IN SOIL,
SEDIMENT AND ROCK SAMPLES**

Figure 10.3

BARRINGER



REGIONAL ZINC IN SOIL, SEDIMENT AND ROCK SAMPLES

Figure 10.4

BARRINGER

TABLE 10.1

ROCK AND SOIL SAMPLE DATA COLLECTED IN THE AREA OF GRID 2

<u>Sample Number</u>	<u>Location</u>	<u>PPM</u>			<u>Description</u>
		<u>Cu</u>	<u>Ni</u>	<u>Zn</u>	
FBR 4	90E140N	86	4	72	Dark grey sericite schist
FBR 6	120E190N	14	4	57	Biotite schist outcrop
FBR 7	120E180N	55	20	60	Pegmatite(Metamorphic segregation)
FBR 9	120E160N	6	2	4	Sericite schist
FBS 10	120E150N	33	6	120	Soil from frost boil
FBR 11	120E140N	19	8	27	Soil rich in graphite
FBS 12	120E130N	13	4	180	Soil from frost boil
FBR 13	120E130N	23	6	26	Rusty weathered schist
FBS 14	120E110N	32	4	110	Soil from frost boil
FBR 15	120E100N	8	4	8	Sericite schist
FBR 16	120E 90N	9	2	20	Pegmatite with graphite
FBR 39	240E190N	10	14	39	Biotite schist
FBS 40	240E190N	42	2	80	Soil from frost boil

In Table 10.2, geochemical data for rocks, lake sediment, stream sediment and soils along the shore of the lake north of Grid 3 is listed. These data show that pyrite bearing sericite schist from angular frost heaved boulders along the lakeshore contains over 200 ppm Cu and over 1500 ppm Zn. Enhanced Cu, Ni and Zn levels are also present in sediment from a stream flowing through the same area. The highest geochemical values in nearshore lake sediment occur at the mouth of a small, acid stream draining an area of iron stained soil. A sample of mafic rock from a small lens in marble north of Grid 3 contains moderately increased Cu and Zn levels.

Two kilometers west of Grid 2, geochemical data from a dark grey, fine-grained, possibly metavolcanic rock (Table 10.3) reveal relatively high Cu, Ni, and Zn values. Element values in frost boil samples decrease away from the outcrop.

Geochemical data for rock samples collected in an area north of the camp are presented in Table 10.4. Increasing magnetite content from FBR17 through 18 and 19 is accompanied by a fall in Cu content. Significant Cu and Ni levels occur in FBR 66, a serpentine-crysotile sample from a small lens or pod within the granite gneiss, as discussed previously.

TABLE 10.2

SELECTED ROCK AND SOIL SAMPLE DATA COLLECTED IN THE AREA OF GRID 3

<u>Sample Number</u>	<u>PPM</u>			<u>Description</u>
	<u>Cu</u>	<u>Ni</u>	<u>Zn</u>	
FBS 23	120	220	520	Sediment from small stream, pH 7.0
FBR 24	280	160	1600	Sericite schist with dissem. py
FBS 25	31	26	130	Lake sediment, water pH 7.0
FBS 26	82	60	260	Lake sediment, water pH 6.0
FBS 27	140	54	260	Lake sediment, water pH 5.0
FBS 28	45	10	75	Frost boil sample
FBR 29	61	56	150	Sericite schist with dissem. py
FBR 54	87	40	200	Amphibolite in marble.

TABLE 10.3

SELECTED ROCK AND SOIL SAMPLE DATA COLLECTED IN AN AREA WEST OF GRID 2

<u>Sample Number</u>	<u>PPM</u>			<u>Description</u>
	<u>Cu</u>	<u>Ni</u>	<u>Zn</u>	
FBR 55	76	42	120	Dark grey schist (may be volcanic)
FBS 56	34	24	85	Frost boil close to FBR 55
FBS 57	26	20	90	Frost boil close to FBR 55
FBS 58	21	2	60	Frost boil close to FBR 55

TABLE 10.4

SELECTED ROCK AND SOIL SAMPLE DATA COLLECTED IN THE AREA OF GRID 2

<u>Sample Number</u>	<u>PPM</u>			<u>Description</u>
	<u>Cu</u>	<u>Ni</u>	<u>Zn</u>	
FBR 17	32	12	49	Granite gneiss
FBR 18	18	10	60	Granite gneiss w/1% dissem.magnetite
FBR 19	15	10	47	Granite gneiss w/1% dissem.magnetite
FBR 66	220	340	130	Dark green talc-serpentine rich rock

11. EXPLORATION OF SELECTED TARGETS

11.1 GRID 1 RESULTS

11.1.1 GEOLOGY

Grid 1 geology is displayed in Plate 11.1.1. The land surface slopes gently to the east and west of station OE.ON. Much of the bedrock, especially in the region west of site 300W, is concealed under boulders and felsenmeer. Biotite gneiss is the most common rock type cropping out within the grid boundary and this is flanked to north and south by marble. Foliations generally dip to the north or north-northwest at angles varying from 40 to 80°. Rusty weathering pegmatite and silicic, sericite schist crop out in the area south of 80N between 0 and 350W. In addition to iron staining,

gossan soil and rock fragments are frequently present close to 60N, 250W. No sulfide minerals other than scattered fresh disseminated pyrite were identified but the degree of oxidation of the gossan material suggests that this is not the main sulfide source. Disseminated graphite occurs in some of the rocks but is not a major component of any of the rocks at this locality.

11.1.2 GEOCHEMISTRY

Contoured Cu, Ni and Zn values are displayed in Plates 11.1.2, 11.1.3 and 11.1.4. Examination of probability graphs and histograms reveals that values for Cu and Zn fall into three distinct populations, whereas Ni shows only two main populations. Anomalous values are selected as greater than 64 ppm Cu; 42 ppm Ni and 145 ppm Zn. The main areas of anomalous metal are displayed on Plate 11.1.9.

The distribution of anomalous Ni shows a main north-northwest trending anomaly in the east central section of the grid. A second anomaly trending east-west occurs on the west margin of the grid and is open to the west.

Anomalous Cu and Zn distribution patterns are more complex but both metals still indicate to some extent this north-northwest trend in the central part of the grid as well as a separate anomalous east-west trend coinciding with the Ni on the west margin.

A smaller Cu-Zn anomaly (III) on 200N, 300W has no apparent source.

11.1.3 GEOPHYSICS

Amplitude ratios at all three frequency pairs (3037.5/112.5; 1012.5/112.5; 337.5/112.5) exhibit a broad and complex negative anomaly trending approximately east-west over that portion of the grid surveyed by EM, as shown on Plates 11.1.5., 11.1.6, and 11.1.7. Minimum values for the three frequency pairs are -70 per cent, -60 per cent and -30 per cent respectively, suggesting extremely conductive steeply dipping or vertical material.

Each frequency pair indicates a series of individual, subparallel, lensoid conductors within the main, broad zone. Unfortunately the signature produced from each individual conductor tends to interfere with that of the others so that it is difficult to obtain quantitative information regarding dip, depth and conductance. However, from the nature of the first vertical derivative data shown on Plate 11.1.8 all conductors appear to be almost vertical with the exception of Conductor A which may dip steeply to the south.

The relatively short strike length and discontinuous nature of the conductors suggest a complex massive sulfide and/or graphite zone.

11.1.4 DISCUSSION

As shown on Plate 11.1.9, electromagnetic conductors A and C exhibit a direct correlation with a major zone of anomalous Cu in soils. Conductor D also exhibits a correlation with a localized Cu anomaly over a small part of its strike length. The other conductors, with the possible exception of conductor F, show no correlation with Cu. The western portion of the grid was not geophysically surveyed and so it is not known whether there is a conductor beneath the anomalous Cu zone on the western margin of the grid.

All conductors and the anomalous Cu zones show a primary east-west trend which conforms to the general geological trend of the grid. Conductor A and its associated Cu anomaly shows a direct correlation with a gossan in strongly iron stained biotite schist/gneiss.

Superimposed over conductors A, C, D and F there is strong north-northwesterly trending Zn-Ni zone, which shows secondary east-west trends. A north-northwesterly trending fault was first outlined on airphotos and the regional aeromagnetic data (GSC 1970). The Zn-Ni zone on the grid tends to confirm the fault zone and suggests an accumulation of metals on the west side of the fault. Conductors F and G, D and E, and C and B show a distinct break coinciding with the eastern margin of the Zn-Ni zone.

11.1.5 GRID 1 (SOUTH) RESULTS

11.1.6 GEOLOGY

Only reconnaissance mapping has been carried out over this area. A marble ridge with a mafic intrusive body underlies the most northerly part of 100S and 150E. Further to the south are biotite schist and a second marble unit (at 400S). Rusty weathering is intense close to the contact between the marble and schist. South of the marble the land surface slopes moderately steeply to a lake where the rock type is predominately a rusty weathered garnet-biotite schist. The lake sediment sample was highly anomalous in Cu, Ni and Zn.

11.1.7 GEOCHEMISTRY

There is one strongly anomalous soil sample containing 140 ppm Cu, 166 ppm Ni and 700 ppm Zn at 400S on line 150E. This sample is from a frost boil in a shallow ravine close to rusty weathered biotite schist. Additional sampling with geological mapping and prospecting is required to evaluate this location.

11.1.8 GEOPHYSICS

Both lines 100E and 150E as shown on Plates 11.1.10 and 11.1.11 exhibit line-to-line continuity of parallel features on all three frequency pairs. On both lines there are two main conductive zones each of which are clearly composed of multiple, steeply dipping conductors: at least three in the southern zone and two in the northern zone. The southern zone is slightly more conductive than its northern counterpart, but both suggest the presence of buried massive sulfides and/or graphite.

11.1.9 DISCUSSION

A very strong Cu-Ni-Zn anomaly exists on both lines on the flank of the southernmost EM conductor. Cu anomalies also correlate with other conductors on Line 100E. Clearly this area merits further mapping, sampling and geophysical work.

11.2 GRID 2 RESULTS

11.2.1 GEOLOGY

Grid 2 geology is displayed on Plate 11.2.1. The land surface slopes gently to the west and the southern part of the grid is bounded by a stream which flows west through a belt of wetland into a lake. Most outcrops are in the central and northern parts of the grid. Boulders and overburden conceal bedrock close to the lake and in the southwest. In the central part of the grid, garnet-biotite schist, sericite schist and pegmatite have been folded into an open anticline-syncline structure. The axis of this fold is roughly parallel to line 180N and the fold plunges to the east. However, folding is quite complex in this grid and arcuate linears were outlined from airphotos. An area of yellow, gossanous soil contains abundant oxidized float as well as sericite schist with disseminated graphite and fresh pyrite. The area is bounded by lines 90E and 150E and 120N and 160N. Orange-brown, limonite gossan cementing small rock clasts and containing graphite is also abundant in a frost boil at 60E, 140N. Disseminated fresh pyrite and pyrrhotite are common in pegmatite float and in the sericite schist, but this is not considered to be the main sulfide source because of the intense oxidation observed in the main gossanous float fragments associated with the frost boil gossanous soils.

11.2.2 Geochemistry

Contoured Cu, Ni and Zn values are displayed on Plates 11.2.2, 11.2.3 and 11.2.4. Examination of probability graphs and frequency histograms reveals that values for all three metals fall into two main populations. Anomalous values have been selected at greater than 62 ppm Cu, 42 ppm Ni, and 145 ppm Zn. The anomaly patterns are summarized in Plate 11.2.9. The strongest Cu, Ni and Zn association occurs in yellow, gossanous soil at about 160N between 120 and 150E. However, the largest area of anomalous Cu soil extends in a roughly arcuate shape trending generally northwest from 200N to 20N along the western margin of the grid and open to the south and west. The southern section of this Cu anomaly has coincidental anomalous Ni and Zn. Other isolated anomalous values occur in the central and east sections primarily in Cu and Zn. The Cu-Zn anomaly at location 330E, 120N also has anomalous Ni.

11.2.3 GEOPHYSICS

In comparison to the geophysical results over Grid 1, those over Grid 2 are more ambiguous. Results at all frequency pairs, as shown on Plates 11.2.5, 11.2.6, and 11.2.7, tend to suggest "inverted" signatures where positive anomalies are more pronounced than negative anomalies. This usually indicates flat lying, (tabular) conductors which are often associated with conductive overburden within the top few meters of the geological section. However, tabular conductors resulting

from flat lying economic mineralization can occur in this type of structural environment and so a careful assessment of the geology and geochemistry over this grid is needed to evaluate the significance of the geophysical picture. The first vertical derivative results shown on Plate 11.2.8 exhibit greater resolution but do not clarify the ambiguities.

11.2.4 DISCUSSION

The flat lying EM conductor shown on Plate 11.2.9 possesses a relatively strong Cu-Zn association and occurs in an area where pyrite and pyrrhotite have been found in "pegmatite" outcrop. It is uncertain whether the EM conductor is caused by surficial, clayey material or by a genuine flat lying bedrock conductor. However, the association between geochemistry and geophysical features cannot be ignored and the combined anomaly may reflect a sulfide source, possible where a fault intersects the "pegmatite".

The extensive Cu anomaly on the western side of the grid can be explained by an abundance of Cu, possibly Ni and Zn enriched schist float, and perhaps concealed outcrop. Where the anomaly approaches the lake margin, it could reflect entry of the stream draining the wetlands as well as high proportions of sulfide-rich, schist float in the soil. The other geochemical anomalies most probably result from Cu enhancement

in an area of extensive iron staining. They also follow the approximate extension of the mapped conductor, and could reflect sulfides. However, the syncline-anticline mentioned above plunges to the east at a shallow angle. Any surficial mineralization would extend to depth to the east outside the present grid.

11.3 GRID 3 RESULTS

11.3.1 GEOLOGY

Grid 3 geology is displayed in Plate 11.3.1. The grid is bounded by a lake to the north and by a prominent, marble-garnet gneiss ridge to the south. Lenses of intrusive amphibolite occur in the marble near the contact zone. The even, gentle slope of the land surface towards the lake is broken at intervals by low ridges of outcrop and by small topographic high areas. These commonly have abundant frost boils and areas of gossanous iron-stained soil. A belt of wetland 30 to 60m wide following the course of a stream bisects the grid. Throughout most of the grid bedrock is concealed beneath overburden (well sorted fine sand) and boulders. Frost boils on the gossanous and yellow stained ridges in the eastern part of the grid commonly contain an assemblage of pyritic quartz schist, granite gneiss, graphite-biotite schist, sericite schist, and limonitic gossan. Outcrop is most common

in the southwest part of the grid where "pegmatite" pods containing disseminated pyrite and pyrrhotite occur in biotite schist. Along the lake shore at 150W are angular blocks of dark grey sericite schist containing pyrite and specks of chalcopyrite. Although no outcrop is visible, the shape and abundance of the boulders suggests that they are of local origin. Pyritic quartz schist fragments are abundant in iron stained and gossanous frost boils north of 120S between 120W and 300W. The occurrence of completely oxidized rock fragments, however, again suggest a different sulfide source to the pyritic quartz schist. A fault, clearly visible on the air photos crosses the eastern part of the grid from about 150E 280S to 60S. Outside the the grid area in the marble unit to the south an exposure of a mafic intrusive was noted.

11.3.2 GEOCHEMISTRY

Contoured Cu, Ni and Zn values are displayed in Plates 11.3.2., 11.3.3 and 11.3.4. Examination of frequency histograms reveal that all the metals fall into two main populations. Anomalous values are selected at greater than 62 ppm Cu, 400 ppm Ni and 155 ppm Zn.

The Cu, Ni, Zn correlation of anomaly trends is very strong in this grid area. Two main anomalous zones are evident. One of these is in the southwest section and along

the southern margin of the grid, open to the south and west. The second zone trends southeasterly from the northwest corner along the lake margin. The location and trend of metal distribution of this anomalous zone strongly suggest an accumulation of metal at the lake shore.

11.3.3 GEOPHYSICS

Grid 3 exhibits some extremely strong conductors whose amplitude ratios exceed -80 per cent, as shown on Plates 11.3.5, 11.3.6 and 11.3.7. Two fairly well defined trends exist, namely east-west and approximately north-northwest to south-southeast, as indicated on Plate 11.3.8. Conductor A appears to dip steeply to the south, but it is not possible to obtain accurate dip directions of the other conductors. Conductor depths generally vary from about 40 to 60m.

The various sources of the conductors are considered to be either graphite and/or massive sulfides.

11.3.4 DISCUSSION

The anomalous soil zone, shown on Plate 11.3.9, in the north near the lake, shows a strong Cu-Zn-Ni association, and follows the regional structural trend. The zone may reflect surface exposure of a plunging sulfide body with displacement

of the pattern to the northeast by solifluction and hydromorphic dispersion. The high Zn mobility could deplete this metal from the eastern part of the soil anomaly and enrich the lake sediments. It should be noted that geophysical coverage did not extend as far as the geochemical zone.

The Cu-Zn-Ni anomalies in the southwestern and southern portion of the grid follow the belt of "pegmatite" float and EM conductors A and B. There is greater Ni-Zn enrichment at the west end of the anomalous zone where pyrite and pyrrhotite are abundant at surface.

Conductor C and its extension correlates in part with a Cu-Ni-Zn anomaly which could be an expression of weathered sulfide bearing rock at the base of the slope above the lake. Several pyrite occurrences are also closely associated with this group of conductors.

11.4 GRID 4 RESULTS

11.4.1 GEOLOGY

The geology of Grid 4 is displayed on Plate 11.4.1. Much of the grid is covered with boulders. At the center of the grid close to the hill crest an east-west trending belt of iron stained "pegmatite" boulders extends for about 300m. Near the

OE.ON location the pegmatite contains coarse disseminations of pyrite and pyrrhotite. North of the pegmatite a boulder covered hill slope extends to the lake. Boulders also cover the northwest part of the grid and much of the southern area. In the western part of the grid there is a low ridge of outcrop consisting of marble rich in diopside. To the east the grid is underlain by a quartz-biotite schist containing minor marble units. A small diabase dike is exposed on the southeast edge of the grid.

11.4.2 GEOCHEMISTRY

Contoured Cu, Ni and Zn values are displayed on Plates 11.4.2, 11.4.3 and 11.4.4. The frequency histograms reveal that Cu, Ni and Zn values fall into two main populations. Anomalous values are selected at greater than 62 ppm Cu, 62 ppm Ni and 185 ppm Zn. The general concentration level of these metals are high in this grid suggesting a more mafic environment. Distribution of anomalous samples is outlined in Plate 11.4.9. The correlation of Cu, Ni and Zn anomalous values is again good in this grid. With the strongest Cu-Ni-Zn values trending subparallel to the belt of mineralized "pegmatite" float and extending from the area of 20S, 30E to 120S, 120E. The relatively high concentrations of these metals again are more typical of a mafic rock than of a pegmatite.

The anomalous values in Cu and Zn in the northwest corner show a general east-west trend parallel to the lakeshore. More isolated anomalous Ni values occur in this area and generally ring the edge of the lake. An interesting anomalous Ni-Zn area is located in the southwest section suggesting a more mafic source.

11.4.3 GEOPHYSICS

The amplitude ratios over that part of Grid 4 geophysically surveyed, show a strong conductive zone in the center of the area and a less well defined conductor in the north. Both trend west northwest to east-southeast and both possess strong minima exceeding -40 per cent, typical of massive sulfide and/or graphite conductors.

Interestingly, the central conductive zone becomes resolved into two closely spaced, separate conductors (A & B) on the first vertical derivative map (Plate 11.4.8), with Conductor A apparently dipping to the south and Conductor B, to the north. No dip information is available for Conductor C. The only depth information suggests that Conductor A is some 20 to 30 meters below surface.

11.4.4 DISCUSSION

Conductor A, shown on Plate 11.4.9, shows an excellent correlation with a gossan and a Cu-Zn geochemical anomaly in the central part of the grid. The presence of pyrite and pyrrhotite at this location, plus the fact that the conductor occurs below "pegmatite" float rather than schist, suggests the conductor is primarily sulfidic rather than graphitic. The conductor follows the pegmatite to the east where it is associated with a further, complex geochemical zone which exhibits Ni enrichment in addition to Cu-Zn. The position of the gossan and sulfide mineralization relative to conductor A in the central part of the grid tends to confirm the southern dip of the conductor.

Conductor B is parallel to conductor A and is associated with a Cu anomaly at its west- and a Zn-Ni anomaly at its east end.

Conductor C is also parallel to the previous conductors and correlates with a major geochemical zone near the edge of the lake.

11.5 GRID 5 RESULTS

11.5.1 GEOLOGY

Much of Grid 5 is unmapped but the known geology is displayed on Plate 11.5.1. A steep sided, east-west-trending ridge extends from the lake shore to beyond line 250E. The western part of the grid is underlain predominantly by a garnet-biotite schist. Large, rusty-weathered boulders of dark green, dense mafic rock, identified as amphibolite, scatter the lake shore between 0 and 40W. One amphibolite outcrop mapped at 80E, 10N contains abundant pyrite and pyrrhotite and traces of chalcopyrite. The amphibolite appears to be lens-like and follows the general foliation of the host schist. Amphibolite float disappears east of line 200E. This occurrence is located in the nose of a major syncline plunging to the east. As a result the amphibolite may continue down plunge to the east as the amphibolite float disappears east of line 200E. This is the largest outcrop of mafic rock seen to date within the permit areas.

11.5.2 GEOCHEMISTRY

Contoured Cu, Ni and Zn values are displayed on Plates 11.5.2, 11.5.3 and 11.5.4. Only a few samples were collected and values are scattered. However, the frequency histograms

reveal that anomalous values are greater than 60 ppm Cu, 60 ppm Ni and 135 ppm Zn. The Ni background is significantly higher in this grid, confirming the mafic rock association. The anomalies in Ni, therefore probably reflect the rock geochemistry. Only one soil sample has both anomalous Cu and Zn values. A rock chip from the amphibolite outcrop contained 45 ppm Cu, 42 ppm Ni and 32 ppm Zn. Of particular interest, however, is the abundance of sulfides in this unit along strike. The other Cu, Ni and Zn anomalous results do not show much cohesion or similarity in location or trends. The area is essentially a boulder field and soil samples may not be as relevant in this location as in other areas. Of importance is the relatively anomalous nature of the grid in Ni and the suggestion that the mafic intrusive is much more extensive than seen at surface.

11.5.3 GEOPHYSICS

In contrast to the other grids, Grid 5 shows no major anomalies, as shown on Plates 11.5.5, 11.5.6, 11.5.6, 11.5.7 and 11.5.8. The very weak negative anomaly in the north represents an extremely weak conductor which probably results from superficial material. However, such anomalies could result from massive sulfide mineralization at the limit of the depth penetration of the moving source transmitter.

11.5.4 DISCUSSION

Although this grid contains a relatively impressive outcrop of weakly mineralized amphibolite and although there are anomalous Cu-Zn-Ni values within soils on the grid, as shown on Plate 11.5.9, the lack of a good EM conductor is discouraging. Possibly a much deeper penetrating EM survey is justified in light of the favorable geology.

11.6 GRID 6 RESULTS

11.6.1 GEOLOGY

The geology of Grid 6 is displayed on Plate 11.6.1. Within the grid, much of the bedrock is concealed beneath boulder fields. Quartz-biotite schist and gneiss form low ridges along the northern edge and southern part of the grid. Rusty-weathered sericite schist and biotite schist containing a small but intense limonitic gossan forms a low ridge parallel to line OE.

11.6.2 GEOCHEMISTRY

Contoured Cu, Ni and Zn values are displayed on Plates 11.6.2, 11.6.3 and 11.6.4. The frequency histograms reveal that Cu, Ni and Zn values fall into two main populations. Anomalous values are selected at greater than 80 ppm Cu, 37 ppm Ni and 144 ppm Zn.

Anomalous distribution patterns of all three elements are similar. Three main anomalous areas are shown by the Cu, Ni and Zn data as follows: 1) In the southwest corner of the grid the multi-element anomalous area trends generally in a northwest direction. 2) In the northern part of the grid a second anomalous zone occurs which shows an east-west trend but the anomaly feature is less continuous than in the southwest, and, 3) On the eastern edge of the grid a third anomalous zone remains open to the east.

11.6.3 GEOPHYSICS

That portion of the grid surveyed by geophysics contains three conductive zones, as shown on Plates 11.6.5, 11.6.6 and 11.6.7, which are relatively well resolved by the first vertical derivative of the amplitude ratios, as shown on Plate 11.6.8. Conductors A and B are extremely conductive whereas Conductor C is moderately conductive. Conductors A and C

clearly extend beyond the margins of the survey, but Conductor B possesses a relatively short strike length of about 150m.

The strength of all three conductors suggests a massive sulfide and/or graphite source.

11.6.4 DISCUSSION

As shown on Plate 11.6.9 conductor A is associated with a Cu-Zn-Ni soil anomaly and with an isolated Cu anomaly. It occurs between mapped quartz-biotite schist/gneiss and "pegmatite".

Conductor B occurs directly below a significant area of surface iron staining and very close to a gossan occurrence within biotite-sericite schist. The eastern end of conductor B correlates with anomalous Cu values, the anomalous Cu forming part of a Cu-Zn-Ni anomaly to the northeast.

Conductor C is parallel to conductor B in an area where there is no outcrop. The conductor correlates with anomalous Zn on the western edge of the grid and almost extends into the multielement anomaly mentioned above at its eastern end.

The correlation of geophysical and geochemical anomalies together with favorable geology, especially at the location of the gossan, make this grid a top priority.

12. CONCLUSIONS

1. The Penrhyn rocks have been metamorphosed to upper amphibolite grade such that their origin is ambiguous. The presence of marbles suggests a sedimentary origin, but many of the biotite-rich schists with lapillae-like clasts and some of the chloritic amphibolite units indicate at least some volcanic activity.
2. Intrusive ultramafic and mafic occurrences occur in the Archean as well as in the Penrhyn units in the area.
3. Field geological associations confirm many similarities in this area to those in the Thompson Ni-Co-Cu belt of Manitoba, as originally proposed.
4. Pyrite and pyrrhotite are widespread across certain sections of the Penrhyn sequence together with discrete areas of gossan and gossanous soil which should represent concentrations of massive sulfides. Discrete graphite bodies are spatially associated with the sulfide concentrations in some of the host schists.
5. Geochemical results from soils and rocks confirm the anomalous Cu, Ni and Zn association with these sulfide concentrations.

6. Ground electromagnetic surveys over these gossanous areas have detected the presence of extremely conductive material at depth. Such conductors can only be interpreted as massive sulfides and/or graphite, both of which are considered to be primary drill targets.
7. Grids 1, 4 and 6 are priority follow-up targets requiring more detailed investigations and drilling. All of these grids have correlating geochemistry and geophysics with surface mineralization.
8. Grids 2 and 3 do not show as close a correlation of geochemistry with geophysics and are given lower priority. However, the structural complexities make these areas difficult to interpret with present information.
9. Grid 5 has the best exposure of a mafic intrusive which contains disseminated sulfides. It is located in the nose of a fold, but neither geochemistry nor geophysics gives a clear cut indication of a massive sulfide body. However, a weak conductor could indicate a massive sulfide source at greater depths than in the other grids. The geochemistry suggests a larger mafic intrusive than surface exposure indicates and with the easterly plunge of the fold, additional deeper penetrating geophysics is necessary to evaluate this area.

13. RECOMMENDATIONS

The following alternative exploration programs for 1990 are recommended. Program 1 applies ground geophysics at the initial stage whereas Program 2 applies an airborne geophysical approach:

PROGRAM 1

A. Ground Geophysics:

- 1) Reconnaissance Phase
Fixed Loop #EM - 4 frequencies
Gradient Magnetics

To survey the mineralized belt 20km long x 2km wide in Figure 1 at 500 meter line spacing and 50 meter stations.

Total 80km Geophysics \$40,000

- 2) Detailed Geophysics
Estimate 12 areas approximately 750 meter square at 100 meter line spacing and 25 meter stations.

\$38,000

PROGRAM 2

There is a high potential for the discovery of deeply buried ore bodies in this geological setting. As a result, we consider it may be necessary to explore at deeper levels than is possible using the reconnaissance ground geophysical methods recommended in Program 1.

Transient EM ground and airborne systems would provide greater penetration. However, the airborne rather than the ground approach would be less expensive and give more comprehensive results. Therefore, we recommend an INPUT survey at the reconnaissance stage to detect priority conductive targets. Limited ground transient EM methods would then be necessary to maximize the advantages, and would replace the detailed fixed-loop EM stage.

The estimated cost of Program 2 has not yet been finalized but should not be greatly in excess of the geophysical portion of Program 1.

14. REFERENCES

- Cameron, E. M., 1979, Investigation of base metal mineralization in Proterozoic metasediments, Melville Peninsula, District of Franklin, N.W.T., G.S.C. Paper 79-7A, pp. 187-196.
- Fraser, I., 1970, Airborne geophysical surveys of permits 186-199, South Melville Peninsula. Assessment Report, Document 060743, N.W.T.
- Geological Survey of Canada, 1972, Airborne magnetic Survey of NTS Sheet Nos. 460 and 46P. GSC Map 7669G.
- Heywood, W. W., 1967, Geological Notes, Northeastern District of Keewatin and Southern Melville Peninsula, District of Northwest Territories, GSC Paper, 66-40.
- Salat, H., 1972, Report on Exploration of prospecting permits 177-199, Melville Peninsula area, District of Franklin, N.W.T., Assessment Report for N.W.T., 16 pages, Document No. 019680.
- Underhill, D. H., 1969, Mineral Exploration, District of Franklin, N.W.T., for Borealis Exploration Ltd.

For COMINCO

- Delpierre, M.E.R. (1979) Geological, Geophysical, and Geochemical Assessment of part of the Melville Peninsula with diamond drilling on claims X12Y5. NWT Assessment Report Doc. No. 081260.

For NORANDA

- Wark, J.M. (1980) Prospecting, Geological and Ground VLF-EM Reconnaissance Surveys, Folster Lake Project, BETS 1-6 claims. NWT Assessment Report Doc. No. 081271.

For BOREALIS

- Petrie, J. (1985) Base metal exploration program on Z1, Z2, and Z3 claims, Melville Peninsula. Borealis Exploration Ltd. Internal Report No. BSX 053.

APPENDIX 1

APPENDIX 1

Personnel Employed on Project Relating
(All units in Man/Days)

<u>Person</u>	<u>Position</u>	<u>Mob/Demob</u>	<u>Field</u>	<u>Reporting/ Office Evaluation</u>
J. Walker	Project Mgr.(2 field trips)	8	9	3
R. Lett	Geochemist	5	23	10
A. Webb	Geophysicist	4	8	3
H. Lahti	Geologist (Contract)	6	7	1
D. Boyd	Camp Manager (Contract)	6	27	2
D. Tuktudjuk	Guide/Sampler	2	5	
A. Milortok	Field Assistant	2	18	
L. Katokra	Field Assistant	2	19	
B. Wakerman	Geologist	3	11	
R. Giraud	Geologist	3	11	
M. Weber	Geophysicist	4	8	10
R. Routledge	Cook (Contract)	3	8	
R. Cadiz	Field Assistant	2	7	
G. Tomecek	Field Assistant	2	7	
A. Klawitter	Satellite Image Analyses			0
S. Perry	Air Photo Interp.			0
K. Reinbold	Drafting			8
J. Bukofski	Computer Data Proc.			2
J. Mattson	Logistic/Expeditior		2	15
L. Sears	Secretary/Expeditior			18

STATEMENT OF EXPENDITURES, PERMITS 1164, 1165, 1166

Field Program

1. A) Labor - Barringer/Kennecott/Borealis Personnel	\$101,634.71
B) Labor - Outside contracts	32,408.56
2. Local camp equipment purchases	53,905.63
3. Camp provisions	30,228.83
4. Field Air Charters	156,574.98
5. Telephone and Geophysical equipment rentals	5,756.60
6. Mobilization/Demobilization	13,383.71
	<hr/>
<u>Total Field</u>	<u>\$393,893.02</u>

Report Preparation

1. A) Labor - Barringer personnel	\$ 36,627.95
B) Labor - Outside contracts	3,183.44
2. Material	1,219.34
3. Travel	2,451.40
	<hr/>
<u>Total Report</u>	<u>\$ 43,482.13</u>

Assessment Report

1. Labor	\$ 4,500.00
2. Material	850.00
	<hr/>
<u>Total Assessment Report</u>	<u>\$ 5,350.00</u>

APPENDIX 2

QUALIFICATION

R. E. LETT

I, R. E. Lett, am a graduate of the University of London (B.Sc., 1969), University of Leicester (M.Sc., 1970) and the University of British Columbia (Ph.D., 1979).

I have practiced my profession as a geologist and geochemist in Canada for nineteen years.

I am a Member of the Association of Exploration Geochemists (1972), the Institution of Mining and Metallurgy (U.K.), the Canadian Institution of Mining and Metallurgy and a Chartered Engineer (U.K.).

I directed the geochemical sampling of the permits, assisted in the geological mapping of the permits and assisted in preparation of the project report.

I am presently Chief Geochemist, Barringer, Laboratories, 5735 McAdam Road, Mississauga, Ontario L4Z 1N9.

R. E. Lett

October 30, 1989

QUALIFICATION

A. J. WEBB

I, A. J. Webb, am a graduate of Portsmouth Polytechnic (B.Sc., [Hons], 1972) and the University of London (M.Sc., 1978).

I have practiced my profession as a geologist and geophysicist for nineteen years.

I directed the geophysics carried out in the permit areas, interpreted the results and assisted in the preparation of the project report.

I am presently Chief Geophysicist, Barringer Laboratories Inc., 15000 West 6th Avenue, Suite 300, Golden, Colorado 80401

A. J. Webb

October 30, 1989

QUALIFICATION

J. WALKER

I, J. Walker, am a graduate of Aberdeen University (BSc Hons. Geology 1952) and London University, Royal School of Mines (Ph.D. 1964). I am a Profession Engineer in the Province of Ontario.

I have been in the mineral industry for 38 years.

I was Project Manager of this exploration program and visited the property twice during the field program and supervised overall the entire project.

I am presently Vice President, Barringer Laboratories, Inc., 15000 West 6th Avenue, Suite 300, Golden, Colorado 80401.

J. L. Walker

October 30, 1989

APPENDIX 3



MISSISSAUGA, ONTARIO
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 FAX: (416) 890-8575

APPENDIX III

3-Oct-89

John Walker
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 Suite 300,
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 U.S.A. 80401

Page: 1
 Copy: 1 of 1
 Set : 1

Authority: Ray Lett
 Project : Freuchen Bay JV Purchase order :

Job: 691227

Status: Final

Type	Sample	Cu	Ni	Zn
		AA	AA	AA
		ppm	ppm	ppm
Rock	FBR-1	60	50	79
	FBR-2	37	46	60
	FBR-4	86	4	72
	FBR-5	63	6	64
	FBR-6	14	4	57
	FBR-7	56	20	60
	FBR-8	7	10	35
	FBR-9	6	2	4
	FBR-11	19	8	27
	FBR-13	23	6	26
	FBR-15	8	4	8
	FBR-16	9	2	20
	FBR-17	32	12	49
	FBR-18	18	10	60
	FBR-19	15	10	47
	FBR-20	27	18	28
	FBR-22	16	8	16
	FBR-24	280	160	1600
	FBR-27	N	N	N
	FBR-28	N	N	N
	FBR-29	61	56	150
	FBR-30	12	10	68
	FBR-32	35	16	140
	FBR-33	27	24	54
	FBR-34	29	12	41
	FBR-37	39	20	22
	FBR-39	10	14	39
	FBR-41	30	44	40
	FBR-43	12	28	17



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Authority: Ray Lett

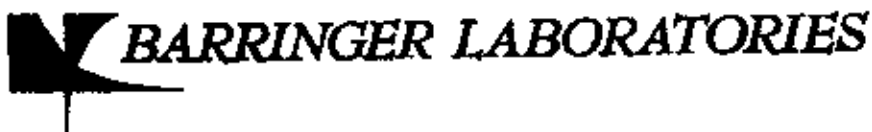
Project : Freuchen Bay JV

Purchase order :

Job: 891226

Status: Final

Type	Sample	Cu	Ni	Zn
		AA PDE	AA PDE	AA PDE
Soil	FBD-44	61	52	200
	FBD-47	30	26	120
	FBD-49	72	68	300
	FBD-50	45	36	170
	FBD-53	37	10	70
	FBD-54	87	40	200
	FBS-56	39	24	85
	FBS-57	36	20	90
	FBS-58	21	2	60



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Authority: Ray Lett
Project: Freuchen Bay JV

Purchase order:

Job: 891228

Status: Final

Type	Sample	Cu	Ni	Zn
		AA	AA	AA
		ppm	ppm	ppm
Soil	FBS-3	180	16	150
	FBS-10	33	6	120
	FBS-11	14	2	30
	FBS-12	13	4	180
	FBS-14	32	4	110
	FBS-21	58	26	110
	FBS-23	120	220	520
	FBS-25	31	26	130
	FBS-26	82	60	260
	FBS-27	140	54	260
	FBS-28	45	10	75
	FBS-31	69	12	130
	FBS-35	110	6	120
	FBS-36	81	4	88
	FBS-38	84	4	50
	FBS-40	42	2	80
	FBS-42	24	40	32



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Authority: Ray Lett
 Project : Freuchen Bay JV Purchase order :

Job: 891252 Status: Final

Type	Sample	Cu	Ni	Zn
		AA	AA	AA
		ppm	ppm	ppm
Rock	FBR-501	18	32	55
	FBR-502	29	10	43
	FBR-503	10	6	6
	FBR-504	8	4	10
	FBR-505	66	40	50
	FBR-506	13	12	34
	FBR-507	14	26	50
	FBR-508	10	28	56
	FBR-509	9	4	17
	FBR-510	20	24	19
	FBR-511	22	16	56
	FBR-513	9	14	50
	FBR-515	300	400	610
	FBR-517	8	14	21
	FBR-519	32	124	21
	FBR-520	7	4	6
	FBR-525	22	8	49
	FBR-526	30	4	14
	FBR-527	19	18	26
	FBR-70	13	10	22
	FBR-71	16	18	16
	FBR-72	19	10	13
	FBR-73	17	36	55
	FBR-74	14	22	43
	FBR-77	20	8	38
	FBR-80	11	6	29
	FBR-82	37	14	26
	FBR-110	180	50	400
	FBR-111	9	2	9
	FBR-112	110	4	72

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Authority: Ray Lett
Project: Freuchen Bay JV Purchase order:

Job: B91252 Status: Final

Type	Sample	Cu AA ppm	Ni AA ppm	Zn AA ppm
Soil	FBS-500	47	54	140
	FBS-512	43	59	120
	FBS-514	220	70	38
	FBS-516	160	74	190
	FBS-518	190	82	180
	FBS-521	40	124	85
	FBS-522	340	976	1400
	FBS-523	300	116	330
	FBS-524	300	168	390
	FBS-528	650	120	1800
	FBS-76	140	26	190
	FBS-78	60	24	64
	FBS-79	70	17	85
	FBS-81	42	12	70
	FBS-83	28	11	350
	FBS-84	52	14	65
	FBS-86	78	13	130
	FBS-87	48	80	230
	FBS-88	46	43	130
	FBS-89	20	30	60
	FBS-90	40	43	130
	FBS-91	73	43	140
	FBS-92	55	50	140
	FBS-93	82	9	230
	FBS-94	30	36	76
	FBS-95	38	46	85
	FBS-96	54	23	66
	FBS-97	57	36	83
	FBS-98A	57	17	70
	FBS-98B	35	18	59



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Authority: Ray Lett
Project : Freuchen Bay JV Purchase order :

Job: 891252 Status: Final

Type	Sample	Cu	Ni	Zn
		AA	AA	AA
		DDM	DDM	DDM
	FBS-98C	120	17	69
	FBS-99A	60	29	80
	FBS-99B	50	32	85
	FBS-99C	70	22	69


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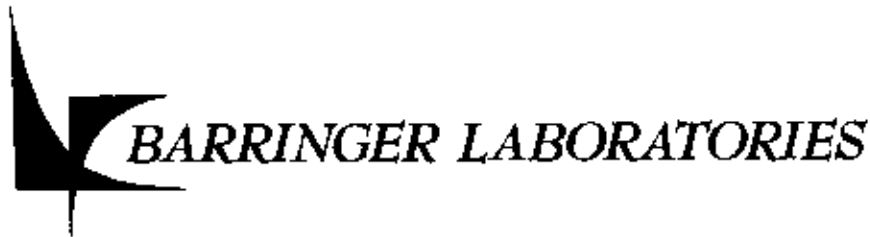
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Authority: Ray Lett
 Project : Freuchen Bay JV Purchase order :

Job: 891274 Status: Final

Type	Sample	Cu	Ni	Zn
		AA	AA	AA
		ppm	ppm	ppm
Soil	FBS-85	48	10	68
	FBD-207	47	78	220
	FBS-208	32	6	204
	FBS-209	36	6	158
	FBS-210	26	2	260



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Authority: Ray Lett
 Project : Freuchen Bay JV Purchase order :

Job: 891290 Status: Final

Type	Sample	Cu AA ppm	Ni AA ppm	Zn AA ppm
Soil	G1-100E-20S	45	14	27
	G1-100E-40S	30	41	82
	G1-100E-60S	120	52	69
	G1-100E-80S	20	21	67
	G1-100E-100S	32	34	92
	G1-100E-120S	51	64	145
	G1-100E-140S	33	34	120
	G1-100E-160S	95	24	135
	G1-100E-180S	35	28	110
	G1-100E-200S	20	30	98
	G1-100E-220S	14	17	57
	G1-100E-240S	46	46	91
	G1-100E-260S	34	30	105
	G1-100E-280S	37	20	70
	G1-100E-300S	105	5	97
	G1-100E-320S	37	14	48
	G1-100E-340S	40	16	58
	G1-100E-360S	37	16	60
	G1-100E-380S	42	27	105
	G1-100E-400S	52	18	70
	G1-100E-420S	38	74	240
	G1-100E-440S	110	260	125
	G1-100E-460S	19	28	81
	G1-100E-480S	21	33	110
	G1-100E-500S	34	35	91
	G1-100E-520S	20	26	165
	G1-100E-540S	16	21	92
	G1-100E-560S	32	43	180
	G1-100E-580S	110	40	79
	G1-100E-600S	29	27	85



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 Copy: 1 of 1
 Set: 1

Authority: Ray Lett
 Project : Freuchen Bay JV Purchase order :

Job: 891290 Status: Final

Type	Sample	Cu AA ppm	Ni AA ppm	Zn AA ppm
	G1-100E-620S	37	30	115
	G1-100E-640S	49	39	140
	FBD-75	280	180	700
	G6-100W-20N	60	15	125
	G6-100W-40N	18	26	275
	G6-100W-60N	57	15	125
	G6-100W-80N	73	29	150
	G6-100W-100N	73	17	93
	G6-100W-120N	70	28	125
	G6-100W-140N	59	13	84
	G6-100W-BLOOS	57	18	115
	G6-100W-20S	95	21	160
	G6-100W-40S	37	36	155
	G6-100W-60S	45	55	175
	G6-100W-80S	42	49	165
	G6-100W-100S	48	36	155
	G6-100W-120S	72	35	170
	G6-100W-140S	52	33	140
	G6-100W-160S	75	48	250
	G6-100W-180S	55	61	240
	G6-00W-120N	90	34	160
	G6-00W-140N	78	17	120
	G6-00W-120S	84	92	355
	G6-00W-140S	87	19	135
	G6-00W-160S	105	76	345
	G6-00W-180S	57	26	180
	G6-50W-120N	62	14	110
	G6-50W-140N	70	17	125
	G6-100E-BL	73	14	100
	G6-100E-BLOON	N	N	N



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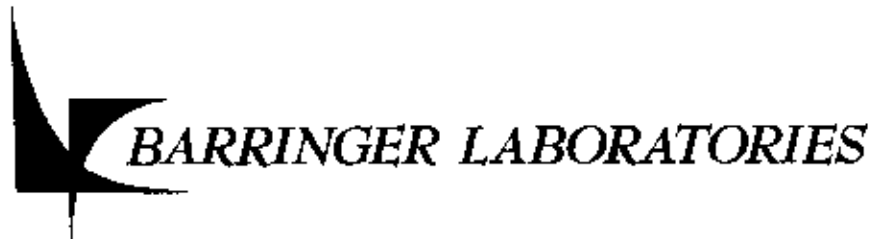
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Page: 3
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 Set: 1

Authority: Ray Lett
 Project : Freuchen Bay JV Purchase order :

Job: 891290 Status: Final

Type	Sample	Cu	Ni	Zn
		AA	AA	AA
		ppm	ppm	ppm
	G6-100E-20N	105	14	130
	G6-100E-40N	62	24	135
	G6-100E-60N	47	20	105
	G6-100E-80N	55	31	175
	G6-100E-100N	90	28	125
	G6-100E-120N	81	29	130
	G6-100E-140N	63	15	96
	G6-50E-120S	66	28	115
	G6-50E-140S	84	15	110
	G6-50E-160S	54	36	170
	G6-50E-180S	60	26	145
	G6-100E-20S	69	8	63
	G6-100E-40S	72	5	59
	G6-100E-60S	87	9	110
	G6-100E-80S	78	9	93
	G6-100E-100S	66	16	110
	G6-100E-120S	75	16	120
	G6-100E-140S	75	22	130
	G6-100E-160S	78	14	110
	G6-100E-180S	67	25	150
	G6-50W-120N	38	17	78
	G6-50W-140N	55	23	140
	G6-50W-120S	70	11	165
	G6-50W-140S	110	16	135
	G6-50W-160S	95	91	560
	G6-50W-180S	37	32	200
	DH-100E-20N	220	67	235
	DH-100E-40N	59	73	170
	DH-100E-60N	165	98	260
	DH-100E-80N	125	51	105



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 Project : Frenchen Bay JV Purchase order :

Job: 891290 Status: Final

Type	Sample	Cu AA ppm	Ni AA ppm	Zn AA ppm
	DH-100E-100N	48	155	180
	DH-00E-20N	210	73	205
	DH-00E-40N	62	41	96
	DH-00E-60N	280	41	135
	DH-00E-80N	150	69	180
	DH-00E-100N	68	57	60
	DH-50E-20N	275	215	510
	DH-50E-40N	215	92	190
	DH-50E-60N	80	62	85
	DH-50E-80N	190	97	320
	DH-50E-100N	91	75	200
	DH-100E-BLOOS	355	36	190
	DH-100E-20S	205	40	130
	DH-100E-40S	30	44	85
	DH-100E-60S	475	38	150
	DH-100E-80S	20	26	85
	DH-100E-100S	140	42	250
	DH-100E-120S	120	72	235
	DH-100E-140S	95	58	135
	DH-100E-160S	110	140	275
	DH-100E-180S	81	72	190
	DH-100E-200S	73	66	180
	DH-100E-220S	87	165	365
	DH-00E-BLOOS	140	37	60
	DH-00E-20S	125	31	115
	DH-00E-40S	115	24	83
	DH-00E-60S	215	98	245
	DH-00E-80S	120	31	130
	DH-00E-100S	150	49	100
	DH-00E-120S	230	54	30



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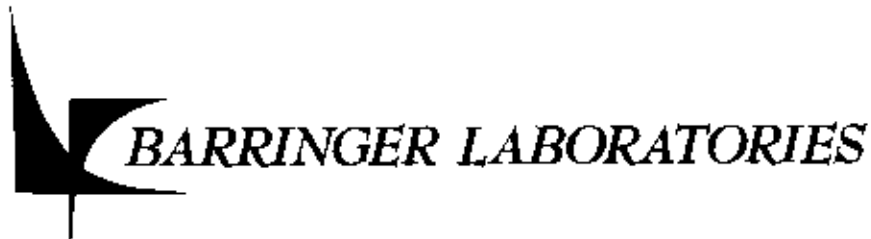
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Type	Sample	Cu	Ni	Zn
		AA	AA	AA
		ppm	ppm	ppm
	DH-00E-140S	120	20	90
	DH-00E-160S	57	30	115
	DH-00E-180S	24	30	59
	DH-00E-200S	32	59	165
	DH-00E-220S	190	78	290
	DH-50E-BL00S	380	25	470
	DH-50E-20S	40	33	61
	DH-50E-40S	210	36	130
	DH-50E-60S	220	70	145
	DH-50E-80S	310	200	385
	DH-50E-100S	245	95	245
	DH-50E-120S	195	32	115
	DH-50E-140S	340	52	195
	DH-50E-160S	54	61	165
	DH-50E-220S	95	93	285
	G1-100E-BL	45	84	50



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Job: 891290 Status: Final

Signed:

.....
M.C. Nimjee
Manager, Geochem/Fire Assay Services



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Job: 891253 Status: Final

Type	Sample	Cu	Ni	Zn	Co
		AA	AA	AA	AA
		ppm	ppm	ppm	ppm
Soil	G1-600W-000N	8	12	40	----
	G1-600W-040N	65	84	320	----
	G1-600W-080N	16	14	50	----
	G1-600W-120N	45	42	114	----
	G1-600W-160N	120	22	124	----
	G1-600W-200N	65	122	300	----
	G1-600W-240N	12	16	42	----
	G1-600W-280N	18	26	90	----
	G1-600W-300N	9	12	32	----
	G1-550W-000N	27	32	120	----
	G1-550W-040N	9	14	38	----
	G1-550W-080N	9	12	32	----
	G1-550W-120N	8	12	32	----
	G1-550W-160N	11	16	36	----
	G1-550W-200N	120	84	160	----
	G1-550W-240N	24	28	76	----
	G1-550W-280N	13	18	56	----
	G1-550W-300N	9	14	36	----
	G1-500W-000N	15	22	80	----
	G1-500W-040N	12	16	42	----
	G1-500W-080N	16	18	56	----
	G1-500W-120N	11	14	38	----
	G1-500W-160N	17	32	108	----
	G1-500W-240N	18	21	66	----
	G1-500W-280N	11	18	42	----
	G1-450W-000N	15	24	86	----
	G1-450W-040N	15	22	56	----
	G1-450W-080N	14	22	60	----
	G1-450W-120N	17	22	62	----
	G1-450W-160N	44	30	112	----



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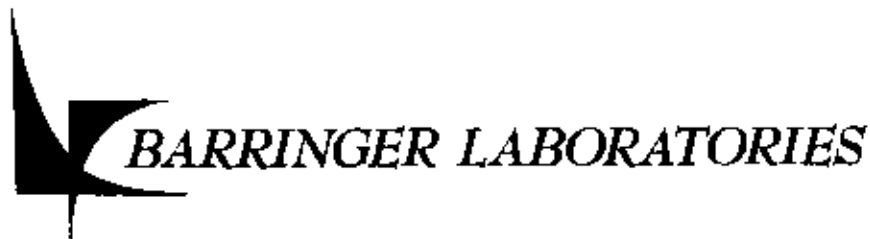
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Project : Freuchen Bay JV Purchase order :

Job: 891253 Status: Final

Type	Sample	Cu AA ppm	Ni AA ppm	Zn AA ppm	Co AA ppm
	G1-150W-200N	14	18	64	----
	G1-150W-240N	30	28	78	----
	G1-150W-280N	13	14	46	----
	G1-400W-000N	27	30	120	----
	G1-400W-040N	33	24	102	----
	G1-400W-080N	22	22	92	----
	G1-400W-120N	45	34	128	----
	G1-400W-160N	45	28	104	----
	G1-400W-200N	52	22	98	----
	G1-400W-240N	25	26	94	----
	G1-400W-280N	73	40	206	----
	G1-400W-300N	32	32	112	----
	G1-350W-000N	42	24	118	----
	G1-350W-040N	30	32	142	----
	G1-350W-080N	32	30	128	----
	G1-350W-120N	33	30	96	----
	G1-350W-160N	40	34	94	----
	G1-350W-200N	28	22	72	----
	G1-350W-240N	28	26	90	----
	G1-350W-280N	30	30	88	----
	G1-350W-300N	15	22	64	----
	G1-300W-000N	41	16	88	4
	G1-300W-020N	63	20	114	5
	G1-300W-040N	53	20	90	5
	G1-300W-060N	19	28	96	8
	G1-300W-080N	24	28	104	8
	G1-300W-100N	32	24	100	7
	G1-300W-120N	39	32	126	10
	G1-300W-140N	50	40	170	7
	G1-300W-160N	34	36	136	10



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Type	Sample	Cu AA ppm	Ni AA ppm	Zn AA ppm	Co AA ppm
	G1-300W-180N	50	32	146	11
	G1-300W-200N	68	34	202	17
	G1-300W-220N	110	28	152	9
	G1-300W-240N	26	28	94	10
	G1-300W-260N	17	24	72	7
	G1-300W-280N	20	32	92	10
	G1-300W-300N	35	50	138	16
	G1-250W-000N	51	34	176	8
	G1-250W-020N	57	12	106	4
	G1-250W-040N	70	16	112	4
	G1-250W-060N	120	30	188	5
	G1-250W-080N	140	14	168	2
	G1-250W-100N	110	44	220	10
	G1-250W-120N	180	6	112	1
	G1-250W-140N	44	20	126	4
	G1-250W-160N	15	24	86	7
	G1-250W-180N	53	44	80	12
	G1-250W-200N	76	46	154	22
	G1-250W-220N	34	38	126	11
	G1-250W-240N	34	44	126	10
	G1-250W-260N	39	54	170	9
	G1-250W-280N	53	52	122	14
	G1-250W-300N	28	38	68	10
	G1-200W-000N	110	64	300	40
	G1-200W-020N	45	14	96	4
	G1-200W-040N	130	22	174	6
	G1-200W-060N	110	12	134	3
	G1-200W-080N	120	16	128	3
	G1-200W-100N	38	48	200	11
	G1-200W-120N	70	24	132	4



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 Project : Freuchen Bay JV Purchase order :

Job: 891253 Status: Final

Type	Sample	Cu	Ni	Zn	Co
		AA	AA	AA	AA
		ppm	ppm	ppm	ppm
	G1-200W-140N	41	60	138	17
	G1-200W-160N	80	88	194	26
	G1-200W-180N	41	52	136	14
	G1-200W-200N	75	74	220	29
	G1-200W-220N	35	60	152	16
	G1-200W-240N	18	30	82	9
	G1-200W-260N	30	44	98	12
	G1-150W-000N	35	34	186	7
	G1-150W-020N	37	8	76	2
	G1-150W-040N	71	40	200	5
	G1-150W-060N	66	92	480	8
	G1-150W-080N	92	72	340	9
	G1-150W-100N	46	44	146	13
	G1-150W-120N	34	38	106	12
	G1-150W-140N	40	56	122	15
	G1-150W-160N	22	34	66	11
	G1-150W-180N	29	34	76	10
	G1-150W-200N	41	30	98	10
	G1-150W-220N	20	28	76	8
	G1-150W-240N	34	38	106	11
	G1-150W-260N	14	20	52	7
	G1-150W-280N	37	50	124	11
	G1-150W-300N	28	32	86	9
	G1-100W-000N	34	20	102	5
	G1-100W-020N	35	18	104	5
	G1-100W-040N	62	18	158	5
	G1-100W-060N	120	4	130	1
	G1-100W-080N	45	18	114	5
	G1-100W-100N	18	24	76	9
	G1-100W-140N	10	16	38	5



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Project : Freuchen Bay JV Purchase order :

Job: 891253 Status: Final

Type	Sample	Cu	Ni	Zn	Co
		AA	AA	AA	AA
		ppm	ppm	ppm	ppm
	G1-100W-180N	27	34	162	11
	G1-100W-200N	60	22	130	5
	G1-100W-220N	16	26	72	7
	G1-100W-240N	26	38	104	10
	G1-100W-260N	29	34	72	10
	G1-100W-280N	13	20	62	7
	G1-100W-300N	13	18	42	7
	G1-050W-000N	35	56	156	13
	G1-050W-020N	12	18	44	6
	G1-050W-040N	12	18	70	5
	G1-050W-060N	72	6	108	1
	G1-050W-080N	31	26	102	6
	G1-050W-100N	10	14	38	5
	G1-050W-120N	15	18	52	5
	G1-050W-160N	15	24	62	8
	G1-050W-180N	18	22	50	9
	G1-050W-200N	38	42	86	8
	G1-050W-220N	13	22	62	7
	G1-050W-240N	25	44	114	5
	G1-050W-260N	11	16	42	5
	G1-050W-280N	16	18	46	7
	G1-050W-300N	32	28	54	9
	G1-000W-000N	28	68	86	14
	G1-000W-020N	10	16	36	5
	G1-000W-040N	11	18	42	6
	G1-000W-060N	17	24	66	6
	G1-000W-080N	14	26	114	5
	G1-000W-100N	32	22	74	6
	G1-000W-120N	33	28	120	7
	G1-000W-140N	8	12	32	4



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Type	Sample	Cu	Ni	Zn	Co
		AA ppm	AA ppm	AA ppm	AA ppm
	G1-000W-160N	70	12	86	3
	G1-000W-180N	48	10	76	2
	G1-000W-200N	55	38	124	11
	G1-000W-220N	17	28	68	11
	G1-000W-240N	35	56	148	11
	G1-000W-260N	24	32	98	8
	G1-000W-280N	9	16	44	6
	G1-000W-300N	18	22	60	7
	G1-150E-000S	41	84	78	21
	G1-150E-040S	18	22	66	7
	G1-150E-080S	28	36	104	12
	G1-150E-120S	45	24	106	7
	G1-150E-160S	12	18	78	5
	G1-150E-200S	41	26	136	6
	G1-150E-240S	56	38	148	8
	G1-150E-280S	36	6	152	<1
	G1-150E-320S	83	12	86	4
	G1-150E-360S	92	6	104	<1
	G1-150E-400S	140	166	700	35
	G1-150E-440S	30	38	116	9
	G1-150E-480S	80	100	154	45
	G1-150E-520S	18	22	90	6
	G1-150E-560S	19	22	138	7
	G1-150E-600S	55	72	360	18
	G1-150E-640S	93	12	88	2



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Job: 891253 Status: Final

Signed:

.....
M.C. Nimjee
Manager, Geochem/Fire Assay Services



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Job: 891254 Status: Final

Type	Sample	Cu	Ni	Zn
		AA ppm	AA ppm	AA ppm
Soil	G2-000E-020N	130	34	204
	G2-000E-060N	35	22	116
	G2-000E-120N	48	24	114
	G2-000E-140N	51	28	136
	G2-000E-180N	42	26	118
	G2-000E-200N	33	30	112
	G2-000E-220N	27	24	96
	G2-000E-240N	77	26	172
	G2-000E-260N	130	36	202
	G2-000E-300N	50	14	62
	G2-000E-320N	52	26	114
	G2-030E-060N	58	22	138
	G2-030E-080N	59	22	132
	G2-030E-100N	190	16	150
	G2-030E-140N	190	4	118
	G2-030E-180N	60	16	92
	G2-030E-240N	110	18	154
	G2-030E-300N	55	22	118
	G2-030E-320N	70	54	220
	G2-060E-020N	140	82	420
	G2-060E-040N	110	22	134
	G2-060E-060N	49	16	102
	G2-060E-080N	120	24	164
	G2-060E-100N	110	16	176
	G2-060E-120N	120	22	144
	G2-060E-140N	120	16	118
	G2-060E-160N	130	10	116
	G2-060E-200N	150	14	214
	G2-060E-220N	60	32	174
	G2-060E-240N	60	30	158



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Type	Sample	Cu AA ppm	Ni AA ppm	Zn AA ppm
	G2-060E-280N	70	32	200
	G2-060E-300N	50	46	204
	G2-060E-320N	28	30	134
	G2-090E-000N	82	38	192
	G2-090E-020N	130	54	260
	G2-090E-040N	110	14	90
	G2-090E-060N	120	14	84
	G2-090E-080N	110	20	120
	G2-090E-100N	170	12	110
	G2-090E-120N	78	16	102
	G2-090E-140N	33	18	70
	G2-090E-160N	22	4	160
	G2-090E-180N	45	14	116
	G2-090E-240N	65	32	148
	G2-120E-020N	110	32	158
	G2-120E-060N	65	26	122
	G2-120E-080N	72	8	92
	G2-120E-100N	48	12	138
	G2-120E-120N	26	4	88
	G2-120E-140N	56	6	134
	G2-120E-160N	35	24	380
	G2-120E-180N	39	6	68
	G2-120E-200N	70	20	112
	G2-120E-220N	45	44	180
	G2-120E-240N	93	4	72
	G2-150E-040N	120	12	94
	G2-150E-060N	45	16	84
	G2-150E-080N	81	14	110
	G2-150E-100N	57	10	94
	G2-150E-120N	46	4	136



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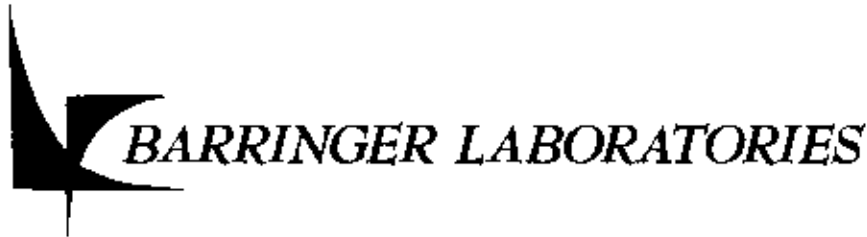
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Job: 891254 Status: Final

Type	Sample	Cu AA ppm	Ni AA ppm	Zn AA ppm
	G2-150E-140N	24	4	164
	G2-150E-160N	85	40	220
	G2-150E-200N	77	16	70
	G2-150E-220N	51	46	204
	G2-150E-240N	29	30	132
	G2-150E-260N	46	24	110
	G2-180E-000N	68	40	150
	G2-180E-020N	73	34	180
	G2-180E-040N	78	8	76
	G2-180E-060N	38	12	72
	G2-180E-080N	50	18	98
	G2-180E-120N	40	20	102
	G2-180E-140N	43	28	116
	G2-180E-160N	38	20	90
	G2-180E-180N	46	24	122
	G2-180E-200N	52	32	140
	G2-180E-220N	31	32	128
	G2-180E-240N	44	24	112
	G2-180E-260N	35	18	86
	G2-180E-280N	58	20	90
	G2-180E-300N	50	26	116
	G2-210E-020N	70	38	180
	G2-210E-040N	75	6	76
	G2-210E-060N	46	24	116
	G2-210E-080N	76	14	94
	G2-210E-100N	30	18	80
	G2-210E-120N	37	22	102
	G2-210E-140N	35	24	108
	G2-210E-160N	35	20	92
	G2-210E-180N	42	16	84



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Authority: Ray Lett
 Project : Freuchen Bay JV Purchase order :

Job: 891254 Status: Final

Type	Sample	Cu AA ppm	Ni AA ppm	Zn AA ppm
	G2-210E-200N	84	16	94
	G2-210E-220N	48	14	70
	G2-210E-240N	48	20	136
	G2-210E-260N	80	26	150
	G2-210E-280N	53	28	134
	G2-210E-300N	20	20	86
	G2-210E-320N	41	18	82
	G2-240E-020N	36	16	78
	G2-240E-040N	55	12	132
	G2-240E-060N	46	8	68
	G2-240E-080N	70	6	134
	G2-240E-100N	35	22	118
	G2-240E-120N	77	16	110
	G2-240E-140N	30	18	82
	G2-240E-160N	35	6	52
	G2-240E-200N	110	6	78
	G2-240E-220N	40	30	144
	G2-240E-240N	57	30	142
	G2-240E-260N	41	14	64
	G2-240E-280N	30	16	70
	G2-240E-300N	52	24	114
	G2-240E-320N	32	20	84
	G2-270E-000N	46	20	90
	G2-270E-040N	40	18	74
	G2-270E-060N	42	16	80
	G2-270E-080N	26	20	76
	G2-270E-100N	32	26	100
	G2-270E-120N	37	22	94
	G2-270E-140N	110	14	106
	G2-270E-160N	38	28	112



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Authority: Ray Lett
Project : Freuchen Bay JV Purchase order :

Job: 891254 Status: Final

Type	Sample	Cu	Ni	Zn
		AA ppm	AA ppm	AA ppm
	G2-270E-180N	50	14	72
	G2-270E-200N	47	24	104
	G2-270E-240N	40	28	110
	G2-270E-260N	52	36	142
	G2-270E-280N	58	16	92
	G2-270E-320N	38	18	78
	G2-300E-000N	47	30	142
	G2-300E-020N	70	42	204
	G2-300E-040N	41	26	108
	G2-300E-060N	37	16	94
	G2-300E-080N	34	20	96
	G2-300E-100N	38	16	76
	G2-300E-120N	46	22	104
	G2-300E-140N	40	16	74
	G2-300E-160N	45	24	124
	G2-300E-180N	43	10	52
	G2-300E-200N	42	20	130
	G2-300E-220N	24	14	76
	G2-300E-260N	57	16	78
	G2-300E-280N	37	14	60
	G2-300E-320N	50	4	130
	G2-330E-000N	44	22	114
	G2-330E-040N	50	20	110
	G2-330E-060N	42	16	84
	G2-330E-080N	73	36	170
	G2-330E-100N	60	12	86
	G2-330E-120N	110	58	280
	G2-330E-140N	44	22	100
	G2-330E-160N	77	48	220
	G2-330E-180N	58	16	76



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Project : Freuchen Bay JV Purchase order :

Job: 891254 Status: Final

Type	Sample	Cu	Ni	Zn
		AA	AA	AA
		ppm	ppm	ppm
	G2-330E-200N	75	44	196
	G2-330E-220N	34	18	116
	G2-330E-240N	64	22	148
	G2-330E-260N	31	22	82
	G2-330E-280N	52	16	78
	G2-330E-300N	16	4	68
	G2-330E-320N	66	6	32
	G2-360E-000N	50	28	120
	G2-360E-040N	10	30	108
	G2-360E-060N	28	22	90
	G2-360E-080N	43	28	128
	G2-360E-100N	34	24	116
	G2-360E-120N	35	22	94
	G2-360E-140N	20	20	88
	G2-360E-160N	28	22	104
	G2-360E-180N	38	38	152
	G2-360E-200N	30	22	94
	G2-360E-220N	27	22	86
	G2-360E-240N	65	24	118
	G2-360E-260N	40	28	114
	G2-360E-280N	37	4	176
	G2-360E-300N	90	2	26
	G2-360E-320N	75	6	24
	G2-390E-000N	40	26	104
	G2-390E-020N	60	22	110
	G2-390E-060N	26	18	72
	G2-390E-080N	68	40	148
	G2-390E-100N	63	44	160
	G2-390E-120N	20	28	92
	G2-390E-140N	18	18	61



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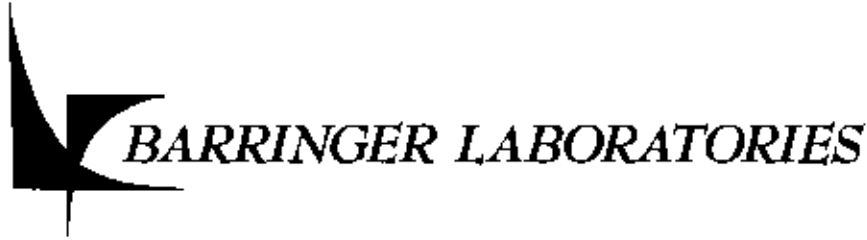
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Authority: Ray Lett
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Job: 891254 Status: Final

Type	Sample	Cu	Ni	Zn
		AA	AA	AA
		ppm	ppm	ppm
	G2-390E-160N	34	30	130
	G2-390E-180N	30	26	118
	G2-390E-200N	30	34	136
	G2-390E-220N	45	32	144
	G2-390E-240N	66	32	162
	G2-390E-260N	62	14	114
	G2-390E-280N	45	14	72
	G2-390E-300N	31	12	78
	G2-390E-320N	38	8	84
	G2-420E-300N	89	4	208
	G2-420E-320N	26	18	68



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Project : Freuchen Bay JV Purchase order :

Job: B91254 Status: Final

Signed:

.....
M.C. Nimjee
Manager, Geochem/Fire Assay Services



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Type	Sample	Cu	Ni	Zn
		AA ppm	AA ppm	AA ppm
Soil	G3-150W-000S	50	24	126
	G3-150W-020S	27	22	128
	G3-150W-040S	28	30	110
	G3-150W-060S	28	32	126
	G3-150W-080S	25	26	108
	G3-150W-100S	33	32	138
	G3-150W-140S	25	28	120
	G3-150W-200S	32	42	166
	G3-150W-220S	75	34	148
	G3-150W-260S	65	34	164
	G3-150W-280S	81	88	280
	G3-180W-000S	42	26	102
	G3-180W-020S	45	14	68
	G3-180W-040S	35	28	98
	G3-180W-060S	26	26	96
	G3-180W-080S	36	32	120
	G3-180W-100S	39	36	144
	G3-180W-120S	52	30	132
	G3-180W-140S	28	32	134
	G3-180W-160S	18	26	102
	G3-180W-180S	38	56	210
	G3-180W-200S	29	32	118
	G3-180W-220S	75	36	170
	G3-180W-240S	47	32	108
	G3-180W-260S	53	32	132
	G3-180W-280S	22	26	94
	G3-210W-000S	67	24	126
	G3-210W-020S	39	14	90
	G3-210W-040S	34	16	76
	G3-210W-060S	44	20	96



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Type	Sample	Cu AA ppm	Ni AA ppm	Zn AA ppm
	G3-210W-080S	39	18	104
	G3-210W-100S	48	20	106
	G3-210W-120S	42	28	126
	G3-210W-140S	35	32	150
	G3-210W-160S	53	52	200
	G3-210W-180S	52	42	196
	G3-210W-200S	40	50	176
	G3-210W-220S	60	66	200
	G3-210W-240S	30	34	102
	G3-210W-260S	60	54	192
	G3-210W-280S	60	56	182
	G3-240W-000S	37	28	108
	G3-240W-020S	40	34	122
	G3-210W-040S	40	30	126
	G3-240W-060S	57	18	80
	G3-240W-080S	46	26	96
	G3-240W-100S	74	20	104
	G3-210W-120S	35	32	106
	G3-210W-140S	40	42	182
	G3-240W-160S	32	30	128
	G3-240W-180S	47	36	144
	G3-240W-200S	42	52	168
	G3-240W-220S	47	50	144
	G3-240W-240S	28	46	128
	G3-210W-260S	47	50	142
	G3-240W-280S	71	72	260
	G3-270W-000S	23	26	96
	G3-270W-020S	40	28	116
	G3-270W-040S	39	30	106
	G3-270W-060S	19	44	164



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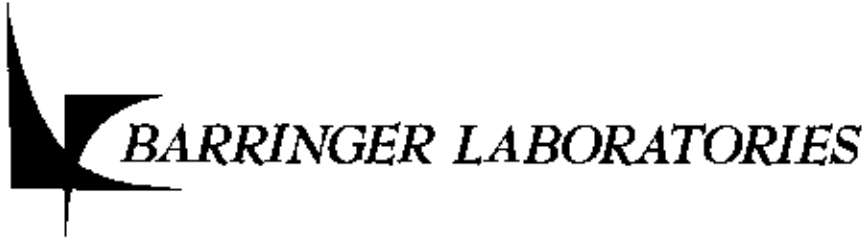
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Type	Sample	Cu AA ppm	Ni AA ppm	Zn AA ppm
	G3-270W-080S	80	52	196
	G3-270W-100S	43	42	136
	G3-270W-120S	13	22	74
	G3-270W-140S	55	52	176
	G3-270W-160S	41	46	150
	G3-270W-180S	35	48	172
	G3-270W-200S	46	40	166
	G3-270W-240S	52	62	220
	G3-270W-260S	75	68	220
	G3-270W-280S	110	60	200
	G3-300W-000S	38	40	176
	G3-300W-020S	43	42	184
	G3-300W-040S	35	41	166
	G3-300W-060S	45	50	182
	G3-300W-080S	23	38	136
	G3-300W-100S	20	34	126
	G3-300W-120S	32	48	182
	G3-300W-110S	35	12	158
	G3-300W-160S	34	44	182
	G3-300W-180S	70	62	240
	G3-300W-200S	86	60	210
	G3-300W-220S	23	48	172
	G3-300W-240S	63	62	220
	G3-300W-260S	120	58	216



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Manager, Geochem/Fire Assay Services



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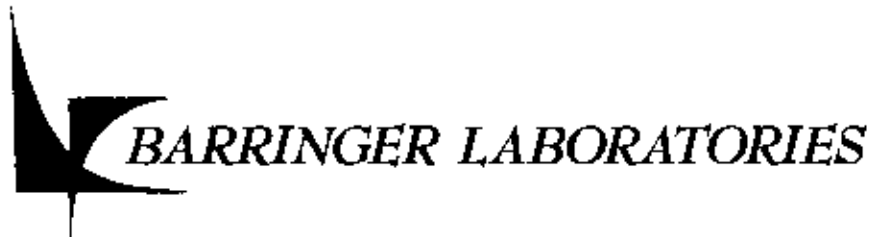
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Type	Sample	Cu	Ni	Zn
		AA	AA	AA
		ppm	ppm	ppm
Soil	G3150E0S	23	22	75
	G3150E20S	15	16	68
	G3150E10S	20	16	67
	G3150E60S	30	18	85
	G3150E80S	28	28	130
	G3150E100S	16	10	72
	G3150E120S	40	22	140
	G3150E140S	35	26	120
	G3150E160S	32	28	130
	G3150E180S	56	42	200
	G3150E200S	39	24	89
	G3150E220S	33	22	120
	G3150E240S	39	16	77
	G3150E260S	54	14	85
	G3150E280S	15	10	48
	G3120E00S	62	34	190
	G3120E20S	25	22	89
	G3120E40S	18	30	160
	G3120E60S	19	20	150
	G3120E80S	41	22	150
	G3120E100S	35	22	140
	G3120E120S	41	18	82
	G3120E140S	56	24	130
	G3120E160S	20	22	84
	G3120E180S	69	20	140
	G3120E200S	27	30	150
	G3120E220S	28	10	50
	G3120E240S	31	11	62
	G3120E260S	44	14	110
	G3120E280S	45	4	43



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Type	Sample	Cu	Ni	Zn
		AA	AA	AA
		ppm	ppm	ppm
	G390E00S	38	22	150
	G390E20S	19	18	130
	G390E40S	34	24	130
	G390E60S	44	22	140
	G390E80S	36	22	120
	G390E100S	31	18	110
	G390E120S	25	26	120
	G390E140S	36	20	72
	G390E160S	22	18	110
	G390E180S	29	18	110
	G390E200S	37	18	110
	G390E220S	36	12	68
	G390E240S	35	22	120
	G390E260S	50	20	110
	G390E280S	56	20	130
	G3060E000S	38	24	150
	G3060E020S	32	26	140
	G3060E040S	60	52	330
	G3060E060S	26	22	120
	G3060E080S	29	54	260
	G3060E100S	52	56	210
	G3060E120S	50	32	150
	G3060E140S	28	22	120
	G3060E160S	45	12	64
	G3060E180S	41	34	170
	G3060E200S	14	24	130
	G3060E220S	51	10	110
	G3060E240S	52	4	64
	G3060E260S	22	22	110
	G3060E280S	57	8	62



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Job: 891238 Status: Final

Type	Sample	Cu AA ppm	Ni AA ppm	Zn AA ppm
	G3030E020S	23	28	180
	G3030E040S	37	28	150
	G3030E060S	48	22	150
	G3030E080S	71	24	130
	G3030E100S	65	14	110
	G3030E120S	51	24	140
	G3030E140S	57	6	170
	G3030E160S	52	30	190
	G3030E180S	38	6	64
	G3030E200S	46	6	60
	G3030E220S	54	20	150
	G3030E240S	58	8	65
	G3030E260S	72	4	64
	G300E00S	150	58	230
	G300E20S	54	16	110
	G300E40S	75	24	110
	G300E60S	70	18	74
	G300E80S	44	10	62
	G300E100S	27	<1	48
	G300E120S	36	6	50
	G300E140S	47	6	73
	G300E160S	38	22	110
	G300E180S	45	<1	110
	G300E200S	50	6	59
	G300E220S	65	12	61
	G300E240S	67	4	67
	G3030W020S	52	10	73
	G3030W040S	51	6	66
	G3030W060S	54	4	74
	G3030W080S	10	<1	57



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Job: 891238 Status: Final

Type	Sample	Cu AA ppm	Ni AA ppm	Zn AA ppm
	G3030W100S	69	10	73
	G3030W120S	42	20	78
	G3030W160S	38	32	150
	G3030W180S	64	24	130
	G3030W200S	39	16	73
	G3090W020S	30	<1	130
	G3090W080S	25	36	190
	G3090W100S	39	26	150
	G3090W220S	36	34	150
	G3090W240S	110	88	300
	G3090W260S	56	44	160
	G3120W000S	38	16	75
	G3120W020S	65	10	69
	G3120W040S	120	<1	110
	G3120W060S	52	14	56
	G3120W080S	63	16	71
	G3120W120S	34	30	120
	G3120W160S	38	32	140
	G3120W180S	58	56	180
	G3120W200S	33	26	120
	G3120W220S	27	34	140
	G3120W260S	83	220	340



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M.C. Nimjee
Manager, Geochem/Fire Assay Services



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Type	Sample	Cu	Ni	Zn
		AA ppm	AA ppm	AA ppm
Soil	G4-210W-000N	55	62	200
	G4-210W-020N	71	60	192
	G4-210W-040N	36	64	148
	G4-210W-120N	55	54	204
	G4-210W-140N	40	46	178
	G4-210W-160N	82	86	240
	G4-210W-020S	33	38	126
	G4-210W-040S	26	34	108
	G4-210W-060S	60	66	220
	G4-210W-080S	41	54	168
	G4-210W-100S	34	46	168
	G4-210W-120S	44	50	198
	G4-210W-140S	24	36	104
	G4-180W-000N	34	40	108
	G4-180W-020N	40	62	126
	G4-180W-040N	19	28	104
	G4-180W-060N	110	78	260
	G4-180W-100N	28	52	208
	G4-180W-120N	34	42	136
	G4-180W-140N	75	54	202
	G4-180W-160N	27	36	136
	G4-180W-020S	23	28	92
	G4-180W-040S	31	46	126
	G4-180W-060S	50	54	170
	G4-180W-080S	54	66	208
	G4-180W-100S	65	72	210
	G4-180W-120S	35	44	128
	G4-180W-140S	32	42	126
	G4-150W-000N	33	42	134
	G4-150W-020N	20	34	122



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Authority: Ray Lett
Project : Freuchen Bay JV Purchase order :

Job: 891256 Status: Final

Type	Sample	Cu AA ppm	Ni AA ppm	Zn AA ppm
	G4-150W-040N	85	66	220
	G4-150W-060N	35	48	116
	G4-150W-120N	80	52	196
	G4-150W-140N	83	40	176
	G4-150W-160N	41	36	136
	G4-150W-020S	27	40	104
	G4-150W-040S	38	48	142
	G4-150W-060S	37	48	152
	G4-150W-080S	45	58	192
	G4-150W-100S	50	60	198
	G4-150W-120S	35	46	152
	G4-150W-140S	54	64	194
	G4-120W-000N	33	44	160
	G4-120W-020N	60	34	168
	G4-120W-040N	85	58	206
	G4-120W-060N	110	16	156
	G4-120W-120N	65	38	158
	G4-120W-140N	80	64	220
	G4-120W-160N	35	48	140
	G4-120W-020S	32	32	120
	G4-120W-040S	45	40	130
	G4-120W-060S	59	58	186
	G4-120W-080S	70	72	240
	G4-120W-100S	49	44	152
	G4-120W-120S	31	42	152
	G4-120W-140S	24	36	92
	G4-090W-000N	38	32	126
	G4-090W-020N	70	36	166
	G4-090W-040N	63	40	158
	G4-090W-060N	60	58	212



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Authority: Ray Lett
Project : Freuchen Bay JV Purchase order :

Job: 891256 Status: Final

Type	Sample	Cu	Ni	Zn
		AA ppm	AA ppm	AA ppm
	G4-090W-080N	70	132	360
	G4-090W-120N	51	38	138
	G4-090W-140N	29	46	114
	G4-090W-160N	35	42	138
	G4-090W-020S	48	46	150
	G4-090W-040S	32	32	116
	G4-090W-060S	68	58	182
	G4-090W-080S	33	34	124
	G4-090W-100S	42	44	158
	G4-090W-120S	25	30	92
	G4-090W-140S	68	74	182
	G4-060W-000N	44	44	180
	G4-060W-020N	60	34	146
	G4-060W-040N	51	50	188
	G4-060W-080N	64	56	206
	G4-060W-120N	50	42	170
	G4-060W-140N	60	74	208
	G4-060W-160N	120	72	260
	G4-060W-020S	43	44	178
	G4-060W-040S	33	40	144
	G4-060W-080S	30	26	114
	G4-060W-100S	55	44	182
	G4-060W-120S	63	40	186
	G4-060W-140S	44	38	178
	G4-030W-000N	56	26	144
	G4-030W-020N	52	30	132
	G4-030W-040N	72	62	206
	G4-030W-060N	26	40	152
	G4-030W-080N	69	56	240
	G4-030W-120N	66	72	240



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Page: 4
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 Set: 1

Authority: Ray Lett
 Project : Freuchen Bay JV Purchase order :

Job: 891256 Status: Final

Type	Sample	Cu AA ppm	Ni AA ppm	Zn AA ppm
	G4-030W-020S	110	68	240
	G4-030W-040S	66	68	240
	G4-030W-060S	35	38	132
	G4-030W-100S	37	44	162
	G4-030W-120S	59	22	152
	G4-030W-140S	47	34	154
	G4-000-000N	50	38	146
	G4-000-020N	40	32	136
	G4-000-040N	35	50	166
	G4-000-060N	45	66	204
	G4-000-080N	58	64	206
	G4-000-020S	55	28	128
	G4-000-040S	57	42	164
	G4-000-060S	29	30	108
	G4-000-080S	35	46	148
	G4-000-100S	30	32	112
	G4-000-120S	33	40	144
	G4-000-140S	32	36	130
	G4-030E-000N	65	70	240
	G4-030E-020N	39	50	166
	G4-030E-040N	50	72	202
	G4-030E-060N	75	60	208
	G4-030E-080N	57	54	200
	G4-030E-020S	55	16	148
	G4-030E-040S	61	46	220
	G4-030E-060S	43	56	194
	G4-030E-080S	66	64	240
	G4-030E-100S	80	44	172
	G4-030E-120S	87	46	206
	G4-030E-140S	50	36	156



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 Set: 1

Authority: Ray Lett
 Project : Freuchen Bay JV Purchase order :

Job: 891256 Status: Final

Type	Sample	Cu AA ppm	Ni AA ppm	Zn AA ppm
	G4-060E-000N	57	66	212
	G4-060E-020N	50	56	168
	G4-060E-040N	30	36	142
	G4-060E-060N	68	62	190
	G4-060E-080N	83	68	240
	G4-060E-020S	75	58	114
	G4-060E-010S	50	6	76
	G4-060E-060S	80	26	130
	G4-060E-080S	57	86	300
	G4-060E-100S	48	48	166
	G4-060E-120S	44	70	200
	G4-060E-140S	50	38	160
	G4-090E-020N	73	60	212
	G4-090E-060N	65	68	240
	G4-090E-020S	170	24	162
	G4-090E-060S	89	50	220
	G4-090E-080S	80	98	300
	G4-090E-100S	67	38	196
	G4-090E-120S	78	76	28
	G4-120E-000N	30	50	194
	G4-120E-020N	80	54	220
	G4-120E-040N	57	50	188
	G4-120E-060N	55	54	220
	G4-120E-020S	49	52	138
	G4-120E-040S	55	48	176
	G4-120E-060S	68	14	126
	G4-120E-080S	110	26	110
	G4-120E-100S	60	40	176
	G4-120E-120S	64	90	400



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Project : Freuchen Bay JV Purchase order :

Job: 891256 _____ Status: Final

Signed:

.....
M.C. Nimjee
Manager, Geochem/Fire Assay Services



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Copy: 1 of 1
Set: 1

Authority: Ray Lett
Project : Freuchen Bay JV Purchase order :

Job: 891257 Status: Final

Type	Sample	Cu AA ppm	Ni AA ppm	Zn AA ppm
Soil	G5-00E-000N	45	20	128
	G5-00E-020N	67	104	168
	G5-00E-040N	37	42	98
	G5-00E-060N	26	32	76
	G5-00E-080N	22	26	78
	G5-00E-100N	44	70	174
	G5-50E-000N	49	34	78
	G5-50E-020N	35	52	100
	G5-50E-040N	38	24	64
	G5-50E-060N	50	56	100
	G5-50E-080N	24	10	58
	G5-50E-100N	140	136	300
	G5-100E-000N	110	12	74
	G5-100E-020N	30	42	96
	G5-100E-040N	32	30	62
	G5-100E-060N	32	48	88
	G5-100E-080N	33	34	60
	G5-100E-100N	27	46	100
	G5-150E-000N	55	76	144
	G5-150E-020N	30	96	126
	G5-150E-040N	22	28	138
	G5-150E-060N	120	64	164
	G5-150E-080N	52	66	150
	G5-150E-100N	30	52	130
	G5-200E-000N	47	54	108
	G5-200E-020N	72	66	114
	G5-200E-040N	35	50	114
	G5-200E-060N	18	26	86
	G5-200E-080N	60	46	122
	G5-200E-100N	48	56	162



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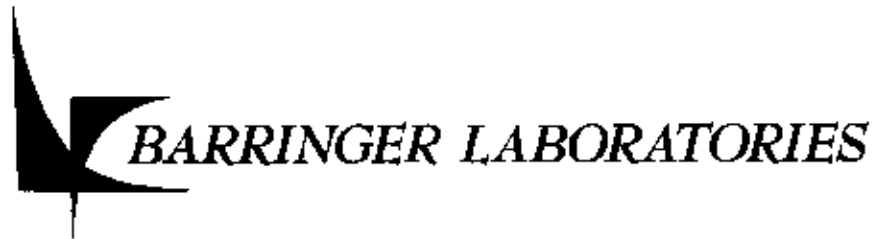
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Authority: Ray Lett
 Project : Freuchen Bay JV Purchase order :

Job: 891257 Status: Final

Type	Sample	Cu AA ppm	Ni AA ppm	Zn AA ppm
	G5-250E-000N	26	42	126
	G5-250E-020N	23	42	126
	G5-250E-040N	39	38	108
	G5-250E-060N	110	54	156
	G5-250E-080N	45	62	148
	G5-250E-100N	130	162	192
	G5-010W-005N	80	12	70
	G5-010W-085N	94	16	72
	G5-000E-015S	110	18	102
	G5-010E-020S	85	28	210
	G5-000N-013W	60	6	60



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Project : Frouchen Bay JV Purchase order :

Job: 891257 Status: Final

Signed:

.....
M.C. Nimjee
Manager, Geochem/Fire Assay Services



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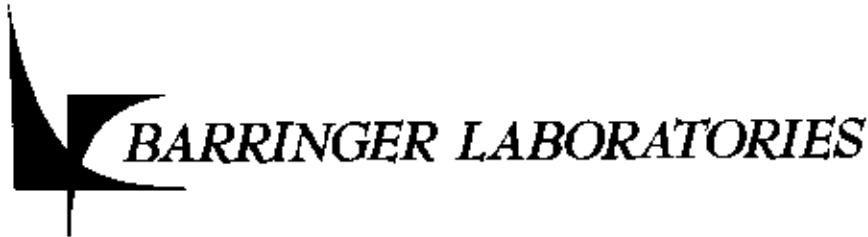
Authority: Ray Lett
Project : Freuchen Bay

Purchase order :

Job: 891278

Status: Final

Type	Sample	Cu	Ni	Zn
		AA	AA	AA
		ppm	ppm	ppm
Rock	FBR-200	70	40	186
	FBR-203	20	10	16
	FBR-206	10	6	12
	FBR-208	160	360	29



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Authority: Ray Lett
 Project : Freuchen Bay Purchase order :

Job: 891278 Status: Final

Type	Sample	Cu AA ppm	Ni AA ppm	Zn AA ppm
Soil	G6-50W-20N	67	18	108
	G6-50W-40N	67	18	182
	G6-50W-80N	60	32	158
	G6-50W-60N	48	16	136
	G6-50W-100N	130	108	280
	G6-50W-0S	68	16	124
	G6-50W-20S	78	8	74
	G6-50W-40S	72	10	86
	G6-50W-60S	72	20	128
	G6-50W-80S	110	98	320
	G6-50W-100S	86	46	218
	G6-0E-0N	58	6	70
	G6-0E-20N	62	6	94
	G6-0E-40N	50	10	96
	G6-0E-80N	64	22	128
	G6-0E-100N	70	20	124
	G6-0E-20S	46	14	30
	G6-0E-40S	85	8	90
	G6-0E-60S	77	16	108
	G6-0E-80S	68	10	96
	G6-0E-100S	59	10	86
	G6-50E-0N	70	14	94
	G6-50E-20N	88	16	118
	G6-50E-40N	60	18	152
	G6-50E-60N	73	26	132
	G6-50E-80N	60	26	122
	G6-50E-100N	60	24	108
	G6-50E-20S	80	10	86
	G6-50E-40S	80	8	154
	G6-50E-60S	44	8	108



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Authority: Ray Lett
 Project : Freuchen Bay

Purchase order :

Job: 891278

Status: Final

Type	Sample	Cu AA ppm	Ni AA ppm	Zn AA ppm
	G6-50E-80S	78	8	80
	G6-50E-100S	110	8	104
	G3-150W-20N	63	34	160
	G6-150W-40N	45	36	176
	G6-150W-60N	52	30	180
	G3-180W-20N	60	32	174
	G3-180W-40N	65	94	104
	G3-180W-60N	35	34	178
	G3-180W-80N	54	54	280
	G3-210W-20N	50	40	194
	G3-210W-40N	45	44	220
	G3-210W-60N	40	52	216
	G3-210W-80N	69	48	260
	G3-240W-20N	40	42	174
	G3-240W-40N	28	42	136
	G3-240W-60N	40	36	140
	G3-270W-20N	46	42	154
	G3-270W-40N	28	32	96
	G3-270W-60N	110	38	212
	G3-270W-80N	70	36	152
	G3-300W-20N	26	30	118
	G3-300W-40N	28	48	188
	G3-30W-20N	82	56	380
	G3-60W-20N	64	26	194
	G3-90W-20N	85	64	340
	G3-120W-20N	44	40	192
	G3-120W-40N	88	18	168
	G3-120W-60N	52	26	132
	FBS-201	78	4	52
	FBS-202	92	20	58



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Authority: Ray Lett
Project : Freuchen Bay Purchase order :

Job: 891278 Status: Final

Type	Sample	Cu AA ppm	Ni AA ppm	Zn AA ppm
	FBS-204	130	8	26
	FBS-205	90	20	38

APPENDIX 4

STANDARD STATISTICAL PACKAGE FOR BARRINGER CONSULTANTS LTD.

FOR:

PROJECT CUEL - 1983

SAMPLE TYPE: soils

FREQUENCY DISTRIBUTION HISTOGRAM FOR NI

CLASS MARK	0	5	10	15	20	25	30	35	40	45	50	PERCENT
-19.89	I											
-12.74	I											
-5.58	I											
1.57	II											
8.72	IIIIIIII											
15.87	IIIIIIIIIIIIIIIIII											
23.03	IIIIIIIIIIIIIIIIIIII											
30.18	IIIIIIIIIIIIIIIIIIII											
37.33	IIIIIIIIIIIIII											
44.48	IIIIIIII											
51.63	IIII											
58.79	IIII											
65.94	II											
73.09	II											
80.24	I											
87.39	IIII											
94.55	II											
101.70	I											
108.85	I											
116.00	II											

DATA ANALYSIS FOR NICKEL

BARRINGER

Grid 1

STANDARD STATISTICAL PACKAGE FOR BUSINESS
 FOR:
 DATA ANALYSIS FOR 20 SAMPLE TYPE: SOILS PROJECT CODE: 295A

FREQUENCY DISTRIBUTION HISTOGRAM FOR 20

CLASS MARK	0	5	10	15	20	25	30	35	40	45	50	PERCENT
68.92	I											
43.74	I											
18.57	I											
6.60	I											
31.77		IIIIIIIIIIIIII										
56.95		IIIIIIIIIIIIII										
82.12		IIIIIIIIIIIIII										
107.29		IIIIIIIIIIIIII										
132.46		IIIIIIIIIIIIII										
157.64		IIIIIIIIII										
182.81		IIII										
207.98		IIIIII										
233.15		I										
258.33		I										
283.50		I										
308.67		III										
333.84		II										
359.02		I										
384.19		I										
409.36		II										

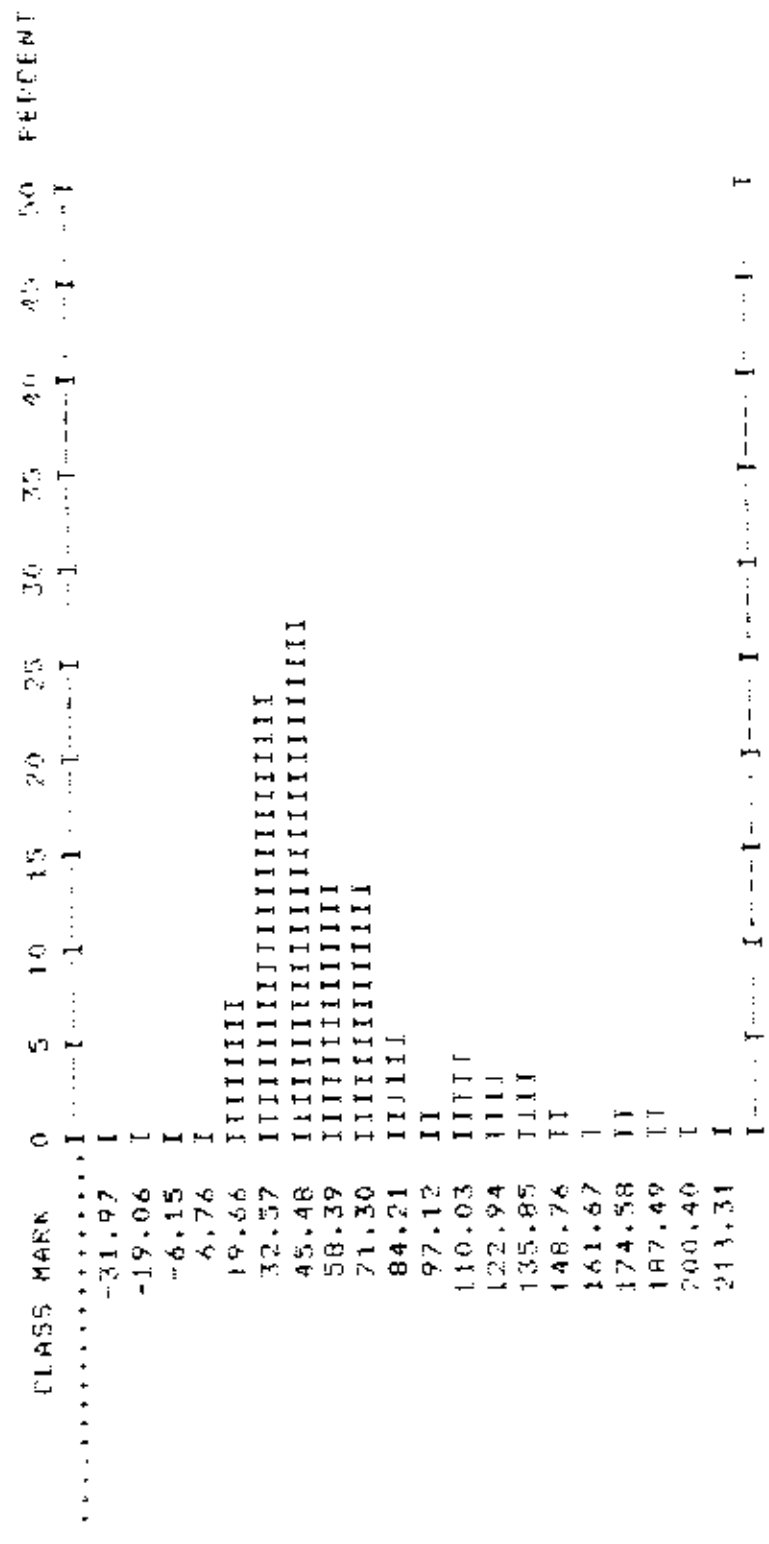
DATA ANALYSIS FOR ZINC

BARRINGER

Grid 1

STANDARD STATISTICAL PAPER
 FOR: GRID #2 PROJECT CODE: 294
 DATA ANALYSIS FOR CU SAMPLE TYPE= soils

FREQUENCY DISTRIBUTION HISTOGRAM FOR CU



DATA ANALYSIS FOR COPPER

Grid 2

BARRINGER

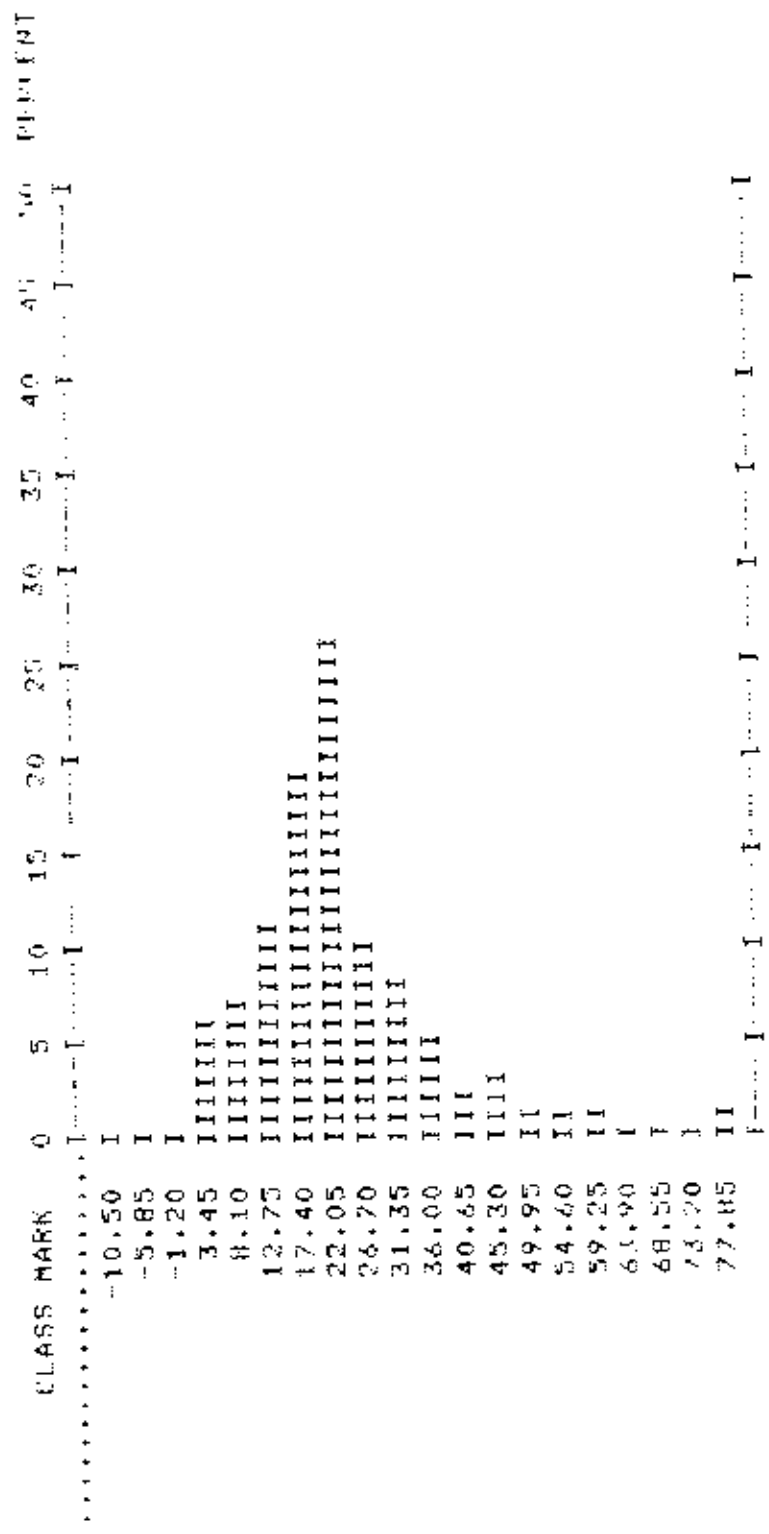
STANDARD STATISTICAL PACKAGE... BARRINGER RESULTS 100

FOR: Solid #2

PROJECT CODE: 295

DATA ANALYSIS FOR 01 SAMPLE TYPE: soils

FREQUENCY DISTRIBUTION HISTOGRAM FOR 01



DATA ANALYSIS FOR NICKEL

BARRINGER

Grid 2

STANDARD STATISTICAL PACKAGE ... BARRINGER PRODUCTS INC.

FOR: Grid #2

PROJECT CODEL- 295

DATA ANALYSIS FOR 20 SAMPLE TYPE= SOILS

FREQUENCY DISTRIBUTION HISTOGRAM FOR 20

CLASS MARK	0	5	10	15	20	25	30	35	40	45	50	PERCENT
-24.35	I											
-3.63	I											
17.10	II											
37.83	II											
58.55	IIIII											
79.28	IIIIIIIIIIIIIIIIIIII											
100.01	IIIIIIIIIIIIIIIIIIII											
120.73	IIIIIIIIIIIIIIIIIIII											
141.46	IIIIIIIIIIIIIIIIIIII											
162.19	IIIIIIII											
182.91	IIIIII											
203.64	IIIIII											
224.37	IIII											
245.09	I											
265.82	II											
286.55	II											
307.27	I											
328.00	I											
348.73	I											
369.45	II											

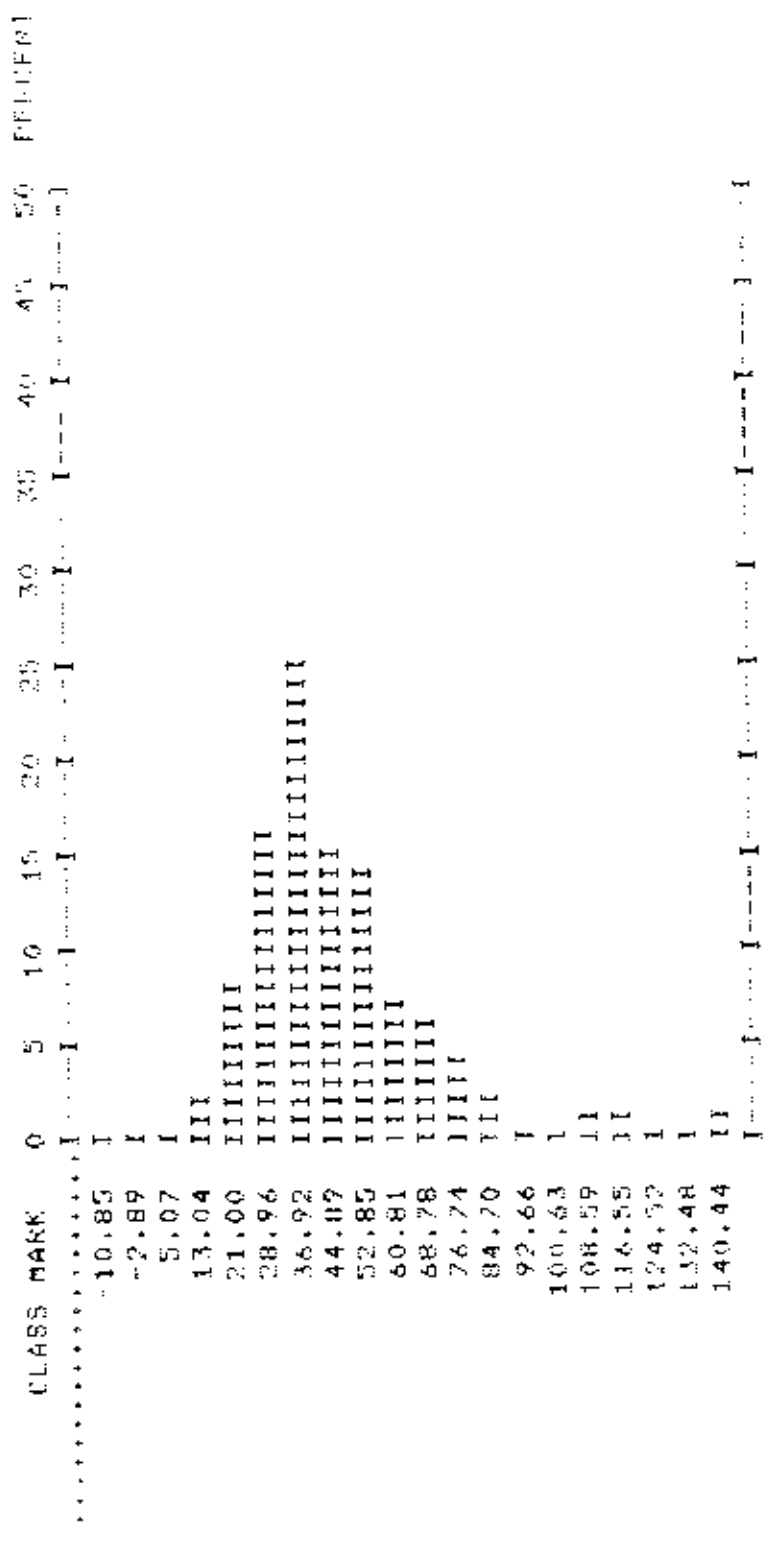
DATA ANALYSIS FOR ZINC

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Grid 2

STANDARD STATISTICAL PACKAGE... CONTINUED ON SURFACE...
 FOR:
 DATA ANALYSIS FOR CU SAMPLE TYPE- SOILS PROJECT CODE- 040

FREQUENCY DISTRIBUTION HISTOGRAM FOR CU



DATA ANALYSIS FOR COPPER

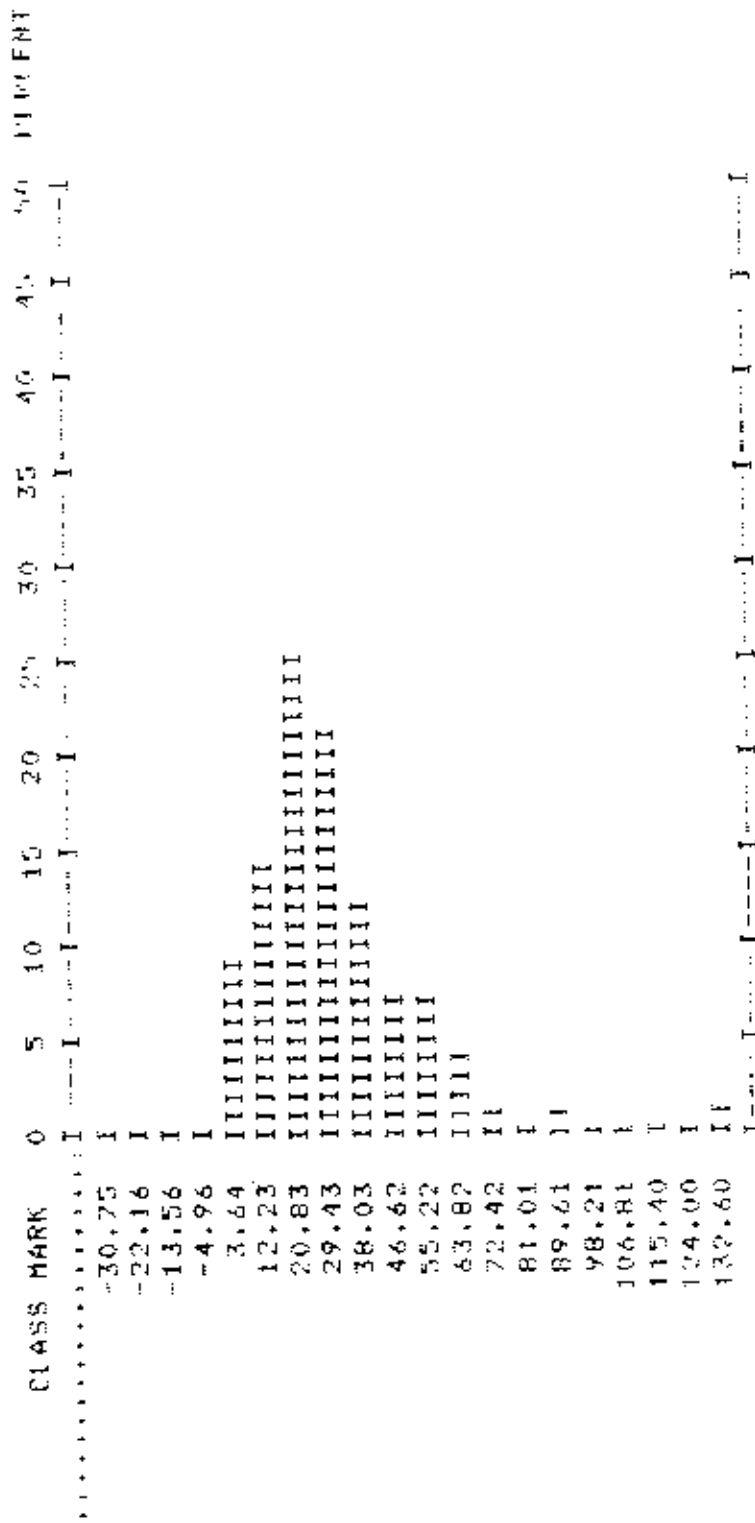
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Grid 3

PROJECT CODE- 295

DATA ANALYSIS FOR NI SAMPLE TYPE- soils FOR:

FREQUENCY DISTRIBUTION HISTOGRAM FOR NI



DATA ANALYSIS FOR NICKEL

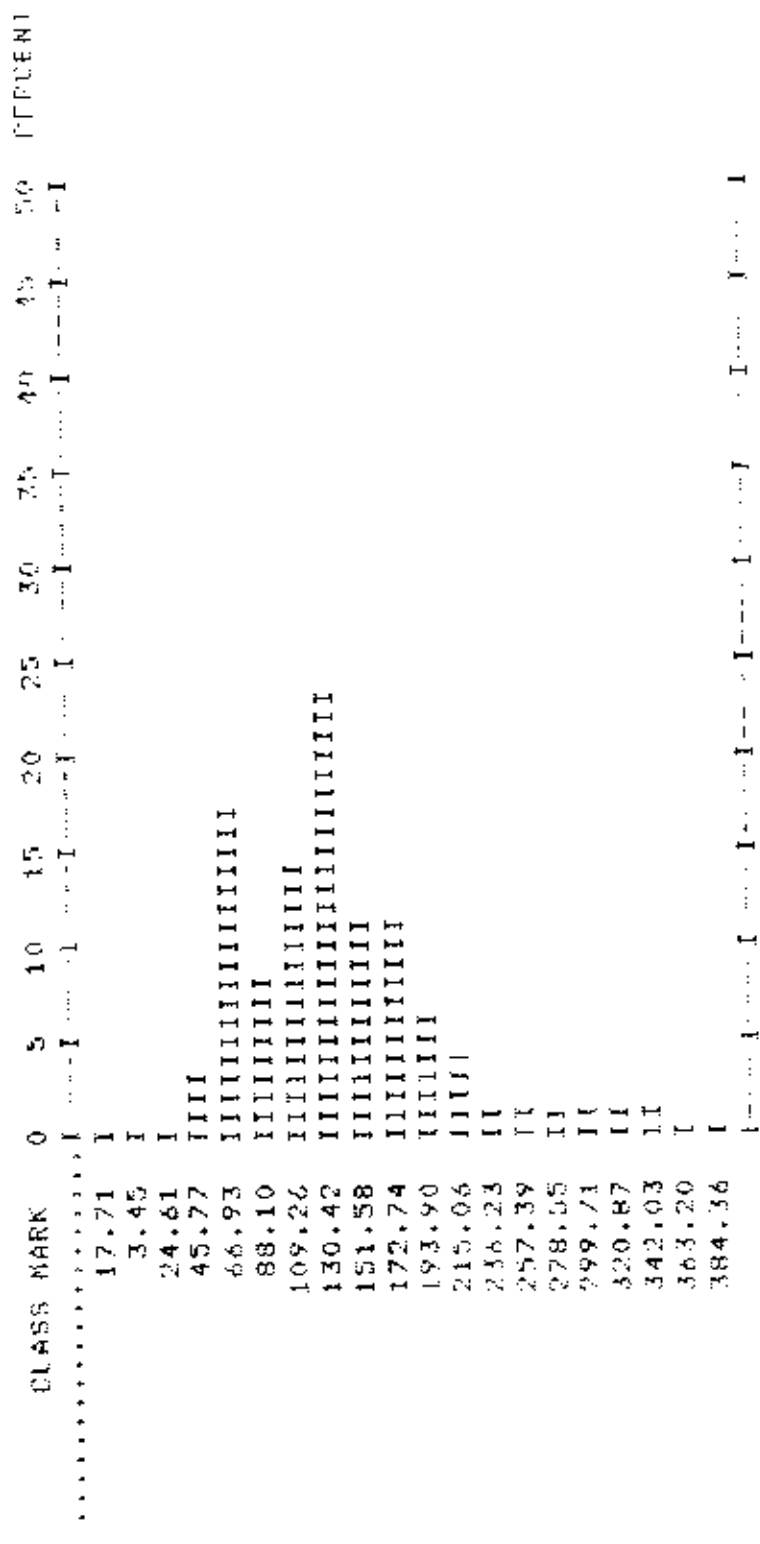
BARRINGER

Grid 3

STANDARD STATISTICAL PACKAGE BARRINGER CONSULTANTS LTD
 PROJECT CODE: 395

DATA ANALYSIS FOR 26 SAMPLE TYPE= SOILS FOR: 395

FREQUENCY DISTRIBUTION HISTOGRAM FOR 26



DATA ANALYSIS FOR ZINC

BARRINGER

Grid 3

STANDARD STATISTICAL PRACTICES FOR BARRINGER MINERALS, INC.

FOR:

PROJECT CODE - 295

DATA ANALYSIS FOR CU SAMPLE TYPE= SOILS

FREQUENCY DISTRIBUTION HISTOGRAM FOR CU

CLASS MARK	0	5	10	15	20	25	30	35	40	45	50	EFFICIENCY
-10.62	I											
-1.39	I											
7.84	I											
17.06	II											
26.29	IIIIIIIIII											
35.52	IIIIIIIIIIIIIIIIIIIIII											
44.75	IIIIIIIIIIII											
53.97	IIIIIIIIIIIIIIIIIIIIII											
63.20	IIIIIIIIIIIIIIIIIIIIII											
72.43	IIIIIIIIIIII											
81.65	IIIIIIIIII											
90.88	II											
100.11	I											
109.34	III											
118.56	II											
127.79	I											
137.02	II											
146.25	I											
155.47	I											
164.70	II											

DATA ANALYSIS FOR COPPER

BARRINGER Grid 4

TYPE: 100% FINE SANDS, SILTS, CLAYS, AND MUDS, TAC

PROJECT CODE: 299

FOUR

DATA ANALYSIS FOR

FREQUENCY DISTRIBUTION HISTOGRAM

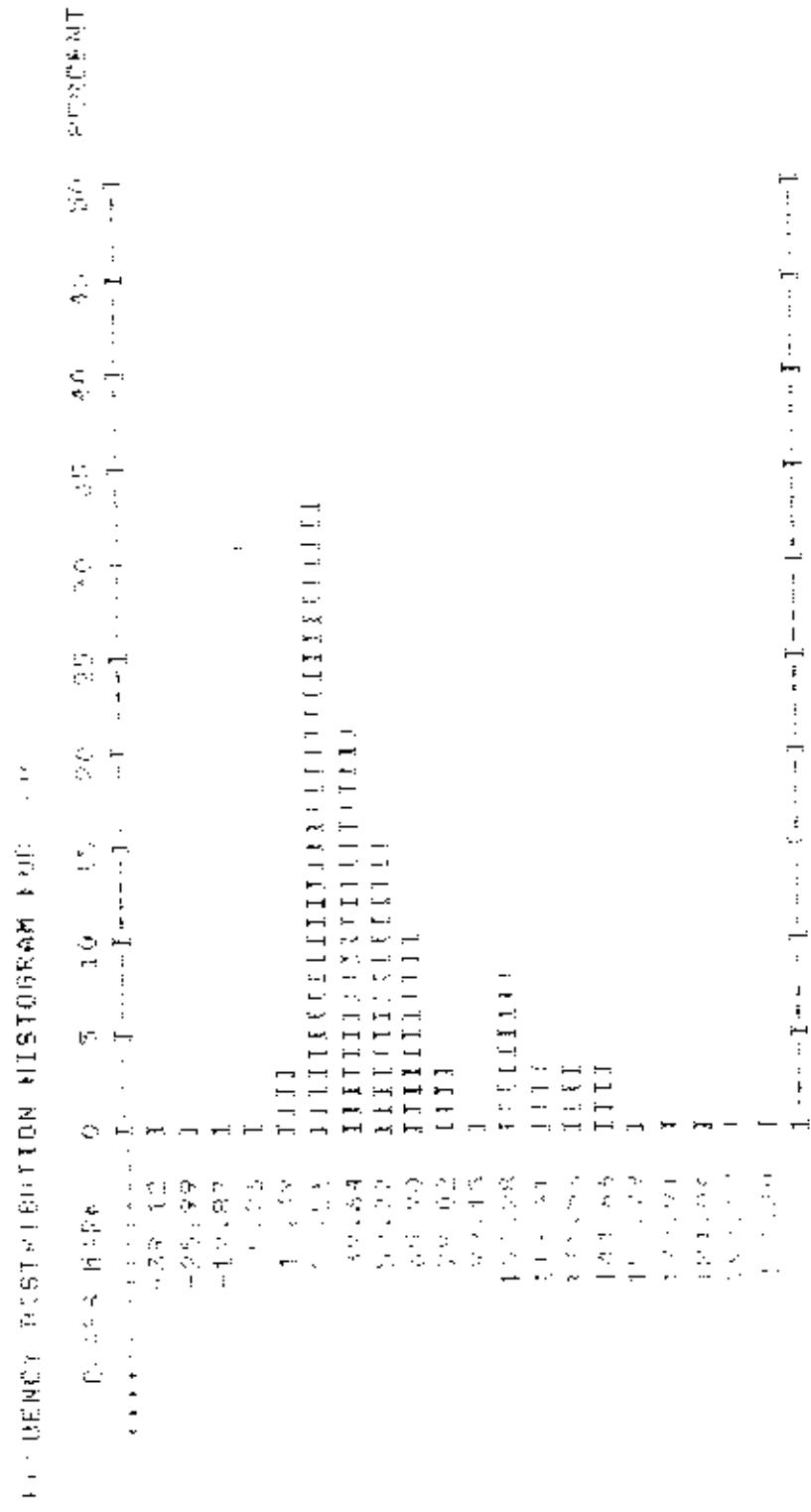
CLASS MARK	0	5	10	15	20	25	30	35	40	45	50	PERCENT
30.76												
30.98												
31.19												
31.40												
31.62												
31.83												
32.04												
32.26												
32.47												
32.68												
32.89												
33.11												
33.32												
33.53												
33.75												
33.96												
34.17												
34.39												
34.60												
34.81												

DATA ANALYSIS FOR ZINC

Grid 4

BARRINGER

DATA ANALYSIS FOR CU SAMPLE TYPE= 40 34 PROJECT CODE= 095
 FREQUENCY DISTRIBUTION HISTOGRAM FOR CU FIRE GRID #5



DATA ANALYSIS FOR COPPER

Grid 5

BARRINGER

STANDARD STATISTICAL PACKAGE, BARRINGER REOURCES, INC.
 PROJECT CODE 290
 GRID #5
 SAMPLE TYPE SOILS

DATA ANALYSIS FOR DISTRIBUTION HISTOGRAM FOR

CLASS MARK	0	5	10	15	20	25	30	35	40	45	50	PERCENT
28.99	1											
26.28	1											
23.56	1											
20.85	1											
18.14	1	1	1	1	1	1	1	1	1	1	1	
15.42	1	1	1	1	1	1	1	1	1	1	1	
12.71	1	1	1	1	1	1	1	1	1	1	1	
10.00	1	1	1	1	1	1	1	1	1	1	1	
7.29	1	1	1	1	1	1	1	1	1	1	1	
4.58	1	1	1	1	1	1	1	1	1	1	1	
1.87	1	1	1	1	1	1	1	1	1	1	1	

DATA ANALYSIS FOR NICKEL

Grid 5

BARRINGER

STANDARD STATISTICAL PACKAGE... BARRINGER RESOURCES INC.
 FOR: SPID # 6 PROJECT CODE

PROJECT CODE

SAMPLE TYPE SOILS

FREQUENCY DISTRIBUTION HISTOGRAM FOR Cu

CLASS MARK	0	5	10	15	20	25	30	35	40	45	50	PERCENT
19.58	I											
27.05	I											
34.52	I											
41.99	I											
49.46	I											
56.93	I											
64.40	I											
71.88	I											
79.35	I											
86.82	I											
94.29	I											
101.76	I											
109.23	I											
116.70	I											
124.17	I											
131.64	I											
139.11	I											
146.58	I											
154.05	I											
161.52	I											

DATA ANALYSIS FOR COPPER

BARRINGER

Grid 6

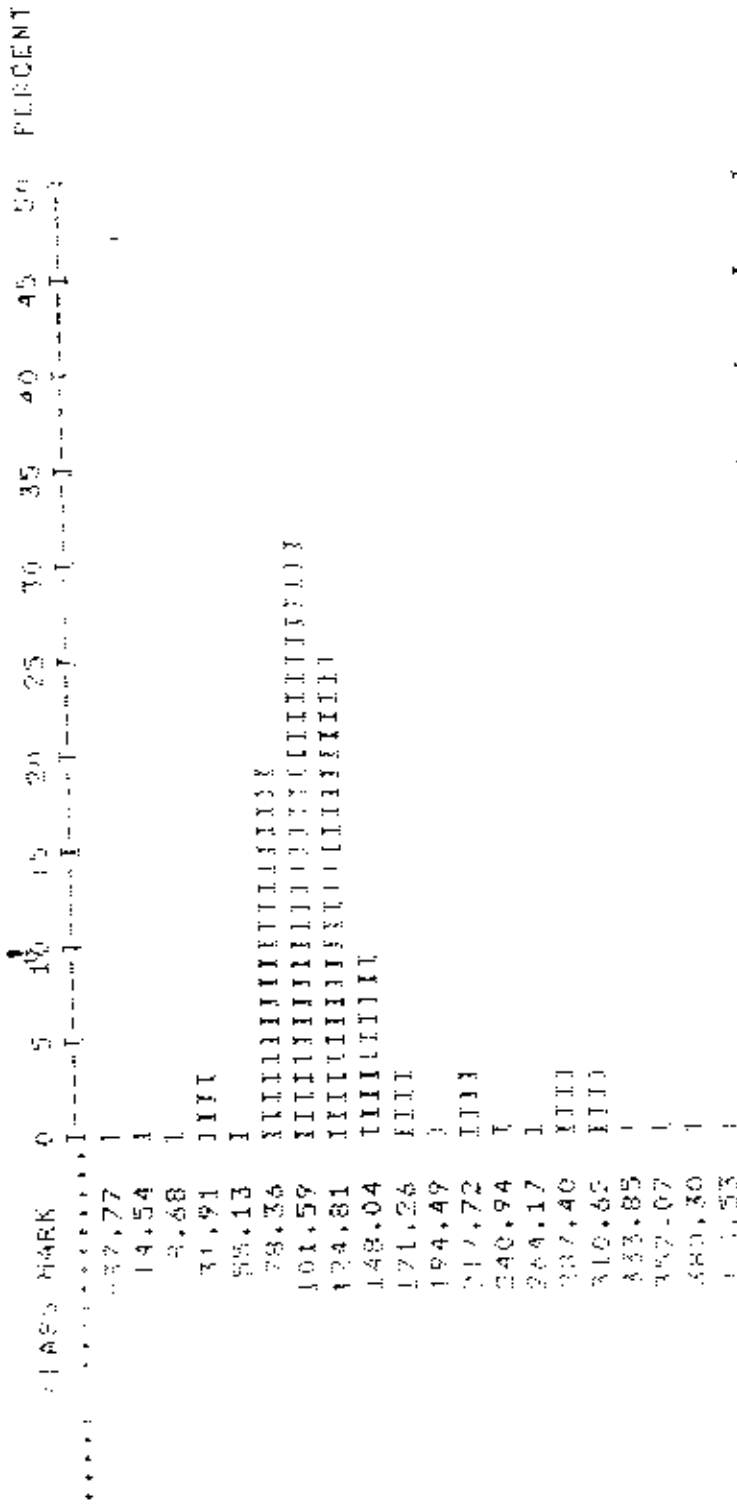
STANDARD STATISTICAL PACKAGE...BARRINGER RESOURCES INC

PORT # 6

PROJECT CODE=

DATA ANALYSIS FOR Zn SAMPLE TYPE= soils

REQURER: DISTRIBUTION HISTOGRAM FOR Zn



DATA ANALYSIS FOR ZINC

Grid 6

BARRINGER