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Geochemical Report on
The Slave Project
Northeastern Alberta

by

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SUMMARY

In 1978 Taiga Consultants Ltd. on behalf of Marline Oil Corporation took some 239 sediment samples and 241 water samples from lakes and muskegs in the Slave River area. The former samples were analyzed geochemically for U, Cu, Pb, Zn, Ni, Mo and Ag; the latter were analyzed for U, pH and specific conductivity. The results were computer plotted, moving average and residual maps were drawn and basic statistical parameters calculated.

Generally most of the permits are underlain by Devonian limestones and dolomites unconformably overlying Precambrian granitic rocks. The contact between these rocks trends southeast-northwest along the east border of the permits. Airphoto lineaments are dominently northeast and northwest and probably represent major faults in the area.

Overlapping northeasterly geochemical trends for Pb-Ag-U (W) and specific conductivity are dominent in the southeast part of the permits; in the northeast sector of the permits U(W)- Zn-Cu-Mo regional trends occur. Devonian strata underlie all these areas.

Outside of the permits definitive northeast coincident regional U-Zn-Ni-Ag trends are present over Devonian terrane in the northwest corner of the surveyed area. The Precambrian granitic terrane in the east sector of the area is marked by north trending coincident reigonal increases in U-Zn-Ni, overlap with Ag occurs in the north and with specific conductivity in the south. Within the U-Ni regional highs there are northeast trends coinciding with airphoto lineaments.

Significant U in water anomalies are present in the south part of the permits, in the vicinity of Four Mile Lake and southwest of Fort Smith. U anomalies have been found by Taiga Consultants Ltd. in humus samples in the vicinity of some of the anomalies in these area. Near Fitzgerald U water anomalies occur in an area where high background granites (3-7.5ppm U) outcnop and limestones west of here also are abnormally high in U (1.5-3ppm over a background of < 0.4ppm).

It is recommended that geochemical pilot studies involving sectional sampling of the overburden be carried out in the vicinity of the U(W) anomalies over the permits. Results from these studies will help determine the proper sample media and interval for future systematic follow-up goechemical surveys. All available outcrops should be sampled, particularly where they are fractured and geochemically analyzed for U.

INTRODUCTION

During the 1978 field season Taiga Consultants Ltd. carried out a lake sediment and lake water survey on behalf of Marline Oil Corporation covering some 79535 acres($310km^2$)in the Slave River area of northeastern Alberta. A total of 239 lake sediments and 241 lake waters were taken. The sediments were analyzed geochemically for U, Cu, Pb, Zn, Ni, Mo and Ag, the waters were analyzed for U; specific conductivity and pH were also determined on the water samples. Subsequently these results were computer plotted, moving average and residual maps were drawn for each element and basic statistical parameters were calculated. In this presentation these results will be reported on and interpreted. This report should be considered an addendum to the one submitted to Marline Oil Corporation by Taiga Consultants Ltd.*

*Taiga Consultants Ltd. (1978): A preliminary geological and geochemical evaluation of the Slave project, northeast Alberta: A report to Marline Oil Corp., November 15, 1978.

LOCATION AND ACCESS

The area is located west of Slave River and south of the town of Fort Smith. The northlimit of the permits is about 300 meters south of the Alberta-N.W.T. border (latitude 60°N).

Three all-weather gravel highways provide good access to most of the project area. These include: Highway 5 from Hay River to Fort Smith which parallels the northern boundary; the Fort Smith-Fort Chipewyan road parallels the east boundary and the Fort Smith-Peace Point road trends southwesterly through the area.

A float-plane base is located on the west bank of Four Mile Lake and the Fort Smith airport is serviced 6 days a week by Pacific Western Airlines jet from Edmonton (725km).

GEOLOGY

For specific details on surficial and bedrock geology the reader is referred to the report by Taiga Consultants Ltd.

The permits straddle the Precambiran-Paleozoic unconformity in the northeast corner of Alberta. The Precambrian rocks along the eastern margin of the property consist of granitic rocks containing minor mafic gneisses. The western parts of the permit area are underlain by a series of middle Devonian limestones and dolomites. A regolith (La Loche Formation) 0-8.8m thick, made up of breccia, conglomeratic sandstone, arkosic sandstone and sandy mudstone with a matrix of clay and iron oxide marks the contact between the Paleozoic and Precambrian rocks.

Major northeast and northwest trending faults occur in the area.

Overburden over the permits consists of glaciolacustrine silts and clays up to 30m or more in thickness. In the north part of the property these are overlain by fine-grianed aeolian sands and silts. Glacial meltwater channels occur in the eastern sector of the property, they are presently occupied by small lakes and ponds. The most recent glacial ice advance was from the east-northeast.

GEOCHEMISTRY

FIELD AND LABORATORY PROCEDURES:

Samples of lake and muskeg sediment were taken using a free-fall cylindrical sampler from a float-equipped helicopter. Water samples were collected in 8 ounce polyethelyne bottles at a depth of 30cm below the surface. The survey was carreid out in 2 stages; samples 1 to 177 were taken in July and 178-300 were obtained in September. The first batch of samples were sent to Loring Laboratories Ltd., Calgary where the waters were analyzed for U and the sediments were analyzed for U, Cu, Pb, Zn, Ni, Mo and Ag. The second group were analyzed by Chemex Laobatories, Calgary; subsequently these sediments were reanalyzed for U, Mo and Ag by Loring Laboratories and the Chemex results for these elements were discarded. pH, Rn222 and specific conductivity measurements on waters were done in the field by Taiga Consultants Ltd.

U in water was analyzed by evaporating to dryness a 50ml aliquot to which 2ml of HNO_3 was added. The dissolved residue was fused with a carbonate-fluoride flux on a platinum dish. U was determined on the fused disc using a fluorometer. The detection limit was 0.25ppb U.

U in lake sediments was also determined fluorometrically after 0.5g of -80 mesh material was digested for 3hrs in hot HCl. Loring Laboratories submit results in ppm U_3O_8, for this report all results have been converted to ppm U.

Cu, Pb, Zn, Ni, Mo and Ag were analyzed by atomic absorption spectroscopy after digesting 500mg of -80 mesh material in hot aqua regia for 3 hours. For Mo determinations aluminum chloride was added to the solution after digestion.

Using the above procedures detection limits are 2ppm for Cu, Pb, Zn, Ni and Mo, 0.2ppm for Ag and 0.1ppm for U.

Specific conductivity was measured using a Lectro Mho-Meter and pH determiantions were made with a pH meter (Model P.H.M. 29 Radiometer). In addition radon was tested for in the water using a EDA Instruments Model RDU-200 degassing system and emanometer; no significant amounts of Rn were detected in the waters.

COMPUTER PROCEDURE:

The computation stages were carried out by Luciano Martin of CASE (Computer Applications and Systems Engineering).

The analytical results were transferred to punch cards. The 1:50000 scale field maps provided the positional data, the co-ordinates of all samples were digitized with an Istronics Gradicon and a Coradi co-ordinatograph. An independent origin was established and all

positions were related to it. An IBM 370/168 computer was then employed to convert the digitized co-ordinates to standard U.T.M. values and merged with the corresponding analytical data.

The weighted, moving-average technique was then applied to separate the regional and residual components. To do this for any given point on the map a search is made of all samples enclosed by a circular window of radius 4km (2.4mi) centered at that point. The size of the search radius is determined by including a set minimum number of samples; if the search area fails to reach the minimum number the search radius at that point is increased. The computation positions have been selected on a regular east-west, north-wouth grid lattice spaced at 2km (1.2mi) in both directions. This interval allows a 50% overlap of search windows in both east-west and north-south directions. The size of the search window, and hence of the lattice spacing, is determined by a step by step iterative process to reach the best compromise between regional clarity and local detail. The particular window size and lattice spacing chosen is unique to any particular lake or stream sediment study and the most important control is exercised by areas with the least complete sampling compared to the overall sampling density and by the complexity of local geological detail.

A weighted average of values in each search area is then computed with a maximum weight being set for samples close to the centre. These weighted, moving-average values at each search area approximate to the regional component.

The difference at any one sample point between the laboratory measured value and this computer generated regional value is the residual value. Maps of the residual values plotted at the original sample point are an exploration guide to specific geochemical anomalies within a given regional area; these have been computer plotted on 1:50000 scale maps and combined with the moving (regional) average maps.

The regional component values were then contoured and plotted by a Calcomp 748 flatbed plotter on 1:50000 scale maps. The contour intervals were empirically chosen after a thorough study of the statistics. No particular predetermiend statistical parameter was used to choose contour intervals. The important criteria is the ability of the contours to illustrate metal distribution patterns; a compromise between clarity and clutter has to be accepted.

The measured values for U, Cu, Pb, Zn, Ni, Mo and Ag in lake sediments and for pH, specific conductivity and U in lake waters as well as residual and contoured moving averages are shown on the accompanying 1:50000 scale maps.

In addition to the above, basic statistical parameters such as means, standard deviations and correlation coefficients were calculated and histograms and cumulative frequencies were calculated and plotted. A complete listing of computerized data can be found in the accompanying report from CASE. A summary is presented in Table 1.

TABLE 1: Statistical summary for trace metals in lake waters and sediments - Slave Project.

Element	Arith. Mean	Geom. Mean	Std. Dev.	Ln. Dev.	Range of Values	No. of Samples
U(W)	1.2	0.5	2.1	3.7	0.1-18.6	241
pH(W)	7.9	7.9	0.4	1.1	6.7-9.4	235
S.C.(W)	1050	443	3074	2.4	100-24000	246
U	2.7	1.6	3.1	2.9	0.1-24.0	239
Cu	9	8	5	2	3-36	144
Pb	8	6	6	2	1-70	239
Zn	67	59	36	2	16-340	249
Ni	18	16	8	2	4-84	239
Mo	5	4	2	2	0.5-19	239
Ag	0.9	0.7	0.5	1.9	0.1-3.5	239

(W) = water sample, other determinations are for lake sediment samples.

U(W) in ppb

S.C.(W) specific conductivity in μ mhos

Values for elements in sediments in ppm

A study of the correlation coefficients shows that the following positive correlations listed in descending order of magnitude are statistically significant at the 99 percnet confidence level:

U(W) vs Pb
pH(W) vs Pb
S.C.(W) vs Ag, Ni
U vs Cu, Zn, Ni
Cu vs Zn, Ni, U
Pb vs U(W),pH, Mo

Zn vs Cu, Ni, U
Ni vs Cu, Zn, S.C.(W), U
Mo vs Pb, Ag
Ag vs S.C.(W), Mo.

The following negative correlations are significant at the 99% confidence level:

pH(W) vs S.C.(W), Ag
S.C.(W) vs U, pH
U vs S.C.(W)
Zn vs Ag
Ag vs Zn, pH

The possible geological implications of these correlations will be referred to later when the regional metal distributions are discussed. However metallogenetically good positive correlations between such metals as U and Cu, Zn, Ni in the lake sediments suggest mineralization associated with mafic rocks and/or graphite. U(W) best correlates with Pb which is suggestive of mineralization associated with carbonate rocks.

RESULTS:

Uranium (Water)

The regional values for U in waters are highest over Paleozoic rocks west of Slave River. Regional U(W) values over these rocks generally are greater than 1ppb and they reach a maximum of 2.4ppb in the northeast corner of the area in the vicinity of Four Mile Lake. Other regional highs are present southwest of Fort Smith and in the southeast part of the property west of Fitzgerald. Also there is another regional U(W) anomaly (1.6 to 2.4ppb) in the southwest corner of the region near the head of Salt River.

The trends of the regional U (W) anomalies are northeast and northwest which corresponds to the major lineaments in the area. Hence it is possible that these lineaments exert some control on the distribution of U in the Paleozoic rocks underlying the above regional anomalies.

There is good correspondance between the regional distribution patterns for Pb in lake sediments and U(W). In the southeast sector of the property there are coincident regional increases in U and Ag in lake sediments, specific conductivity and U in waters. In the southwest over Salt River regionally high U(W) values are associated with corresponding regional increases in specific conductivity, Ni and Mo. In the Four Mile Lake area there is a coincidence between regional increases in U(W), pH, Mo, Ag and Ni and southwest of Fort Smith there are coincident regional increases in U(W), pH, Zn and Mo.

In the northeast (Four Mile Lake) and north (southwest of Fort Smith) parts of the property positive residual U values in water vary from 1.0 to 16.4ppb values(measured values 1.0 to 18.6ppb). Also there are positive residual values of 1.0 to 13.1ppb U(measured values 2.0-15.0ppb) in the south-east corner of the permit area. Taiga Consultants Ltd. have reported above normal amounts of U (3.0-7.5ppm) in granites west and northwest of Fitzgerald; also 6.25km (4 miles) west of Fitzgerald limestones were found to be anomalous in U (1.5-3.0ppm). Residual U(W) values near these outcrops range from 1.1 to 13.1ppb. Off of the southwest corner of the permits there is a residual U(W) values of 8.8ppb, the measured U(W) values at this site is 11ppb. Outcrops of fetid and bituminous limestone occur along Salt River here, analyses of these rocks by Taiga showed that they contain less than 0.4ppm U.

Uranium (Lake Sediments)

The regional values for U in lake sediments are highest over the Precambrian rocks east of Slave River. The major trend is west of north, this is shown by the 4ppm contour. This regional high is lobate in a northeast direction where northeast trending lineaments (faults?) have been interpreted. West of Slave River in the south portion of the area a regional U high (3-5ppm) lies along the Precambrian-Paleozoic contact. The regional U values for lake sediments over Paleozoic rocks are highest (2-3.5ppm) in the southeast corner of the permits, in the southwest corner of the sampled area (2-2.5ppm) and in the northwest (2-2.5ppm). The regional trend is northeast in the latter area, northwest in the southeast part of the permit area and northwest-northeast in the southwest corner of the area. These trends correspond to air photo lineaments (faults?) defined by Taiga Consultants Ltd.

Many of the positive residual values (2-18.9ppm) for U in lake sediments occur over the Precambrian rocks east of Slave River. The highest measured values (7.9-24ppm) are present north of Fitzgerald and near the north boundary of the area (10-5-12.7ppm).

Positive residual U values are also high (3-15.2ppm) in the east and southeast parts of the permits west of Slave River near the Paleozoic-Precambrian contact and over the Paleozoic rocks west of the contact. Above normal measured U values range from 4.5 to 17.4ppm here.

pH (Water)

Maximum regional pH values, greater than 8, are present in the central part of the permits and west of Fort SmithThe regional trend is northwest. The highest measured values (9.1-9.4ppm) are present west and south of Fitzgerald where high U values in waters and sediments occur. Precambrian granitic rocks in this area also contain above normal amounts of U (3-7.5ppm).

Specific Conductivity (Water)

Regionally specific conductivity increases to the southwest and reaches a maximum in the vicinity of Salt River where saline springs discharge.

Copper

Cu was analyzed only on samples west of Slave River. Regionally there is an increase in Cu (8-10ppm) over the Precambrian rocks in the southeast part of the area. Over the Paleozoic rocks to the south and west Cu reaches a regional maximum of 10ppm in several places. Regional Cu trends are mainly northeast. Coincident anomalies in Cu (14-23ppm), U(W) (2-3ppb), U (8.1-12.3ppm), Zn (110-260ppm), Pb (13-16ppm), Ni (24-38ppm) and Mo (7-14ppm) are present over the Precambrian and Paleozoic rocks in the south part of the area. In the southwest corner of the area on Salt River a site with a Cu value of 14ppm is high also in U(W)(11ppb), Pb (16ppm), Ni (28ppm), Mo (7ppm) and Ag (1.5ppm). Southwest of Fort Smith above normal Cu (14-20ppm) in lake sediments correlates with above normal values in one or more of the following: Pb (13-20ppm), Zn (108-340ppm), Mo (13ppm) and Ni (25-28ppm).

Lead

Regionally Pb is low over the area underlain by Precambrian rocks (< 6ppm). Major regional increases (8-11ppm) occur over Paleozoic rocks in the south sector of the area where a northeast trend is evident and in the north part of the area where a strong northwest trend extends from south of Four Mile Lake to northwest of Fort Smith. There is a remarkable similarity between the regional distribution patterns for Pb and for U(W) over the Paleozoic rocks. In the north sector of the area there is an overlap between high regional Pb and high regional Cu, Zn and Mo. In the south there appears to be a good coincidence between regional increases in Pb, Ag and Mo Positive residual Pb anomalies are highest (3-63ppm) in the south part of the permits. Anomalous measured Pb values here range from 13-70ppm; there are several coincident Cu-Pb anoamlies in the southeast corner of the permits and south of Fitzgerald U (W) (3.3ppb), Cu (14ppm) and Pb (13ppm) are anomalous. Coincident above normal measured values in Pb (16-20ppm), U(W) (3-5ppb) and Ag (1.5-2ppm) are common in south part of the permits. Several coincident Pb-Cu highs and in places Pb-Zn-Cu-Ni highs are also present south and southwest of Fort Smith.

Zinc

There is a north trending moving average Zn high (70-80ppm) over Precambrian rocks east of Slave River where Ni (18-22ppm) and U (4-5.5ppm) also are regionally anomalous. Regional values up to 80ppm Zn occur over Paleozoic rocks southwest of Fort Smith where northeast Zn trends coincide with above normal regional values in U(W), Cu, Pb and Mo. West of here regional Zn values reach a maximum of 90ppm, the anomaly trends northeast and crosses Salt River. Other elements abnormally high in this area are specific conductivity, Ni and Ag. South of the permits and west of Slave River there is a northwest

trending regional Zn increase of 70-75ppm and in the central part of the area there are two low intensity northeast trending regional Zn anomalies (65-70ppm). These 3 anomalies are underlain by Paleozoic rocks and there appears to be a good coincidence between them and airphoto lineaments as defined by Taiga Consultants Ltd.

Positive residual Zn values ranging from 23-264ppm occur within the regional anomalies.

Most of the measured values in excess of 100ppm Zn are present over Paleozoic rocks west of Slave River. A series of high values (130-340ppm) are present southwest of Fort Smith, coincident with the highest Zn values are anomalies in Pb, Cu and Mo. Sediment samples from Salt River generally are above normal in Zn (95-150ppm). Coincident high Cu-Zn values and in places U are present in sediments in the southeast sector of the permits. Many of these anomalous values occur close to or over northeast and/or northwest lineaments.

Nickel

North and northeast trending regional Ni anomalies (18-22ppm) occupy the area east of Slave River. In this area coincident regional increases in Zn and U also occur. A strong northeast trending regional Ni anomaly (20-22ppm) occupies the northwest corner of the area where similar increases in Zn, Ag and specific conductivity occur. Several regional highs of 18ppm Ni also occur along Salt River and another is present north of Four Mile Lake. Again it is interesting to note the coincidence in the attitude of the regional Ni trends and airphoto lineaments.

The two highest positive residual Ni values (35-67ppm) are located about 2km north of Four Mile Lake just west of the Paleozoic-Precambrian contact, measured Ni values here are 52 and 84ppm; at the latter site U in water is also anomalous (5.3ppb). The high Ni values would indicate the presence of mafic rocks nearby. Other high residual Ni values ranging from 6 to 23ppm are present over the Paleozoic rocks in the south sector of the permits. Anomalous measured values range from 24 to 38ppm Ni. At the latter site U (12.3ppm), Cu (22ppm), Pb (16ppm), Zn (134ppm), Mo (7ppm) and Ag (1.5ppm) are also above normal; another anomalous sample contains 6.6ppm U, 23ppm Cu, 280ppm Zn, 32ppm Ni and the water contains 3ppb U. Also south of Fitzgerald there are anomalous Ni values (28-34ppm) with associated base metal anomalies and at one site, 2km south of Fitzgerald, there is a water sample containing 3.3ppb U and south of this site a sediment sample contains 8.1ppm U. This area is underlain by Precambrian rocks. Ni values along and near Salt River to the northwest are above background (18-38ppm), abnormally high Zn values (95-150ppm) generally are associated with the high Ni values and where the highest Ni occurs U is also anomalous (6.8ppm). Two anomalous Ni values of 26 and 30ppm are present northwest of Fort Smith where Pb is also above normal (14ppm). In Paleozoic terrane west of Four Mile Lake a value of 26ppm Ni is associated with above normal Pb (13ppm), Cu (19ppm) and Zn (108ppm), south of here several Cu (16-36ppm), Ni (26-28ppm) anomalies are present. The most likely source of the Ni west of Slave River would be mafic dykes. In Precambrian terrane northeast of Slave River high Ni (24-34ppm) values in lake sediments are associated with anomalous U (10.5-13.8ppm) and above normal Ag (1.5ppm).

Molybdenum

The regional Mo pattern is dominated by a high (5-7ppm) centered over Four Mile Lake area. The major trend is northwest but the anomaly is lobate to the northeast in the vicinity of Fort Smith. There is a good correspondence between regionally high Mo,U(W), pH and Pb in this area. Major airphoto lineaments here correspond to the regional trends for Mo. There is also a series of regional Mo anomalies (5ppm) lined up in a northeast direction at the head of Salt River in the southwest corner of the sampled area; overlap with regional increases in U(W), Cu and Pb are apparent.

Enclosed in the regional high near Four Mile Lake are positive residual Mo values varying from 2 to 12ppm. Anomalous measured values ranging from 7 to 19ppm Mo occur southwest of Fort Smith and in Four Mile Lake area; associated Pb and in places Ag anomalies occur with the high Mo values. Southwest of Fort Smith Zn and Mo are coincidentally high. A high Mo value of 14ppm (residual 9ppm Mo) occurs at a site about 11km northwest of Fitzgerald, this sample is anomalous also in Cu (18ppm) and Zn (160ppm). Other multi-metal anomalies associated with above normal Mo values includes a Cu (23ppm)-U (6.6ppm)-U(W) (3ppb)-Zn (280ppm)-Ni (32ppm)-Mo (7ppm) anomaly 8km northwest of Fitzgerald and a U (12.3ppm)-Cu (22ppm)-Pb (16ppm)-Zn (134ppm)-Ni (38ppm)-Mo (7ppm)-Ag (1.5ppm) anomaly in the southwest corner of Permit 6878020001, 2.5km north of Salt River. All of the above anomalies occur over Paleozoic rocks.

Silver

A northeast trending regional Ag high (0.8-1.4ppm) is present over Paleozoic rocks in the south part of the permits and south of the permits. Another northeast trending regional Ag anomaly (1.0-1.2ppm) is present in the southwest part of the area west of Salt River. South of Four Mile Lake there is a 1ppm regional Ag high enclosed by a northeast trending 0.8ppm lobe; to the northeast over Precambrian rocks regional Ag values again reach 1ppm. Regional values for pH, Pb and Mo are high at the former site and regional anomalies in Ni, Zn and U occur at the latter locale. A regional Ag high (1ppm) extends northeast from Salt River in the northwestern sector of the area, Zn and Ni are regionally high here too.

Positive residual Ag values (0.3-2ppm) are most abundant in the southeast sector of the permits where measured anomalous values range from 1.5-3ppm. The latter value is at a site 7.5km northwest of Fitzgerald where Pb (16ppm) and U in water (5.7ppb) are also anomalous. The highest Ag value (3.5ppm) in the sampled region is present in the northwest corner of the area at a site that is anomalous in Ni (24ppm); Ag values up to 2ppm are present in the southeast corner of the permits where U in lake sediments and water is also above normal (4.6ppm and 6ppb) respectively. South of the south boundary of the permits at the head of Salt River several Ag values ranging from 2-2.5ppm occur. In Precambrian terrane to the northeast values of 1.5ppm Ag are associated with anomalies in U (10.5-12.7ppm) and Ni (24-34ppm).

DISCUSSION:

The Precambrian terrane in the east sector of the sampled area is distinguished by coincident regional northerly to west of north trends in U, Zn and Ni. The trends are defined by the 4ppm U, 70ppm Zn and 18ppm Ni. The attitude of the U trends more or less parallels the Paleozoic-Precambrian contact west of Slave River. The northeast lobate nature of the regional U, Zn and Ni anomalies suggest a coincidence between the distribution of these metals and northeast trending structural lineaments as defined from airphotos by Taiga Consultants Ltd.

Associated with the southern half of the regional U anomaly over the Precambrian rocks are coincident regional increases in U(W)-Zn-Pb-Ni-Specific Conductivity-pH. For the most part, these increases are centered around Fitzgerald where significant anomalies in these metals occur.

Follow-up work by Taiga Consultants has shown that granitic rocks west of Fitzgerald are anomalous in U (3-7.5ppm). In addition soil samples, especially humus, taken on either side of a major northeast trending lineament that traverses this area contain anomalous amounts of U (3-10ppm) over a background of < 0.4ppm . Reconnaissance soil sampling to the southwest indicates these anomalous zones probably extend westward to the Precambrian-Paleozoic contact. Additional systematic till and soil sampling and rock geochemistry would have to be done to better delineate the most promising areas.

The northern portion of the regional lake sediment U trend east of Pelican Rapids has coincident regional increases in Zn-Ni-Ag; the metal association is suggestive of vein

type U mineralization or mineralization associated with mafic rocks (eg, dykes). On the west bank of Slave River south of Mountain Rapids Taiga Consultants found two samples of granite containing 3 and 6ppm U. The granite is chloritized and hematized along joint planes. Resampling of this outcrop should concentrate on obtaining samples along the joint planes. In the northeast corner of the area lake sediments contain 10.5-12.7ppm U and waters contain up to 1.06ppb U. The sediments also contain 24-34ppm Ni, 1.5ppm Ag and 100ppm Zn. Southeast of this area similar anomalies occur. They all appear to lie along a northwest trending lineament. Prospecting in these areas is required to explain these anomalies.

Coincident with the regional increases for U in lake sediments and waters in the southeast corner of the permits is a marked regional increase in Ag (1-1.2ppm) with overlapping increases in specific conductivity, Cu and Pb. Again many of the metal patterns are lobate to the northeast especially Ag and U(W). This area is underlain by Devonian celcareous rocks and overburden would appear to be relatively thin. Follow-up work by Taiga Consultants outlined U soil anomalies varying from 3-28ppm. A water sample from this area contains 15ppb U, other water samples in the vicinity range from 3-5ppb U. Over the surveyed area Taiga Consultants Ltd. had 13 samples of Devonian limestone analyzed for U, all but 9 of these contained less than 0.4ppm U, 3 of them contained 1.5ppm U and 1 had 3ppm U in it. The four samples containing 1.5ppm U or greater were obtained from an outcrop area in the vicinity of the U soil and lake water anomalies. One of the most anomalous lake sediment sites is about 2km north of Salt River where sample No 79 contains 12.3ppm U, 22ppm Cu, 15ppm Pb, 134ppm Zn, 7ppm Mo and 1.5ppm Ag. Sample site 63 on Salt River 8km south of west of the latter site U in water is 11ppb, the sediment sample here also contains 14ppm Cu, 16ppm Pb, 28ppm Ni and 7ppm Mo. To the

north (3-4km) of site 63, U in waters is also anomalous (2-2.6ppb) and a sediment sample is abnormally high in Cu (36ppm), Zn (130ppm), Ni (26ppm) and Mo (7ppm). Also there is a group of anomalous U in water samples (1.3-3.3ppb) north of Salt River in the southwest corner of the permits. Another lake sediment sample 8km northwest of Fitzgerald contains above normal amounts of Cu (23ppm), Zn (280ppm), Ni (32ppm), Mo (7ppm) and U (6.6ppm).

Hence there are significant U anomalies in waters and sediments over Devonian limestone in the south sector of the permits. Target areas should be localized by systematic soil and till sampling prospecting and rock geochemistry. All springs in the area should also be sampled and when sampling outcrop particular emphasis should be placed on getting samples of fractured material. Initially follow-up work should be concentrated around the highest U(W) (15ppb) value. Pilot studies well have to be carried out to test the effectiveness of soil and basal till sampling.

On the west side of Slave River southwest of Pelican Rapids there are 2 water samples containing 1.4 and 2.2ppb U. Precambrian rocks underlie these sites and nearby humus samples taken by Taiga Consultants range from 1.5 to 5.5ppm U.

Some of the highest U in water values (10-18.6ppb) come from Paleozoic terrane at the north end of Four Mile Lake. Humus samples taken by Taiga Consultants west of the north end of Four Mile Lake contain 1.5-9.5ppm U. The source of the U is not known and additional work will be required to determine this. South of Four Mile Lake there are anomalies in Mo-Pb and Ag and to the north Mo and Ni are anomalous.

The two highest Ni values (52 and 84ppm) in the surveyed area occur about 2km north of the north and of Four Mile Lake close to the Paleozoic-Precambrian contact. The higher Ni value has a high U in water value (5.3ppb) and a Mo value of 7ppm associated with it. These anomalous Ni values suggest the presence of mafic rocks nearby. This area warrants additional work.

Southwest of Fort Smith there are several anomalous U in water values ranging from 2 to 8.3ppb. Northeast of the latter sample Mo (13-19ppm) and Zn (158-340ppm) anomalies are present. Whether these values are associated with bedrock sources or with high background metals in glaciolacustrine overburden is not known additional work is required to evaluate these anomalies. It is interesting to note that a sample of humus taken 1.5km west of Fort Smith contains 18ppm U.

CONCLUSIONS AND RECOMMENDATIONS

The lake sediment-water survey has outlined several anomalous U areas on the permits. In the southeast sector of the permits there is a group of northeast trending U(W) anomalies enclosing values ranging from 2 to 15ppb. Less intense U in lake sediment anomalies (4-17ppm) are present in the same area. The highest U in water in this area occurs where above background U values (1.5-3ppm) in limestones have been found and where anomalous soil samples have been taken (7-28ppm U). In places coincident anomalies for one or more elements are present. In the southwest Cu, Pb, Zn, Ni, Mo and Ag are associated with the U highs, in the northeast corner of Permit 6878020001 there is a coincidence between high Cu-Zn-Ni-Mo and U. Above normal Ag values (1.5-2ppm) are frequently

associated with the U anomalies in the southeast corner of the permit area. The source of U in the south part of the permits is not known and additional work will be required to better define target areas for drilling.

Very anomalous U in water values (5.3, 10 and 18.6ppb) are present north of Four Mile Lake, anomalous Ni (84ppm) occurs with the first value and Mo is generally high (7-13ppm) in the area. There is a good correspondance between the regional northwest geochemical trends for Pb-Mo-pH-U(W) and northwest trending airphoto lineaments. Also soil samples taken by Taiga Consultants just west of Four Mile lake contain anomalous amounts of U (1.5-9.5ppm). More systematic soil and/or till sampling will have to be done to better define the anomalous area.

The third group of U in water anomalies is present southwest of Fort Smith where values range from 2.3 to 8.3ppb U. High Zn (158-340ppm) and Mo (8-19ppm) is present in lake sediment samples northeast of the latter value. Strong northeast regional geochemical trends for Zn, Ni, Mo and U coincide with the direction of major lineaments in the area.

The sources of the U in the above areas are not known. It could be related to high levels of U in the glaciolacustrine sediments or it could be related to U charged groundwaters from mineralized rocks and/or structures.

To determine the proper sample media and sample density for follow-up work it is recommended that pilot studies be carreid out in the anomalous areas. A series of sections from surface to bedrock should be taken over each anomaly and the heavy and light fractions analyzed geochemically for U, Cu, Pb, Zn, Ni, Ag, and Mo.

The regional geochemical patterns over Precambrian terrane east of Slave River are oriented west of north and northeast. Coincident regional anomalies occur for U, Ag, Ni and Zn in the northeast part of the area and for U, Zn, Ni and specific conductivity in the vicinity of Fitzgerald. Samples of granite taken west of Fitzgerald are above normal in U (3-7.5ppm) and the highest values (3.3-5ppb) for U in waters over granites come from this area. Corresponding anomalies for Cu and Ni in the area suggest a metal source associated with mafic rocks.

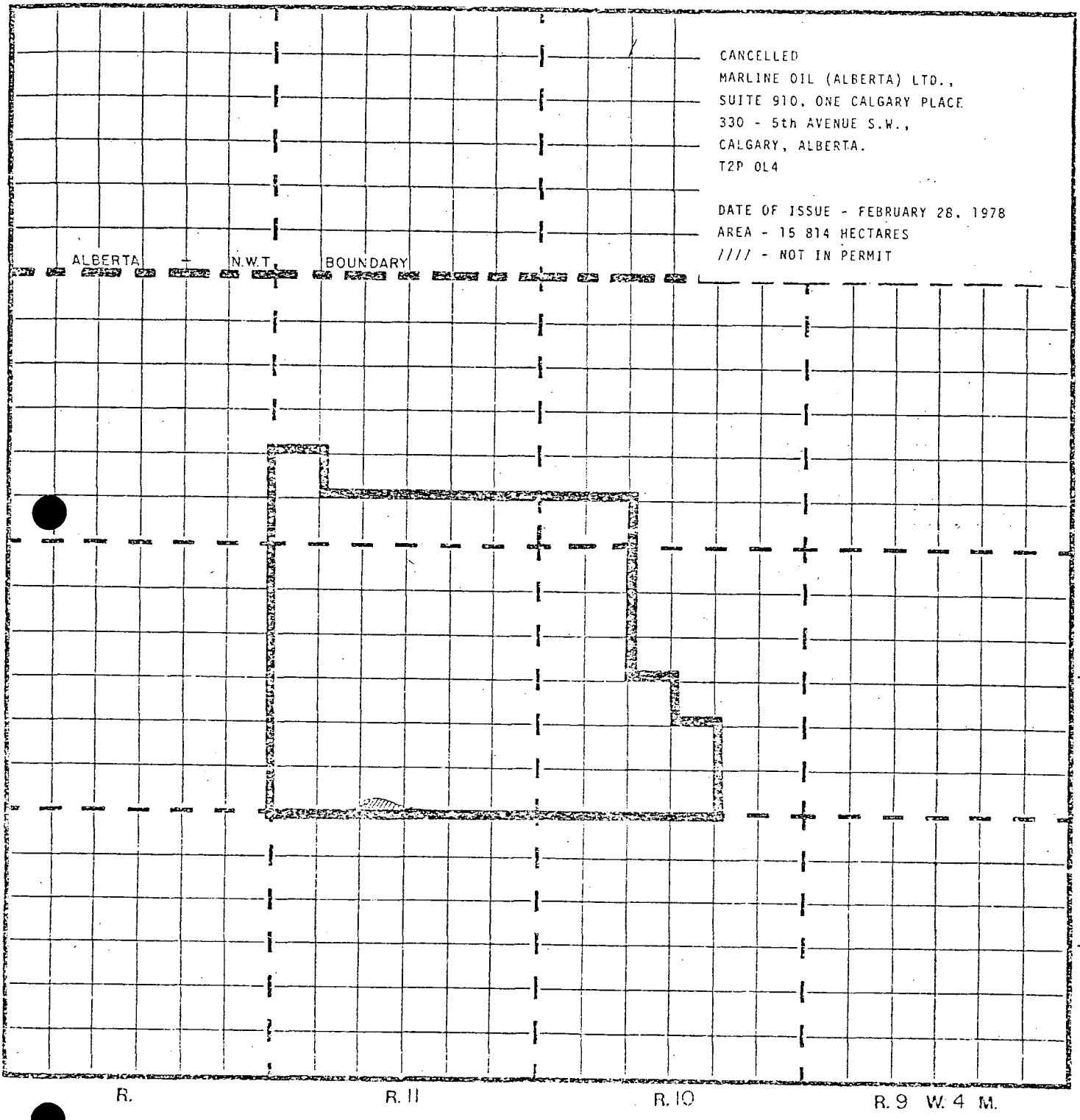
Submitted by,

C.F. Gleeson PhD, P.Eng.

CFG/mg
April 9,1979

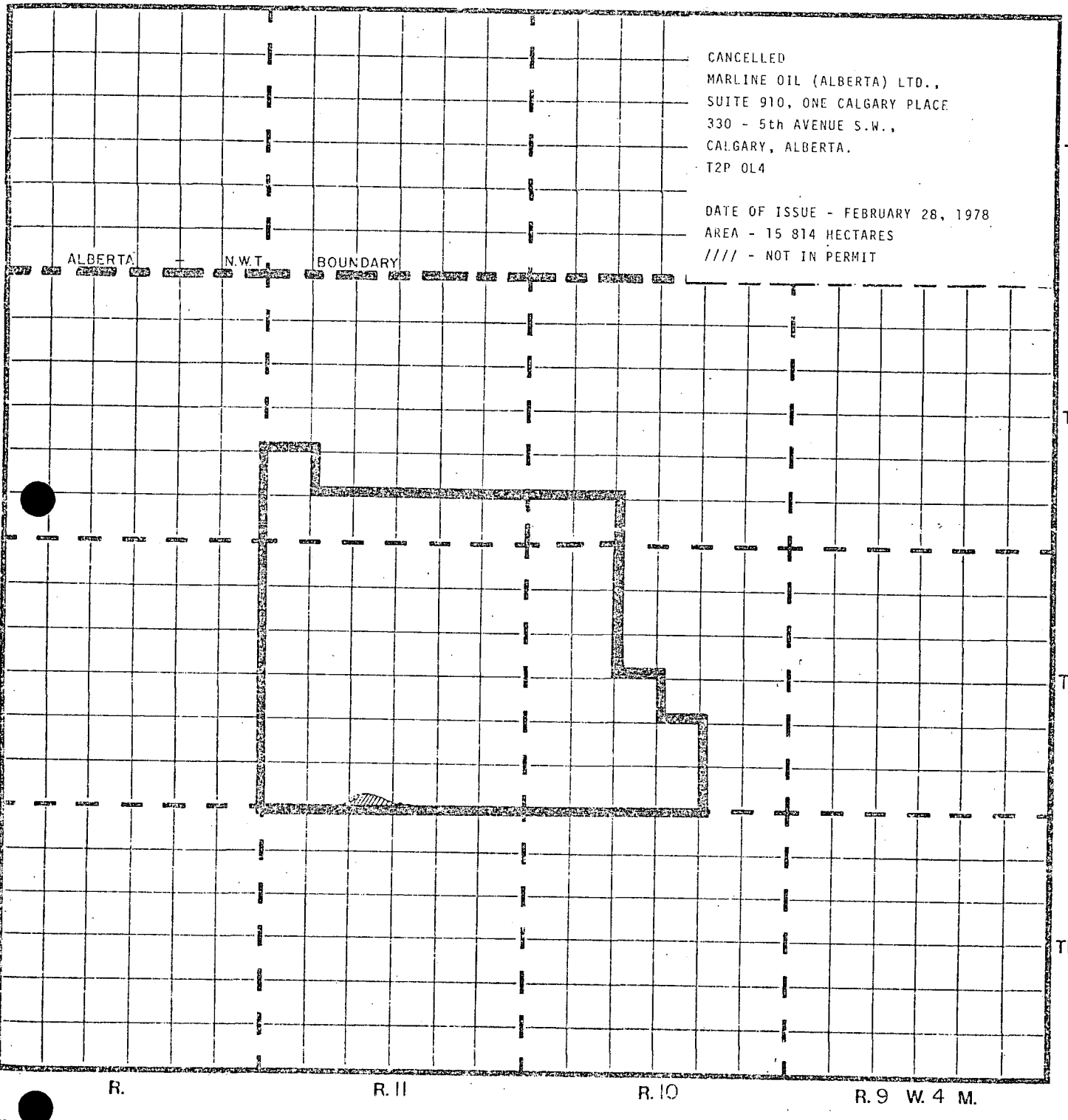
19790014

QUARTZ MINERAL EXPLORATION PERMIT NO. 6878020001



19790014

QUARTZ MINERAL EXPLORATION PERMIT NO. 6878020001



MARLINE OIL CORPORATION
SLAVE PROJECT - ALBERTA
QUARTZ MINERAL EXPLORATION PERMITS 6878020001, 2
TWP 125, 126 R.10-13 W4M

LAKE & MUSKEG GEOCHEMICAL SURVEY

PERMIT BOUNDARIES
AIRPHOTO LINEAMENTS
RAPIDS, SANDBARS
POWERLINE
ROADS
CUTLINES & TRAILS
SAMPLE SITE - PH Series Samples
Basemap compiled from uncontrolled photo mosaic

SCALE: 1:50,000
1000m 0 1km 2km 3km 4km

MAP NO. Mo Analytical
1979014

SAWMILL ISLAND
CUNNINGHAM LANDING
BELL ROCK
SLAVE RIVER
HWY 5 (to Hay River)
FORT SMITH
NORTHWEST TERRITORIES
ALBERTA
112°00'
60°00'
R13 R12
R12 R11
R11 R10
R10 R9
84-P-16 74-M-13
PERMIT 6878020002
PERMIT 6878020001
MOUNTAIN RAPIDS
FOUR MILE LAKE
PELICAN RAPIDS
FITZGERALD
RYAN ISLAND
SALT RIVER
SLAVE RIVER
59°55'
59°50'
TWP 126
TWP 125
WOOD BUFFALO NATIONAL PARK

MARLINE OIL CORPORATION
SLAVE PROJECT GEOCHEMISTRY
MEASURED ANALYTICAL VALUES

Mo
- <4
- 4 - 6
- 6
- 7 - 9
- ≥10

PPM

COMPUTATION AND PLOTTING BY LUCIANO MARTIN
C A S E-TORONTO,CANADA 1979

100

SLA V 6

MARLINE OIL CORPORATION
SLAVE PROJECT - ALBERTA
QUARTZ MINERAL EXPLORATION PERMITS 6878020001, 2
TWP. 125, 126 R. 10-13 W4M

LAKE & MUSKEG GEOCHEMICAL SURVEY

SCALE: 1:50,000
1000m 0 1 km 2 km 3 km 4 km

MAP NO. Ag Analytical
19790014

PERMIT BOUNDARIES
AIR PHOTO LINEAMENTS
RAPIDS, SANDBARS
POWERLINE
ROADS
CUTLINES & TRAILS
SAMPLE SITE - PH Series Samples
Basemap compiled from uncontrolled photo mosaic

SAWMILL ISLAND
CUNNINGHAM LANDING
SLAVE RIVER
BELL ROCK
HWY 5 (to Hay River)
FORT SMITH
NORTHWEST TERRITORIES
ALBERTA
MOUNTAIN RAPIDS
FOUR MILE LAKE
PELICAN RAPIDS
FITZGERALD
RYAN ISLAND
SALT RIVER
SLAVE RIVER
WOOD BUFFALO NATIONAL PARK

84-P-16 74-M-13
PERMIT 6878020002
PERMIT 6878020001

R13 R12 R11 R10 R9
TWP 126
TWP 125
112° 00'
60° 00'
59° 55'
59° 50'

MARLINE OIL CORPORATION
SLAVE PROJECT GEOCHEMISTRY
MEASURED ANALYTICAL VALUES

Ag PPM
- <0.6
- 0.6 - 0.9
- 1.0 - 1.4
- 1.5 - 1.9
- ≥2.0

COMPUTATION AND PLOTTING BY LUCIANO MARTIN
C A S E - TORONTO, CANADA 1979

SLA V 7

MARLINE OIL CORPORATION
SLAVE PROJECT - ALBERTA
QUARTZ MINERAL EXPLORATION PERMITS 6878020001, 2
TWP. 125, 126 R.10-13 W4M

LAKE & MUSKEG GEOCHEMICAL SURVEY

PERMIT BOUNDARIES
AIR PHOTO LINEAMENTS
RAPIDS, SANDBARS
POWERLINE
ROADS
CUTLINES & TRAILS
SAMPLE SITE - PH Series Samples

Basemap compiled from uncontrolled photo mosaic

SCALE: 1:50,000
1000m 0 1km 2km 3km 4 km

MAP NO. Zn Analytical
1979004

SAWMILL ISLAND
CUNNINGHAM LANDING
SLAVE RIVER
BELL ROCK
HWY 5 (to Hay River)
FORT SMITH
NORTHWEST TERRITORIES
ALBERTA
84-P-16 74-M-13
PERMIT 6878020002
PERMIT 6878020001
MOUNTAIN RAPIDS
FOUR MILE LAKE
PELICAN RAPIDS
FITZGERALD
RYAN ISLAND
SALT RIVER
SLAVE RIVER
WOOD BUFFALO NATIONAL PARK
TWP 126
TWP 125
R3 R12
R12 R11
R11 R10
R10 R9
112°00'
111°30'
60°00'
59°55'
59°50'

MARLINE OIL CORPORATION
SLAVE PROJECT GEOCHEMISTRY
MEASURED ANALYTICAL VALUES

ZN
- <56
- 56 - 69
- 70 - 94 PPM
- 95 - 124
- ≥125

COMPUTATION AND PLOTTING BY LUCIANO MARTIN
C A S E-TORONTO.CANADA 1979

SLA V 4

MARLINE OIL CORPORATION
SLAVE PROJECT - ALBERTA
QUARTZ MINERAL EXPLORATION PERMITS 6878020001, 2
TWP. 125, 126 R.10-13 W4M

LAKE & MUSKEG GEOCHEMICAL SURVEY

SCALE: 1:50,000
1000m 0 1 km 2 km 3 km 4 km
MAP NO. Ni Analytical
19790014

PERMIT BOUNDARIES
AIR PHOTO LINEAMENTS
RAPIDS, SANDBARS
POWERLINE
ROADS
CUTLINES & TRAILS
SAMPLE SITE - PH Series Samples
Basemap compiled from uncontrolled photo mosaic

SAWMILL ISLAND
CUNNINGHAM LANDING
SLAVE RIVER
BELL ROCK
HWY. 5
(to Hay River)
FORT SMITH
NORTHWEST TERRITORIES
ALBERTA
84-P-16 74-M-13
PERMIT 6878020002
PERMIT 6878020001
MOUNTAIN RAPIDS
FOUR MILE LAKE
PELICAN RAPIDS
FITZGERALD
SALT RIVER
RYAN ISLAND
SLAVE RIVER
WOOD BUFFALO NATIONAL PARK
TWP. 126
TWP. 125
R 13 R 12 R 11 R 10 R 9
112° 00'
111° 30'
60° 00'
59° 55'
59° 50'

MARLINE OIL CORPORATION
SLAVE PROJECT GEOCHEMISTRY
MEASURED ANALYTICAL VALUES

Ni
- ▫ <16
- ▫ 16 - 19
- ▫ 20 - 23 PPM
- ▫ 24 - 31
- ▨ ≥32

COMPUTATION AND PLOTTING BY LUCIANO MARTIN
C A S E - TORONTO, CANADA 1979

SLA V 5

MARLINE OIL CORPORATION
SLAVE PROJECT - ALBERTA
QUARTZ MINERAL EXPLORATION PERMITS 6878020001, 2
TWP. 125, 126 R. 10-13 W4M

LAKE & MUSKEG GEOCHEMICAL SURVEY

PERMIT BOUNDARIES
AIR PHOTO LINEAMENTS
RAPIDS, SANDBARS
POWERLINE
ROADS
CUTLINES & TRAILS
SAMPLE SITE - PH Series Samples
Basemap compiled from uncontrolled photo mosaic

SCALE: 1:50,000
1000m 0 1 km 2 km 3 km 4 km

MAP NO. Cond - Analytical
1979001A

SLAVE RIVER
SAWMILL ISLAND
CUNNINGHAM LANDING
BELL ROCK
HWY. 5 (to Hay River)
FORT SMITH
NORTHWEST TERRITORIES
ALBERTA
MOUNTAIN RAPIDS
PELICAN RAPIDS
FOUR MILE LAKE
PERMIT 6878020002
84-P-16 74-M-13
PERMIT 6878020001
SALT RIVER
FITZGERALD
RYAN ISLAND
SLAVE RIVER
WOOD BUFFALO NATIONAL PARK
TWP 126
TWP 125
R13 R12 R11 R10 R9
60°00'
59°55'
59°50'
112°00'
111°30'

MARLINE OIL CORPORATION
SLAVE PROJECT GEOCHEMISTRY
MEASURED ANALYTICAL VALUES

COND
- <350
- 350 - 449
- 450 - 649 UMHO
- 650 - 1999
- ≥2000

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C A S E - TORONTO, CANADA 1979

MARLINE OIL CORPORATION
SLAVE PROJECT - ALBERTA

QUARTZ MINERAL EXPLORATION PERMITS 6878020001, 2
TWP. 125, 126 R. 10-13 W4M

LAKE & MUSKEG GEOCHEMICAL SURVEY

PERMIT BOUNDARIES
AIRPHOTO LINEAMENTS
RAPIDS, SANDBARS
POWERLINE
ROADS
CUTLINES & TRAILS
SAMPLE SITE - PH Series Samples

Basemap compiled from uncontrolled photo mosaic

SCALE: 1:50,000

1000m 0 1km 2km 3km 4km

MAP NO. Cu Analytical
19790014

SAWMILL ISLAND
CUNNINGHAM LANDING
SLAVE RIVER
HWY 5 (to Hay River)
BELL ROCK
FORT SMITH
NORTHWEST TERRITORIES
ALBERTA
MOUNTAIN RAPIDS
FOUR MILE LAKE
PELICAN RAPIDS
FITZGERALD
RYAN ISLAND
SALT RIVER
SLAVE RIVER
WOOD BUFFALO NATIONAL PARK

84-P-16 74-M-13

PERMIT 6878020002

PERMIT 6878020001

R13 R12 R12 R11 R11 R10 R10 R9

TWP 126 TWP 125

112°00' 111°30' 60°00'

59°55' 59°50'

MARLINE OIL CORPORATION
SLAVE PROJECT GEOCHEMISTRY
MEASURED ANALYTICAL VALUES

CU	<7		PPM
	7	- 9	
	10	- 13	
	14	- 17	
	≥18		

COMPUTATION AND PLOTTING BY LUCIANO MARTIN
C A S E - TORONTO, CANADA 1979

SLA V 2

MARLINE OIL CORPORATION
SLAVE PROJECT - ALBERTA
QUARTZ MINERAL EXPLORATION PERMITS 6878020001, 2
TWP 125, 126 R.10-13 W4M

LAKE & MUSKEG GEOCHEMICAL SURVEY

SCALE: 1:50,000
1000m 0 1km 2km 3km 4 km

MAP NO. Pb Analytical
19790014

PERMIT BOUNDARIES
AIRPHOTO LINEAMENTS
RAPIDS, SANDBARS
POWERLINE
ROADS
CUTLINES & TRAILS
SAMPLE SITE - PH Series Samples
Basemap compiled from uncontrolled photo mosaic

SAWMILL ISLAND
CUNNINGHAM LANDING
SLAVE RIVER
BELL ROCK
HWY 5
(to Hay River)
FORT SMITH
NORTHWEST TERRITORIES
ALBERTA
84-P-16 74-M-13
PERMIT 6878020002
PERMIT 6878020001
MOUNTAIN RAPIDS
FOUR MILE LAKE
PELICAN RAPIDS
SALT RIVER
FITZGERALD
RYAN ISLAND
SLAVE RIVER
WOOD BUFFALO NATIONAL PARK
TWP 126
TWP 125
R13 R12
R13 R11
R11 R10
R10 R9
112° 00'
111° 30'
60° 00'
59° 55'
59° 50'

MARLINE OIL CORPORATION
SLAVE PROJECT GEOCHEMISTRY
MEASURED ANALYTICAL VALUES

PB
- ▫ <6
- ▫ 6 - 9
- ▫ 10 - 12
- ▫ 13 - 16
- ▨ ≥17

PPM

COMPUTATION AND PLOTTING BY LUCIANO MARTIN
C A S E-TORONTO, CANADA 1979

SLAVY 3

MARLINE OIL CORPORATION
SLAVE PROJECT - ALBERTA

QUARTZ MINERAL EXPLORATION PERMITS 6878020001, 2
TWP 125, 126 R.10-13 W4M

LAKE & MUSKEG GEOCHEMICAL SURVEY

PERMIT BOUNDARIES
AIRPHOTO LINEAMENTS
RAPIDS, SANDBARS
POWERLINE
ROADS
CUTLINES & TRAILS
SAMPLE SITE - PH Series Samples

Basemap compiled from uncontrolled photo mosaic

SCALE: 1:50,000

1000m 0 1km 2km 3km 4km

MAP NO. U-W Analytical
1979004

SLAVE RIVER
SAWMILL ISLAND
CUNNINGHAM LANDING
BELL ROCK
HWY 5 (to Hay River)
FORT SMITH
NORTHWEST TERRITORIES
ALBERTA
MOUNTAIN RAPIDS
PELICAN RAPIDS
FOUR MILE LAKE
FITZGERALD
RYAN ISLAND
SALT RIVER
SLAVE RIVER
WOOD BUFFALO NATIONAL PARK
PERMIT 6878020002
84-P-16 74-M-13
PERMIT 6878020001
TWP 126
TWP 125
R 13 R 12
R 12 R 11
R 11 R 10
R 10 R 9
112°00'
111°30'
60°00'
59°55'
59°50'

MARLINE OIL CORPORATION
SLAVE PROJECT GEOCHEMISTRY
MEASURED ANALYTICAL VALUES

U-W
- <0.30
- 0.30 - 0.99
- 1.00 - 2.24 PPB
- 2.25 - 4.99
- ≥5.00

COMPUTATION AND PLOTTING BY LUCIANO MARTIN
C A S E - TORONTO, CANADA 1979

MARLINE OIL CORPORATION
SLAVE PROJECT - ALBERTA
QUARTZ MINERAL EXPLORATION PERMITS 6878020001, 2
TWP 125, 126 R.10-13 W4M

LAKE & MUSKEG GEOCHEMICAL SURVEY

PERMIT BOUNDARIES
AIR PHOTO LINEAMENTS
RAPIDS, SANDBARS
POWERLINE
ROADS
CUTLINES & TRAILS
SAMPLE SITE - PH Series Samples
Basemap compiled from uncontrolled photo mosaic

SCALE: 1:50,000
1000m 0 1km 2km 3km 4km

MAP NO. U-S Analytical
19790014

SAWMILL ISLAND
CUNNINGHAM LANDING
SLAVE RIVER
BELL ROCK
HWY 5
(to Hay River)
FORT SMITH
NORTHWEST TERRITORIES
ALBERTA
MOUNTAIN RAPIDS
PELICAN RAPIDS
FOUR MILE LAKE
SALT RIVER
FITZGERALD
RYAN ISLAND
WOOD BUFFALO NATIONAL PARK
84-P-16, 74-M-13
PERMIT 6878020002
PERMIT 6878020001
R13 R12 R12 R11 R11 R10 R9
TWP 126
TWP 125
112°00'
112°30'
60°00'
59°55'
59°50'

MARLINE OIL CORPORATION
SLAVE PROJECT GEOCHEMISTRY
MEASURED ANALYTICAL VALUES

U-S
- <1.5
- 1.5 - 2.4
- 2.5 - 4.4
- 4.5 - 8.9
- ≥9.0

PPM

COMPUTATION AND PLOTTING BY LUCIANO MARTIN
C A S E-TORONTO, CANADA 1979

SLR V 1

MARLINE OIL CORPORATION
SLAVE PROJECT - ALBERTA
QUARTZ MINERAL EXPLORATION PERMITS 6878020001, 2
TWP. 125, 126 R.10-13 W4M

LAKE & MUSKEG GEOCHEMICAL SURVEY

PERMIT BOUNDARIES
AIRPHOTO LINEAMENTS
RAPIDS, SANDBARS
POWERLINE
ROADS
CUTLINES & TRAILS
SAMPLE SITE - PH Series Samples

Basemap compiled from uncontrolled photo mosaic

SCALE: 1:50,000
1000m 0 1km 2km 3km 4km

MAP NO. pH Analytical
1979014

SAWMILL ISLAND
CUNNINGHAM LANDING
SLAVE RIVER
BELL ROCK
HWY 5
(to Hay River)
FORT SMITH
NORTHWEST TERRITORIES
ALBERTA
84-P-16 74-M-13
PERMIT 6878020002
PERMIT 6878020001
MOUNTAIN RAPIDS
PELICAN RAPIDS
FOUR MILE LAKE
SALT RIVER
FITZGERALD
RYAN ISLAND
WOOD BUFFALO NATIONAL PARK
TWP 126
TWP. 125
R13 R12 R12 R11 R11 R10 R10 R9
112°00'
60°00'
59°55'
59°50'

MARLINE OIL CORPORATION
SLAVE PROJECT GEOCHEMISTRY
MEASURED ANALYTICAL VALUES

PH
- ◻ <7.80
- ◻ 7.80 - 8.09
- ◻ 8.10 - 8.39
- ◻ 8.40 - 8.59
- ◪ ≥8.60

COMPUTATION AND PLOTTING BY LUCIANO MARTIN
C A S E - TORONTO, CANADA 1979

SLAVE

MARLINE OIL CORPORATION
SLAVE PROJECT - ALBERTA
QUARTZ MINERAL EXPLORATION PERMITS 6878020001, 2
TWP. 125, 126 R.10-13 W4M

LAKE & MUSKEG GEOCHEMICAL SURVEY

PERMIT BOUNDARIES
AIRPHOTO LINEAMENTS
RAPIDS, SANDBARS
POWERLINE
ROADS
CUTLINES & TRAILS
SAMPLE SITE - PH Series Samples
Basemap compiled from uncontrolled photo mosaic

SCALE: 1:50,000
1000m 0 1km 2km 3km 4km

MAP NO. Mo Residual
19790014

SLAVE RIVER
SAWMILL ISLAND
CUNNINGHAM LANDING
BELL ROCK
HWY 5
(to Hay River)
FORT SMITH
NORTHWEST TERRITORIES
ALBERTA
MOUNTAIN RAPIDS
PELICAN RAPIDS
FOUR MILE LAKE
SALT RIVER
FITZGERALD
RYAN ISLAND
WOOD BUFFALO NATIONAL PARK

84-P-16 74-M-13
PERMIT 6878020002
PERMIT 6878020001

TWP. 126
TWP. 125

112°00'
60°00'
59°55'
59°50'
R13 R12 R11 R10 R9
20' 15' 10' 05' 50' 45' 40' 35'

MARLINE OIL CORPORATION
SLAVE PROJECT GEOCHEMISTRY
POSITIVE RESIDUAL VALUES
REGIONAL COMPONENT CONTOURS

Mo
- 2 (OMITTED)
- 3
- 4 - 5
- ≥6

PPM

COMPUTATION AND PLOTTING BY LUCIANO MARTIN
C A S E-TORONTO, CANADA 1979

100

SLA Mo 14

MARLINE OIL CORPORATION

SLAVE PROJECT - ALBERTA

QUARTZ MINERAL EXPLORATION PERMITS 6878020001, 2

TWP 125, 126 R.10-13 W4M

LAKE & MUSKEG GEOCHEMICAL SURVEY

PERMIT BOUNDARIES
AIRPHOTO LINEAMENTS
RAPIDS, SANDBARS
POWERLINE
ROADS
CUTLINES & TRAILS
SAMPLE SITE - PH Series Samples
Basemap compiled from uncontrolled photo mosaic

SCALE: 1:50,000

1000m 0 1km 2km 3km 4km

MAP NO. Ag Residual
1974001-4

SAWMILL ISLAND
CUNNINGHAM LANDING
SLAVE RIVER
BELL ROCK
HWY 5 (to Hay River)
FORT SMITH
NORTHWEST TERRITORIES
ALBERTA
MOUNTAIN RAPIDS
FOUR MILE LAKE
PELICAN RAPIDS
SALT RIVER
FITZGERALD
RYAN ISLAND
WOOD BUFFALO NATIONAL PARK

84-P-16 74-M-13

PERMIT 6878020002

PERMIT 6878020001

R13 R12 R11 R10 R9

TWP 126

TWP 125

112° 00'
111° 30'
60° 00'
59° 55'
59° 50'

MARLINE OIL CORPORATION
SLAVE PROJECT GEOCHEMISTRY
POSITIVE RESIDUAL VALUES
REGIONAL COMPONENT CONTOURS

Ag
- ▫ <0.3 (OMITTED)
- □ 0.3 - 0.4
- ▫ 0.5 - 0.6 PPM
- ▨ 0.7 - 1.0
- ▩ ≥1.1

COMPUTATION AND PLOTTING BY LUCIANO MARTIN
C A S E - TORONTO, CANADA 1978

MARLINE OIL CORPORATION
SLAVE PROJECT - ALBERTA
QUARTZ MINERAL EXPLORATION PERMITS 6878020001, 2
TWP 125, 126 R.10-13 W4M

LAKE & MUSKEG GEOCHEMICAL SURVEY

PERMIT BOUNDARIES
AIR PHOTO LINEAMENTS
RAPIDS, SANDBARS
POWERLINE
ROADS
CUTLINES & TRAILS
SAMPLE SITE - PH Series Samples
Basemap compiled from uncontrolled photo mosaic

SCALE: 1:50,000
1000m 0 1km 2km 3km 4km

MAP NO. Zn Residual
19790014

SAWMILL ISLAND
CUNNINGHAM LANDING
SLAVE RIVER
BELL ROCK
HWY 5
(to Hay River)
FORT SMITH
NORTHWEST TERRITORIES
ALBERTA
84-P-16 74-M-13
PERMIT 6878020002
MOUNTAIN RAPIDS
PELICAN RAPIDS
FOUR MILE LAKE
SALT RIVER
PERMIT 6878020001
FITZGERALD
RYAN ISLAND
WOOD BUFFALO NATIONAL PARK
TWP 126
TWP 125
R13 R12
R12 R11
R11 R10
R10 R9
112°00'
111°30'
60°00'
59°55'
59°50'

MARLINE OIL CORPORATION
SLAVE PROJECT GEOCHEMISTRY
POSITIVE RESIDUAL VALUES
REGIONAL COMPONENT CONTOURS

ZN
- o <12 (OMITTED)
- □ 12 - 21
- ▨ 22 - 49 PPM
- ▩ 50 - 89
- ⊠ ≥90

COMPUTATION AND PLOTTING BY LUCIANO MARTIN
C A S E-TORONTO, CANADA. 1979

SLR VZN 14

MARLINE OIL CORPORATION
SLAVE PROJECT - ALBERTA
QUARTZ MINERAL EXPLORATION PERMITS 6878020001, 2
TWP 125, 126 R.10-13 W4M

LAKE & MUSKEG GEOCHEMICAL SURVEY

PERMIT BOUNDARIES
AIR PHOTO LINEAMENTS
RAPIDS, SANDBARS
POWERLINE
ROADS
CUTLINES & TRAILS
SAMPLE SITE - PH Series Samples
Basemap compiled from uncontrolled photo mosaic

SCALE: 1:50,000
1000m 0 1km 2km 3km 4km

MAP NO. Ni Residual
19790014

SAWMILL ISLAND
CUNNINGHAM LANDING
SLAVE RIVER
HWY. 5 (To Hay River)
ESSO ROCK
FORT SMITH
NORTHWEST TERRITORIES
ALBERTA
MOUNTAIN RAPIDS
FOUR MILE LAKE
PELICAN RAPIDS
FITZGERALD
RYAN ISLAND
SALT RIVER
SLAVE RIVER
TWP 126
TWP 125
84-P-16 74-M-13
PERMIT 6878020002
PERMIT 6878020001
60°00'
59°55'
59°50'
112°00'
111°30'
WOOD BUFFALO NATIONAL PARK

MARLINE OIL CORPORATION
SLAVE PROJECT GEOCHEMISTRY
POSITIVE RESIDUAL VALUES
REGIONAL COMPONENT CONTOURS

	▫	<4	(OMITTED)	
	▫	4 - 5		
NI	☐	6 - 9	PPM	
	☑	10 - 15		
	☒	≥16		

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SLA VNI 15

MARLINE OIL CORPORATION
SLAVE PROJECT - ALBERTA
QUARTZ MINERAL EXPLORATION PERMITS 6878020001, 2
TWP 125, 126 R.10-13 W4M

LAKE & MUSKEG GEOCHEMICAL SURVEY

SCALE: 1:50,000
1000m 0 1km 2km 3km 4 km

MAP NO. Cond Residual
19790014

PERMIT BOUNDARIES
AIRPHOTO LINEAMENTS
RAPIDS, SANDBARS
POWERLINE
ROADS
CUTLINES & TRAILS
SAMPLE SITE - PH Series Samples
Basemap compiled from uncontrolled photo mosaic

SAWMILL ISLAND
CUNNINGHAM LANDING
SLAVE RIVER
BELL ROCK
FORT SMITH
NORTHWEST TERRITORIES
ALBERTA
84-P-16 74-M-13
PERMIT 6878020002
PERMIT 6878020001
MOUNTAIN RAPIDS
FELIX RAPIDS
FOUR MILE LAKE
SALT RIVER
FITZGERALD
RYAN ISLAND
WOOD BUFFALO NATIONAL PARK
TWP 126
TWP 125
R13 R12
R12 R11
R11 R10
R10 R9
59° 55'
60° 00'
111° 30'

MARLINE OIL CORPORATION
SLAVE PROJECT GEOCHEMISTRY
POSITIVE RESIDUAL VALUES
REGIONAL COMPONENT CONTOURS

COND
- <100 (OMITTED)
- 100 - 174
- 175 - 999 UMHO
- 1000 - 11999
- ≥12000

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SLA VCN 20

MARLINE OIL CORPORATION
SLAVE PROJECT - ALBERTA
QUARTZ MINERAL EXPLORATION PERMITS 6878020001, 2
TWP. 125, 126 R.10-13 W4M

LAKE & MUSKEG GEOCHEMICAL SURVEY

PERMIT BOUNDARIES
AIRPHOTO LINEAMENTS
RAPIDS, SANDBARS
POWERLINE
ROADS
CUTLINES & TRAILS
SAMPLE SITE - PH Series Samples

Basemap compiled from uncontrolled photo mosaic

SCALE: 1:50,000
1000m 0 1km 2km 3km 4 km

MAP NO. Cu Residual
19790014

SAWMILL ISLAND
CUNNINGHAM LANDING
SLAVE RIVER
BELL ROCK
HWY 5 (to Hay River)
FORT SMITH
NORTHWEST TERRITORIES
ALBERTA
MOUNTAIN RAPIDS
FOUR MILE LAKE
PELICAN RAPIDS
FITZGERALD
RYAN ISLAND
SALT RIVER
SLAVE RIVER
WOOD BUFFALO NATIONAL PARK

84-P-16 74-M-13
PERMIT 6878020002
PERMIT 6878020001

TWP 126
TWP 125

R13 R12
R12 R11
R11 R10
R10 R9

112°00'
111°30'
60°00'
59°50'

MARLINE OIL CORPORATION
SLAVE PROJECT GEOCHEMISTRY
POSITIVE RESIDUAL VALUES
REGIONAL COMPONENT CONTOURS

CU
- <3 (OMITTED)
- 3 - 4
- 5 - 8 PPM
- 9 - 13
- ≥14

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100
SLR VCU 12

MARLINE OIL CORPORATION
SLAVE PROJECT - ALBERTA
QUARTZ MINERAL EXPLORATION PERMITS 6878020001, 2
TWP 125, 126 R.10-13 W4M

LAKE & MUSKEG GEOCHEMICAL SURVEY

PERMIT BOUNDARIES
AIR PHOTO LINEAMENTS
RAPIDS, SANDBARS
POWERLINE
ROADS
CUTLINES & TRAILS
SAMPLE SITE - PH Series Samples
Basemap compiled from uncontrolled photo mosaic

SCALE: 1:50,000
1000m 0 1km 2km 3km 4km

MAP NO. Pb Residual
1979004

MARLINE OIL CORPORATION
SLAVE PROJECT GEOCHEMISTRY
POSITIVE RESIDUAL VALUES
REGIONAL COMPONENT CONTOURS

	o	<3	(OMITTED)
	□	3 - 4	
PB	□	5 - 6	PPM
	▨	7 - 9	
	⊠	≥10	

COMPUTATION AND PLOTTING BY LUCIANO MARTIN
C A S E - TORONTO, CANADA 1979

SAWMILL ISLAND
CUNNINGHAM LANDING
SLAVE RIVER
BELL ROCK
HWY 5 (to Hay River)
FORT SMITH
NORTHWEST TERRITORIES
ALBERTA
84-P-16 74-M-13
PERMIT 6878020002
PERMIT 6878020001
MOUNTAIN RAPIDS
FOUR MILE LAKE
PELICAN RAPIDS
SALT RIVER
FITZGERALD
RYAN ISLAND
WOOD BUFFALO NATIONAL PARK
TWP 126
TWP 125
R13 R12 R11 R10 R9
112°00'
111°30'
60°00'
59°55'
59°50'

MARLINE OIL CORPORATION
SLAVE PROJECT - ALBERTA
QUARTZ MINERAL EXPLORATION PERMITS 6878020001, 2
TWP. 125, 126 R.10-13 W4M

LAKE & MUSKEG GEOCHEMICAL SURVEY

PERMIT BOUNDARIES
AIR PHOTO LINEAMENTS
RAPIDS, SANDBARS
POWERLINE
ROADS
CUTLINES & TRAILS
SAMPLE SITE - PH Series Samples

Basemap compiled from uncontrolled photo mosaic

SCALE: 1:50,000
1000m 0 1 km 2km 3km 4 km

MAP NO. U-W Residual
1979014

SAWMILL ISLAND
CUNNINGHAM LANDING
SHELL ROCK
SLAVE RIVER
HWY. 5 (to Hay River)
FORT SMITH
NORTHWEST TERRITORIES
ALBERTA
MOUNTAIN RAPIDS
PELICAN RAPIDS
FOUR MILE LAKE
FITZGERALD
RYAN ISLAND
SALT RIVER
SLAVE RIVER
WOOD BUFFALO NATIONAL PARK

84-P-16 74-M-13

PERMIT 6878020002

PERMIT 6878020001

R13 R12 R12 R11 R11 R10 R10 R9

TWP 126
TWP 125

60°00'
59°55'
59°50'
45'
40'
35'
30'
25'
20'
15'
05'

MARLINE OIL CORPORATION
SLAVE PROJECT GEOCHEMISTRY
POSITIVE RESIDUAL VALUES
REGIONAL COMPONENT CONTOURS

U-W
- <0.70 (OMITTED)
- 0.70 - 1.74
- 1.75 - 3.19 PPB
- 3.20 - 7.99
- ≥8.00

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MARLINE OIL CORPORATION
SLAVE PROJECT - ALBERTA
QUARTZ MINERAL EXPLORATION PERMITS 6878020001, 2
TWP. 125, 126 R. 10-13 W4M

LAKE & MUSKEG GEOCHEMICAL SURVEY

PERMIT BOUNDARIES
AIR PHOTO LINEAMENTS
RAPIDS, SANDBARS
POWERLINE
ROADS
CUTLINES & TRAILS
SAMPLE SITE - PH Series Samples

Basemap compiled from uncontrolled photo mosaic

SCALE: 1:50,000
1000m 0 1 km 2 km 3 km 4 km

MAP NO. U-S Residual
19790014

SAWMILL ISLAND
CUNNINGHAM LANDING
SLAVE RIVER
BELL ROCK
HWY 5 (to Hay River)
FORT SMITH
NORTHWEST TERRITORIES
ALBERTA
84-P-16 74-M-13
PERMIT 6878020002
PERMIT 6878020001
MOUNTAIN RAPIDS
PELICAN RAPIDS
FOLLER LAKE
SALT RIVER
FITZGERALD
BRYAN ISLAND
SLAVE RIVER
WOOD BUFFALO NATIONAL PARK
TWP 126
TWP 125
R 13 R 12
R 12 R 11
R 11 R 10
R 10 R 9
112°00'
111°30'
60°00'
59° 55'
59° 50'

MARLINE OIL CORPORATION
SLAVE PROJECT GEOCHEMISTRY
POSITIVE RESIDUAL VALUES
REGIONAL COMPONENT CONTOURS

U-S
- ○ <1.0 (OMITTED)
- ⊡ 1.0 - 1.9
- □ 2.0 - 4.4 PPM
- ▨ 4.5 - 8.9
- ⊠ ≥9.0

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C A S E-TORONTO, CANADA 1979

SLA VUS II

MARLINE OIL CORPORATION
SLAVE PROJECT - ALBERTA
QUARTZ MINERAL EXPLORATION PERMITS 6878020001, 2
TWP. 125, 126 R.10-13 W4M

LAKE & MUSKEG GEOCHEMICAL SURVEY

SCALE: 1:50,000
1000m 0 1km 2km 3km 4km

MAP NO. pH Residual
19790014

PERMIT BOUNDARIES
AIRPHOTO LINEAMENTS
RAPIDS, SANDBARS
POWERLINE
ROADS
CUTLINES & TRAILS
SAMPLE SITE - PH Series Samples
Basemap compiled from uncontrolled photo mosaic

SAWMILL ISLAND
CUNNINGHAM LANDING
BELL ROCK
HWY 5 (To Hay River)
SLAVE RIVER
FORT SMITH
NORTHWEST TERRITORIES
ALBERTA
MOUNTAIN RAPIDS
FOUR MILE LAKE
PELICAN RAPIDS
FITZGERALD
RYAN ISLAND
SALT RIVER
SLAVE RIVER
WOOD BUFFALO NATIONAL PARK

84-P-16 74-M-13

PERMIT 6878020002

PERMIT 6878020001

R13 R12 R12 R11 R11 R10 R10 R9

TWP 126 TWP. 125

112°00' 111°30' 60°00' 59°55' 59°50'

MARLINE OIL CORPORATION
SLAVE PROJECT GEOCHEMISTRY
POSITIVE RESIDUAL VALUES
REGIONAL COMPONENT CONTOURS

PH
- o <0.20 (OMITTED)
- □ 0.20 - 0.34
- ▨ 0.35 - 0.54
- ▩ 0.55 - 0.99
- ⊠ ≥1.00

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C A S E - TORONTO, CANADA 1979

SLA VPH 1%