ANALYSIS OF PALEOZOIC CORE DATA FOR THE EVALUATION OF POTENTIAL Pb-Zn MINERALIZATION IN NORTHEASTERN ALBERTA

Canada-Alberta Partnership on Mineral Development
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ACKNOWLEDGMENTS AND DISCLAIMER

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The personal knowledge of the study area and the extensive database provided by Mr. D. A. McPhee (PanCanadian Petroleum Ltd.) was invaluable to the successful completion of this project. The authors would also like to thank the staff of the ERCB Core Research Center, and Loring Laboratories for their efforts on our behalf. Thanks are also extended to Mr. Michael J. Ranger (University of Alberta) for allowing the use of his AppleCORE software which enabled us to produce lithologs of the core intervals examined, and Mr. Rob Klettl (Imperial Oil Ltd.) who provided a short list of wells with potential Pb and/or Zn occurrences in Northwest Alberta.

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SUMMARY

In order to evaluate the potential for Mississippi Valley-type Pb-Zn mineralization in Northeastern Alberta, over 11500' (3500m) of core from 50 wells was examined at the ERCB Core Reseach Center (Calgary, Alberta). Emphasis was placed on the major Carbonate formations within the study area, the Winnipegosis (Keg River) formation, the Beaverhill Lake (Waterways) formation, as well as the Cooking Lake and Grosmont formations of the Woodbend Group. An additional 10 wells were examined from outside the study area, primarilly from Northwestern Alberta, in order to examine previously reported sub-surface Pb-Zn occurrences (see figures 1 and 2).

In essence, this project provided an opportunity to carry out a regional scale, sub-surface, Geochemical survey of the Paleozoic succesion of Northeastern Alberta. A total of 675 rock samples were collected and analysed for 30 elements by the ICP method. 633 of these samples were removed from more than 11500' (3500m) of core examined from wells within the study area. The remaining 42 samples were removed from 1500' (458m) of core examined from wells with previously reported Pb-Zn occurrences located outside of the study area. 247 of the study area samples from 9 wells in the Fort MacKay area, along with all other samples from the Cambrian Sandstones and the Precambrian Basement, were analysed for gold by fire assay. In addition to the Geochemical data, Geological logs of the wells examined within the study area are provided in the Appendices of this report.

No significant Pb-Zn mineralization or indicative alteration (ie. coarse, sparry, "saddle" dolomite recrystallization) was observed within the study area. However, several interesting Geological and Geochemical anomalies were discovered which may warrant further examination. Firstly, an interesting zone of recrystallized vuggy limestone, surrounded by sandy collapse brecciated limestone, was observed between 492' and 510' in well 12-6-99-8w4 (figure 3). Secondly, a value 2816 ppm Zn (the highest within the study area) was returned from a sample of dolostone from the Prairie Evaporite formation at a depth of 743' in well 8-20-89-9w4. Thirdly, the following values (including the third highest zinc value from the study area) were returned from two samples of dolomitic limestone from the Grosmont formation (?)

containing 2-3% very coarse blebs of pyrite and traces of sphalerite.

6-10-77-25w4

sample #	depth (feet)	Pb (ppm)	Zn (ppm)	Ni (ppm)
93-11-09-03	3462.6	98	310	123
93-11-09-04	3463.3	68	1620	120

Fourthly, three samples of nodular limestone from the moberly member of the Beaverhill Lake formation with trace to several percent blebby pyrite and a trace of sphalerite (a single small crystal within a calcite filled fracture) returned the following values of zinc (including the second highest zinc value from the study area).

7-8-71-11w4

sample #	depth (feet)	Zn (ppm)
93-11-02-01	1909	56
93-11-02-03	1918	254
93-11-02-08	1932	1690

Finally, the most significant Pb-Zn occurrence was observed in well 16-34-118-21w5 from Northwest Alberta. The results tabulated below confirmed the previously reported Pb-Zn mineralization within the Keg River formation. Sphalerite occurs as both finely crystalline honey colored disseminations, and as very finely crystalline fracture fillings along with pyrite and minor sparry dolomite in breccia zones (figure 4).

16-34-118-21w5

sample #	depth(feet)	Pb (ppm)	Zn (ppm)	Cd (ppm)
94-01-20-01	4269.3	1064	1122	2.8
94-01-20-02	4239	30	15601	36.5
94-01-20-03	4212.3	675	37633	64.8
94-01-20-04	4203.7	246	>99999	<.2
94-01-20-05	4197.3	732	1246	3.2

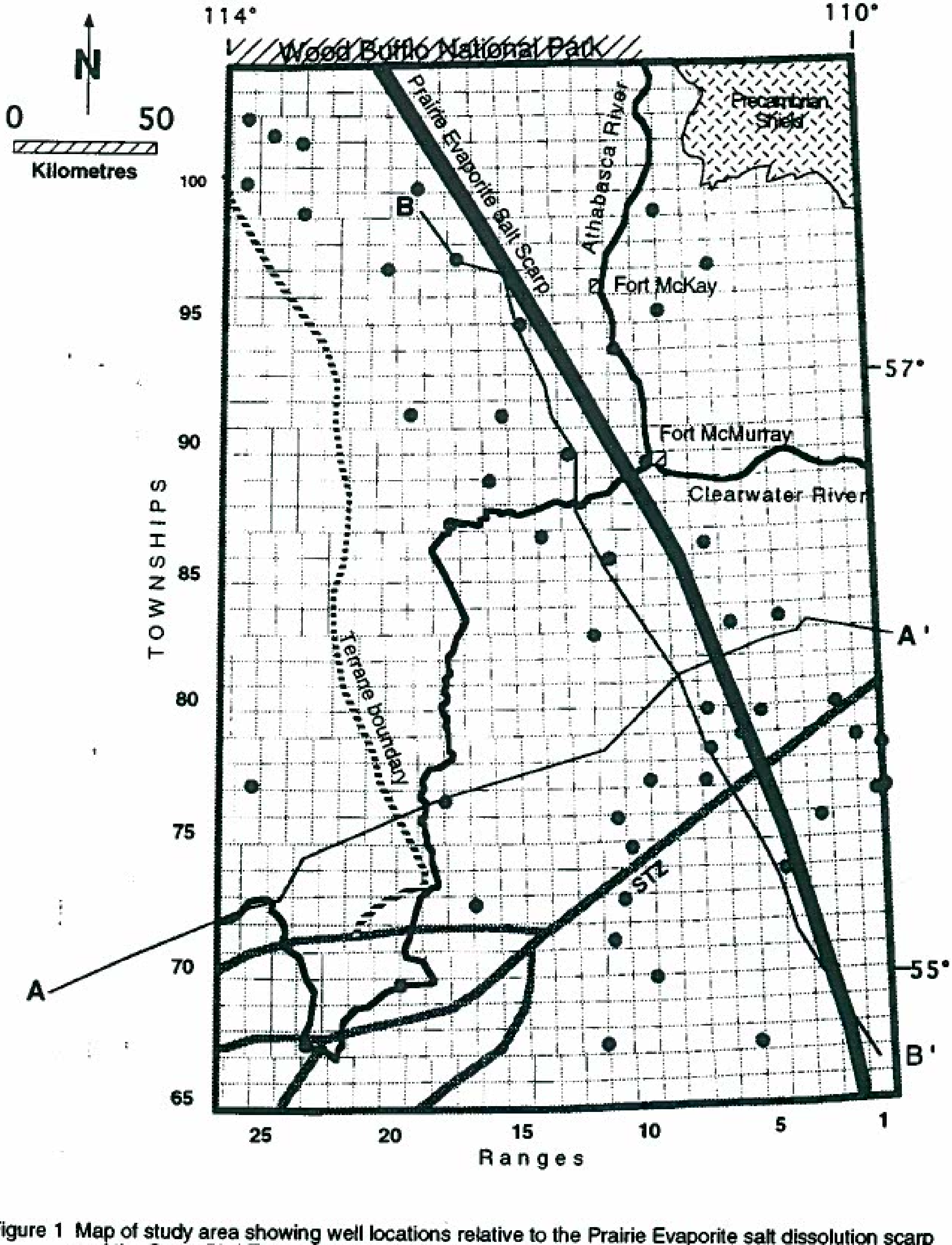


Figure 1 Map of study area showing well locations relative to the Prairie Evaporite salt dissolution scarp and the Snow Bird Tectonic Zone (STZ); see figure 7c and 7d for cross-section A-A' and B-B'.

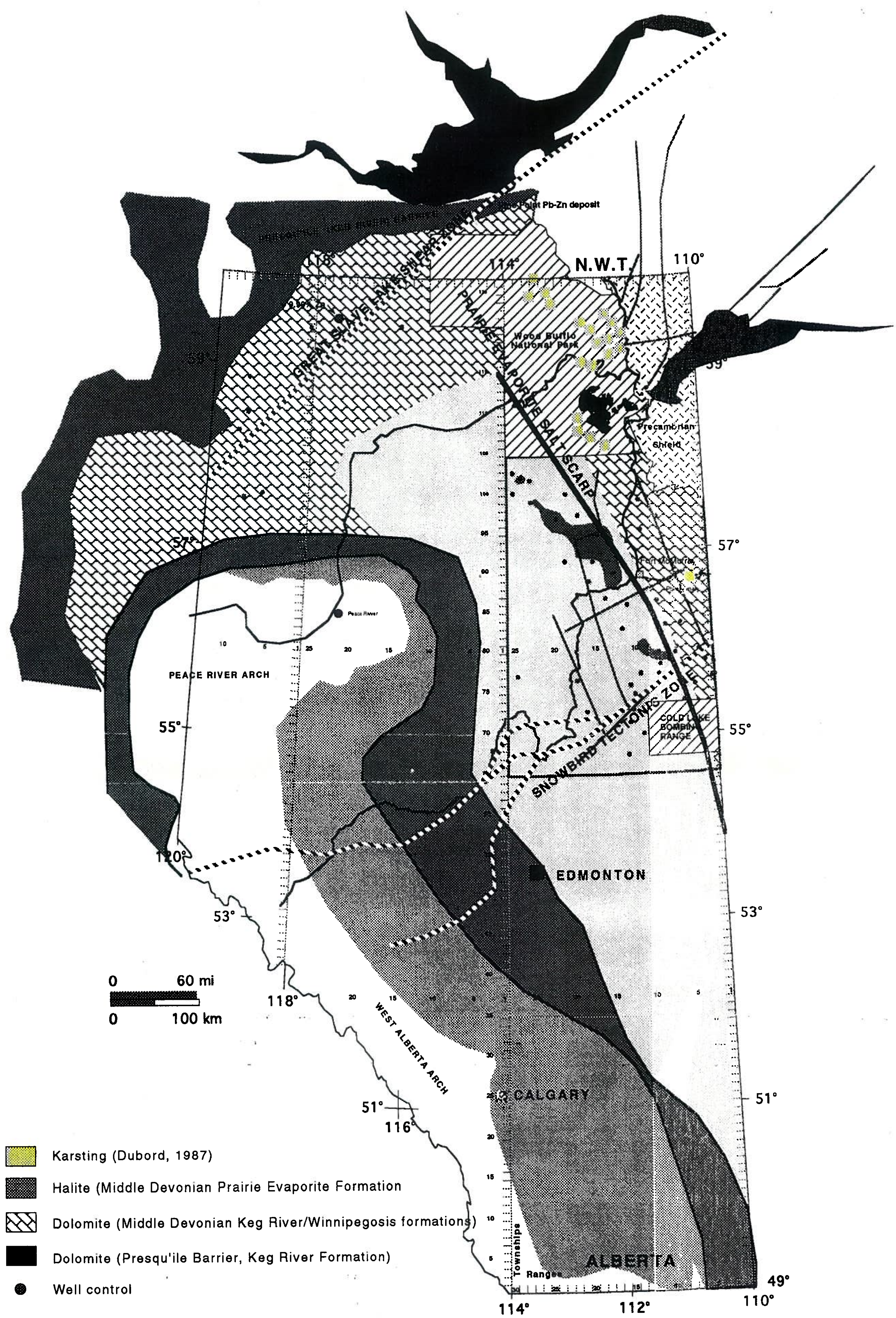
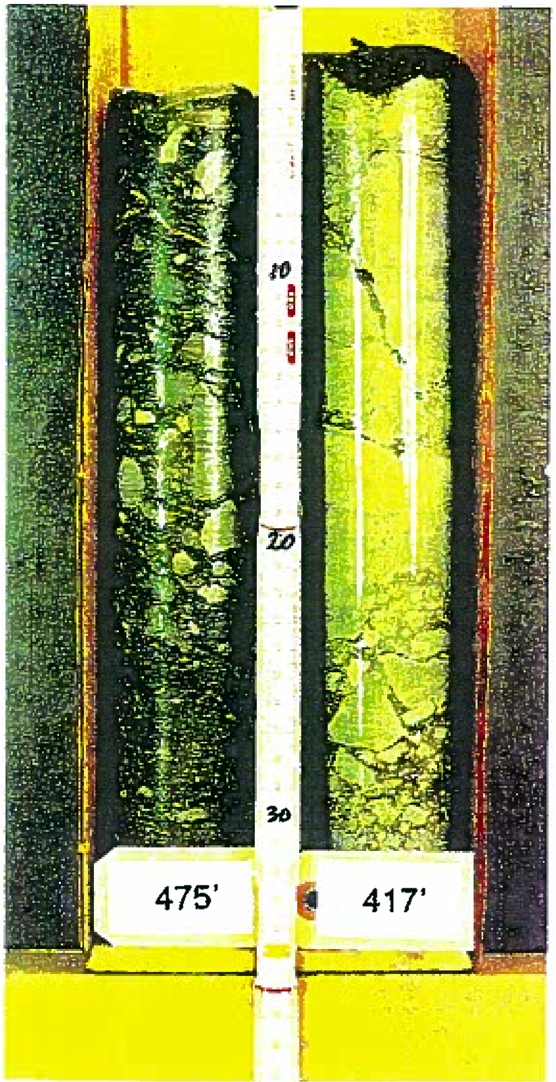
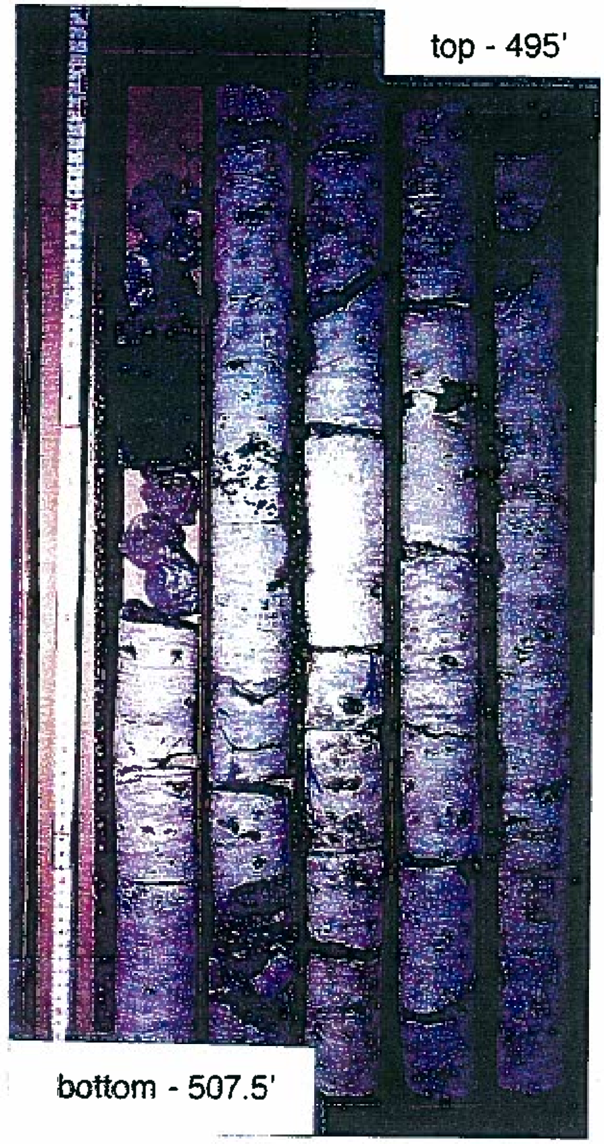


Figure 2 Paleogeographic setting of the Pine Point Pb-Zn Deposit and well locations with examined core (modified form Kidd, 1951; Sproule, 1956; Godfrey, 1960; Garland and Bower, 1959; Carrigy, 1963; Norris, 1963; Dubord, 1987; Ross and Stephenson, 1989; Moore, 1989).



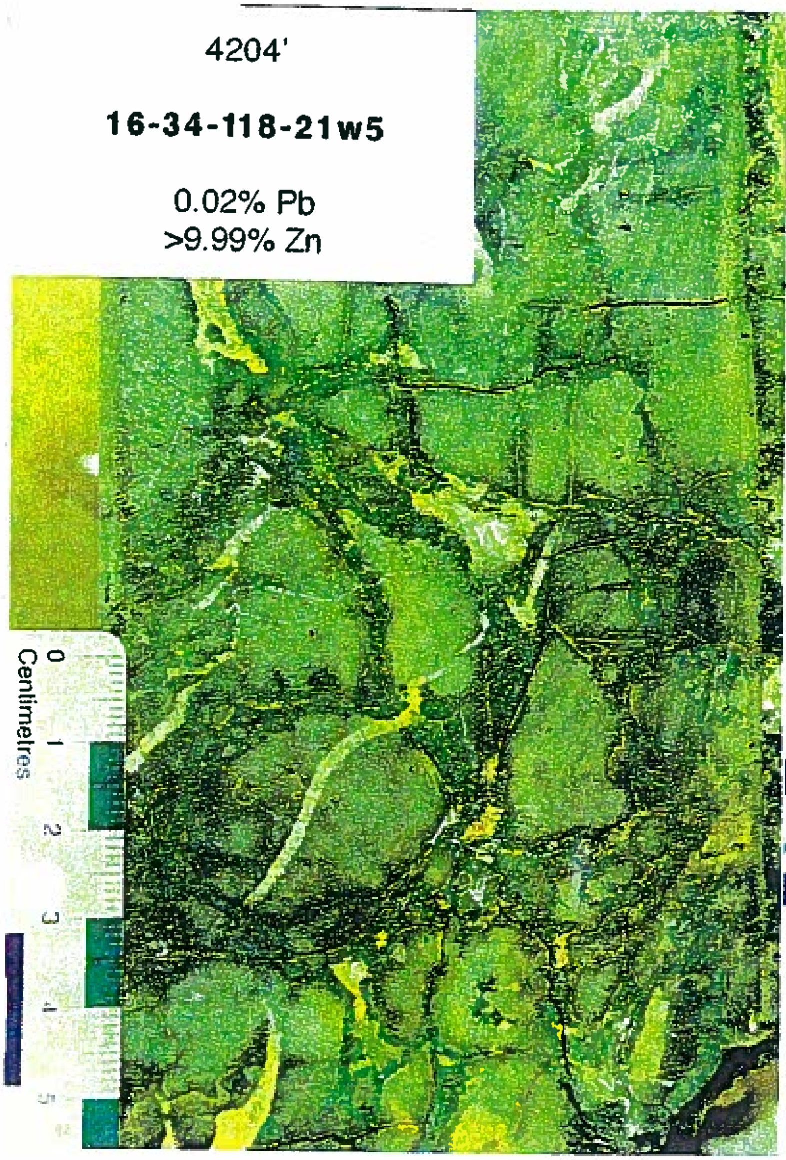
3 a.



3 b.

Figure 3 a. Examples of Limestone breccia (417') and Shaley Limestone breccia (475') from well 12-6-99-8w4.

Figure 3 b. Recrystallised vuggy Limestone from well 12-6-99-8w4.



4 a.

4 b.

Figure 4. Mineralized Winnipegosis (Keg River) formation with (a.) Breccia with 10-15% fracture filling, finely crystalline, pyrite and sphalerite with minor sparry dolomite, and (b.) 5% disseminated honey colored sphalerite.

INTRODUCTION

The potential for metalic mineral deposits in the Province of Alberta remains largely undetermined. The Canada-Alberta partnership on Mineral Development (1992-1995) is the first concerted effort to change this situation. This report is the product of an MDA funded project innitiated in October, 1993 which was designed to examine the potential for Mississippi Valley-type Pb-Zn meralization in Northeastern Alberta, and will provide Geological and Geochemical information to the Mineral Exploration Industry. Included in this information will be additional Geochemical data regarding anomalous gold concentrations hosted in the Phanerozoic strata of Northeastern Alberta, which has recently become of considerable interest.

LOCATION

The project area lies in Northeastern Alberta and is generally centered on the city of Fort McMurray (figure 1). Fifty wells were examined between Townships 65 and 104 (approximate latitude 54°35' and 58°05'), and between the Fourth and Fifth Meridians (West longditude110°00' and 114°00'). The other eleven wells examined are located in Northwest Alberta and are shown in figure 2.

The scope of the project is limited to the southeast by the Primrose Air Weapons Range, to the east by the Alberta-Saskatchewan border, to the northeast by the exposed Canadian Shield and to the northwest by Wood Buffalo National Park. The project is also limited to the west and southwest by the increasing depth of Paleozoic strata.

PREVIOUS WORK

In the past, mineral exploration in Northeastern Alberta has concentrated on the Canadian Shield which is exposed in the Northeast corner of the Province. The majority of the exploration work carried out within the study area has, in turn, concentrated on reports of gold occurrences. There has been very little investigation of the Pb-Zn potential of this area to date (Olson et al , in press).

Dubord (1987), produced a report for the Alberta Research Council on the potential for Carbonate hosted Pb-Zn deposits in Northeast Alberta. Although preliminary in nature, the report provides an excellent summation of the available data concerning Mississippi Valley-type ore deposit models and their applicability to the Geological setting of Northeast Alberta. The report indicated that (1) there is a good potential metal source to the west within the Alberta Sedimentary Basin, (2) there has been fluid flow out of the basin, and (3) there are potential host rocks within the study area. Dubord noted that no significant Pb-Zn mineralization had been recorded in Northeastern Alberta and that A.W. Norris, who has a considerable amount of experience in the area, had never encountered any Pb-Zn mineralization. Godfrey (1985) mentions unsubstantiated reports of Pb-Zn showings descovered by prospectors inside Wood Buffalo National Park, and Carrigy (1959, p.22) reported an occurence of galena east of Fort McMurray. A compilation of Pb-Zn occurences in Northern Alberta from Dubord (1987) is provided in figure 2.

For a history of Gold exploration within the study area the reader is refered to the "Metalogenic Evaluation of Alberta" MDA report by Olson et al (in press), which has been summarized below. Briefly, Allan (1920) reported that a sample from a well known as Athabasca Oils Ltd. No.1 (8-2-96-11w4) returned an assay of 0.63 oz Au/T (21.6 g Au/T). Little is known about this well, and a controversy arose as to the exact depth and formation from which this sample was taken. Allan (1920) reported that the sample was from a zone within the Precambrian Basement below a depth of 1105' (336.8m). Ells (1926) reported that the basement unconformity was actually at 957' (291.7m). Furthermore, the driller's logs from this well indicate an intersection with two auriferous quartz veins within limestone between 907' (276.5m) and 922.5' (281.2m), which lead Halferdahl (1986) to conclude that the sample in question was most likely from the Methy (Winnipegosis) formation. The current interest in this area began with Halferdal (1986), who reported that a sample of the Methy formation, from 792' (241.4m) within a well drilled approximately 35km south of the Athabasca Oils Ltd. No.1 well, returned an assay of 0.063 oz Au/T (2.16 g Au/T). Subsequently, Focal Resources Ltd. (1993) and Tintina Mines Ltd. (1993) have carried out seperate surface sampling and diamond drilling programs within the Devonian Carbonates of the Fort MacKay area. Focal Resources Ltd. (1993) has reported up to 2 oz Au/T, 1.19 oz Pt, 1.3 oz Rh, 4.46 oz Os, 3.74 oz Ru, .17 oz Pd, and 10.49 oz Ir from surface samples, and drill intercepts of up to 5' at .4 oz Au/T, 2.29 oz Pt and .54 oz Rh. It has been reported (Northern Miner, 1993a and b) that the mineralization was from "Devonian limestones with high silica and commercial values of gold and platinum group metals in salt form". Recent work by Abercrombie and Feng (1994), on samples provided by Tintina Mines Ltd., has confirmed "that anomalous gold concentrations do exist in Upper Devonian Carbonates and Mesozoic clastic rocks in the Fort MacKay area of Northeastern Alberta". However, this work has indicated that the gold is not tightly held within the rock and that the presence of Au-organic and/or Au-halogen complexes is suspected.

SAMPLING PRCEDURES AND ANALYSES

All of the core examined for this report was generated by petroleum exploration and is now stored at the ERCB Core Research Center (Calgary, Alberta). In order to best preserve the core, the ERCB has set very specific procedures and guide lines regarding core sampling. A maximun of 1 cubic inch (40-50g) of material per foot of core is allowed to be removed for destructive analysis. Also, the written permission of the well licensee must be obtained before sampling core which is not slabbed and has undergone full diameter porosity/permiability testing. In order to obtain a more practical and statistical 100 - 200 g sample, it was agreed that this project would be allowed to remove and analyse a 1/2" thick slab, no greater than 6" in length, from the back of the core. In order to accomodate this increase of material, sample spacing was also increased. All samples were approved by the staff at the ERCB.

All of the 675 samples removed from the core were analysed for 30 elements by the Inductively Coupled Plasma spectrophotometry (ICP) method. A subset of 247 of the samples from within the study area were further analysed for gold by the Fire Assay with Atomic Absorption emission spectrometry finish (FA-AA) method. All sample analyses (ICP and FA-AA) were performed by Loring Laboratories Ltd. (Calgary, Alberta). A complete list of samples with their well location, depth, formation and relevant comments is provided in Appendix I of this report. A complete list of the ICP results is provided in Appendices II and III, and a list of Au assays is provided in Appendix IV. A listing of all of the wells and core intervals examined, along with lithologs of the wells examined from Northeast Alberta, is provided in Appendix V.

REGIONAL GEOLOGY

WESTERN CANADA SEDIMENTARY BASIN

The Western Canada Sedimentary Basin is a sedimentary wedge that thickens westward from a zero-edge on the Canadian Shield to more than 6 km in the foreland thrust belt (figure 5). Adjacent to the Canadian Shield, the regional dip for Paleozoic strata is approximately 4 m/km, while that of the overlying Mesozoic strata is approximately 1.4 m/km. Approaching the foreland thrust belt, the regional dip increases to 10 m/km. Excellent sources on the geologic history and geology of the Western Canada Sedimentary Basin include publications by McCrossan and Glaister (1964), Parson (1973), Porter et al., (1982), Stearn et al., (1979), and Ricketts (1989b).

The Precambrian platform beneath the Western Canada Sedimentary Basin is the western extension of the Canadian shield, the cratonic nucleus of North America. This portion of the shield consists primarily of Archean crystalline rock of the Slave, Rae, Hearne, and Superior Provinces (Figure 6). The crystalline basement in Alberta is segmented by two major crustal discontinuities: the Snowbird Tectonic Zone (STZ) in central Alberta, the Great Slave Lake Shear Zone (GSLSZ) in northern Alberta, both of which can be traced into the Canadian Shield (Ross & Stephenson, 1989). The basement is subdivided into three basins and two arches in the Interior Plains area that include from northwest to southeast: Northern Alberta Basin, Peace River Arch, Central Alberta Basin, Sweetgrass Arch and Williston Basin. The Peace River Arch and the Sweet Grass Arch, both tend at a high angle to basement structure. Ross & Stephenson (1989) suggest that the origin of these structures is not linked directly to basement structure, but more likely to crustal properties on a broader wavelength than tectonic domains. Ross & Stephenson (1989), Stephenson et al., (1989), and Cant (1988) suggest an origin related to a subtle thermo-extensional rifting event for Peace River Arch.

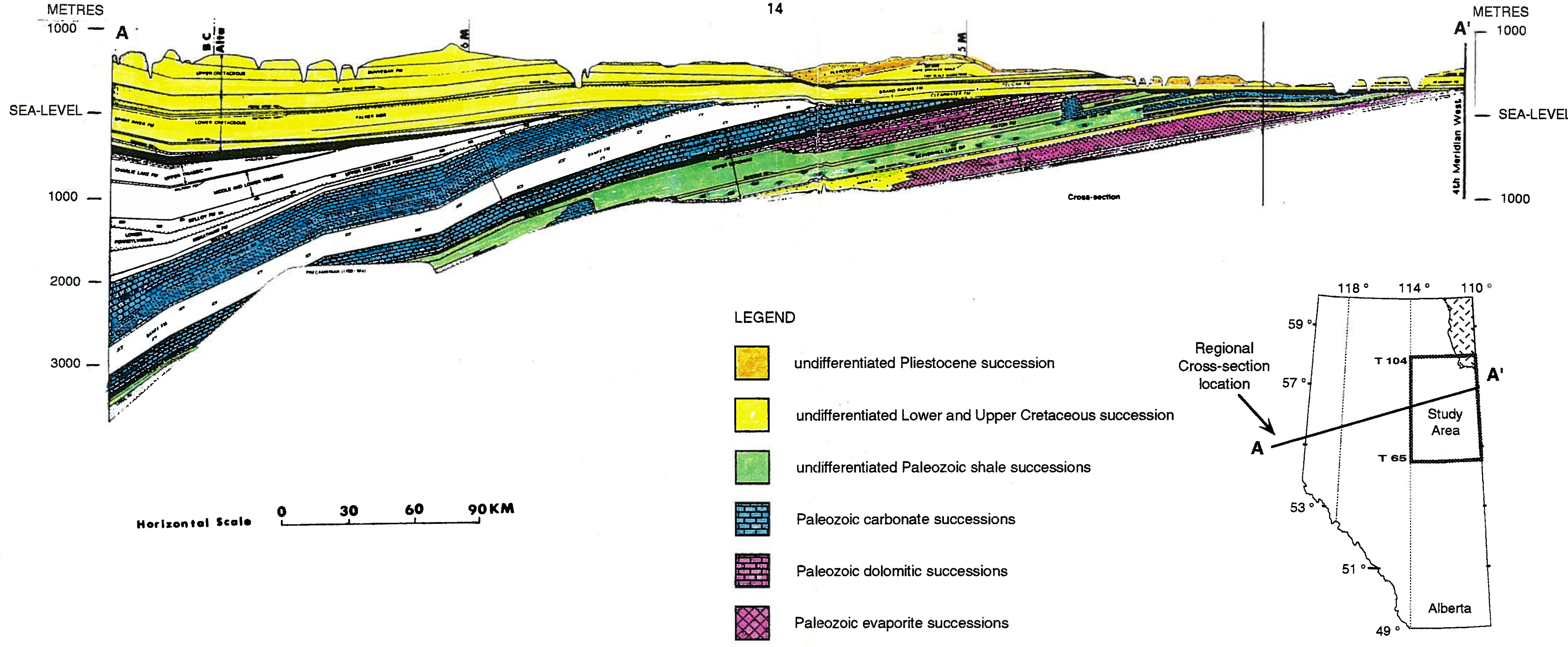


Figure 5. General lithology of the Phanerozoic succession of the Western Canada Sedimentary Basin (modified from GSC Map 1559A; Gussow, 1962)

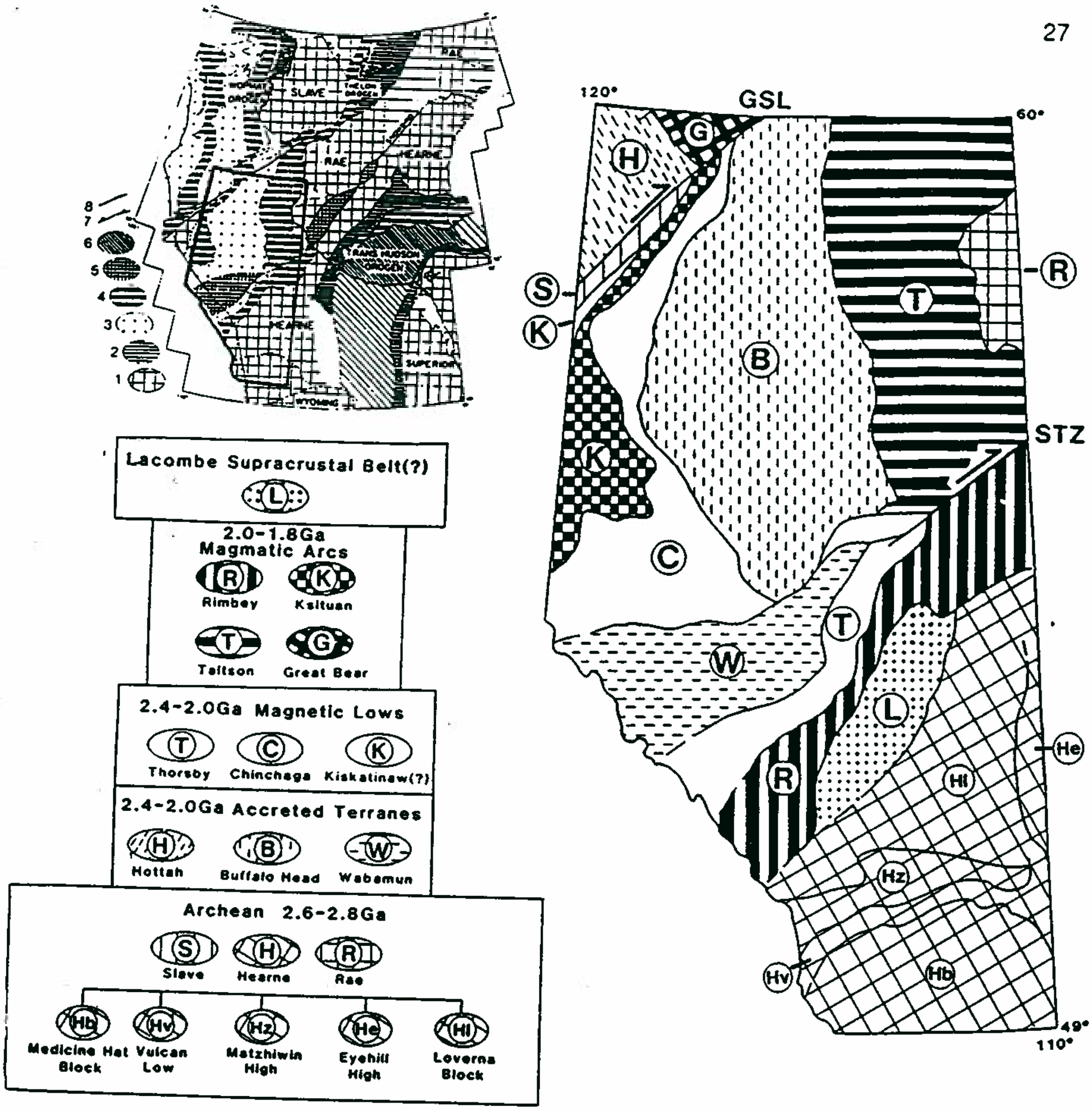


Figure 6. Map of tectonic domains postulated in the basement of Alberta. The outline of the domains corresponds to aeromagnetic boundaries. Ages for each domain are based on U/Pb zircon and monazite geochronology Key for inset: 1. Archean (>2.6 Ga); 2. reactivated Archean crust; 3. Early Proterozoic (2.4-2.1 Ga) Crust; 4. 1.97-1.81 Ga magmatic arcs; 5. crustal blocks of uncertain age along Snowbird tectonic zone; 6. juvenile Proterozoic (1.91-1.85 Ga) crust; 7. edge of Cordilleran deformation; 8. edge of Phanerozoic cover (from Ross et al, 1991).

Major sequences of the Western Canada Sedimentary Basin, when explained in terms of current plate tectonic theory, comprise two fundamentally different tectono-sedimentary realms: the long-lived passive margin, and the foreland basin.

The initial passive margin or platformal phase was initiated during the Proterozoic by the rifting of the North American craton resulting in the generation of a miogeocline-platform. Thermal contraction (McKenzie, 1978; Bond & Kominz, 1984), following on the heels of the initial rifting event, led to the transgressive onlap of the North American cratonic platform from Middle Cambrian to Middle Jurassic time. During this time interval the platform was overlain by dominantly shallow water carbonate and evaporite successions (Ricketts, 1989). Only the lower part of the succession (Cambrian age) is a dominantly composed of clastics. Following this phase of deposition, epeirogenic arches and basins were developed on the cratonic platform.

The foreland basin developed in two stages: Middle Jurassic to early Cretaceous (Colombian orogeny) and late Cretaceous to Paleocene (Laramide orogeny), as a result of the collision of allocthonous oceanic terranes with the western margin of the craton. During these orogenies the miogeoclinal succession was compressed, detached from its basement and thrust over the flank of the craton to form the present eastern part of the Cordillera (Porter et al., 1982). The continental lithosphere responded to the tectonic loading by isostatic flexure, initiating the development of a foreland basin to the east. Erosion of the evolving Cordillera from the Middle Jurassic to about the Oligocene filled the foreland basin with clastic detritus (Cant, 1989; Leckie, 1989).

PHANEROZOIC GEOLOGY OF THE STUDY AREA

The Precambrian crystalline basement of northeast Alberta is unconformably overlain by a Phanerozoic succession (see figure 7 a, and related cross sections in figure 7 c and d) consisting of Lower to Upper Devonian strata unconformably overlain by Lower to Upper Cretaceous strata. A thin veneer of Pleistocene glacial deposits overlie Cretaceous, Paleozoic and Precambrian strata. At the sub-Cretaceous

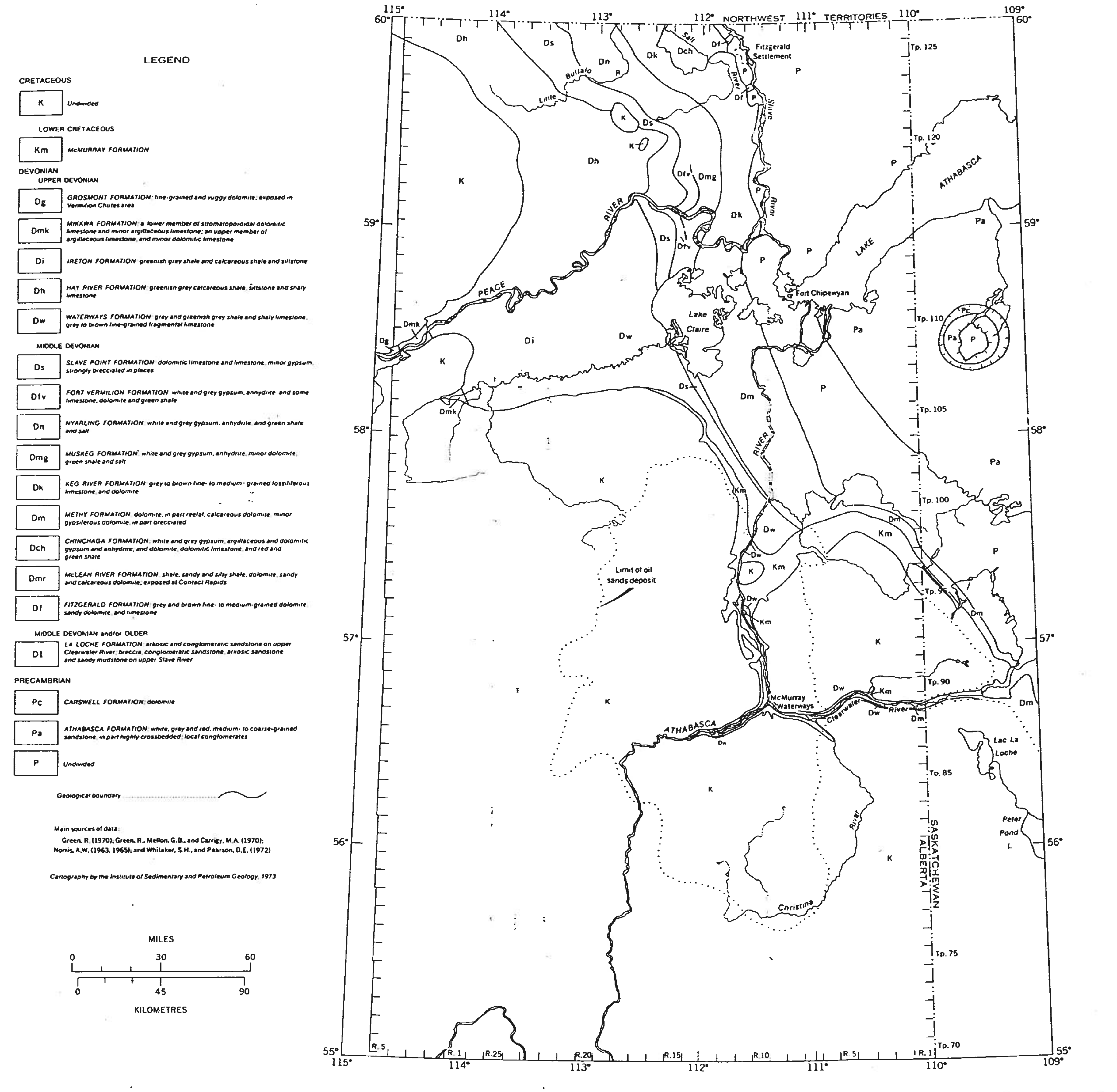
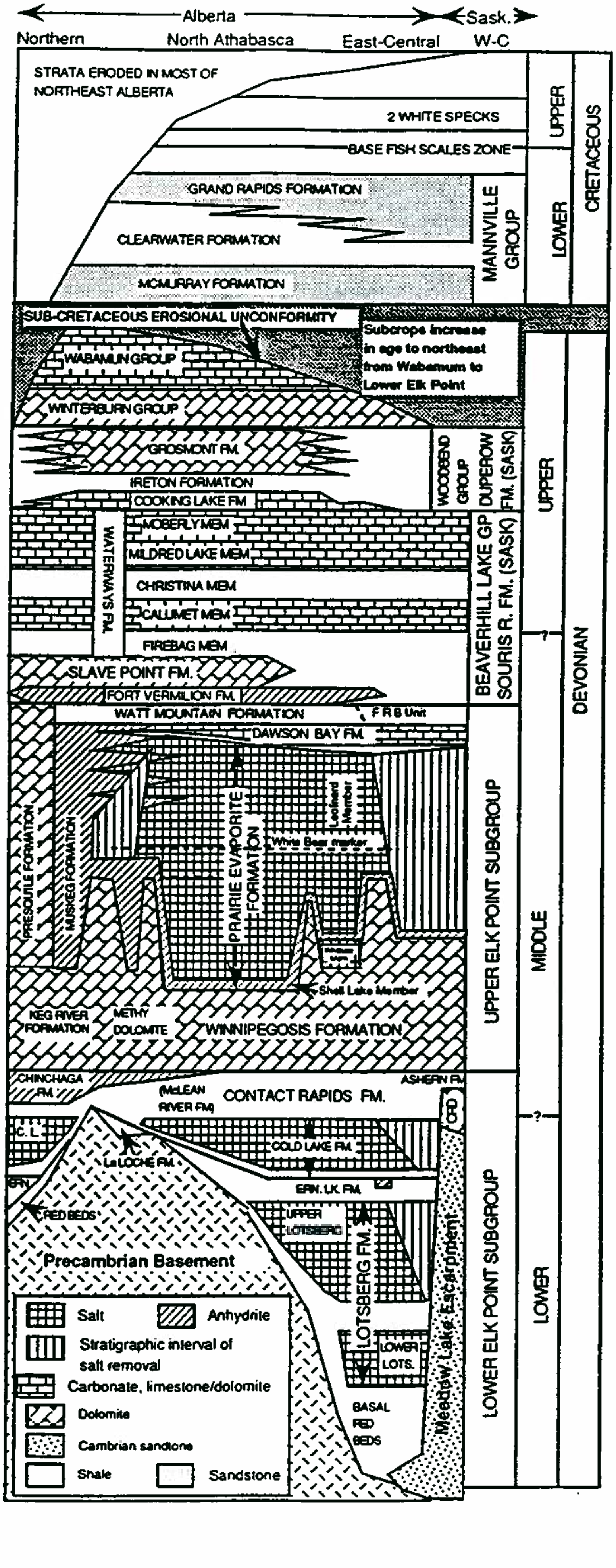


Figure 7 a. Geology of northeastern Alberta and northwestern Saskatchewan (from Norris, 1973)



SOURCES

East-Central Alberta

Sherwin 1962; Grayston et al. 1964; Geological Staff, Imperial Oil Ltd. 1950; Meijer-Drees 1986

North Athabasca

Crickmay 1957; Norris 1963, 1973; Grayston et al. 1964; Leavitt & Fischbuch 1968; Meijer-Drees 1986 Harrison 1986

Northern Alberta

Law 1955

FIGURE 7b. STRATIGRAPHIC SEQUENCE & NOMENCLATURE along a northwest trend form WEST-CENTRAL SASKATCHEWAN to NORTH-EAST ALBERTA

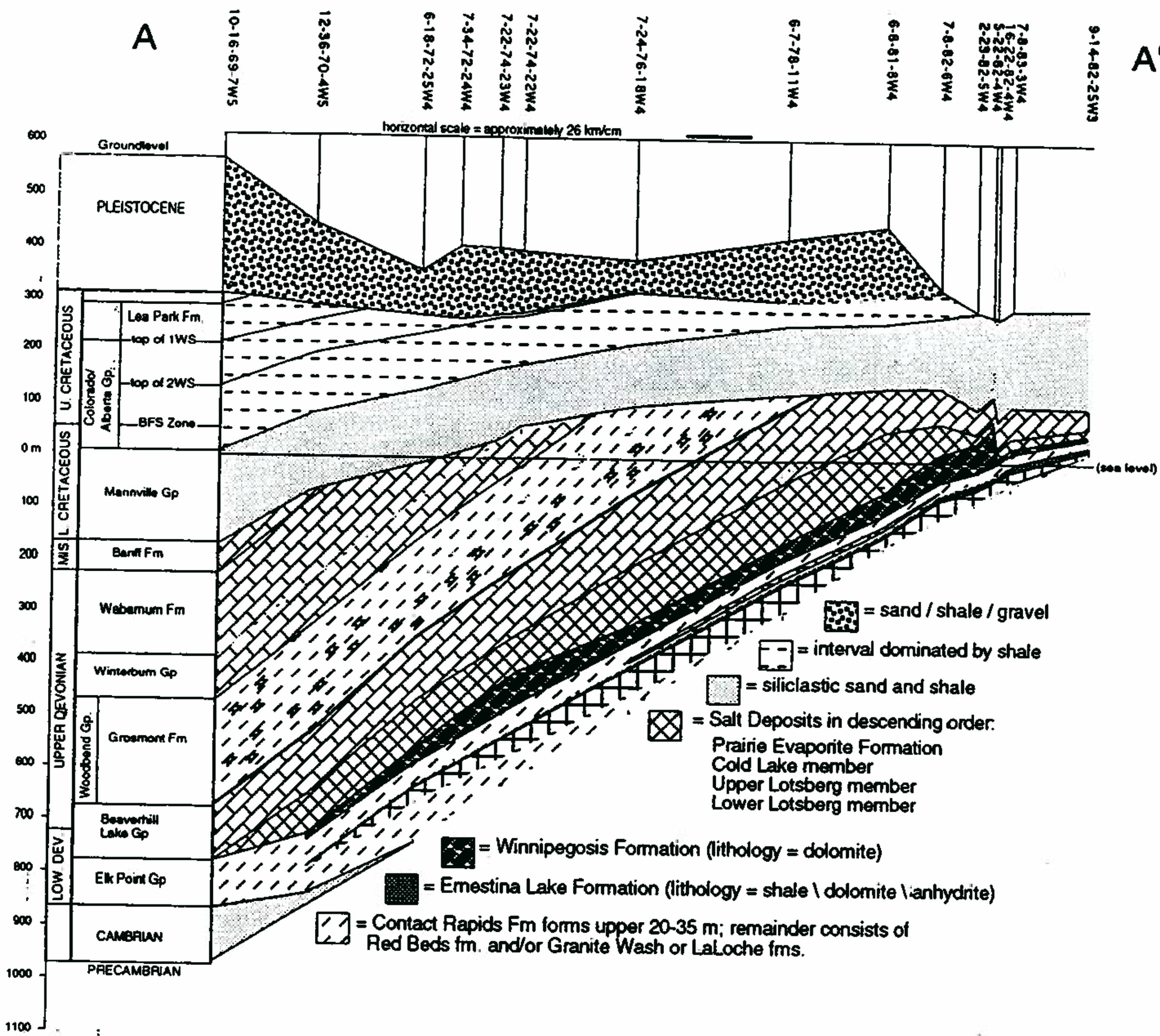


Figure 7 c Structural dip section A-A' of Phanerozoic Succession overlying Precambrian basement in Northeast Alberta, cross-section locaton on Figure 1

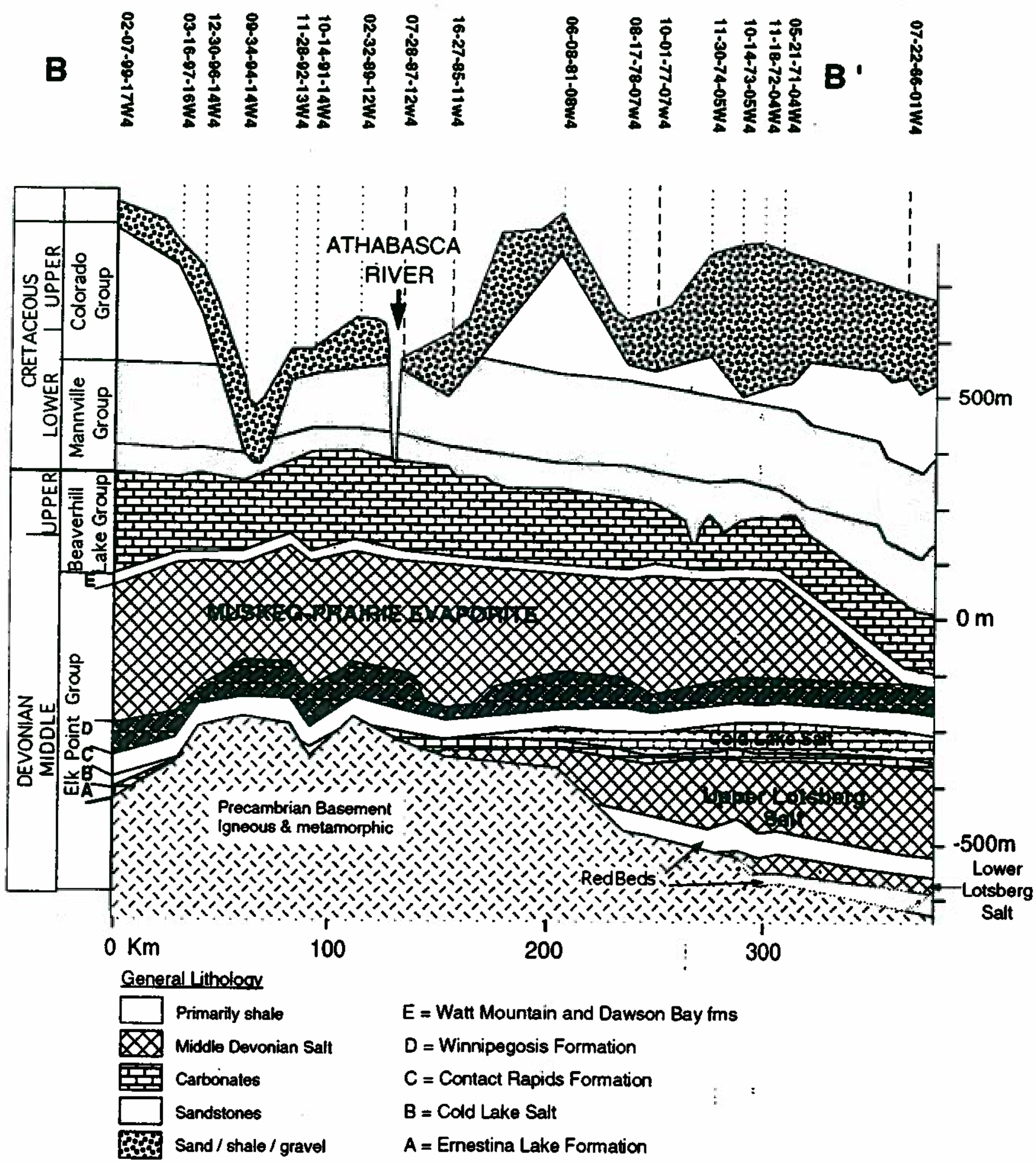


Figure 7 d Structural strike section B-B' illustrating Phanerozoic stratigraphy in the study area, cross-section locaton on figure 1.

unconformity, Devonian strata subcrop with increasing age to the northeast, toward the Precambrian Shield. Within the study area the Phanerozoic succession forms a wedge, gradually tapering from ≥ 1900 m in the southwest.

The nomenclature and regional stratigraphy applied to the region is summarized in Figure 7 b. The geological synthesis of the study area is illustrated through a series of paleogeographic maps that outline the lateral extent and general lithology of the Paleozoic successions (see figure 8).

The Precambrian basement is unconformably overlain by the Lower to Middle Devonian Elk Point Group consisting of a lower succession of red beds and salts, and an upper succession of platform carbonates and evaporites. The lower succcession is subdivided in ascending order into the Lotsberg, Ernestina Lake, Cold Lake and Contact Rapids Formations. The upper succession is subdivided in ascending order into the Winnipegosis, Prairie Evaporite and Watt Mountain Formations.

The Lotsberg Formation is a red bed succession that envelopes two halite deposits, the Lower and Upper Lotsberg Salts (Figure 8 a) (Hamilton, 1971). North of Latitude 56°, the formation ranges from 0 to 7 m, consisting only of red beds overlying the Precambrian basement. Progressing eastward between latitudes 56° and 57° and longitudes 110° and 112°, the red beds merge with coarser grained clastics referred to as the La Loche Formation (Sproule, 1951; Norris, 1973). South of Latitude 56°, the red beds diverge into three units enveloping the Lower and Upper Lotsberg Salts. The basal unit referred to as the Basal Red Beds (Meijer-Drees, 1986) underlies the Lower Lotsberg Salt. The second unit lying between the Lower and Upper Lotsberg Salts is unnamed and the upper unit forms the base of the overlying Ernestina Lake Formation. The limits of the salt deposits are depositional except for their northeastern limit which is the result of evaporite dissolution.

The Lotsberg Formation is conformably overlain by the Ernestina Lake Formation (figure 8 b), a thin succession with an average thickness of 17 m, consisting of a basal, red, dolomitic shale, a middle, anhydritic limestone shale and an upper anhydrite bed (Sherwin 1962). North of Latitude 56°, the Ernestina Lake

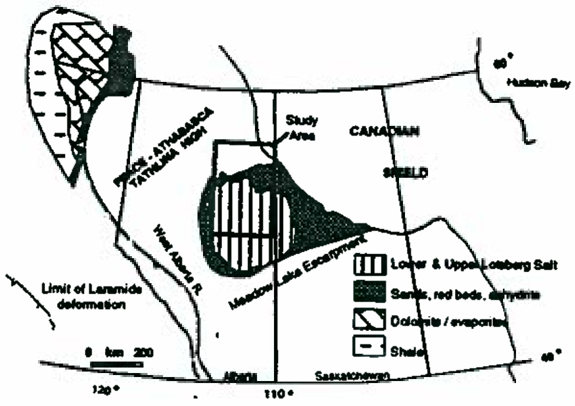


Figure 8 a Paleogeography of Lotsberg Formation, restricted to central Alberta

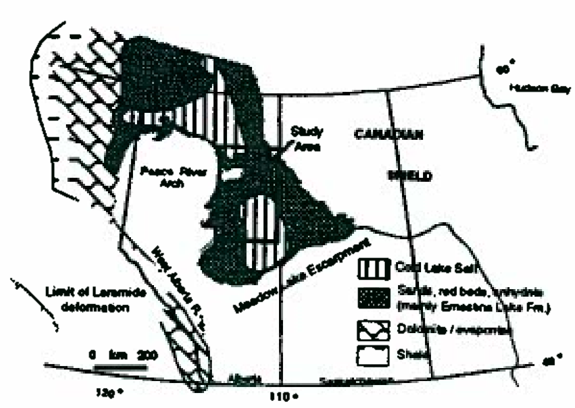


Figure 8 b Paleogeography of Ernestina Lake and Cold Lake formations in central Alberta

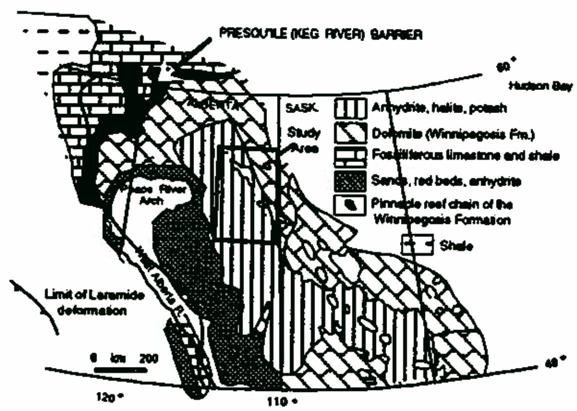


Figure 8 c Paleogeography of Upper Elk Point Group, consisting in ascending order of the Contact Rapids, Keg River/Winnipegosis, Muskeg/Prairie Evaporite and Watt Mountain formations

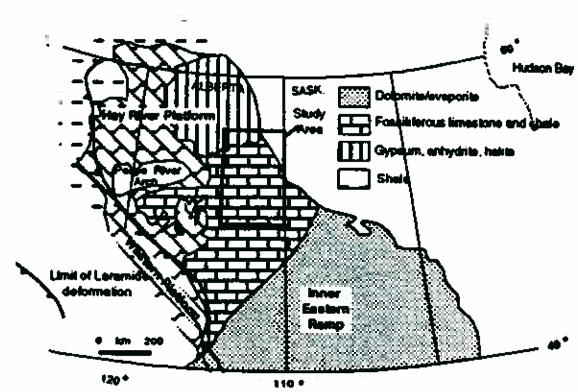


Figure 8 d Paleogeography of Beaverhill Lake Group and equvialents; the equivalent of the BHL Gp. in the study area is the Waterways Formation

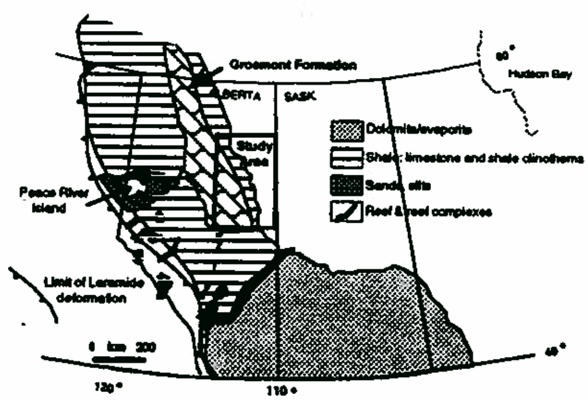


Figure 8 e Paleogeography of the Woodbend Group, consisting in ascending order of the Cooking Lake, Duvernay, Leduc, Ireton, and Grosmont formations

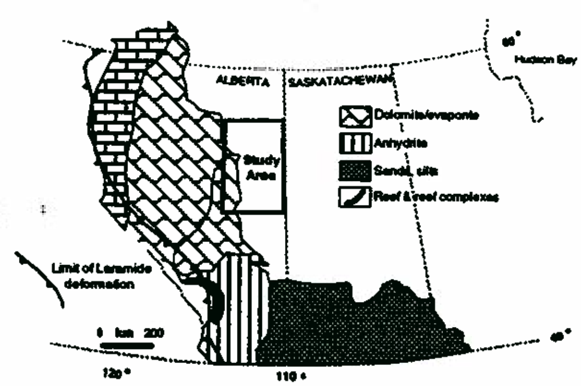


Figure 8 f Paleogeography of the Winterburn Group and Wabamun Formation

Figure 8. Paleogeographic setting and lithology of the Paleozoic succession within the study area (modified from Ricketts, 1989).

Formation onlaps and pinches out to the northeast against the Precambrian basement.

The Cold Lake Formation (figure 8 b) (Sherwin,1962; Hamilton, 1971) consists of a basal red bed unit overlain by two isolated salt deposits. The basal red bed unit thickens westward from a minimun of 5 m in the east to ≥ 20 m in the southwest. The basal red bed is pervasive except to the east of the depositional/erosional limit of the Ernestina Lake Formation, where it is difficult to distinguish from the underlying La Loche Formation. The southern salt deposit gradually wedges out depositionally to the northwest from a maximum thickness of 42 m. The northern salt deposit gradually wedges out depositionally to the south from a maximum thickness of 27 m. The eastern limits of both salt deposits is the result of salt dissolution.

The Contact Rapids Formation (figure 8 b) consists of interbedded argillaceous dolostones and shales (Sherwin, 1962) that grade laterally into the Chinchaga Formation of Northern Alberta, an interbedded succession of anhydrite and dolostone (Law, 1955; Meijer-Drees, 1986). To the north, the top of the Contact Rapids Formation interval correlates with the top of a southerly tapering, 1-5m thick anhydrite wedge of the Chinchaga Formation. The base of the Contact Rapids Formation is distinct where it is underlain by the Cold Lake Salt, but it is difficult to define where the Cold Lake Salt is absent. The Contact Rapids Formation thins to the northeast from a maximum thickness of 45 m in the southwest, thinning to less than 20 m in the northeast.

The Contact Rapids Formation is conformably overlian by reef and non-reef carbonates called the Keg River Formation in the northwest (Law, 1955), the Methy Dolomite in the central North Athabasca area (Nauss, 1950; Greiner, 1956), and the Winnipegosis Formation to the south (Baillie,1953; Grayston et al., 1964) (figure c). In this study, they are collectively referred to as the Winnipegosis-Keg River succession. Reef carbonates up to 115 m in thickness occur along linear southeast - northwest trend. Platform carbonates generally have an average thickness of 50 to 60 m, with inter-reef carbonates thinning to 12 m.

The Keg River - Winnipegosis succession is conformably overlain by an extensive evaporite succession (figure 8 b). The succession is thickest along a north-northwest trend increasing from 160 m in the south to 274 m in the northwest. Thinner intervals along this trend are the result of the reef build-ups of the underling Keg River-Winnipegosis succession. The northern part of the succession is called the Muskeg Formation (Law, 1955) and the southern the Prairie Evaporite Formation (Baillie,1953; Grayston et. al., 1964). The two names of the evaporite succession reflect a lithofacies change from anhydrite to halite progressing south of Township 100. The Muskeg Formation is a succession of rhythmic carbonate and anhydrite. There is a rapid transition from anhydrite to halite between Townships 100 and 90. The eastern boundary of the evaporite succession is a dissolution salt scarp (figure 9) with an average width of 20 km that has migrated towards the centre of the basin since post-Middle Devonian time. The Muskeg-Prairie Evaporite succession is conformably overlain by the Watt Mountain Formation (Law, 1955), a widespread succession of dolomitic shales with an interval thickness of 15 to 20 m.

BEAVERHILL LAKE GROUP

The Beaverhill Lake Group (figure 8 d) consists in ascending order of the: Fort Vermillion, Slave Point, and Waterways Formations. Anhydrite of the Fort Vermillion Formation, and limestones of the Slave Point Formation, occur only in the northwest as thin southerly tapering wedges. The Waterways (or Beaverhill Lake) Formation (Warren, 1933) is an alternating succession of calcareous shales and carbonates, subdivided in ascending order into the Firebag, Calumet, Christina, Moberly and Midred Lake members. Because of post-Devonian erosion, the Beaverhill Lake Group thins to the northeast over a 90 km wide subcrop belt from average maximum thickness of 200 m in the southwest.

WOODBEND GROUP

The Woodbend Group (figure 8 e) consists of two stacked carbonate platforms which pass conformably into limy shales of the Ireton Formation to the north and west. The carbonate platforms are successively referred to as the Cooking Lake and the Grosmont Formations. Progressing from the north and west, the Ireton Formation can be subdivded into the Lower Ireton shale and the Upper Ireton shale. The Lower Ireton

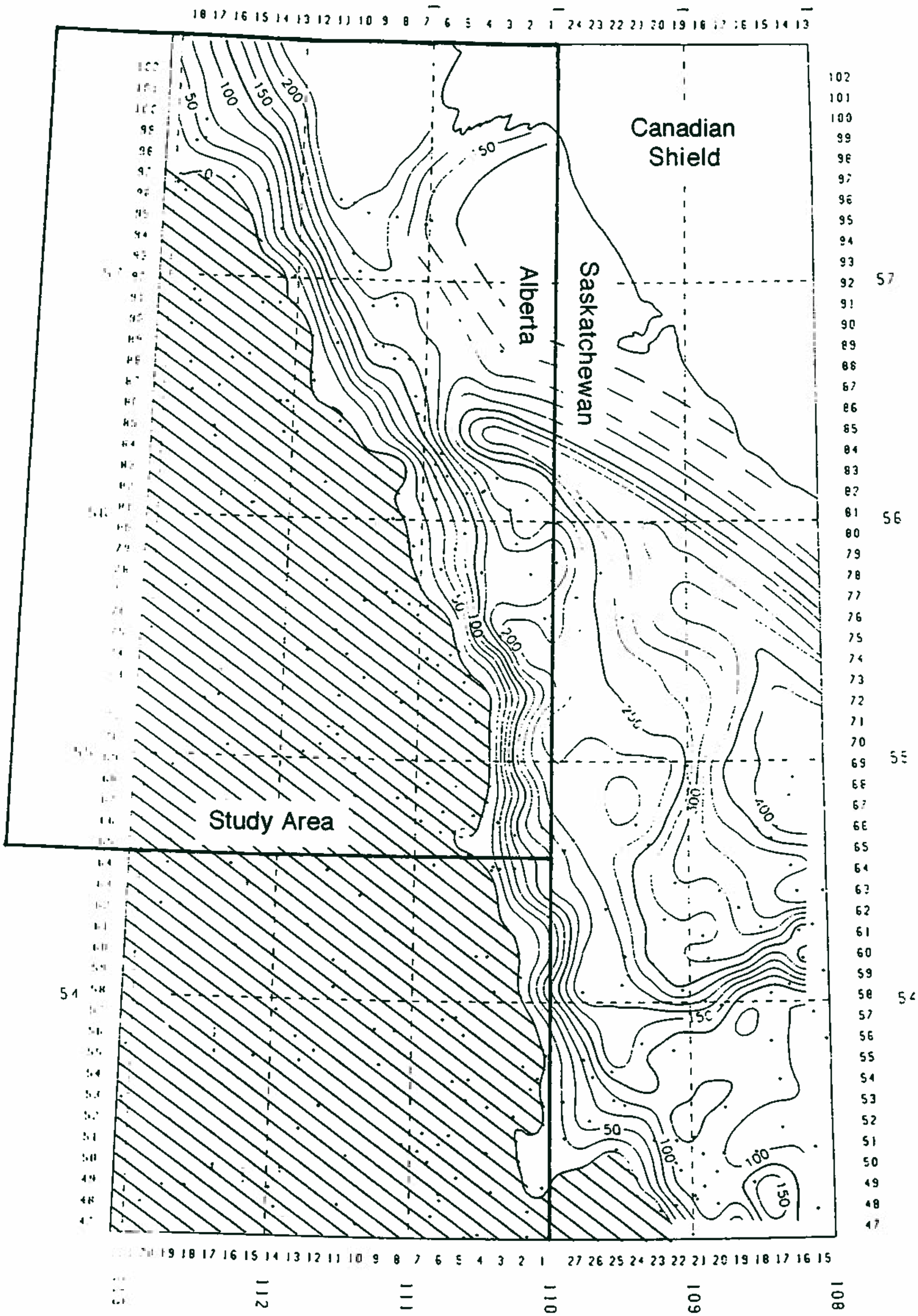


Figure 9. Estimate of salt removal from the Middle Devonian Elk Point Group evaporite successions in northeastern Alberta and northwestern Saskatchewan. The western limit of salt removal corresponds to the Prairie Evaporite Salt Scarp (McPhee and Wightman, 1991).

shale, ranging from 100 to 150 m in thickness, separates the carbonate platforms and subcrops along a narrow north-northwest trending belt ranging from 1 to 25 km. The Upper Ireton shale is a 20 to 30 m interval overly the upper carbonate platform. The Cooking Lake Formation, forms a northerly tapering spear which ranges up to a maximum thickness of 80 m. The eastern limit is a relatively linear north-northwest trending subcrop belt approximately 18 km wide. West of Longitude 113°, the Cooking Lake Formation rapidly thins depositionally to a few metres. The Grosmont Formation (Harrison, 1986) uniformly tapers to the northeast, over a 30 km wide subcrop belt from an average maximum thickness of 170 m. Several Townships to west of the 5th Meridian, the Grosmont carbonate platform gradually terminates along a north-northwest trend, interfingering with the Ireton Formation.

The overlying Winterburn Group and succeeding Wabamum Formation, the product of basinwide carbonate platform progradation, are restricted to the extreme southwest corner of the study area. The Winterburn Group consists primarily of dolomitic rocks and has a maximum thickness of 125 m (figure 8 f). The Wabamun Formation, a massive limestone unit, is represented by an incomplete interval with a maximum thickness of 125 m.

TECTONIC FEATURES

Several fault systems have been inferred by previous authors (Garland and Bower, 1959; Kidd, 1951; Sproule, 1956; Carrigy, 1959; Norris, 1963; and Hackbarth and Nastasa, 1979). Structure on Paleozoic strata does not reflect structural movement along the inferred fault systems, the erosional topograghy of the Precambrian basement, nor flexure along the Snowbrid Tectonic Zone. It does reflect structural due to salt dissolution of the Middle Devonian evaporitic units (McPhee and Wightman, 1991). The isopach of the Lower Cretaceous Upper Mannville sub-Group (Rudkin, 1964) indicates up to 70 m of basement subsidence to the northwest of the Snowbird Tectonic Zone.

DISCUSSION

MISSISSIPPI VALLEY TYPE ORE DEPOSTS

A brief discussion of Mississippi Valley-type (MVT) ore deposits in general is necessary before evaluating the potential for such deposits in Northeast Alberta. The general characteristics of MVT deposits have been summarized by many authors (eg. Ohle, 1980; Anderson and Macqueen, 1982; and Sangster, 1983) and include:

1. Ores are simple in mineralogy; composed primarilly of galena and sphalerite with lesser amounts of pyrite, marcasite, chalcopyrite, barite and flourite. Also, precious metal concentrations are low but may include Co, Ni, Ag, Cu, Cd, In, Ge, and Ga.
2. Ores are stratiform and epigenetic.
3. The majority of deposits are hosted by Carbonates which are...
   a) dolostones
   b) brecciated, with Karsting
   c) unmetamorphosed, and
   d) Proterozoic to Cretaceous in age
4. There is no evidence of associated igneous activity.
5. Ores are located near the edges of basins, or along arches or "hinge-zones" between basins.
6. Ores are precipitated from brines with salinities 5 to 10 times that of normal sea water, and with temperatures of between 80° and 200°C.
7. Sulphur isotopes are indicative of coeval sea water sulphate. Pb isotopes are ambiguous and can be either anomalous (ie. shallow crustal), or normal (ie. deep crustal).

These characteristics were used to produce the most widely held MVT ore deposit model which is representative of the normal evolution of a sedimentary basin (Jackson and Beales, 1967). Metal laden brines, produced by the diagenetic dewatering of formations deep within a sedimentary basin, move upward and outward from the basin toward the surface. These fluids have been referred to as "hydrothermal", however there is no evidence of a magmatic influence as may be inferred by this terminology. The metal-bearing brines become channeled along paleokarst structures, or zones of extensive porosity and permiability, where ore deposition takes place.

The timing and exact mechanism of MVT ore precipitation are not well understood. The models that have been proposed for ore precipitation are based on either mixing or non-mixing of fluids. The non-mixing models require that both metals and sulfur are carried within the same fluid. However, work by Anderson (1975) and Beales (1975) has shown that in order to carry ore quantities of lead, for example, the fluid cannot contain sulfur. If sulfur is present in significant quantities, the resulting acidity of the fluid is such that calcite and/or dolomite (which has been shown to precipitate along with ore) is unstable. Therefor, the most likely method of ore precipitation requires the introduction of a metal-bearing brines to a source of reduced sulfur by the mixing of two fluids (Heyl et al., 1974; Anderson, 1978). Further karsting, brecciation and extensive coarse sparry dolomitization of host rocks accompanies ore deposition.

PINE POINT, NWT

The Pine Point district, south of Great Slave Lake in the Northwest Territories (figures 2 and 10), is perhaps Canada's best known example of MVT mineralization. The Pine Point property contains a total of 87 individual orebodies in an area 65 km (east-west) by 24 km (north-south). As of the end of 1983, 58.2 million short tons of ore grading 3.0% Pb and 6.6% Zn had been mined. At that time, reserves were estimated at a further 25.7 million tons grading 2.7% Pb and 6.3% Zn (Rhodes et al., 1984). This world class Pb-Zn deposit is of importance to this project due to its proximity to the study area, and its Geological setting.

Pb-Zn mineralization is hosted within the middle Givetian platformal and reefal carbonates of the Pine Point Barrier complex (Krebs and Macqueen, 1984). The barrier is composed of buildups within the Pine Point and the overlying Slave Point

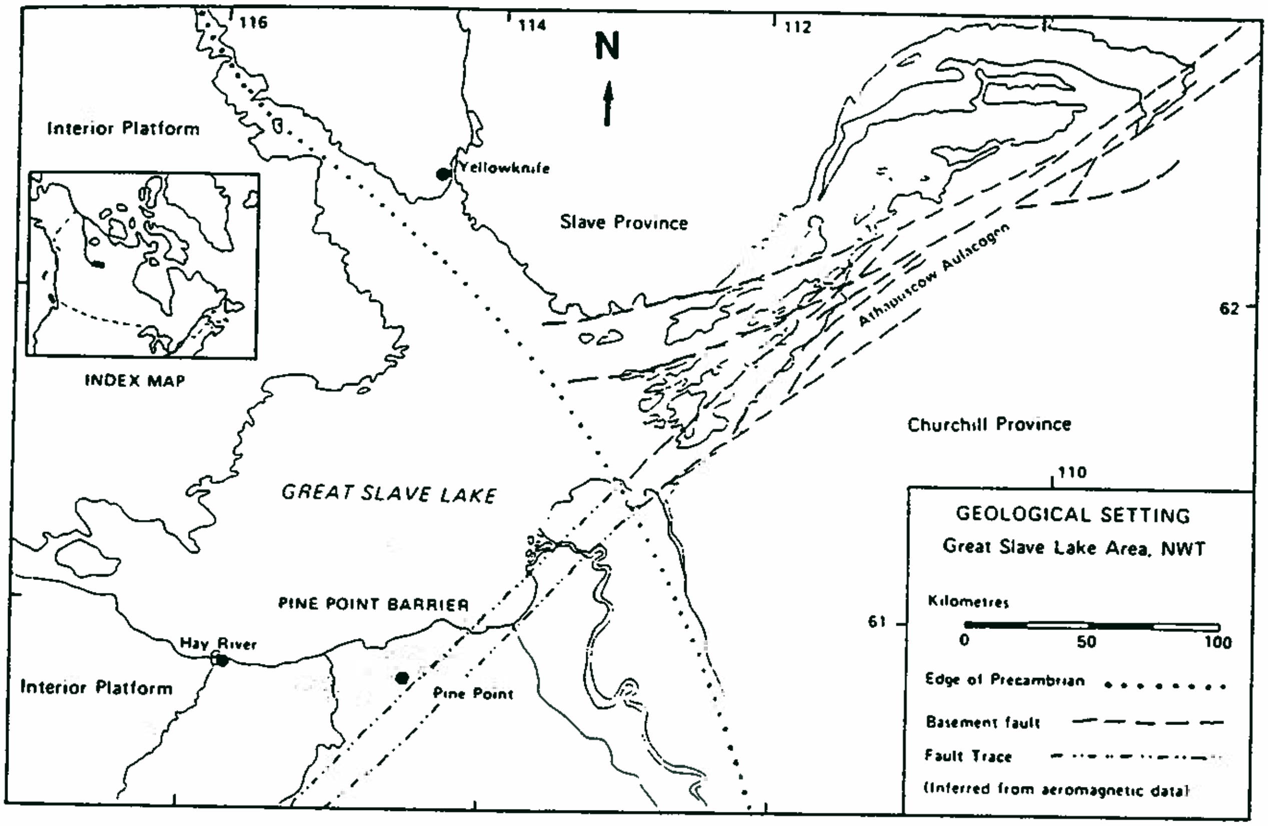


Figure 10 . Location and geological setting of the Pine Point property, illustrating the relationship between basement faults and the trend of the Pine Point barrier (from Rhodes et al , 1984).

Formations. The ores are epigenetic and the majority occur as cavity fillings and replacements within an interconnected network of paleokarst features (Rhodes et al., 1984). The karst structures are generally located at the base of a zone of coarse dolomite alteration, known as the Presqu'ile dolomite, which predominantly replaces the Sulfur Point formation. Karsting occurs in two major trends. The Main trend strikes approximately 060°, which is more or less parallel to the strike of the barrier complex (figure 11), and the North trend which is basically perpendicular to the Main trend.

Nonradiogenic Pb, high fluid inclusion temperatures within the orebodies and thermally immature indigenous organic material in the carbonate host rocks lead Krebs and Macqueen (1984) to deduce a relatively deep seated source for the metals in the ores of Pine Point. Isotope studies have suggested the adjacent middle Devonian Muskeg and Chinchaga Formations as a likely sources of sulfur (Jackson and Beales, 1967; and others refereced by Krebs and Macqueen, 1984). Thus, mineralization at Pine Point is the result of the interaction of a warm metal-bearing brine and a second sulfur bearing fluid (Haynes and Kesler, 1987).

It has been suggested that the proximity of Pine Point mineralization to the Great Slave Lake Shear Zone (GSLSZ - formerly the MacDonald Fault) is more than coincidental. Campbell (1966) was the first to suggest that the (GSLSZ) might have provided a structural control, and perhaps a source, for ore forming solutions. Arguments for activity along basement faults in this area, however subtle, have been presented by Belyea (1971) and Skall (1975). Recently, Hitchon (1993) has also suggested that the relationship between strongly dolomitized trends in the Devonian of western Canada and underlying basement structure may be more than coincidental.

The most significant unknown factor with many MVT deposits is the timing of ore formation. The published data regarding the timing of ore precipitation at Pine Point is ambiguous. Pb isotopes and Rb-Sr age determinations have yielded ages of late Devonian (361$\pm$13 Ma) to late Pennsylvanian (290 Ma) (Cummings et al., 1990; Nakai et al.,1993). Alternatively, It has been suggested that the Pine Point orebodies are the result of basinal fluid migration caused by tectonic activity which began in the Late Jurassic to Early Cretaceous and climaxed in the Late Cretaceous to Paleocene

(Garven, 1985; and Qing and Mountjoy, 1992). Also, Symons et al. (1993) has suggested, based upon paleomagnetic data, that Pine Point ores are late Cretaceous to Paleocene (84 - 58 Ma) in age. A tectonic event, such as the Laramide orogeny, would provide an excellent mechanism for the movement of large quantities of fluids from west to east through the Western Canada Sedimentary Basin. However, Nesbitt and Muehlenbachs (1994) have suggested that the same basinal dewatering event that was responsible for the formation of extensive coarse, sparry dolomite, as well as Pb-Zn, magnesite and talc mineralization within Cambrian Carbonates in the southern Canadian Rockies, was also responsible for Pb-Zn mineralization within Devonian strata (specifically Pine Point). Furthermore, fluid inclusion work (Ibid) excluded the involvement of Tertiary meteoric water in the precipitation of ore at Pine Point, and a time of ore formation during the Late Devonian to Early Mississippian is proposed.

NORTHEAST ALBERTA

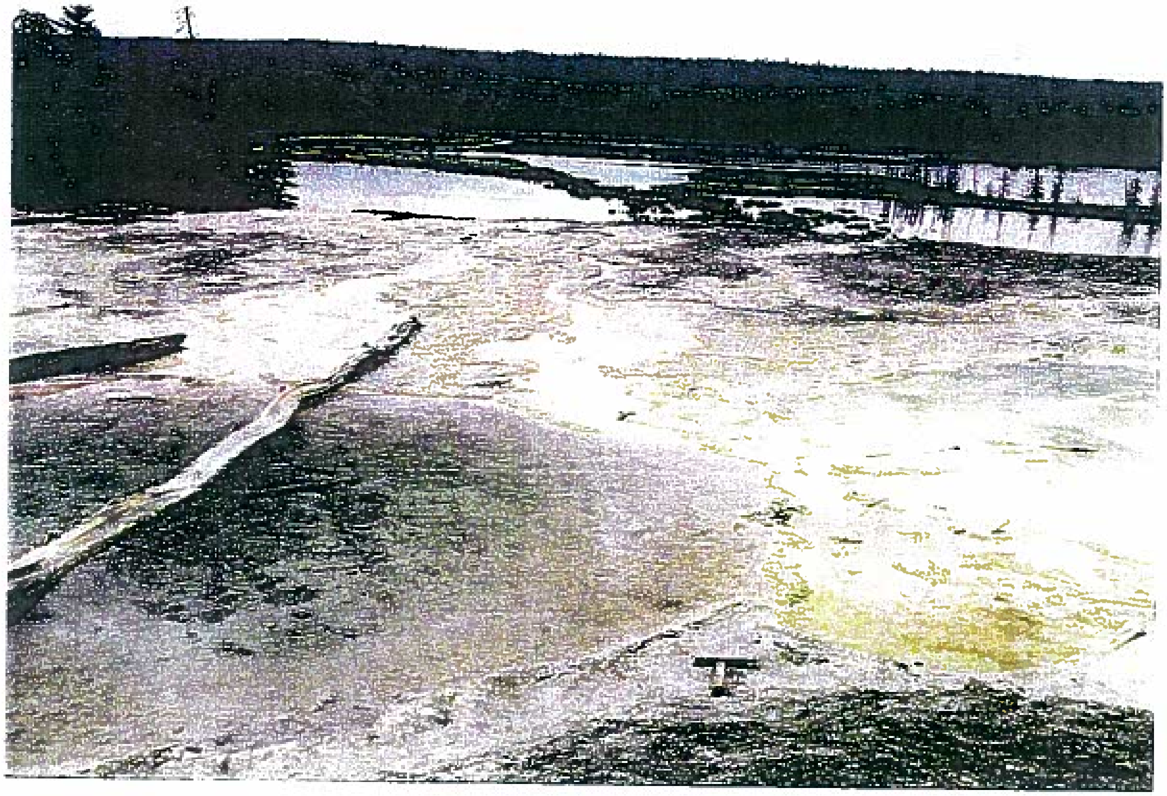
Dubord (1987) reviewed the available data regarding fluid migration within the Alberta Sedimentary Basin and concluded that; 1) there are large amounts of leachable metals within Devonian Shales in western Canada (Hitchon (1979); 2) high metal contents within oil field brines are not uncommon (Billings et al., 1969); and 3) fluid flow out of the basin has occurred and is gravity driven (Garven, 1985).

Given the high potential for metal-bearing fluids moving out of the Alberta Basin, there are a number of Geological feature in Northeastern Alberta that may be considered favourable for their concentration. These include the presence of considerable thicknesses of Carbonate lithologies as potential aquifers and host rocks, the proximity of the edge of the Alberta Basin, the dissolution front of Middle Devonian evaporites and related collapse, and basement structures such as the Snowbird Tectonic Zone (STZ). All of these features are illustrated in figure 1.

The Carbonate formations within the study area, and the present limit of Paleozoic cover at the edge of the Canadian Shield, have been dicussed earlier within the Regional Geology section of this report. Of particular interest to the formation of potential fluid conduits within northeastern Alberta, is the large zone of intrastratal karst that has been produced by salt dissolution (figure 9). Removal of salt from the Middle Devonian Prairie Evaporite Formation has resulted in several hundred feet (175 -200 m) of collapse in the overlying Beaverhill Lake Formation. For the mostpart, salt removal has been gradual, resulting in the draping of strata over the remaining insoluble portions of the Prairie Evaporite Formation and other irregularities within the underlying strata. Deformation of the Beaverhill Lake Formation exposed along the Athabasca River north of Fort McMurray is characterised by very gentle folding with bedding rarely exceeding dips of 20-30°, with ocassional faulting. Also associated with the removal of salt are salt springs and features indicative of karsting such as sinkholes (figure 11), which occasionally appear to define linear features. For a further discussion of these features see Dufresne et al., (in press).

The main hypothesis underlying this study is based upon a potential analogy between Pine Point mineralization with respect to the GSLSZ, and as yet undiscovered mineralization in Northeast Alberta with respect to the STZ. The Snowbird zone is the dominant structure in the basement of central Alberta, and is characterised by anastomosing mylonite zones which extend from Hudsons Bay in the Northeast to the foothills of the Rocky mountains in the southwest (Ross et al., 1991). The Snowbird and GSL shear zones are remarkably simillar in that they both are of continental scale, have a dextral sence of movement, and are Northeast striking. Also present within the study area is a major terrane boundary which extends to the north from the STZ (see figures 1 and 6). This boundary seperates 2.4 - 2.0 Ga crust of the Buffalo Head terrane to the west and the 2.0 - 1.8 Ga Taltson Magmatic Zone to the east. Beside the STZ, several other faults have been postulated in the basement of northeastern Albert based upon interpretations of aeromagnetic data by Garland and Bower (1959). It is hypothesised that potential mineralizing fluids could be channeled either by these major basement features directly, or indirectly by disturbances within the overlying Paleozoic strata that may have resulted from movement along these features.

11 a.



11 b.

Figure 11 a. Salt spring overlooking Saline Lake, 15km southeast of Fort MacKay.

Figure 11 b. Sinkhole north of McClelland Lake, in the vicinity of breccia node in well 12-6-99-8w4 (see Figure 3a. and 3b.)

RESULTS

GEOCHEMICAL ANALYSES FROM NORTHEAST ALBERTA

A total of 633 rock samples were removed from the core of 47 of the 50 wells examined in the study area, and were analysed for 30 elements by the ICP method. Highlights of which are provided in table 1. In all, more than 11500' (3500m) of core were examined from these wells, the majority of which came from the Winnipegosis and Beaverhill Lake formations. The specific results of the Geochemical analyses are discussed by formation below. It should be noted that no statistical significance is attached to the term 'anomaly', which is used simply to indicate unusually high values. No significant Pb-Zn mineralization was observed within the study area. Also, no significant alteration (ie. "presqu'ile-type" dolomitization) was observed. Lead values were very low with only 7 values greater than 50 parts per million (ppm) including a maximum of 120 ppm. Zinc values were slightly higher with 15 values greater than 50 ppm including a maximum of 2816 ppm (or 0.28% Zn).

CRYSTALLINE BASEMENT

17 samples were analysed from Granites and Granite Gneisses of the Precambrian Basement which yielded 1 anomalous value. A fairly strong U/Th anomaly of 300 ppm and 291 ppm, respectively, was yielded by a hematite stained Granite Gneiss at a depth of 1994.5' from well 9-34-94-14w4. This type of Uranium occurrence is not uncommon in Granite Gneisses of the Taltson Magmatic Zone exposed on the Canadian Shield in the northeast corner of Alberta (Langenberg et al., 1993).

GRANITE WASH (LA LOCHE) FORMATION

There was one sample of interest of the 14 taken from the Sandstones and Pebbly Conglomerates (generally Fe-stained) of the La Loche formation. This was a sample from 864.5' from well 4-32-93-10w4 which contained 119 ppm Cu. This sample is one of only 9 that exceeded 50 ppm Cu.

Table 1. Geochemical Highlights from Northeast Alberta.

WELL LOCATION	SAMPLE #	Fm.	Pb (ppm)	Zn (ppm)	OTHER
3-30-74-10w4	93-10-18-01	Bh. Lk.	55		
	93-10-18-03	Bh. Lk.	52		
4-32-93-10w4	93-10-21-19	Keg R.			57 ppb Au
	93-10-22-07	La Loche			119 ppm Cu
8-20-89-9w4	93-10-26-12	Bh. Lk.			15 ppb Au
	93-10-27-14	P. Evap.		2816	8.7 ppm Cd
	93-10-28-06	Keg R.			50 ppm Cu
	93-10-28-19	Ern. Lk.			328ppm Cu, 37ppb Au
7-8-71-11w4	93-11-02-01	Bh. Lk.		56	
	93-11-02-03	Bh. Lk.		254	
	93-11-02-08	Bh. Lk.		1690	
15-29-79-5w4	93-11-03-03	Bh. Lk.			115 ppm Ni
6-10-77-25w4	93-11-09-03	Grosm.	98	310	123 ppm Ni
	93-11-09-04	Grosm.	68	1620	120 ppm Ni
	93-11-09-13	Xl. Bsmt			93 ppm Cu
10-22-76-1w4	93-11-10-08	Keg R.		125	
10-16-91-18w4	93-11-15-18	Keg R.			80 ppm Cu
12-7-95-8w4	93-11-17-02	Xl. Bsmt		74	
	93-11-17-07	Cont. R.		100	
	93-11-17-11	Keg R.		70	87 ppm Cu,106ppm Ni
13-31-96-6w4	93-11-22-02	Red Beds			398 ppm Ni
	93-11-22-07	Cont. R.		58	59 ppm Cu
	93-11-22-11	Keg R.			50 ppm Cu
13-17-67-23w4	93-11-23-01	McM		53	
	93-11-23-02	McM		100	
7-11-87-17w4	93-11-26-02	La Loche			35 ppb Au
	93-11-30-03	Sl. Pnt.		73	
	93-11-30-05	Bh. Lk.	120		
	93-12-03-03	Ireton	50		
	93-12-03-05	Ireton	63		111 ppm Ni
5-25-69-20w4	93-12-06-01	Leduc		247	199 ppm Ni
	93-12-06-02	Leduc			130 ppm Ni
3-16-97-16w4	93-12-06-16	Bh. Lk.			127 ppm Ni
16-27-102-24	93-12-09-11	Muskeg		62	
9-34-94-14w4	93-12-14-07	Xl. Bsmt			300ppm U,291ppm Th

RED BEDS

The Red Beds are easily distinguished in core from the La Loche Formation firstly by their stratigraphic position above the La Loche sandstones and beneath the Contact Rapids Formation, and secondly, by the large amount of very fine grained matrix. This matrix, which can be as much as 80% of the rock, is usually dolomitic, and has a mottled appearance which is produced by a combination of red-brown Fe-staining and pale green clay alteration. A sample (1 of 29 taken from the Red Beds) located just above the basement unconformity in well 13-31-96-6w4 returned the highest value for Ni of 398 ppm.

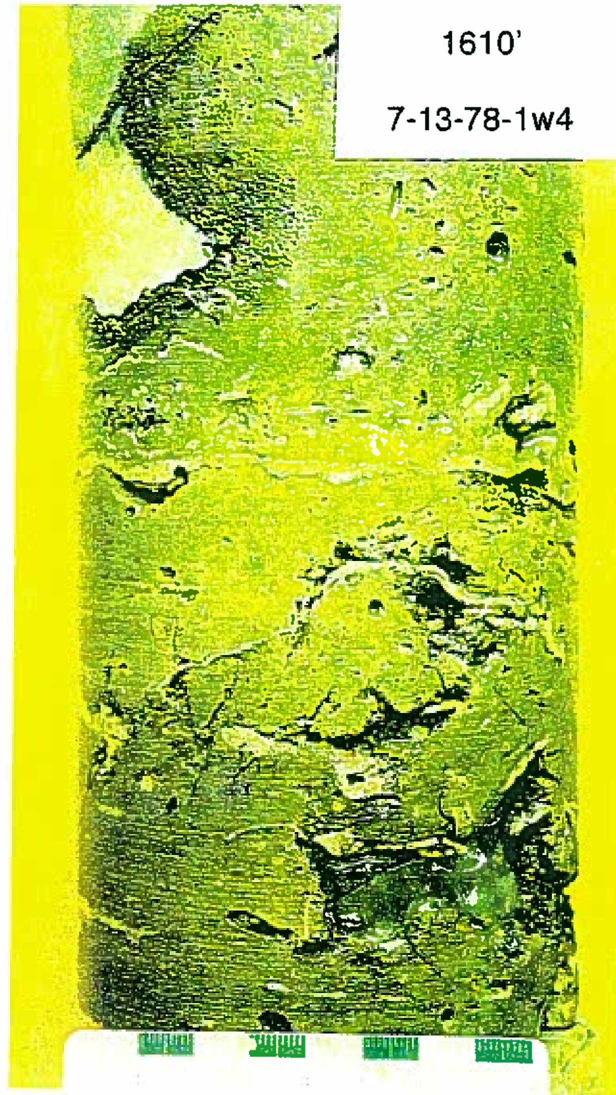
CONTACT RAPIDS FORMATION

20 samples taken from the dark greenish grey, thinly bedded dolomitic shales of the Contact Rapids formation yielded a small Zn anomaly (58 ppm, with 59 ppm Cu), and a small Cu anomaly of 100 ppm. The first sample came from a conglomeratic Mudstone bed at 774' in well 13-31-96-6w4. The second sample was of a thin, fibrous gypsum vein (which are common within both the Red Beds and Contact Rapids Formations) containing traces of pyrite at 277.6' in well 12-7-95-8w4.

WINNIPEGOSIS (KEG RIVER) FORMATION

A total of 212 samples were analysed from the first of the major Carbonates within the study area, the Winnegegosis (Keg River) formation. An additional 25 samples were taken from the Muskeg formation, which is the more evaporitic equivalent of the Winnepegosis formation in the northern part of the study area, and is composed of interbedded tan Dolostones and Anhydrite. A generallized section of the formation would include non-fossiliferous, thinly bedded, dolostone and anhydrite at the top, followed by fossiliferous Grainstones and Floatstones often containing abundant large Stromatoporoids and Amphipora, and finally, wavy bedded to nodular, crinoid and brachiopod bearing, dolomitic Wackestones and Packestones toward the base of the formation. With few exceptions (eg. 4-20-83-4w4), the carbonates of the Winnipegosis formation (to the south) are completely dolomitized. No evidence of "hydrothermal" activity, that is, coarse sparry saddle dolomite, brecciation, or karsting was observed (see figure 12 for examples of typical Keg River dolostones).

12 a.



12 b.

Figure 12 a. Alternating finely and coarsely crystalline algal laminated Dolostone of the upper Winnipegosis formation.

Figure 12 b. Salt and gypsum filled vuggy Dolostone of the Winnipegosis formation.

Minor alteration in dolostones and anhydrite of the Muskeg Formation was observed in wells in the northwest corner of the study area (eg. 16-27-102-24w4). The alteration, which is associated with the influx of minor amounts of bitumen, has resulted in the interlayering of thin zones of very coarse, dark brown, recrystallized limestone, and sucrosic to finer crystalline, tan dolostones. Dark brown recrystallized limestone also occurs as rounded nudules up to 15cm in diameter within anhydrite beds.

The 237 samples taken from the Winnipegosis Formation yielded 3 zinc, 5 copper and 1 nickel anomaly. The highest Pb and Zn values were 29 ppm and 125 ppm, respectively. A sample of a very dark brown, carbonaceous, finely crystaline, laminated Dolostone with trace to 1% blebby pyrite, ran 70 ppm Zn, 87 ppm Cu and 106 ppm Ni. This sample was taken from a depth of 261.75m in well 12-7-95-8w4. Aside from occasional blebs and small zones of disseminated pyrite (which were primarilly concentrated in the above mentioned laminated, carbonaceous zone), no mineralization was observed within the Winnipegosis formation.

PRAIRIE EVAPORITE AND WATT MOUNTAIN FORMATIONS

19 samples of thinly bedded, finely crystalline Dolostone and Dolomitic Anhydrite were taken from the Prairie Evaporite Formation. The most interesting of these samples was taken at a depth of 743' in well 8-20-89-9w4, which returned the highest Zinc value of all the samples within the study area of 2816 ppm (0.28% Zn). This sample was taken from a 5 foot zone of interbedded medium to coarsely crystalline, tan colored, thinly bedded to laminated dolostones with white feathery gypsum interlayers. The zinc value is believed to be the result of disseminated coarse sphalerite crystals which were first interpreted as anhydrite. Simillar crystals, where observed and sampled in other wells, did not return any anomalous values.

BEAVERHILL LAKE (WATERWAYS) FORMATION

235 samples were taken from the second major Carbonate unit, the Beaverhill Lake (Waterways) formation. An additional 19 samples were collected from limestones of the Slave Point formation. The Beaverhill Lake formation is composed primarilly of

alternating zones of dark grey calcareous shale and lighter grey argillaceous limestones. Frequently these lithologies are thinly interbedded and bioturbated. As a result, nodular textures dominate this formation (figure 13). Brachiopod and crinoid debris is abundant throughout. Toward the top of the formation, within the moberly member, light tan (clean), often stromatoporoid-rich, limestones occur. Calcareous shales of the Beaverhill Lake formation (chritina and firebag members) are very finely crystalline and dense, while the limestones (moberly, mildred and calumet members) are slightly more coarsely crystalline. No dolomitization or significant Pb-Zn minerlization was observed. Blebby and disseminated pyrite occurs throughout the formation and tends to occur most frequently in association with unconformable sufaces. No obvious mineralization, and only minor Fe-staining, was observed at the sub-Cretaceous unconformity (see figure 13a). A typical occurrence of blebby pyrite from well 12-7-95-8w4, and a less typical pyrite filled vein from well 10-32-79-7w4 are illustrated in figure 14.

One significant Geological anomaly was identified within the Beaverhill Lake formation in well 12-6-99-8w4. This well is located very near to the limit of Paleozoic cover and within the zone of collapse due to salt removal. The well contained two zones of brecciated argillaceous Limestone between approximately 400' and the end of the cored interval at 540'. The upper zone is characterised by variable amounts of angular limestone clasts within a calcareous shaley matrix (figure 3a). The lower zone may be described as a Sandy breccia due to the large amount of clean McMurray (?) sand within the matrix. These breccias are simillar to those described by Park and Jones (1985) from the Peace Point area of Wood Buffalo National Park. The breccias are seperated by a zone of very coarsely crystalline limestone with large, open, sparry calcite rimmed vugs from 492.5' to 507.5' (figure 3b). This was the only zone of extensive alteration and recrystallization observed within the study area.

5 lead, 4 zinc and 3 nickel anomalies resulted from the sampling of the Beaverhill Lake formation. The highest lead value from the study area, 120 ppm, was returned from a sample of argillaceous limestone with trace amounts of pyrite at a depth of 1629.5' in well 7-11-87-17w4. The most interesting interval examined was in well 7-8-71-11w4 where 3 of 12 samples of the moberly member of the Beaverhill

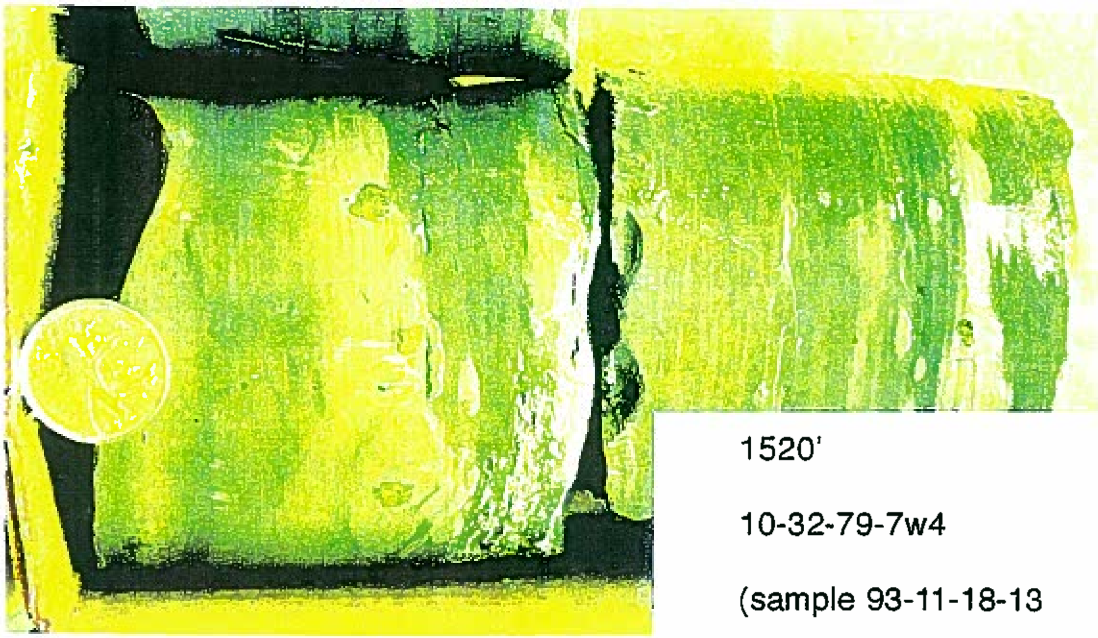
1125' 1142'

7-11-87-17w4

13 a. 13 b.

Figure 13 . Nodular Limestones of the Beaverhill Lake formation, (a.) outcropping along Hwy. 63 south of Fort MacKay (note the Fe-stained matrix), and (b.) in core from well 7-11-87-17w4.

14 a.



14 b.

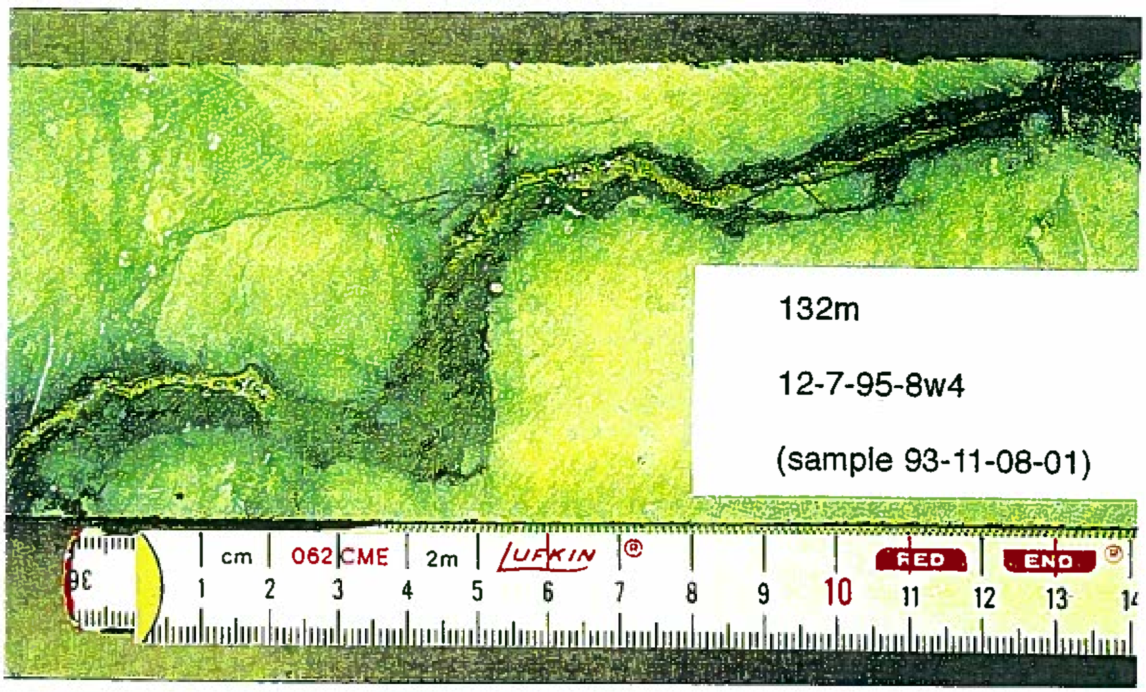


Figure 14. Examples of pyrite mineralization within the Beaverhill lake formation.
(a.) Typical blebby pyrite from 1520' in well 10-32-79-7w4, and
(b.) Atypical pyrite vein from 132m in well 12-7-95-8w4

Lake Formation between 1909' and 1932' returned anomalous zinc values of 56 ppm, 254 ppm and 1690 ppm. The first two of these values came from samples containing blebs of very finely crystalline pyrite. The third and highest of these samples (1690 ppm Zn - 1932') came from a calcite filled fracture with a trace of crystalline sphalerite.

WOODBEND GROUP

39 samples were taken from five intervals within the Woodbend Group, the last of the major Carbonate units in the study area. The relatively low number of samples is the result of emphasis being placed upon the examination of wells in proximity to the salt solution front where the Woodbend Group is not present. However, from this limited number of samples two interesting anomalies (one Zn and one Pb-Zn) were discovered. The first of these anomalous zones is defined by two samples taken from depths of 2394' and 2396' within well 5-25-69-20w4. The samples contained trace amounts of blebby pyrite within a zone of nodular argillaceous limestone of the Leduc Formation (formation pick by AccuMAP). The first sample (2396') returned a value of 247 ppm Zn, along with 199 ppm Ni. A second sample (2394') returned a value of only 5 ppm Zn, but contained 130 ppm Ni. Due to the poor condition and recovery of the core, a log has not been produced of this well. The second anomalous zone from the Woodbend Group, and the most interesting of the anomalies within the study area, is from well 6-10-77-25w4. Two samples were taken from a fossiliferous, finely crystalline, dark greyish brown dolostone to dolomitic limestone, which contained 3-5% very coarse blebs of finely crystalline pyrite (and minor sphalerite). The first sample at 3462.6' returned values of 98 ppm Pb, 310 ppm Zn and 123 ppm Ni. The second sample at 3463.3' returned values of 68 ppm Pb, 1620 ppm Zn and 120 ppm Ni.

CRETACEOUS FORMATIONS

4 samples were taken from clastic formations just above the sub-Cretaceous unconformity. Generally, the formation encountered immediately above the Devonian was the McMurray sandstone. The McMurray Formation was normally bitumen stained to saturated and, with the exception of two samples from well 12-6-99-9w4, was not sampled. The two remaining samples were taken from black Shales of the Wabiskaw member of the lower Mannville Group in well 13-17-67-23w4 and contained siderite nodules and returned values of 53 ppm and 100 ppm Zn.

Au ANALYSES FROM NORTHEAST ALBERTA

A subset of 247 of the 633 study area samples from 9 wells in the Fort MacKay area, along with all other samples from the La Loche Sandstones and the Precambrian Basement, were analysed for gold by fire assay. No significant gold mineralization was detected, and only 11 samples returned values greater than or equal to the detection limit of 5 parts per billion (ppb). Highlights of the gold analyses from northeastern Alberta are discussed below, and are presented in table 1.

A sample of buff colored sucrosic dolostone from the Wnnipegosis Formation at a depth of 645.2' in well 4-32-93-10w4 returned a value of 57 ppb Au, which was the highest of the gold assays. A value of 37 ppb Au was returned from a sample of argillaceous dolostone, of the Ernestina Lake Formation (?), at a depth of 1103' in well 8-20-89-9w4. From the same well, five other samples returned values at or above the detection limit, including a value of 15 ppb Au which was returned from a sample of argillaceous limestone of the Beaverhill Lake Formation at a depth of 403.5'. A value of 35 ppb Au was returned from an Fe-stained, coarse granular sandstone to fine pebble conglomerate from just above the basement at a depth of 2844.7' in well 7-11-87-17w4.

OTHER Pb-Zn OCCURRENCES (NORTHWEST ALBERTA)

A list of wells containing previously reported Pb-Zn occurrences has been compiled by Dubord (1987) (table 2). Core from seven of these wells, along with 4 other wells that were suggested by personal communications with Rob Klettl of Imperial Oil Ltd., has been examined. All of the wells are located in northwestern Alberta (figure 2). Over 1400' (425m) of core was examined and 42 samples were removed from 10 of these wells and were analysed for 30 elements by the ICP method. A complete list of the sample analyses is provided in the Appendices of this report, and highlights of which are provided in table 3.

Lead and/or Zinc occurrences were confirmed in 7 of the 10 wells examined from Northwest Alberta by visual examination and Geochemical analysis of core.

Table 2. List of Pb and/or Zn Mineralized Wells in Northern Alberta (after Dubord, 1987).

WELL NAME	LOCATION	(Pb/Zn)	HOST FORMATION
from Dubord (1987)			
Chevron Lutose	16-34-118-21 w5	Zn	Keg River
B. A. Sadle River	11-23-76-9 w6	Zn	Belly R.-Spray R. Ctct.
B.A. Zama Lake	9-5-114-8 w6	Zn	Keg River
B. A. Zama Lake A	6-33-113-7 w6	Zn	Keg River
Home KCL Chisholm	10-5-68-2 w5	Pb+Zn	lower Winterburn Gr.
IOE Rainbow	13-20-107-9 w6	Zn	Keg River
Calstan et al Loon River	4-23-89-12 w5	Zn	Muskeg
BP Ethyl Winterburn 7-3	7-30-80-11 w6	Zn	Wabamun-Banff trans.
PCL Dome Oak	11-8-83-6 w6	Zn	Wabamun
Socony-Duhamel #29-11	11-29-45-21 w4	Zn	Top D3
Socony-Duhamel #29-14	14-29-45-21 w4	Zn	Top D2, Ireton, D3
Socony-Flint	13-17-45-21 w4	Zn	Top D3
Banff Aquitaine	7-23-109-8 w6	Zn	Muskeg
Sun-Orr #1 New Norway	44-21 w4	Zn	?
Texaco Wizzard Lake	?	Zn	?
Imperial Golden Spike #11	?	Zn	?
Imperial Leduc 253	11-13-50-27 w4	Zn	?
Imperial Golden Spike #8	?	Zn	?
from Rob Kiettl (per. comm.)			
Pan Am A-1 Yates River	6-34-120-13 w5	Pb	?
Encor Snowfall	10-7-99-8 w6	Zn ?	Slave Point
Gulf et al Mega	16-34-100-6 w6	Pb	Slave Point
Can Seab'd Hay River	10-22-120-1 w6	Pb	?

Table 3. Geochemical Highlights from Northwest Alberta.

WELL LOCATION	SAMPLE #	FM.	Pb (ppm)	Zn (ppm)	Cd (ppm)
16-34-100-6w6	93-12-20-30	?		61	
10-22-120-1w6	93-12-20-05	?		4707	
	93-12-20-06	?	5187		
6-34-120-13w5	93-12-20-08	?		250	
	93-12-20-10	?	222		
16-34-118-21w5	94-01-20-01	Keg R.	1064	1122	2.8
	94-01-20-02	Keg R.		15601	36.5
	94-01-20-03	Keg R.	675	37633	64.8
	94-01-20-04	Keg R.	246	99999	
	94-01-20-05	Keg R.	732	1246	3.2
9-5-114-8w6	94-01-20-06	Keg R.		255	
	94-01-20-07	Keg R.		101	
	94-01-20-09	Keg R.		118	
	94-01-20-10	Keg R.		1435	4
4-23-89-12w5	94-01-31-02	Muskeg		118	
13-20-107-9w6	94-01-31-05	?		151	

Trace amounts of zinc were returned from samples in wells 4-23-89-12w5 and 13-20-107-9w6. Trace amounts of sphalerite were observed in wells 9-5-114-8w6 and 16-34-100-6w6. A trace amount of galena was observed in well 6-34-120-13w5. Traces of galena and sphalerite were observed seperately in well 10-22-120-1w6. These Pb-Zn occurrences are of an isolated nature and are not accompanied by alteration of host rocks.

The most significant Pb-Zn occurrence was varified in well 16-34-118-21w5. Potentially ore grade values of 3.76% and >9.99% Zn were obtained from samples of mineralized dolomitic Keg River formation. The zinc in this well occurred in two distinct styles of mineralization. The first style of zinc mineralization returned values of up to 675 ppm Pb, 3.76% Zn and 64.8 ppm Cd, and is characterised by a dusting of the core with up to 5-10%, disseminated, 0.5mm, honey colored sphalerite crystals. The second style of zinc mineralization returned values of up to 1064 ppm Pb, >9.99% Zn and 36.5 ppm Cd, and is characterised by brecciation of the Keg River formation. The breccia zones are actually zones of intense fracturing, over intervals of 2-3 feet, with very little alteration of the host rock. Minor sparry dolomite and up to 15-20% finely crystalline pyrite and sphalerite are present as fracture fillings. The core is dolomitized throughout, but does not indicate extensive recrystallization. Unfortunately, this mineralization occurs at a depth of approximately 4200 feet.

CONCLUSIONS AND RECOMMENDATIONS

No significant Pb-Zn mineralization was encountered during the examination of over 11500' (3500m) of core generated by pertoleum exploration in northeastern Alberta. The few Pb-Zn anomalies that were encountered could be explained simply as ubiquitous occurrences. However, this report cannot preclude the existence of such mineralization. It has been shown that there is a good potential for migration of metal-bearing fluids into the study area by dewatering of shales deeper within the basin to the west. The movement of fluids into the study area could be related either to the normal evolution of the basin or due to tectonic stresses associated with subsequent deformation of the basin (ie. the Laramide Orogeny). Both of these scenarios have been presented previously to explain the MVT Pb-Zn mineralization at Pine Point, which is located approximately 400km north of the study area in the Northwest Territories. If such fluids have migrated into Northeast Alberta, regardless of the timing, there is a considerable thickness of Devonian Carbonate formations that could be considered as potential hosts for Pb-Zn mineralization. Firstly, the Winnipegosis (keg River) Formation, which was depositted contemporaneously with the barrier complex which hosts the mineralization at Pine Point, was examined and found to be extensively dolomitized. However, no significant mineralization or sparry dolomite recrystallization was encountered. Secondly, the Beaverhill Lake Formation has recently become of considerable interest, although this is due to the potential for Au mineralization associated with the sub-Cretaceous unconformity. No significant Pb-Zn (or Au) mineralization or dolomitization was encountered. However, the karsting and brecciation of the Beaverhill Lake Formation in the area of well 12-6-99-8w4 for example, east of the Athabasca River, should still be considered for future exploration. From the core and cross sections produced by Don McPhee, it is unlikely that there has been any deformation of the Paleozoic strata in Northeast Alberta associated with the Snowbird Tectonic Zone.

The results from Abercrombie (1994), indicating that anomalous concentrations of Au and PGE exist in the Phanerozoic of Northeast Alberta, were obtained using a variation of the ICP method involving laser ablation rather than the more standard solution technique. Standard ICP and Fire assay techniques were applied to the samples in this report. It is therefor suggested that parties interested in carrying out less conventional analytical techniques on the remaining sample material should contact the authors.

LIST OF REFERENCES

Abercrombie, H. J. and R. Feng (1993) : Gold and PGE anomalies in Phanerozoic Sedimentary Rocks, Northeast Alberta - Potential for new Deposits. In the Calgary Mining Forum, program and abstracts, 10 and 11 February 1994. Calgary Mineral Exploration Group.

Allan, J. A. (1920) : First Anual Report on the Mineral Resources of Alberta Report No.1.

Anderson, G. M. (1975) : Precipitation of Mississippi Valley-type ores. Econ. Geol. v.70, pp.937-942.

Anderson, G. M. (1978) : Basinal brines and Mississippi Valley-type deposits: Episodes, Geological Newsletter, International Union of Geological Sciences, v. 1978, no. 2, p. 15-19.

Anderson, G. M. and R.W. Macqueen (1982) : Ore Deposit Models - 6. Mississippi Valley-type lead-zinc deposits; Geoscience Canada, v. 9, pp. 108-117.

Baillie, A.D., (1953) : Devonian names and correlation in Williston Basin area; American Association of Petroleum Geologists, Bulletin, V. 37, No. 2, p. 444-452.

Beales, F. W. (1975) : Precipitation Mechanisms for Mississippi Valley-type deposits. Econ. Geol. v. 70, pp. 943-948.

Belyea, H. R. (1971) : Middle Devonian tectonic history of the Tathlina uplift, southern District of Mackenzie and northern Alberta, Canada: Canada Geol, Survey Paper 70-14, 30 p.

Billings, G. K., KeslerS. E. and S. A. Jackson (1969) : Relation of Zinc-rich formation waters, northern Alberta, to the Pine Point ore deposit. Econ. Geol. v. 64, pp. 385-391.

Bond, G.C., and M.A. Kominz, (1984) : Construction of tectonic subsidence curves for the early Paleozoic miogeocline, southern Canadian Rocky Mountains: implications for subsidence mechanisms, age of break-up and crustal thinning. Geological Society of American Bulletin, V. 95, p. 155-173.

Campbell, N, (1966) : The lead-zinc deposits of Pine Point: Canadian Mining Metall. Bull., v. 59, p. 953-960.

Cant, D.J., (1988) : Regional structure and development of the Peace River Arch, Alberta: a Paleozoic failed-rift system? Bull. of Can. Petrol. Geol., V.36, p.284-5.

Cant, D.J., (1989) : Zuni sequence: The foreland basin - Lower Zuni sequence: Middle Jurrassic to Middle Cretaceous; in Ricketts, B.D. (ed.), Western Canada Sedimentary Basin - A case history; Canadian Society of Petroleum Geologists, Calgary, Alberta. pp. 251-262.

Carrigy, M. A. (1959) : Geology of the McMurray Formation, Part III, General Geology of the McMurray Area: Alberta Research Council, Geological Division, Memoir 1, 130p.

Cummings, G. L., Kyle, J. R. and D. F. Sangster (1990) : Pine Point: A case history of Pb homogeneity in a Mississippi Valley-type district. Econ. Geol. v. 85. pp. 133-144

Dubord, M. (1987) : Carbonate Hosted Pb-Zn Potential of Northeastern Alberta and the Applicability of Petroleum Data for Mineral Exploration; Alberta Research Council, open file report EO 1987-07, 42 p.

Dufresne, M. B., Fenton, M. M., Pawlowicz, J. G. and R. J. H. Richardson (in press) : Economic Mineral Potential of the Marguerite River and Fort MacKay Areas, Northeast Alberta, NTS 74 E; Preliminary Study. Alberta Research Council open file report.

Ells, S. C. (1926) : Bituminous Sands of Northern Alberta: Occurrences and Economic Possibilities ; Report on investigations to theend of 1924. Canada Mines Branch Report 362.

Focal Resources Limited (1993) : various press releases issued by Focal Resources Ltd. and provided by the ASE. dated : April 15, 1993; April 21, 1993; May 6, 1993; June 7, 1993; June 28, 1993; and September 15, 1993.

Garland, G. D. and M. E. Bower (1959) : Interpretation of aeromagnetic anomalies in Northeastern Alberta; 5th World Petroleum Congress. Sec. 1, Paper 42, pp. 787-800.

Garven, G. (1985) : The role of fluif flow in the genesis of the Pine Point Deposit, Western Canada Sedimentary Basin; Econ. Geol. v. 80, pp. 307-324.

Godfrey, J. D. (1960) : Northeast Corner of Alberta and Adjacent Area: Its Development and Mineral Potential. Canadian Mining and Metallurgical Bulletin. pp. 10.

Godfrey, J. D. (1985) : Lead and Zinc - commodity profile; Internal report to AENR, Alberta Research Council Internal Report, 22 p.

Grayston, L.D., Sherwin, D.F., and Allan, J.F. (1964) : Middle Devonian (Chapter 5); in McCrossan, R.G., and Glaister, R.P., eds., Geological history of western Canada;

Alberta Society Petroleum Geologists, Calgary, Alberta, p. 49-59.

Greiner, H.R., (1956) : Methy dolomite of northeastern Alberta: a Middle Devonian reef formation; American Association of Petroleum Geologists, Bulletin, V.40, p. 2057-2080.

Hackbarth D.A., and Nastasa, N., (1979) : The hydrogeology of the Athabasca Oil Sands area, Alberta, Alberta Research Council, Bulletin 38.

Halferdahl, L. B. (1986) : 1986 late winter drilling of mettalic mineral permit 6886020001 near Fort MacKay, Northeast Alberta. Unpublished report prepared for Mr. K. Richardson by Halferdahl and Associates Ltd.

Hamilton, W.N., (1971) : Salt in East-Central Alberta; Research Council of Alberta, Bulletin 29, 53 p.

Harrison, R.S., (1986) : Regional Geology and Resource Characterization of the Upper Devonian Grosmont Formation, Northern Alberta; AOSTRA/ARC Oil Sands Geology Agreement 158B,Research Council of Alberta, 47 p.

Haynes, and Kesler (1987) : Chemical evolution of brines during Mississippi Valley-type mineralization: Evidence from East Tennessee and Pine Point. Econ. Geol. v 82, pp. 53-71.

Heyl, A. V., G. P. Landis and R. E. Zartman (1974) : Isotopic evidence for the origin of Mississippi Valley-type mineral deposits: a review: Econ. Geol., v. 69, p. 992-1006.

Hitchon, B. (1979) : Some economic aspects of rock-water interaction : in Problems of Petroleum Migration, W. H. Roberts III and R. J. Cordell (eds.) ; American Association of Petroleum Geologists, Studies in Geology No. 10. pp. 109-119.

Hitchon, B. (1993) : Geochemistry of formation waters, Northern Alberta, Canada. Alberta Research Council open file report 1993-14.

Jackson, S. A. and F. W. Beales (1967) : An aspect of sedimentary basin evolution : the concentration of Mississippi Valley-type ores during late stages of diagenisis ; Canadian Petroleum Geology Bulletin, v. 15, pp. 383-433.

Kidd, F. A., (1951) : Geology of the bituminous sand deposits of the McMurray area, Alberta; Proc. Athabasca Oil Sands Conf., Govt. Alberta, Edmonton, pp. 30-38.

Krebs, W. and R. W. Macqueen (1984) : Sequence of diagenetic and mineralization events, Pine Point ; Canadian Society of Petroleum Geologists Bulletin, v. 32, no. 4, pp. 434-464.

Langenberg, C. W., Salat, H., Turner, A. J. and D. R. Eccles (1993) : Evaluation of the economic mineral potential of the Andrew Lake - Charles Lake area of Northeast Alberta. Alberta Research Council open file report 1993-08.

Law, J., (1955) : Geology of northwestern Alberta and adjacent areas: American Association of Petroleum Geologists, Bulletin, V. 39, p. 1927-1975.

Leckie, D.A., (1989) : Upper Zuni sequence: Upper Cretaceous to Lower Tertiary; in Ricketts, B.D. (ed.), Western Canada Sedimentary Basin - A case history; Canadian Society of Petroleum Geologists, Calgary, Alberta.

McGrossan, R.G. and R.P. Glaister - eds. (1964) : Geological History of Western Canada; Alberta Society of Petroleum Geologists, Calgary, Alberta.

McKenzie, D., (1978) : Some remarks on the development of sedimentary basins. Alberta Society of Petroleum Geologists, 232p.

McPhee, D. and Wightman, D.M., (1991) : Timing of the dissolution of Middle Devonian Elk Point Evaporites - Townships 47 to 103 and Ranges 15 W3M to 20 W4M; (Abstract), Opportunities for the nineties, CSPG Convention, Calgary, Alberta, Nov. 1991, p. 98.

Meijer Drees, N.C., (1986) : Evaporitic deposits of Western Canada; Geological Survey of Canada, Paper 85-20, 118 p.

Nakai, S., Halliday, A. N., Kesler, S. E., Jones, H. D., Kyle, J. R. and T. E. Lane (1993) : Pb-Sr dating of sphalerites from Mississippi Valley-type (MVT) ore deposits. Geochemica et Cosmochemica Acta. v. 57, pp. 414-427.

Nauss, A.W., (1950) : Regional cross-section through the reef fields of Alberta; Special Report, Aeromagnetic Survey Ltd., Toronto, Oil in Canada, V. 11, no. 47, pp. 46-48.

Nesbit, B. E. and K. Muehlenbachs (1994) : Paleohydrogeology of the Canadian Rockies and origins of brines, Pb-Zn deposits and dolomitization in the Western Canada Sedimentary Basin. Geology. v. 22, pp. 243-246.

Norris, A.W., (1963) : Devonian stratigraphy of northeastern Alberta and northwestern Saskatchewan; Geological Survey of Canada, Memoir 313

Norris, A.W., (1973) : Paleozoic (Devonian) geology of Northeastern Alberta and Northwestern Saskatchewan; in Carrigy, M.A., and J.W. Kramers (eds.), Guide to the Athabasca Oil Sands Area, Canadian Society of Petroleum Geologists Oil Sands Symposium, Information Series 65, pp. 17-76.

Northern Miner (1993a) : Focal Drills Alberta Prospect. Northern Miner Newspaper, April 26 issue, p. 3.

Northern Miner (1993b) : ASE requests Fire Assays of Focal drill samples. Northern Miner Newspaper, May 3 issue, pp. 1-2.

Ohle, E. L. (1980) : Some considerations in determining the origin of ore deposits of the Mississippi Valley-type - Part II; Econ. Geol., v. 75, pp. 161-171.

Olson, R. A., Dufresne, M. B., Freeman, M., Richardson, R. J. H. and D. R. Eccles (in press) : Regional Metallogenic Evaluation of Alberta. Alberta Research Council open file report.

Park, G. D. and B. Jones (1985) : Nature and Genesis of breccia bodies in Devonian strata, Peace Point area, Wood Buffalo Park, Northeast Alberta. Bulletin of Canadian Petroleum Geology. v. 33, no. 28, p. 275-294.

Parsons, W.H. (1973) : Alberta; in The future petroleum provinces of Canada - their geology and potential (R.G. McGrossan, editor); pp. 73-120; Canadian Society of Petroleum Geologists Memoir 1.

Porter, J.W., R.A. Price and R.G. McGrossan (1982): The Western Canada Sedimentary Basin; Phisosophical Transactions of the Royal Society of London, Series A, V. 305, pp.169-192.

Qing, H. and E. Mountjoy (1992) : Large-scale fluid flow in the Middle Devonian Presqu'ile barrier, Western Canada Sedimentary Basin. Geology. v. 20, pp. 903-906.

Rhodes, D. , Lantos, E. A., Lantos, J. A., Webb, R. J. and D.C. Owens (1984) : Pine Point orebodies and their relationship to the stratigraphy, structure, dolomitization, and karstification of the Middle Devonian Barrier Complex; Econ. Geol., v. 79, pp. 991-1055.

Ricketts, B.D. - editor (1989) : Western Canada Sedimentary Basin - A case history; Canadian Society of Petroleum Geologists, Calgary, Alberta.

Ross, G., and R.A. Stephenson, (1989) : Crystalline Basement: The foundations of Western Canada Sedimentary Basin. in Ricketts, B. D., (ed.) Western Canada Sedimentary Basin, A Case History. Canadian Society of Petroleum Geologists, Calgary, 1989.

Ross, G. M., Parrish R. R., Villineuve, M. E. and S. A. Bowring (1991) : Geophysics and Geochronology of the crystalline basement of the Alberta Basin, western Canada. Can. J. Earth Sci., v. 28, p. 512-522.

Rudkin, R.A., (1964) : Lower Cretaceous; in McCrossan, R.G. and Glaister, R.P. (eds.), Geological History of Western Canada: Alberta Society of Petroleum Geologists, pp. 156-168.

Sangster, D. F. (1983) : Mississippi Valley-type deposits : A geological melange: in International Conference on Mississippi Valley-type Lead-Zinc Deposits, Kisvarsanyi, G., Grant, S. K., Pratt, W. P. and J. W. Koenig (eds.); Procedings Volume, University of Missouri - Rolla, Rolla, Missouri, pp. 7-19.

Sherwin, D.F., (1962) : Lower Elk Point section in east-central Alberta: Alberta Society of Petroleum Geologists, Journal, V. 10, no. 4, p. 185-191.

Skall, H. (1975) : The paleoenvironment of the Pine Point Lead-Zinc District; Econ. Geol., v. 70, pp. 24-47.

Sproule, J.C., (1951) : The McMurray Formation in its relation to oil occurrence: Proc. Athabasca Oil Sands Conf., Oil Sands Project, Govt. Alberta, Edmonton, p.6-25.

Sproule, J.C. (1956) : Granite wash of northern Alberta; Journal Alberta Society Petroleum Geologists, vol. 4, no. 9, p. 197-203.

Stearn, C.W., Clark, R.L. and T.H. Clark - editors (1979) : Geological evolution of North America; John Wiley & sons, Inc.

Stephenson, R.A., C.A. Zelt, R.M. Ellis, Z. Hajnal, P. Morel-a-l'Huissier, R.F. Mereu, D.J. Northey, G.F. West and E.R. Kanasewich, (1989) : Crust and upper mantle structure and origin of the Peace River Arch. Bulletin of Canadian Petroleum Geology, V. 37, p. 224-235.

Symons, D. T. A., Pan, H., Sangster, D. F. and E. C. Jowett (1993) : Paleomagnetism of the Pine Point Pb-Zn deposit. Can. Jour. of Earth Sci. v. 30, no. 5, pp.1028-1036.

Tintina Mines Limited (1993) : press release dated October 28, 1993.

Warren, P.S., (1933) : Age of Devonian limestone at McMurray, Alberta; Can. Trans. Roy. Soc. Canada, ser. 3, V. 36, sec. 4, pp. 129-136.

CERTIFICATION

I, Andrew J. Turner, do hereby certify that ...

(1) I reside at #306, 10160-115 street, Edmonton, Alberta T5K-1T6 (ph: (403) 488-2234),

(2) I am a Graduate of the University of Alberta (1989) with a B.Sc. (hons.) in Geology,

(3) I have worked for various companies in the field of Mineral Exploration since my graduation,

(4) I am a member in training woth the Association of Professional Engineers, Geologists, and Geophysicists of Alberta (APEGGA),

(5) this report was produced to evaluate the potential for Mississippi Valley-type Pb-Zn mineralization in Northeast Alberta as a part of the Canada-Alberta Partnership on Mineral Development (1992-1995), with the assistance and supervision of Mr. D. A. McPhee (Calgary, Alberta), as project M93-04-032, and,

(6) I have no financial interest, whatsoever, in Northeast Alberta, nor do I expect to gain such an interestin the future.

Andrew J. Turner (B. Sc.)

Appendix I : Sample Information (Well Location, Depth, Formation and Comments)

SAMPLE #	WELL LOCATION	DEPTH (ft)	FORMATION	COMMENT	ANOMALIES (ppm)
93-10-12-01	01-28-75-03W4	2197.7	Keg R.		
93-10-12-02		2206	"		
93-10-12-03		2211.5	"		
93-10-12-04		2220	"		
93-10-12-05		2223.8	"		
93-10-12-06		2225.6	"		
93-10-12-07		2237.5	"		
93-10-12-08		2239.2	"		
93-10-12-09		2240.5	"		
93-10-12-10		2241.5	"		
93-10-12-11		2245.4	"		
93-10-12-12		2250.8	"		
93-10-12-13		2255.2	"		
93-10-12-14		2261.4	"		
93-10-12-15		2270.8	"		
93-10-12-16		2276.4	"		
93-10-12-17		2282.3	"		
93-10-12-18		2287	"		
93-10-12-19		2292.4	"	gyp vng.	
93-10-12-20		2294.1	"	gyp vng.	
93-10-12-21		2299.4	K.R./Cont.R.		
93-10-12-22		2303.5	Cont. R.	gyp vng.	
93-10-12-23		2318.6	"	gyp vng.	
93-10-13-01	02-34-75-11W4	3196	Keg. R.		
93-10-13-02		3199	"		
93-10-13-03		3208	"		
93-10-13-04		3209	"		
93-10-13-05		3214.5	"		
93-10-13-06		3218.7	"		
93-10-13-07		3222	"	vuggy	
93-10-13-08		3232.3	"	vuggy	
93-10-13-09		3238.4	"		
93-10-13-10		3246.4	"		
93-10-14-01	06-26-72-11W4	1906	Bh. Lk.	vugs/styl.	
93-10-14-02		1907.6	"	vuggy	
93-10-14-03		1914	"	vuggy	
93-10-14-04		1924.2	"	vuggy	
93-10-14-05		1926.2	"	styl.	
93-10-14-06		1930.8	"	clay-rich	
93-10-14-07		1938.1	"	rust spot	

SAMPLE #	WELL LOCATION	DEPTH (ft)	FORMATION	COMMENT	ANOMALIES (ppm)
93-10-14-08	06-26-72-11W4	1940.3	Bh. Lk.	styl.	
93-10-14-09		1951.7	"	styl.	
93-10-14-10		1961.2	"	styl.	
93-10-14-11		1979	"	styl.	
93-10-14-12		1998	"	styl.	
93-10-14-13		2003.1	"	styl.	
93-10-14-14		2007.4	"	vugs/styl.	
93-10-14-15		2014.1	"	rust spot	
93-10-15-01	03-30-74-10W4	1850.7	Bh. Lk.		
93-10-15-02		1855.7	"		
93-10-15-03		1862.7	"		
93-10-15-04		1863.3	"		
93-10-15-05		1870.2	"		
93-10-15-06		1874.3	"		
93-10-15-07		1874.8	"	mottled	
93-10-15-08		1876.2	"	rust spot	
93-10-15-09		1882	"		
93-10-15-10		1892	"		
93-10-15-11		1899	"		
93-10-15-12		1909	"		
93-10-15-13		1914.5	"		
93-10-15-14		1921.6	"		
93-10-18-01		1925.6	"	?	55-Pb
93-10-18-02		1929	"		
93-10-18-03		1942.7	"	?	52-Pb
93-10-18-04		1948.6	"		
93-10-18-05		1951.2	"		
93-10-18-06		1957.7	"		
93-10-18-07		1966.7	"		
93-10-18-08		1967	"	tr py	
93-10-18-09		1976	"		
93-10-18-10		1983	"		
93-10-18-11		1990.5	"		
93-10-18-12		1999	"		
93-10-20-01	04-32-93-10W4	75.8	Bh. Lk.	exp. surf.	
93-10-20-02		90.8	"		
93-10-20-03		145.6	"	tr py	
93-10-20-04		153	"	tr py	
93-10-20-05		158.5	"	tr py	8ppb-Au

SAMPLE #	WELL LOCATION	DEPTH (ft)	FORMATION	COMMENT	ANOMALIES (ppm)
93-10-20-06	04-32-93-10W4	160.4	Bh. Lk.	tr py	
93-10-20-07		161	"	tr py	
93-10-20-08		162.2	"	tr py	
93-10-20-09		174	"	tr py	
93-10-20-10		179	"	tr py	
93-10-20-11		184	"	tr py	
93-10-20-12		187	"	tr py	
93-10-20-13		205.2	"	tr py	
93-10-20-14		251.5	"	rust spot	
93-10-21-01		306	Bh. Lk.	tr py	
93-10-21-02		312.5	"	tr py	
93-10-21-03		335	"		
93-10-21-04		350.5	"	bx	
93-10-21-05		382	"	tr py	
93-10-21-06		431	Sl. Pt. (?)		
93-10-21-07		433	"		
93-10-21-08		441.7	"	bx	
93-10-21-09		475.2	"		
93-10-21-10		487	"	bx	
93-10-21-11		510	Pr. Evap.		
93-10-21-12		538.8	"	(Anhyd.)	
93-10-21-13		555.5	"		5ppb-Au
93-10-21-14		582.8	"	(Anhyd.)	
93-10-21-15		599.5	Keg R.		
93-10-21-16		606	"		
93-10-21-17		617.7	"		
93-10-21-18		637	"		
93-10-21-19		645.2	"		57ppb-Au
93-10-21-20		669.6	"		
93-10-21-21		684.2	"		
93-10-21-22		694.2	"		
93-10-21-23		703.6	"		
93-10-21-24		719.5	"		
93-10-22-01		740.3	"		
93-10-22-02		745	"		
93-10-22-03		775	"		
93-10-22-04		805.8	Cont. R.		
93-10-22-05		841.3	"		
93-10-22-06		861.5	Gr wash (?)	Fe-stain	
93-10-22-07		864.5	gr wash	Fe-stain	119-Cu

SAMPLE #	WELL LOCATION	DEPTH (ft)	FORMATION	COMMENT	ANOMALIES (ppm)
93-10-22-08	04-32-93-10W4	880.5	xl. bsmt		
93-10-25-01	08-20-89-09W4	37	Bh. Lk.	rust spot	
93-10-25-02		46	"	tr py	
93-10-25-03		70	"	mottled	
93-10-25-04		74.5	"	rust spot	
93-10-25-05		87	"		
93-10-25-06		100.5	"	tr py	
93-10-25-07		103.5	"	frac. fill py	
93-10-25-08		108	"	cal. vugs+py	
93-10-25-09		116	"	mottled	
93-10-25-10		120	"	tr py	5ppb-Au
93-10-25-11		126	"		
93-10-25-12		141	"	trpy	
93-10-25-13		155.5	"	trpy	
93-10-25-14		68	"	trpy	
93-10-25-15		189	"	trpy	5ppb-Au
93-10-25-16		196.5	"	trpy	
93-10-25-17		205.5	"	trpy	
93-10-25-18		223.5	"	trpy	
93-10-25-19		229.5	"	trpy	
93-10-25-20		256	"	rust spot	
93-10-25-21		280	"	tr py	
93-10-25-22		284	"	tr py	
93-10-25-23		298.75	"	tr py	
93-10-25-24		311	"	tr py	
93-10-25-25		326.5	"		
93-10-26-01		342.75	"		
93-10-26-02		356.75	"	tr py	
93-10-26-03		359	"	tr py	
93-10-26-04		363	"	tr py	
93-10-26-05		372.75	"	tr py	
93-10-26-06		377	"	tr py	
93-10-26-07		380	"	tr py	
93-10-26-08		384	"	tr py	
93-10-26-09		385.5	"	tr py	
93-10-26-10		386	"	tr py	
93-10-26-11		394.75	"	tr py	
93-10-26-12		403.5	"	tr py	15ppb-Au
93-10-26-13		409	"	tr py	
93-10-26-14		414.75	"	tr py	

SAMPLE #	WELL LOCATION	DEPTH (ft)	FORMATION	COMMENT	ANOMALIES (ppm)
93-10-26-15	08-20-89-09W4	426.75	Bh. Lk.	tr py	
93-10-26-16		469	"	tr py	
93-10-27-01		476.5	Sl. Pt.	py along u/c	
93-10-27-02		481.5	"		
93-10-27-03		490	" (?)		
93-10-27-04		496.5	" (?)		
93-10-27-05		525	" (?)		
93-10-27-06		537	" (?)		
93-10-27-07		553	Pr. Evap.	alt'd Anhyd.	
93-10-27-08		616.75	"		
93-10-27-09		625.5	"		
93-10-27-10		661.3	"	(Anhyd.)	
93-10-27-11		685.7	"	dol.ic anhyd	
93-10-27-12		721	"		
93-10-27-13		733	"		
93-10-27-14		743	" (altr'd)	Gyp/Dol.	2816-Zn, 8.7-Cd
93-10-28-01		846.6	Keg R.		
93-10-28-02		860.6	"		5ppb-Au
93-10-28-03		880.2	Keg R.		
93-10-28-04		898.3	"	Dol. Lst.	
93-10-28-05		912.7	"	Dol. Lst.	
93-10-28-06		922.3	" (carb.)	tr py	50-Cu
93-10-28-07		938.2	"		
93-10-28-08		952.8	"		
93-10-28-09		967.6	Cont. R.		
93-10-28-10		992.2	"	gyp vn.+py	
93-10-28-11		1001	"	gyp. vn.	
93-10-28-12		1024	Red Beds	Fe-stained	
93-10-28-13		1043.3	"	Fe-stained	
93-10-28-14		1049	"	Fe-stained	6ppb-Au
93-10-28-15		1064.5	"	Fe-stained	
93-10-28-16		973.3	"		
93-10-28-17		1073.8	"	Anhyd. nod.	
93-10-28-18		1085.7	"	(sst.)	
93-10-28-19		1103	Ernest. Lk?	Arg. Dol.	328-Cu, 37ppb-Au
93-10-28-20		1113.1	Red beds ?	Fe-stained	
93-10-28-21		1120.6	Gr. wash ?		
93-10-28-22		1124.3	"		
93-10-28-23		1125.6	xl. bsmt	altr'd	
93-10-28-24		1130.3	"	sheared	

SAMPLE #	WELL LOCATION	DEPTH (ft)	FORMATION	COMMENT	ANOMALIES (ppm)
93-10-29-01	10-05-80-02W4	1713.6	Keg R.		
93-10-29-02		1717.7	"		
93-10-29-03		1724.4	"		
93-10-29-04		1728.1	"		
93-10-29-05		1738.3	"		
93-10-29-06		1744.7	"	tr py	
93-10-29-07		1757	"		
93-10-29-08		1765.7	Cont. Rap.		
93-10-29-09	03-25-78-02W4	1735.8	Keg R.		
93-10-29-10		1747	"		
93-10-29-11		1758.3	"		
93-10-29-12		1769.5	"		
93-10-29-13		1780.8	"		
93-10-29-14		1792	"		
93-11-01-01		1803.3	"		
93-11-01-02		1814.5	"		
93-11-01-03		1825.8	"		
93-11-01-04		1837	"	tr py	
93-11-01-05		1848.3	"		
93-11-01-06		1859.5	"		
93-11-01-07		1870.8	"		
93-11-01-08		1882	"		
93-11-01-09		1893.3	"		
93-11-01-10		1904.5	"		
93-11-01-11	03-07-77-07W4	726.77m	Keg R.		
93-11-01-12		729.77m	"		
93-11-01-13		732.05m	"		
93-11-01-14		735.23m	"		
93-11-01-15		736.52m	"		
93-11-01-16		739.75m	"		
93-11-01-17		740.95m	"		
93-11-01-18		745.85m	"		
93-11-02-01	07-08-71-11W4	1909	Bh. Lk.-mob	?	56-Zn
93-11-02-02		1917	"	tr py	
93-11-02-03		1918	"	tr py	254-Zn
93-11-02-04		1919	"	tr py	
93-11-02-05		1924.75	"	tr py	
93-11-02-06		1927	"		
93-11-02-07		1929.75	"	tr py	
93-11-02-08		1931.75	"	tr py/sph	1690-Zn

SAMPLE #	WELL LOCATION	DEPTH (ft)	FORMATION	COMMENT	ANOMALIES (ppm)
93-11-02-09	07-08-71-11W4	1936.25	Bh. Lk.	tr py	
93-11-02-10		1938.8	"		
93-11-02-11		1942	"	tr py	
93-11-02-12		1951.5	"	tr py	
93-11-02-13		2057	Bh. Lk.-chr		
93-11-02-14		2063.5	"		
93-11-02-15		2073	"		
93-11-02-16		2082	"		
93-11-02-17		2093.25	"		
93-11-02-18	07-13-78-01W4	1571.25	Keg R.		
93-11-02-19		1585.4	"		
93-11-02-20		1601.2	"		
93-11-02-21		1615.4	"		
93-11-02-22		1631.2	"		
93-11-02-23		1645.4	"		
93-11-02-24	08-17-78-07W4	2071.7	Keg R.		
93-11-02-25		3021	Gr. wash	Fe-stained	
93-11-02-26		3029.5	"	Fe-stained	6ppb-Au
93-11-02-27		3032.5	"	Fe-stained	
93-11-03-01	11-12-77-10W4	2904.5	Keg R.		
93-11-03-02		2909.5	"	fractured	
93-11-03-03	15-29-79-05W4	1046	Bh. Lk.	Fe-st. u/c	115-Ni
93-11-03-04		1053	"	py	
93-11-03-05		1061.3	"	py	
93-11-03-06		1064.7	"	py	
93-11-03-07		1066.2	"	py	
93-11-03-08		1067.7	"	py	
93-11-03-09		1079.7	"	tr py	
93-11-04-01	10-32-79-07W4	1237	Bh. Lk.	Fe-stained	
93-11-04-02		1241.5	"	Fe-stained	
93-11-04-03		1249.75	"		
93-11-04-04		1252.75	"		
93-11-04-05		1283.25	"	tr py	
93-11-04-06		1295.75	"	2-3% py	
93-11-04-07		1304.75	"		
93-11-04-08		1324.75	"		
93-11-04-09		1332.25	"		
93-11-04-10		1340.75	"		
93-11-04-11		1347.75	"		
93-11-04-12		1358.3	"		

SAMPLE #	WELL LOCATION	DEPTH (ft)	FORMATION	COMMENT	ANOMALIES (ppm)
93-11-04-13	10-32-79-07W4	1368.2	Bh. Lk.		
93-11-04-14		1381.8	"		
93-11-04-15		1392.2	"		
93-11-04-16		1422.8	"		
93-11-04-17		1433.2	"		
93-11-04-18		1463.2	"		
93-11-08-01		1520	Bh. Lk. (?)	blebby py	
93-11-08-02		1590.5	" (?)		
93-11-08-03		1609	Pr. Evap?	(Anhyd.)	
93-11-08-04		1628	?	Dol. Sh.	
93-11-08-05		1651	?	Dol.	
93-11-08-06		1658	?	(Anhyd.)	
93-11-08-07		1669.5	?	(Anhyd.)	
93-11-09-01	06-10-77-25W4	3453.5	Woodbend ?	Dol.	
93-11-09-02		3460.8	"	"	
93-11-09-03		3462.6	"	"+py/sph?	98-Pb, 310-Zn, 123-Ni
93-11-09-04		3463.3	"	"+py/sph	68-Pb, 1620-Zn, 120-Ni
93-11-09-05		5280	Keg R.		
93-11-09-06		5294.5	"		
93-11-09-07		5308	"		
93-11-09-08		5321.5	"		
93-11-09-09		5335	"		
93-11-09-10		5344	"		
93-11-09-11		5355	"		
93-11-09-12		6111	xl. bsmt.		
93-11-09-13		6118.3	"		93-Cu
93-11-10-01	07-24-76-18W4	1958	Bh. Lk. (?)		
93-11-10-02		3744.7	Keg R.		
93-11-10-03		3758.7	"		
93-11-10-04		3774.7	"		
93-11-10-05		3833.7	"		
93-11-10-06		3838.7	"		
93-11-10-07		4633.7	xl. bsmt.		
93-11-10-08	10-22-76-01W4	1854.5	Keg R.	cal. vugs	125-Zn
93-11-10-09		1869.3	"	vuggy	
93-11-10-10		1877	"	rust spot	
93-11-10-11		1892	"		
93-11-10-12		1907.7	"	vuggy	
93-11-10-13		1918	"	sulfur	

SAMPLE #	WELL LOCATION	DEPTH (ft)	FORMATION	COMMENT	ANOMALIES (ppm)
93-11-10-14	10-22-76-01W4	1923.3	Keg R.		
93-11-10-15		1938	"	rust spot	
93-11-15-01	01-25-76-01W4	1701.3	Keg R.		
93-11-15-02		1714.9	"	+Anh. xl.s	
93-11-15-03		1716.2	"	(Lst.)	
93-11-15-04		1723.7	"	(Dol. Lst.)	
93-11-15-05		1754.7	"		
93-11-15-06		1776.2	"		
93-11-15-07	10-16-91-18W4	2799.2	Keg R.		
93-11-15-08		2818	"		
93-11-15-09		2836.7	"		
93-11-15-10		2855.5	"		
93-11-15-11		2873.5	"		
93-11-15-12		2894.2	"		
93-11-15-13		2916	" (carb.)		
93-11-15-14		2918.5	" "	tr py	
93-11-15-15		2921.3	" "	tr py	
93-11-15-16		2929	" "	tr py	
93-11-15-17		2936.7	" "	tr py	
93-11-15-18		2947.5	" "	tr py	80-Cu
93-11-15-19		2956.5	"		
93-11-15-20		2969.3	"		
93-11-16-01	06-02-97-19W4	802.35m	Sl. Pt.	2-3%py@u/c	
93-11-16-02		811.6m	"		
93-11-16-03		814.2m	?	Dol./Anh.	
93-11-16-04		1100.25m	Keg R.	vuggy	
		(sampling restricted)			
93-11-17-01	12-07-95-08W4	308.15m	Xl. bsmt.	Pegmatite	
93-11-17-02		307.5m	"	Fe-stained	74-Zn
93-11-17-03		305.75m	Gr. wash		
93-11-17-04		293m	Red Bed		
93-11-17-05		285.95m	Cont. R.		
93-11-17-06		285.25m	"	tr py	(48-Cu)
93-11-17-07		277.6m	"	tr py	100-Cu
93-11-17-08		267.5m	Cont./Keg R	py @ u/c	
93-11-17-09		264.65m	Keg R.		
93-11-17-10		264.25m	"		
93-11-17-11		261.75m	" (carb.)	tr py	70-Zn, 87-Cu, 106-Ni
93-11-17-12		257.65m	"		
93-11-17-13		254.5m	"		

SAMPLE #	WELL LOCATION	DEPTH (ft)	FORMATION	COMMENT	ANOMALIES (ppm)
93-11-17-14	12-07-95-08W4	245m	Keg R.		
93-11-17-15		243.15m	" ?		
93-11-17-16		237.35m	" ?		
93-11-18-01		188.25m	Sl. Pnt. ?	2-3% py	
93-11-18-02		186.2m	"		
93-11-18-03		183.75m	"/Bh.Lk.	tr py @u/c	
93-11-18-04		178.7m	Bh. Lk.	tr py	
93-11-18-05		174.5m	"	tr py	
93-11-18-06		170.25m	"	tr py @u/c	
93-11-18-07		159.65m	"	tr py	
93-11-18-08		156.65m	"	tr py	
93-11-18-09		153.2m	"	tr py	
93-11-18-10		150.7m	"	tr py	
93-11-18-11		147.2m	"	tr py	
93-11-18-12		143.6m	"	tr py	
93-11-18-13		131.4m	"	1-2% py	
93-11-19-01	12-06-99-08W4	532.75	Bh. Lk. ?	Sandy Bx	(collapse bx)
93-11-19-02		514.35	"	Sandy Bx	
93-11-19-03		507.3	"	re-xlized Lst.	
93-11-19-04		497.7	"	re-xlized Lst.	
93-11-19-05		494.75	"	re-xlized Lst.	
93-11-19-06		481.5	"	Lst Bx	
93-11-19-07		471.3	"	Lst Bx	
93-11-19-08		452.85	"	Lst Bx+tr py	
93-11-19-09		435.6	"	Lst Bx	
93-11-19-10		418	"	Lst Bx	
93-11-19-11		383.1	"	blebby py	
93-11-19-12		381.85	"	blebby py	
93-11-19-13		379.5	McMry	pebble cong	
93-11-19-14		377.75	McMry	Sst.	
93-11-22-01	13-31-96-06W4	869	xl. bsmt		
93-11-22-02		865	Red Bed	@ u/c	398-Ni
93-11-22-03		846	"		
93-11-22-04		828	"		
93-11-22-05		809.4	"		
93-11-22-06		792.3	Cont. Rap.		
93-11-22-07		774	"		58-Zn, 59-Cu
93-11-22-08		757.7	"		
93-11-22-09		744	Keg R.		

SAMPLE #	WELL LOCATION	DEPTH (ft)	FORMATION	COMMENT	ANOMALIES (ppm)
93-11-22-10	13-31-96-06W4	726.5	Keg R.		
93-11-22-11		720.5	"	tr py	50-Cu
93-11-22-12		707.8	"		
93-11-22-13		702.5	"		
93-11-22-14		686.5	"	tr py	
93-11-22-15		676.7	"		
93-11-22-16		655.7	"		
93-11-22-17		624	"		
93-11-22-18		594	"		
93-11-22-19		569.7	"		
93-11-22-20		539.7	"		
93-11-22-21		507.2	" (dol. Lst.)		
93-11-22-22		497.6	" (dol. Lst.)		
93-11-22-23		488.2	?	Sandy Bx	
93-11-22-24		477	?	Sandy Bx	
93-11-22-25		357.6	?		
93-11-23-01	13-17-67-23W4	2037	? K Fm.	Sid. nod.	53-Zn
93-11-23-02		2054.2	"	Sid. nod.	100-Zn
93-11-23-03		2422	Woodbend Gr.		
93-11-23-04		2884.5	"		
93-11-23-05		2950	"		
93-11-23-06		3585	"		
93-11-23-07		3637.5	"		
93-11-23-08		3710.5	"		
93-11-23-09		6178.7	Red Beds		
93-11-23-10		6187	"		
93-11-23-11		6333.2	gr wash		
93-11-23-12		6338	"		
93-11-24-01	14-09-86-07W4	929.8	BhLk-chris	tr py	
93-11-24-02		959.5	"	tr py	
93-11-24-03		967.7	"	tr py	
93-11-24-04		981.2	- chr/cal		
93-11-24-05		1000	- cal		
93-11-24-06		1028	"		
93-11-24-07		1056	"	tr py	
93-11-24-08		1074	- cal/frbg	tr py	
93-11-24-09		1088.5	"	tr py	
93-11-24-10		1102.8	"	tr py	
93-11-24-11		1145.5	"	tr py	
93-11-24-12		1149.3	"	tr py	

SAMPLE #	WELL LOCATION	DEPTH (ft)	FORMATION	COMMENT	ANOMALIES (ppm)
93-11-24-13	14-09-86-07W4	1254.5	- cal/frbg	tr py -u/c	
93-11-24-14		1418.5	Keg R		
93-11-24-15		1445	"		
93-11-25-01		1453.5	"		
93-11-25-02		1474.3	"		
93-11-25-03		1507.5	"		
93-11-25-04		1541.5	"		
93-11-25-05		1577	"		
93-11-25-06		1608.2	"	tr py	
93-11-25-07		1638.7	"		
93-11-25-08		1671.5	Cont. Rap.		
93-11-25-09		1694.7	"		
93-11-25-10		1727.5	Red Bed		
93-11-25-11		1748.5	"		
93-11-25-12		1766	"		
93-11-25-13		1773	xl. bsmt		
93-11-25-14		1781.7	"		
93-11-25-15		1791.7	"		
93-11-26-01	07-11-87-17W4	2849	xl. bsmt.		
93-11-26-02		2844.7	Gr. wash	Fe-stained	35ppb-Au
93-11-26-03		2834.7	Red Beds	Fe-stained	
93-11-26-04		2826.5	"	Fe-stained	
93-11-26-05		2804.2	" (Dol.)		
93-11-26-06		2781.7	"	Fe-stained	
93-11-26-07		2762.7	"	Fe-stained	
93-11-26-08		2744.2	Cont. Rap.	Fe-stained	
93-11-26-09		2724.7	"	Fe-stained	
93-11-26-10		2698	"		
93-11-26-11		2678.7	"		
93-11-26-12		2658.7	Keg R.		
93-11-26-13		2638.5	"		
93-11-26-14		2636.7	"		
93-11-26-15		2625.2	"	minor bx	
93-11-26-16		2617.7	"		
93-11-26-17		2597.7	"		
93-11-26-18		2577.7	"		
93-11-26-19		2558	"		
93-11-26-20		2538.7	"		
93-11-26-21		2520.7	"		
93-11-26-22		2500	"		

SAMPLE #	WELL LOCATION	DEPTH (ft)	FORMATION	COMMENT	ANOMALIES (ppm)
93-11-26-23	07-11-87-17W4	2494.5	Keg R.		
93-11-26-24		2482.2	"		
93-11-26-25		2471.2	"		
93-11-30-01		1734.5	Pr. Evap. ?		
93-11-30-02		1698.2	"		
93-11-30-03		1680.8	Sl. Pnt. (?)	tr py	73-Zn
93-11-30-04		1635.2	Bh. Lk.-frbg		
93-11-30-05		1629.5	"	tr py	120-Pb
93-11-30-06		1628.3	"	tr py	
93-11-30-07		1607.7	"	tr py	
93-11-30-08		1604.5	"	tr py	
93-11-30-09		1585	"	tr py	
93-11-30-10		1505.2	"	tr py	
93-11-30-11		1484.5	"	tr py	
93-11-30-12		1452.7	" - cal ?		
93-11-30-13		1430.2	"		
93-11-30-14		1413	" -cal/chr		
93-11-30-15		1359.5	" - chr		
93-12-01-01		1347.7	"	mottled	
93-12-01-02		1330.2	"	(u/c)	
93-12-01-03		1295.2	" -mob		
93-12-01-04		1283.7	"	tr py -u/c	
93-12-01-05		1260.4	"	(u/c)	
93-12-01-06		1235.5	"	mottled	
93-12-01-07		1233.5	"	tr py -u/c	
93-12-01-08		1224.8	"	tr py	
93-12-01-09		1219.2	"	tr py	
93-12-01-10		1210.5	"	tr py	
93-12-01-11		1191	"		
93-12-01-12		1179.5	"	(u/c)	
93-12-01-13		1156	"	tr py	
93-12-01-14		1138.3	"	tr py -u/c	
93-12-01-15		1128.5	"	tr py	
93-12-01-16		1089.3	"		
93-12-01-17		1072.7	" - mil ?		
93-12-02-01		1027.8	"	tr py	
93-12-02-02		1023.7	"	tr py	
93-12-02-03		1000.5	"	tr py	
93-12-02-04		986	"	tr py	

SAMPLE #	WELL LOCATION	DEPTH (ft)	FORMATION	COMMENT	ANOMALIES (ppm)
93-12-02-05	07-11-87-17W4	977.7	Bh. Lk.	tr py	
93-12-02-06		962	"	tr py	
93-12-02-07		953	"	tr py	
93-12-02-08		936	"	(styl.)	
93-12-02-09		922	"		
93-12-02-10		900.5	"		
93-12-02-11		875	"		
93-12-02-12		855.2	"		
93-12-02-13		815.2	"	tr py	
93-12-02-14		780	"		
93-12-03-01		749.5	"	tr py	
93-12-03-02		734	"	tr py -u/c	
93-12-03-03		709.5	"		50-Pb
93-12-03-04		688.4	"		
93-12-03-05		669.4	"	tr py -u/c	63-Pb, 111-Ni
93-12-03-06		596.6	"		
93-12-03-07		504.5	"		
93-12-03-08	10-24-72-17W4	1485	Grosmont	tr py	
93-12-03-09		1488	"	tr py	
93-12-06-01	05-25-69-20W4	2396	Wdbd-Leduc	tr py	247-Zn, 199-Ni
93-12-06-02		2394	"	tr py	130-Ni
93-12-06-03		2207	"	tr py	
93-12-06-04		2065	"	tr py	
93-12-06-05		2059	"	tr py	
93-12-06-06		1643	"- Wbmn	Fe-stained	
93-12-06-07		2712	" - Duv	tr py	
93-12-06-08		2713	"	tr py	
93-12-06-09		2716	"	tr py	
93-12-06-10	09-25-73-05W4	779.8m	Keg R.		
93-12-06-11		781.5m	"		
93-12-06-12		786.0m	"		
93-12-06-13		790.0m	"		
93-12-06-14		793.5m	"		
93-12-06-15	03-16-97-16W4	1378.2	Bh. Lk.	tr py -u/c	
93-12-06-16		1372	"	tr py	127-Ni
93-12-06-17		1371	"	trpy	
93-12-06-18		2818.5	K.R./Pr.E.?		
93-12-07-01	04-20-83-04W4	1492.5	Keg R.		
93-12-07-02		1500	" (carb.)		

SAMPLE #	WELL LOCATION	DEPTH (ft)	FORMATION	COMMENT	ANOMALIES (ppm)
93-12-07-03	04-20-83-04W4	1506.5	Keg R.		
93-12-07-04	16-27-85-11W4	2286	Keg R.		
93-12-07-05		2294.2	"		
93-12-07-06	10-32-88-15W4	2547.5	K.R./Pr.E.?		
93-12-07-07		2558	"		
93-12-07-08		2573	"		
93-12-08-01	02-10-102-23W4	879.85m	K.R./Pr.E.?		
93-12-08-02		888.95m	"		
93-12-08-03		891.10m	"		
93-12-08-04		895.25m	"		
93-12-08-05		897.35m	"		
93-12-08-06		908.35m	"(Anhyd.)	Lst. nodules	
93-12-09-01	07-06-100-17W4	3006.3	K.R./Pr.E.?		
93-12-09-02		3012	"		
93-12-09-03		3013.5	"		
93-12-09-04		3037	"		
93-12-09-05	03-35-101-22W4	3026	K.R./Pr.E.?		
93-12-09-06		3029	"		
93-12-09-07		3075	"		
93-12-09-08		3079.5	"		
93-12-09-09	16-27-102-24W4	2624	K.R./Pr.E.?		
93-12-09-10		2631.5	"		
93-12-09-11		2656.2	"		62-Zn
93-12-09-12		2665.6	"		
93-12-09-13		2681	"		
93-12-09-14		2697	"		
93-12-13-01	06-36-82-12W4	1681	Bh. Lk.	Fe-stn@u/c	
93-12-13-02		1691	"	tr py	
93-12-13-03		3104.5	K.R./Pr.E.?		
93-12-14-01	06-30-86-13W4	2320	Keg R.	tr py	
93-12-14-02		2337	" (carb.)	tr py	
93-12-14-03		2355	"		
93-12-14-04		2367.3	"	tr py	
93-12-14-05		2376.5	"	tr py	
93-12-14-06		2393.2	K.R./Cont.R	tr py	
93-12-14-07	09-34-94-14W4	1994.5	xl. bsmt.	Fe-stained	300-U, 291-Th
93-12-14-08	02-32-89-12W4	711.25m	xl. bsmt.		
93-12-14-09		712.80m	"		
93-12-14-10	02-32-89-12W4	607.00m	Keg R.		

SAMPLE #	WELL LOCATION	DEPTH (ft)	FORMATION	COMMENT	ANOMALIES (ppm)
93-12-14-11		612.00m	"		
93-12-15-01	11-26-69-10W4	2128	Bh. Lk.		
93-12-15-02		2133.5	"	(mottled)	
93-12-15-03		2150	"		
93-12-15-04		2162	"		
93-12-15-05		2166.7	"		
93-12-15-06		2193	"	(mottled)	
93-12-15-07		2220.5	"	2-3% dis. py	
93-12-15-08		2248.5	"		
93-12-15-09		2255.4	"	tr py	
93-12-15-10		2279	"		
93-12-15-11		3346	Keg R.		
93-12-15-12		3363.5	"		
93-12-15-13		3378	"		
93-12-15-14		3393.5	"		
93-12-15-15		3408	"		
93-12-15-16		3424.5	"		
93-12-15-17		3438	"		
93-12-15-18		3453	"		
93-12-15-19		3469	"		
93-12-16-01	05-34-78-06W4	2805	Red Beds	Fe-stained	
93-12-16-02		2812	"	Fe-stained	
93-12-16-03		2820	"	Fe-stained	
93-12-16-04	07-11-67-06W4	1305.30m	Red Beds	Fe-stained	
93-12-16-05		1307.60m	"	Fe-stained	
93-12-16-06		1313.85m	La Loche ?		
93-12-16-07		1319.70m	"		
93-12-16-08		1327.75m	"		
93-12-16-09		1330.30m	xl. bsmt.		
93-12-17-01	06-13-91-15W4	670	Bh. Lk. ?		
93-12-17-02		2290.5	Keg R.	1-2% dis.py	
93-12-17-03		2298.7	"		
93-12-17-04		2303.7	"	tr py	
93-12-17-05	02-32-89-12W4	349.40m	Bh. Lk.	tr py	
93-12-17-06		354.90m	"	trpy	
93-12-17-07		336.25m	"	trpy	
93-12-17-08		368.40m	"	trpy	
93-12-17-09		375.90m	"	trpy	
93-12-17-10		383.95m	Sl. Pnt. ?	(u/c)	
93-12-17-11		386.75m	Ft. Vermil?		

SAMPLE #	WELL LOCATION	DEPTH (ft)	FORMATION	COMMENT	ANOMALIES (ppm)
93-12-20-01	10-07-99-08W6	2258.2m	Sl. Point ?		
93-12-20-02		2263.3m	"		
93-12-20-03	16-34-100-06W6	1926m	? (frac.)	tr Sph.	61ppm-Zn
93-12-20-04		1936.2m	"		
93-12-20-05	10-22-120-01W6	4046.8	? (frac.)	tr Sph.	4707ppm-Zn
93-12-20-06		4056.9	" (frac.)	tr gal.	5187ppm-Pb
93-12-20-07		4086.7	"		
93-12-20-08	06-34-120-13W5	2617.5	?	?	250ppm-Zn
93-12-20-09		2658.3	"		
93-12-20-10		2691.6	"	fnly.dis.Gal	222ppm-Pb
93-12-20-11		2704	"		
93-12-20-12		2728.5	"		
					Pb, Zn and Cd
94-01-20-01	16-34-118-21W5	4265.4	Keg R.	dis. Sph	1064, 1122, 2.8
94-01-20-02		4239	"	Bx+Sph	30, 15601, 36.5
94-01-20-03		4212.3	"	dis. Sph	675, 37633, 64.8
94-01-20-04		4203.7	"	Bx+Sph	246, >99999, <.2
94-01-20-05		4197.3	"	dis. Sph	732, 1246, 3.2
94-01-20-06	09-05-114-08W6	4871	Keg R.	tr dis.	12, 255, .4
94-01-20-07		4880.6	"	3-5%dis.py	31, 101, .3
94-01-20-08		4899.4	"		4, 19, <.2
94-01-20-09		5523.1	"	tr dis. py	3, 118, <.2
94-01-20-10		5570.1	"	tr dis. Sph	19, 1435, 4.0
94-01-24-01	02/07-32-109-08W6	5761	Muskeg ?	(bit. stn.)	
94-01-24-02		5772.4	"		
94-01-24-03		5796.5	"		
94-01-24-04		5802	"		
94-01-24-05		5815.4	"		
94-01-24-06	00/07-32-109-08W6	5782.5	"		
94-01-24-07		5991.4	"		
94-01-24-08		5800.7	"		
94-01-24-09		5820.8	"		
94-01-24-10		5848	"		
94-01-24-11		5933	"	(re-xl.ized)	
94-01-31-01		5981	"		
94-01-31-02	04-23-89-12W5	5256.6	Muskeg	tr py -u/c	118ppm-Zn
94-01-31-03		5262.3	"	(lst.)	
94-01-31-04		5297.1	"	(lst.)	

SAMPLE #	WELL LOCATION	DEPTH (ft)	FORMATION	COMMENT	ANOMALIES (ppm)
94-02-01-01	04-23-89-12W5	5352	Muskeg	(Lst.)	
94-02-01-02		5390	"	(Lst.)	
94-01-31-05	13-20-107-09W6	1639	?	(Lst+tr py)	151ppm-Zn
94-02-01-03		6332	Keg R.	(Dol.)	
94-02-01-04		6362.2	Keg R.	(Dol.)	

Appendix II : ICP Data from Northeast Alberta

GEOCHEMICAL ANALYSIS CERTIFICATE

Loring Laboratories Ltd. PROJECT 36287 File # 93-3644 Page 1
629 Beaverdam Road N.E., Calgary AB T2K 4W7

SAMPLE#	Mo ppm	Cu ppm	Pb ppm	Zn ppm	Ag ppm	Ni ppm	Co ppm	Mn ppm	Fe %	As ppm	U ppm	Au ppm	Th ppm	Sr ppm	Cd ppm	Sb ppm	Bi ppm	V ppm	Ca %	P %	La ppm	Cr ppm	Mg %	Ba ppm	Ti %	B ppm	Al %	Na %	K %	W ppm
93-10-12-1	<1	31	9	5	.2	5	3	28	.20	13	<5	<2	<2	402	<.2	6	3	3	15.60	.010	<2	10	5.04	3	<.01	16	.12	.12	.07	1
93-10-12-2	<1	6	<2	1	.1	<1	<1	28	.04	4	<5	<2	<2	321	<.2	<2	<2	<2	20.86	.002	<2	4	11.31	2	<.01	16	.03	.11	.01	1
93-10-12-3	<1	2	3	5	<.1	<1	<1	28	.02	3	<5	<2	<2	353	<.2	<2	<2	<2	19.87	.002	<2	2	10.23	2	<.01	21	.01	.10	.01	1
93-10-12-4	<1	2	<2	4	<.1	<1	<1	21	.02	2	<5	<2	<2	396	<.2	3	<2	<2	15.91	.001	<2	3	6.03	2	<.01	22	.01	.06	.01	1
93-10-12-5	<1	2	<2	1	.1	<1	1	33	.03	2	<5	<2	<2	333	<.2	<2	<2	<2	20.36	.002	<2	4	11.74	2	<.01	22	.01	.08	.01	<1
RE 93-10-12-5	<1	2	3	3	.1	4	<1	34	.01	2	<5	<2	<2	328	<.2	<2	<2	<2	20.83	.001	<2	5	11.95	2	<.01	22	.01	.08	<.01	1
93-10-12-6	<1	3	4	11	.2	3	<1	35	.02	4	<5	<2	<2	425	<.2	<2	2	<2	21.81	.001	<2	5	12.60	5	<.01	26	.01	.07	.01	1
93-10-12-7	1	3	<2	2	<.1	<1	<1	25	.03	<2	<5	<2	<2	149	<.2	<2	<2	<2	17.61	.002	<2	2	10.61	3	<.01	23	.02	.11	.02	<1
93-10-12-8	1	1	<2	1	<.1	<1	<1	42	.02	2	<5	<2	<2	615	<.2	<2	<2	<2	19.45	.001	<2	6	12.69	2	<.01	14	.01	.21	<.01	<1
93-10-12-9	<1	2	<2	4	.1	<1	<1	65	.08	3	<5	<2	<2	240	<.2	<2	2	<2	20.12	.002	<2	3	12.34	2	<.01	12	.02	.16	.01	1
93-10-12-10	<1	2	<2	2	.1	<1	<1	53	.03	3	<5	<2	<2	148	<.2	<2	<2	<2	18.80	.001	<2	4	12.86	2	<.01	11	.01	.19	.01	<1
93-10-12-11	1	2	2	2	.1	<1	<1	13	.07	3	<5	<2	<2	450	<.2	2	2	<2	15.43	.002	<2	4	4.42	<2	<.01	27	.04	.04	.03	<1
93-10-12-12	<1	4	4	3	.2	2	1	92	.14	3	<5	<2	<2	137	<.2	<2	<2	2	17.65	.003	<2	6	11.55	9	<.01	28	.06	.12	.02	<1
93-10-12-13	<1	4	<2	4	.1	2	1	149	.19	3	<5	<2	<2	295	<.2	<2	<2	2	23.24	.003	<2	9	8.84	5	<.01	16	.10	.32	.04	1
93-10-12-14	<1	3	2	2	.1	7	1	105	.11	4	7	<2	<2	157	<.2	2	<2	<2	29.16	.006	<2	4	3.95	3	<.01	13	.05	.12	.02	1
93-10-12-15	<1	4	<2	5	.1	5	3	159	.13	2	7	<2	<2	178	<.2	4	<2	<2	32.93	.016	<2	4	2.98	3	<.01	11	.04	.14	.03	1
93-10-12-16	<1	4	<2	4	.1	5	3	130	.13	3	<5	<2	<2	191	<.2	4	<2	<2	33.58	.014	<2	2	2.60	3	<.01	11	.04	.09	.02	1
93-10-12-17	<1	4	<2	6	.2	7	1	97	.15	4	5	<2	<2	183	<.2	3	<2	<2	31.25	.014	<2	3	2.76	3	<.01	10	.05	.12	.02	1
93-10-12-18	<1	4	2	8	<.1	7	3	123	.27	3	<5	<2	<2	191	<.2	4	<2	2	31.46	.010	2	7	3.19	4	<.01	17	.13	.08	.05	1
93-10-12-19	<1	4	<2	13	.2	8	3	127	.19	5	6	<2	<2	271	<.2	3	2	2	33.79	.010	3	8	1.44	4	<.01	12	.12	.14	.05	1
93-10-12-20	1	4	5	8	<.1	12	2	93	.15	3	<5	<2	<2	270	<.2	3	2	2	30.48	.006	2	4	1.55	4	<.01	9	.07	.18	.03	<1
93-10-12-21	<1	10	10	18	.1	31	7	202	.86	3	<5	<2	2	56	<.2	<2	<2	9	12.81	.013	6	22	10.36	14	.01	45	.75	.82	.21	<1
93-10-12-22	<1	7	6	6	.2	10	5	172	.44	3	<5	<2	<2	227	<.2	<2	<2	7	14.88	.013	5	13	10.88	11	.01	28	.31	.26	.12	<1
93-10-12-23	<1	8	4	5	.1	2	4	163	.36	4	<5	<2	<2	186	<.2	<2	<2	5	16.62	.008	5	9	11.93	37	<.01	25	.22	.12	.09	1
93-10-13-1	<1	4	4	7	.1	6	3	44	.29	<2	<5	<2	<2	370	<.2	2	<2	2	28.33	.002	<2	6	1.13	7	<.01	56	.33	.09	.18	1
93-10-13-2	<1	2	<2	2	.1	1	<1	39	.04	2	<5	<2	<2	355	<.2	3	<2	<2	34.95	.002	<2	6	.80	7	<.01	8	.04	.10	.02	1
93-10-13-3	<1	2	<2	2	.1	<1	<1	34	.05	3	5	<2	<2	357	<.2	3	<2	<2	33.56	.001	<2	5	1.13	10	<.01	14	.06	.08	.04	1
93-10-13-4	<1	1	<2	1	.1	<1	<1	37	.05	3	<5	<2	<2	427	<.2	3	<2	<2	33.02	.001	<2	4	1.41	21	<.01	13	.06	.22	.03	1
93-10-13-5	<1	2	2	2	.1	1	1	33	.07	3	<5	<2	<2	347	<.2	3	3	<2	35.54	.002	<2	3	1.05	8	<.01	18	.12	.20	.06	1
93-10-13-6	<1	1	3	2	.1	3	1	25	.06	3	<5	<2	<2	445	<.2	<2	3	<2	35.98	.001	<2	6	.68	8	<.01	8	.07	.08	.04	1
93-10-13-7	<1	1	2	2	.1	<1	<1	35	.05	3	<5	<2	<2	254	<.2	2	<2	<2	35.73	.001	<2	7	.80	3	<.01	9	.07	.47	.04	1
93-10-13-8	<1	2	<2	1	.1	<1	<1	30	.04	3	<5	<2	<2	1569	<.2	4	<2	<2	35.56	.001	<2	8	.48	168	<.01	3	.02	1.76	.02	1
93-10-13-9	<1	4	<2	2	<.1	<1	<1	39	.04	<2	<5	<2	<2	724	<.2	2	<2	<2	36.99	.002	<2	5	.77	25	<.01	12	.05	.03	.03	1
93-10-13-10	<1	4	<2	3	.1	5	1	42	.13	4	<5	<2	<2	509	<.2	3	<2	2	31.88	.003	<2	8	1.83	6	<.01	28	.21	.45	.09	1
93-10-14-1	<1	1	2	1	.1	<1	<1	27	.13	3	<5	<2	<2	114	<.2	2	2	<2	39.68	<.001	<2	3	.15	2	<.01	2	.01	.02	.01	1
STANDARD C	19	60	38	130	6.9	66	32	1025	3.96	43	20	7	37	55	19.8	14	20	56	.51	.081	39	59	.90	194	.09	34	1.88	.08	.15	11

ICP - .500 GRAM SAMPLE IS DIGESTED WITH 3ML 3-1-2 HCL-HNO3-H2O AT 95 DEG. C FOR ONE HOUR AND IS DILUTED TO 10 ML WITH WATER.
THIS LEACH IS PARTIAL FOR MN FE SR CA P LA CR MG BA TI B W AND LIMITED FOR NA K AND AL.
- SAMPLE TYPE: PULP <u>Samples beginning 'RE' are duplicate samples.</u>

SAMPLE#	Mo ppm	Cu ppm	Pb ppm	Zn ppm	Ag ppm	Ni ppm	Co ppm	Mn ppm	Fe %	As ppm	U ppm	Au ppm	Th ppm	Sr ppm	Cd ppm	Sb ppm	Bi ppm	V ppm	Ca %	P %	La ppm	Cr ppm	Mg %	Ba ppm	Ti %	B ppm	Al %	Na %	K %	W ppm
93-10-14-2	<1	2	4	2	.1	8	1	26	.02	<2	<5	<2	<2	93	.2	2	<2	<2	38.10	<.001	<2	1	.13	<2	<.01	3	<.01	.01	.01	<1
93-10-14-3	<1	2	<2	1	.1	11	<1	31	.09	3	<5	<2	<2	128	.3	<2	<2	<2	38.79	<.001	<2	3	.17	<2	<.01	<2	<.01	.02	.01	<1
93-10-14-4	<1	2	6	1	<.1	6	<1	33	.04	3	<5	<2	<2	138	.2	2	<2	<2	38.65	.001	<2	2	.17	17	<.01	<2	.01	.01	.01	<1
93-10-14-5	<1	2	<2	1	.1	14	<1	35	.14	2	<5	<2	<2	121	.5	2	<2	<2	39.34	<.001	<2	2	.16	33	<.01	<2	.01	.01	.01	<1
93-10-14-6	1	7	8	15	.1	24	4	32	.75	5	<5	<2	2	93	.5	2	<2	3	30.01	.006	2	8	.31	6	<.01	28	.30	.06	.15	<1
93-10-14-7	<1	2	2	2	.1	8	<1	18	.06	<2	<5	<2	<2	120	<.2	<2	3	<2	39.16	<.001	<2	2	.17	4	<.01	8	.04	.01	.02	<1
RE 93-10-14-7	<1	2	<2	3	<.1	6	<1	22	.05	2	<5	<2	<2	120	.4	<2	<2	<2	39.10	<.001	<2	2	.17	4	<.01	5	.03	.01	.02	<1
93-10-14-8	1	5	3	4	<.1	10	<1	29	.12	4	<5	<2	<2	134	.2	2	<2	2	37.71	<.001	<2	4	.21	12	<.01	8	.05	.02	.03	<1
93-10-14-9	1	2	12	3	.1	4	<1	30	.09	4	<5	<2	<2	143	.2	4	<2	<2	30.75	<.001	<2	2	.25	20	<.01	5	.04	.01	.02	<1
93-10-14-10	<1	3	<2	1	<.1	11	<1	36	.08	4	<5	<2	<2	148	.3	2	2	<2	39.52	<.001	<2	3	.19	41	<.01	8	.02	.04	.02	<1
93-10-14-11	2	8	5	2	.1	20	1	32	.15	5	<5	<2	<2	153	.4	<2	<2	4	37.80	<.001	<2	4	.23	<2	<.01	4	.03	.03	.02	<1
93-10-14-12	<1	2	3	2	.1	13	<1	31	.07	<2	<5	<2	<2	128	.2	2	<2	<2	36.85	<.001	<2	2	.29	21	<.01	8	.03	.03	.02	<1
93-10-14-13	<1	2	<2	1	<.1	13	2	30	.09	6	<5	<2	<2	140	<.2	2	<2	<2	37.80	<.001	<2	1	.35	<2	<.01	4	.03	.02	.02	<1
93-10-14-14	<1	2	4	1	.1	9	<1	31	.07	5	<5	<2	<2	126	<.2	2	<2	<2	38.84	<.001	<2	2	.39	10	<.01	3	.03	.02	.02	<1
93-10-14-15	<1	2	<2	2	.1	11	<1	33	.06	4	<5	<2	<2	114	<.2	<2	<2	<2	40.67	<.001	<2	3	.21	44	<.01	<2	.02	.01	.01	<1
93-10-15-1	<1	2	4	<1	.1	11	1	49	.04	<2	<5	<2	<2	157	<.2	2	<2	<2	39.64	<.001	<2	7	.27	7	<.01	4	.01	.02	.01	<1
93-10-15-2	1	4	3	2	.1	15	1	45	.19	<2	<5	<2	<2	147	<.2	2	<2	<2	38.07	<.001	<2	4	.24	10	<.01	4	.04	.02	.01	<1
93-10-15-3	<1	2	6	1	.1	7	<1	44	.08	<2	<5	<2	<2	159	.2	3	<2	<2	38.41	<.001	<2	3	.27	18	<.01	3	.02	.02	.01	<1
93-10-15-4	<1	2	2	<1	<.1	7	<1	44	.10	3	<5	<2	<2	171	<.2	2	<2	<2	38.62	<.001	<2	4	.27	17	<.01	5	.02	.03	.01	<1
93-10-15-5	1	2	<2	2	.1	11	<1	42	.13	6	<5	<2	<2	173	<.2	<2	2	2	36.57	<.001	<2	4	.42	18	<.01	6	.04	.02	.02	<1
93-10-15-6	<1	2	<2	1	.1	13	<1	47	.06	3	<5	<2	<2	182	.2	<2	<2	<2	39.33	.001	<2	4	.34	13	<.01	5	.02	.02	.01	<1
93-10-15-7	1	2	<2	2	.1	17	<1	58	.13	8	<5	<2	<2	127	<.2	2	<2	<2	39.71	<.001	<2	1	.25	25	<.01	7	.03	.01	.02	<1
93-10-15-8	<1	2	2	1	<.1	10	1	26	.04	6	<5	<2	<2	141	<.2	<2	<2	<2	41.63	<.001	<2	5	.17	40	<.01	4	.03	.01	.01	1
93-10-15-9	<1	3	3	2	.1	11	<1	41	.07	3	<5	<2	<2	193	<.2	2	<2	<2	40.62	<.001	<2	6	.24	9	<.01	6	.04	.02	.03	<1
93-10-15-10	1	3	2	2	.1	13	<1	35	.10	3	<5	<2	<2	204	<.2	2	<2	<2	37.02	<.001	<2	6	.23	9	<.01	9	.06	.03	.04	<1
93-10-15-11	<1	2	2	1	<.1	6	<1	34	.05	5	<5	<2	<2	156	<.2	2	<2	<2	38.61	<.001	<2	6	.20	12	<.01	2	.03	.04	.02	<1
93-10-15-12	<1	2	<2	<1	.1	10	<1	26	.04	3	<5	<2	<2	134	<.2	2	3	<2	40.24	<.001	<2	1	.15	1058	<.01	2	.01	.01	<.01	<1
93-10-15-13	<1	2	3	1	.1	8	<1	41	.07	6	<5	<2	<2	133	<.2	<2	<2	<2	40.19	<.001	<2	4	.23	17	<.01	8	.02	.01	.01	<1
93-10-15-14	<1	3	2	<1	.1	16	<1	37	.08	3	<5	<2	<2	179	<.2	2	<2	<2	39.55	<.001	<2	4	.34	15	<.01	9	.04	.02	.03	<1
93-10-18-1	2	2	55	<1	.1	14	<1	34	.08	5	<5	<2	<2	151	<.2	11	<2	<2	39.49	<.001	<2	5	.26	6	<.01	7	.02	.02	.01	<1
93-10-18-2	1	2	19	1	.1	10	<1	36	.10	3	<5	<2	<2	196	.3	6	<2	<2	37.84	<.001	<2	5	.35	5	<.01	10	.05	.03	.03	<1
93-10-18-3	1	3	52	1	.2	4	<1	25	.10	9	<5	<2	<2	144	<.2	10	<2	<2	40.41	<.001	<2	2	.31	7	<.01	4	.02	.02	.02	<1
93-10-18-4	<1	3	9	1	.2	10	<1	35	.09	6	<5	<2	<2	152	.3	2	<2	<2	38.32	<.001	<2	4	.55	8	<.01	3	.03	.02	.01	<1
93-10-18-5	1	2	2	<1	.1	12	<1	28	.13	5	<5	<2	<2	133	<.2	3	2	<2	38.92	<.001	<2	3	.24	5	<.01	3	.01	.01	.01	<1
93-10-18-6	<1	4	3	2	.1	14	<1	37	.13	5	<5	<2	<2	142	<.2	<2	<2	<2	35.56	<.001	<2	4	.72	7	<.01	9	.07	.02	.04	<1
STANDARD C	18	60	37	128	7.5	65	31	1017	3.98	42	21	7	35	55	18.5	15	18	55	.51	.079	38	59	.91	195	.09	33	1.89	.06	.14	9

<u>Sample type: PULP. Samples beginning 'RE' are duplicate samples.</u>

SAMPLE#	Mo ppm	Cu ppm	Pb ppm	Zn ppm	Ag ppm	Ni ppm	Co ppm	Mn ppm	Fe %	As ppm	U ppm	Au ppm	Th ppm	Sr ppm	Cd ppm	Sb ppm	Bi ppm	V ppm	Ca %	P %	La ppm	Cr ppm	Mg %	Ba ppm	Ti %	B ppm	Al %	Na %	K %	W ppm
93-10-18-7	<1	1	5	1	.1	3	<1	36	.06	2	<5	<2	<2	164	<.2	4	<2	<2	38.78	<.001	<2	3	.24	4	<.01	5	.02	.02	.01	<1
93-10-18-8	1	1	<2	4	<.1	6	<1	38	.06	5	<5	<2	<2	162	<.2	2	<2	<2	36.78	<.001	<2	3	.24	4	<.01	5	.02	.02	.01	<1
93-10-18-9	<1	1	2	4	<.1	1	<1	44	.15	5	<5	<2	<2	171	<.2	3	<2	<2	35.26	.002	<2	6	.75	7	<.01	12	.10	.02	.05	<1
93-10-18-10	<1	<1	7	<1	<.1	1	<1	33	.06	<2	<5	<2	<2	109	<.2	<2	2	<2	38.19	<.001	<2	4	.31	2	<.01	4	.03	.01	.02	<1
93-10-18-11	<1	2	6	1	<.1	<1	<1	36	.13	2	<5	<2	<2	256	<.2	<2	<2	<2	36.07	.001	<2	7	.54	7	<.01	9	.09	.03	.05	<1
93-10-18-12	1	3	5	<1	<.1	1	<1	38	.13	2	<5	<2	<2	171	<.2	2	<2	2	36.16	.001	<2	3	.57	10	<.01	3	.04	.04	.02	<1
93-10-20-1	<1	7	7	6	<.1	12	4	227	.70	7	<5	<2	<2	251	<.2	2	<2	2	31.55	.007	3	10	.71	148	<.01	15	.19	.04	.09	<1
93-10-20-2	<1	10	13	6	.1	32	16	288	1.15	11	<5	<2	<2	192	<.2	2	<2	3	29.46	.007	3	10	.70	8	<.01	14	.25	.04	.11	<1
93-10-20-3	<1	3	8	6	.1	19	1	264	.65	6	<5	<2	<2	241	<.2	3	<2	3	30.63	.009	3	7	.70	8	<.01	17	.26	.05	.11	<1
93-10-20-4	<1	3	3	18	<.1	18	6	443	1.80	2	<5	<2	2	213	<.2	<2	<2	5	23.25	.012	5	14	.73	13	<.01	20	.49	.06	.19	<1
93-10-20-5	<1	19	5	20	.1	28	7	312	1.96	5	<5	<2	2	167	<.2	<2	<2	9	22.12	.014	5	25	.75	25	<.01	32	1.07	.06	.40	<1
93-10-20-6	<1	4	2	8	.1	13	3	308	.96	2	<5	<2	<2	248	<.2	<2	<2	3	29.39	.009	4	10	1.17	9	<.01	21	.35	.05	.15	<1
93-10-20-7	<1	4	5	9	<.1	24	3	355	1.06	7	<5	<2	<2	189	<.2	2	<2	3	25.61	.012	5	25	1.77	58	<.01	24	.38	.05	.16	<1
93-10-20-8	<1	4	5	7	<.1	7	<1	221	.82	8	<5	<2	<2	227	<.2	2	<2	2	31.97	.005	2	6	.68	4	<.01	4	.15	.03	.07	<1
93-10-20-9	<1	2	10	8	.1	23	3	312	5.43	9	<5	<2	<2	153	<.2	<2	<2	3	24.47	.008	3	28	.45	6	<.01	16	.30	.04	.15	<1
93-10-20-10	<1	6	5	14	<.1	20	3	302	2.11	6	<5	<2	<2	164	<.2	2	<2	3	23.03	.011	4	23	1.51	8	<.01	22	.36	.05	.16	<1
93-10-20-11	1	5	40	14	.1	29	9	503	1.41	4	<5	<2	2	148	<.2	7	<2	5	18.66	.022	8	23	2.21	17	<.01	23	.50	.07	.18	<1
93-10-20-12	<1	5	4	21	<.1	29	11	558	1.56	3	<5	<2	3	176	<.2	<2	<2	8	17.43	.020	10	43	1.94	18	<.01	31	.95	.08	.32	<1
93-10-20-13	<1	7	27	6	.1	18	9	280	1.26	9	<5	<2	<2	246	<.2	3	<2	2	28.88	.010	2	7	.56	8	<.01	11	.22	.04	.09	<1
93-10-20-14	<1	4	<2	19	.1	28	9	491	1.94	7	<5	<2	<2	160	.2	2	2	4	20.98	.014	5	34	1.12	14	<.01	21	.47	.06	.18	<1
93-10-21-1	<1	5	<2	22	<.1	28	10	505	1.86	7	<5	<2	3	159	<.2	2	<2	7	18.64	.018	5	25	1.21	15	<.01	23	.70	.07	.26	<1
RE 93-10-21-1	<1	7	5	25	.1	30	8	513	1.91	5	<5	<2	2	161	<.2	<2	2	7	18.99	.018	5	25	1.23	12	<.01	23	.72	.07	.25	<1
93-10-21-2	<1	10	3	34	.1	34	12	475	2.38	4	<5	<2	4	144	<.2	<2	<2	9	14.75	.023	7	29	1.34	15	<.01	25	.99	.10	.29	<1
93-10-21-3	<1	11	5	17	.1	28	8	272	1.23	7	<5	<2	2	147	<.2	2	<2	9	24.38	.012	4	16	3.43	7	<.01	33	.97	.08	.36	<1
93-10-21-4	<1	1	4	5	<.1	7	3	275	.56	2	<5	<2	<2	186	<.2	<2	<2	3	28.86	.004	2	7	1.10	319	<.01	9	.27	.03	.11	<1
93-10-21-5	<1	10	10	14	.1	14	3	357	3.28	5	<5	<2	<2	133	<.2	<2	<2	3	24.54	.012	4	15	.57	38	<.01	18	.32	.04	.14	<1
93-10-21-6	<1	<1	3	<1	<.1	<1	<1	139	.20	6	<5	<2	<2	130	<.2	<2	<2	<2	31.97	.001	<2	2	.27	<2	<.01	4	.05	.02	.02	<1
93-10-21-7	<1	2	6	10	<.1	5	<1	147	.23	5	<5	<2	<2	148	<.2	<2	2	<2	32.19	.001	<2	3	.32	2	<.01	3	.05	.03	.02	<1
93-10-21-8	1	5	9	13	.1	22	5	148	.76	3	<5	<2	<2	44	<.2	<2	<2	8	19.74	.014	6	40	1.13	26	<.01	19	.58	.07	.18	<1
93-10-21-9	<1	1	3	3	.1	4	<1	198	.27	<2	<5	<2	<2	174	<.2	2	<2	2	28.80	.002	3	11	9.49	5	<.01	7	.06	.03	.03	<1
93-10-21-10	1	9	5	13	<.1	39	8	204	1.18	3	<5	<2	2	230	<.2	<2	<2	14	12.42	.021	8	55	7.63	25	.01	41	1.12	.11	.42	<1
93-10-21-11	1	8	8	18	<.1	33	8	210	1.07	8	<5	<2	2	116	<.2	<2	<2	12	16.66	.015	6	34	4.59	8	.01	29	1.03	.02	.28	<1
93-10-21-12	1	2	31	2	<.1	<1	<1	14	.15	8	16	<2	<2	396	<.2	6	4	2	23.10	.002	<2	7	1.40	3	<.01	6	.15	.03	.04	<1
93-10-21-13	1	<1	19	<1	.1	<1	<1	26	.05	<2	<5	<2	<2	105	<.2	5	<2	<2	30.08	.001	<2	10	1.19	9	<.01	4	.03	.02	.01	<1
93-10-21-14	1	<1	10	<1	<.1	<1	<1	2	.02	<2	<5	<2	<2	620	<.2	<2	<2	<2	17.59	<.001	<2	5	1.33	<2	<.01	22	.03	.03	.01	<1
STANDARD C	17	58	38	127	7.0	64	31	1067	3.98	43	22	7	34	55	17.9	14	20	55	.51	.080	38	58	.90	195	.09	33	1.89	.06	.14	11

Sample type: PULP. Samples beginning 'RE' are duplicate samples.

SAMPLE#	Mo	Cu	Pb	Zn	Ag	Ni	Co	Mn	Fe	As	U	Au	Th	Sr	Cd	Sb	Bi	V	Ca	P	La	Cr	Mg	Ba	Ti	B	Al	Na	K	W
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	%	%	ppm	ppm	%	ppm	%	ppm	%	%	%	ppm
93-10-21-15	<1	3	<2	1	<.1	6	<1	29	.05	2	<5	<2	<2	80	<.2	<2	<2	<2	19.56	.002	<2	12	17.03	2	<.01	12	.06	.04	.02	<1
93-10-21-16	<1	2	2	1	<.1	7	1	18	.03	3	<5	<2	<2	524	<.2	<2	<2	<2	19.02	.001	<2	10	5.20	2	<.01	4	.02	.02	.01	1
93-10-21-17	<1	4	<2	2	<.1	12	1	38	.03	3	<5	<2	<2	59	<.2	<2	<2	<2	18.90	.001	<2	8	16.98	2	<.01	17	.03	.05	.01	<1
93-10-21-18	2	3	2	1	<.1	3	1	45	.06	3	<5	<2	<2	56	<.2	<2	2	<2	19.04	.002	<2	15	17.06	2	<.01	11	.03	.02	.02	<1
93-10-21-19	<1	2	<2	2	.2	3	1	42	.02	<2	<5	<2	<2	39	<.2	<2	<2	<2	18.97	.001	<2	11	17.87	<2	<.01	8	.01	.03	<.01	1
93-10-21-20	1	2	<2	1	.1	<1	1	54	.03	2	<5	<2	<2	38	<.2	<2	<2	<2	19.65	.001	<2	13	18.09	2	<.01	8	.01	.10	.01	1
93-10-21-21	<1	3	<2	<1	<.1	2	<1	51	.03	<2	<5	<2	<2	40	<.2	<2	2	<2	19.47	.002	<2	9	17.76	<2	<.01	9	.01	.03	.01	<1
93-10-21-22	1	5	<2	2	.1	19	2	57	.03	2	<5	<2	<2	38	<.2	<2	<2	<2	18.94	.003	<2	11	17.39	<2	<.01	8	.02	.03	.01	1
93-10-21-23	<1	3	<2	<1	<.1	<1	<1	52	.03	<2	<5	<2	<2	39	<.2	<2	<2	<2	18.45	.002	<2	9	17.08	<2	<.01	9	.01	.06	<.01	<1
93-10-21-24	1	5	2	2	<.1	17	1	53	.03	2	<5	<2	<2	97	<.2	<2	<2	<2	21.00	.002	<2	16	18.29	2	<.01	13	.02	.03	.01	1
93-10-22-1	<1	10	<2	<1	<.1	14	5	59	.10	<2	<5	<2	<2	32	<.2	<2	<2	2	13.23	.007	<2	33	11.63	18	<.01	8	.06	.15	.01	<1
93-10-22-2	1	11	2	1	.1	12	1	61	.08	3	<5	<2	<2	72	<.2	<2	<2	2	19.82	.006	<2	7	14.66	6	<.01	252	.14	.13	.07	<1
93-10-22-3	<1	26	<2	5	.1	47	8	115	.38	3	<5	<2	<2	41	.2	<2	<2	4	16.76	.016	<2	14	14.84	8	<.01	28	.32	.10	.09	<1
93-10-22-4	<1	4	<2	2	<.1	2	2	116	.12	3	<5	<2	<2	467	<.2	<2	<2	<2	19.31	.004	<2	4	10.43	7	<.01	33	.10	.05	.03	<1
93-10-22-5	1	24	13	15	.2	26	9	252	.86	4	<5	<2	2	698	<.2	3	<2	19	15.72	.017	8	21	5.86	14	.02	82	1.07	.26	.30	1
93-10-22-6	2	27	19	34	<.1	30	10	487	1.89	2	<5	<2	3	222	<.2	4	<2	23	11.54	.023	143	61	8.22	21	.04	51	1.11	.22	.33	<1
93-10-22-7	1	119	3	23	<.1	43	14	483	1.43	4	<5	<2	2	125	<.2	<2	<2	17	10.81	.024	58	37	10.82	16	.02	85	1.59	.39	.41	<1
93-10-22-8	4	8	4	24	<.1	21	7	487	2.64	2	<5	<2	11	159	.2	<2	<2	15	6.92	.015	125	150	4.01	14	.03	43	.78	.28	.24	<1
93-10-25-1	1	7	9	2	<.1	13	3	122	.50	9	<5	<2	<2	231	<.2	<2	<2	<2	39.64	.005	<2	5	.43	31	<.01	7	.09	.02	.03	1
93-10-25-2	<1	7	3	36	.2	18	7	279	.70	3	<5	<2	<2	264	<.2	2	<2	3	28.99	.012	3	10	.85	27	<.01	13	.28	.03	.08	1
93-10-25-3	1	6	13	16	.1	6	2	103	.40	6	<5	<2	<2	224	<.2	3	<2	<2	42.53	.001	<2	3	.36	219	<.01	9	.08	.03	.03	1
93-10-25-4	<1	5	<2	5	<.1	6	2	74	.36	5	<5	<2	<2	189	<.2	<2	<2	<2	40.67	.001	<2	7	.40	26	<.01	9	.12	.02	.03	<1
93-10-25-5	<1	5	7	8	<.1	11	4	116	.55	2	<5	<2	<2	239	<.2	3	<2	2	32.40	.003	<2	6	1.04	18	<.01	13	.27	.03	.08	1
93-10-25-6	<1	3	2	7	.2	13	3	107	.57	5	<5	<2	<2	342	<.2	3	<2	2	34.48	.004	<2	6	1.16	24	<.01	9	.17	.02	.05	1
RE 93-10-25-6	<1	4	3	8	<.1	11	3	105	.57	2	<5	<2	<2	341	<.2	2	2	2	32.48	.004	<2	6	1.14	25	<.01	9	.17	.02	.05	1
93-10-25-7	<1	5	2	7	<.1	15	3	102	.48	<2	<5	<2	<2	391	<.2	2	<2	2	29.11	.005	<2	5	1.75	176	<.01	12	.26	.03	.07	1
93-10-25-8	<1	4	4	9	<.1	7	3	102	.51	<2	<5	<2	<2	343	<.2	2	<2	2	29.36	.005	<2	4	1.32	29	<.01	12	.24	.03	.06	1
93-10-25-9	<1	4	6	3	<.1	6	2	87	.53	3	<5	<2	<2	190	<.2	2	<2	<2	32.17	.001	<2	5	.50	15	<.01	8	.14	.02	.05	1
93-10-25-10	<1	11	4	18	<.1	19	8	179	.91	<2	<5	<2	2	206	<.2	3	<2	4	26.98	.007	2	9	.83	25	<.01	19	.48	.05	.14	<1
93-10-25-11	<1	5	<2	5	<.1	6	5	193	.51	4	<5	<2	<2	260	<.2	<2	3	2	33.25	.004	<2	7	.46	21	<.01	11	.19	.03	.06	<1
93-10-25-12	<1	4	9	4	<.1	9	6	203	.53	3	<5	<2	<2	363	<.2	3	<2	2	34.90	.004	<2	3	.64	590	<.01	10	.15	.03	.05	<1
93-10-25-13	<1	12	6	12	<.1	25	12	227	1.22	3	<5	<2	<2	282	.3	3	<2	4	26.37	.007	3	9	1.08	18	<.01	15	.43	.13	.12	<1
93-10-25-14	1	6	3	5	.1	6	3	94	.47	5	<5	<2	<2	266	<.2	3	<2	2	34.96	.001	<2	13	.54	35	<.01	18	.20	.04	.07	1
93-10-25-15	1	11	13	28	<.1	48	19	266	3.07	3	<5	<2	<2	211	.4	<2	<2	6	21.89	.012	<2	19	1.23	22	<.01	22	.72	.06	.17	<1
93-10-25-16	<1	10	<2	23	.1	35	13	260	1.40	<2	<5	<2	2	201	<.2	2	<2	6	21.83	.013	4	11	1.18	12	<.01	20	.70	.06	.16	1
STANDARD C	19	63	39	131	7.3	69	31	1033	3.97	42	18	7	37	56	19.6	14	22	57	.43	.081	40	60	.92	197	.09	34	1.89	.08	.15	10

Sample type: PULP. Samples beginning 'RE' are duplicate samples.

SAMPLE#	Mo ppm	Cu ppm	Pb ppm	Zn ppm	Ag ppm	Ni ppm	Co ppm	Mn ppm	Fe %	As ppm	U ppm	Au ppm	Th ppm	Sr ppm	Cd ppm	Sb ppm	Bi ppm	V ppm	Ca %	P %	La ppm	Cr ppm	Mg %	Ba ppm	Ti %	B ppm	Al %	Na %	K %	W ppm
93-10-25-17	<1	11	<2	23	.1	33	10	252	1.76	4	<5	<2	3	201	<.2	<2	2	6	20.83	.012	4	13	1.01	9	<.01	17	.60	.05	.19	<1
93-10-25-18	<1	2	<2	8	.1	12	3	261	.53	5	<5	<2	<2	215	<.2	<2	<2	2	28.88	.007	5	7	1.35	<2	<.01	16	.24	.04	.11	1
93-10-25-19	<1	1	<2	7	<.1	11	<1	172	.32	6	<5	<2	<2	198	<.2	2	2	<2	31.31	.005	2	5	.87	3	<.01	7	.15	.03	.07	<1
93-10-25-20	<1	1	2	9	.1	16	3	213	.50	4	<5	<2	<2	241	<.2	2	3	3	27.05	.009	3	7	1.26	4	<.01	15	.32	.04	.13	<1
93-10-25-21	<1	5	<2	18	.1	19	5	340	1.00	10	<5	<2	2	198	<.2	<2	<2	4	24.24	.009	5	9	1.21	15	<.01	21	.42	.05	.16	<1
93-10-25-22	<1	6	11	14	.1	21	5	339	.97	6	<5	<2	2	176	<.2	2	<2	4	21.63	.016	5	12	2.10	10	<.01	21	.47	.05	.18	<1
93-10-25-23	<1	4	4	9	.1	18	5	673	1.26	6	<5	<2	<2	165	<.2	<2	<2	3	20.86	.017	5	16	1.72	162	<.01	13	.30	.03	.12	<1
93-10-25-24	<1	10	2	38	.1	46	16	606	2.52	6	<5	<2	4	137	<.2	<2	<2	12	10.74	.032	8	24	1.90	18	<.01	44	1.30	.11	.42	<1
93-10-25-25	<1	5	6	5	.1	14	11	1022	.88	12	<5	<2	<2	217	<.2	<2	<2	2	29.99	.016	6	5	.67	104	<.01	7	.17	.02	.07	<1
93-10-26-1	<1	4	5	14	.1	23	5	489	1.25	12	<5	<2	<2	226	<.2	<2	<2	3	25.04	.010	4	15	.94	23	<.01	17	.36	.06	.13	<1
93-10-26-2	<1	6	<2	22	.1	28	12	484	3.65	9	<5	<2	3	217	<.2	<2	<2	5	19.78	.020	5	24	.91	5	<.01	15	.54	.08	.18	<1
93-10-26-3	<1	14	7	39	.1	43	15	523	2.31	11	<5	<2	4	146	.4	<2	<2	10	12.71	.021	8	20	1.35	12	<.01	33	1.24	.10	.35	<1
93-10-26-4	<1	6	3	28	.1	28	11	544	1.87	3	<5	<2	3	165	<.2	<2	<2	8	16.10	.022	7	20	1.27	9	<.01	24	.95	.15	.27	<1
93-10-26-5	<1	6	4	17	.1	25	8	430	1.32	3	<5	<2	<2	211	<.2	<2	<2	5	21.82	.012	4	9	1.60	11	<.01	16	.56	.05	.18	1
93-10-26-6	<1	8	13	9	.1	22	9	271	1.60	6	<5	<2	2	269	.4	<2	<2	3	26.44	.007	2	7	.97	6	<.01	12	.34	.03	.13	<1
93-10-26-7	<1	8	5	17	.1	31	9	259	1.23	4	<5	<2	2	274	<.2	<2	3	5	24.42	.009	3	9	1.70	11	<.01	16	.58	.05	.20	<1
93-10-26-8	<1	5	6	11	<.1	21	3	216	1.30	8	<5	<2	<2	274	<.2	<2	<2	3	28.27	.005	2	8	.98	6	<.01	11	.30	.04	.11	<1
93-10-26-9	<1	5	5	10	.1	13	7	225	.88	4	<5	<2	<2	264	<.2	3	<2	3	26.22	.005	2	8	1.14	7	<.01	10	.33	.03	.12	<1
93-10-26-10	<1	6	9	10	.1	18	8	213	1.10	<2	<5	<2	2	261	.2	2	<2	3	26.93	.006	2	6	1.31	12	<.01	12	.33	.04	.11	<1
93-10-26-11	<1	5	5	11	.1	17	5	195	.76	6	<5	<2	<2	278	.3	<2	4	4	25.02	.006	2	7	1.81	3	<.01	12	.39	.04	.14	<1
93-10-26-12	<1	3	4	10	.1	11	4	210	.73	3	<5	<2	<2	281	<.2	<2	<2	3	27.58	.006	2	6	1.23	2	<.01	13	.32	.04	.11	<1
RE 93-10-26-12	<1	4	6	9	<.1	13	4	211	.73	2	<5	<2	<2	283	<.2	2	2	3	27.79	.006	2	6	1.24	3	<.01	13	.32	.03	.11	<1
93-10-26-13	<1	11	4	25	.1	39	10	253	1.68	6	<5	<2	2	185	<.2	<2	<2	7	18.42	.014	3	15	1.63	5	<.01	27	.93	.06	.26	<1
93-10-26-14	<1	5	3	19	.1	24	9	366	1.41	4	<5	<2	2	201	<.2	<2	<2	6	21.56	.011	6	12	1.01	8	<.01	23	.62	.07	.21	<1
93-10-26-15	<1	7	3	23	.1	29	9	305	1.62	5	<5	<2	2	197	.2	<2	2	6	19.67	.015	4	11	1.05	8	<.01	19	.59	.06	.16	<1
93-10-26-16	<1	6	7	19	.2	25	7	361	2.87	6	<5	<2	<2	152	<.2	<2	<2	5	21.73	.012	8	11	.69	9	<.01	19	.49	.06	.16	<1
93-10-27-1	3	5	14	4	.1	10	<1	116	2.78	8	<5	<2	<2	508	<.2	<2	<2	2	26.37	.003	2	6	.65	18	<.01	4	.08	.03	.04	<1
93-10-27-2	1	8	18	20	.1	39	10	319	1.85	4	<5	<2	2	81	<.2	2	<2	8	11.06	.013	5	20	7.45	9	.01	44	.95	.09	.33	<1
93-10-27-3	1	<1	7	1	.1	<1	<1	29	.11	2	<5	<2	<2	643	.2	<2	3	<2	14.13	.001	<2	3	1.71	<2	<.01	12	.07	.02	.03	<1
93-10-27-4	<1	<1	<2	7	<.1	2	<1	12	.03	2	<5	<2	<2	601	<.2	<2	<2	<2	13.95	<.001	<2	2	.81	<2	<.01	18	.01	.02	.01	<1
93-10-27-5	<1	3	9	24	.1	46	9	202	1.68	2	<5	<2	3	69	<.2	3	<2	17	5.38	.027	10	39	6.33	14	.02	114	1.77	.33	.71	<1
93-10-27-6	<1	<1	5	4	.1	12	5	201	.48	2	<5	<2	<2	115	<.2	<2	<2	6	15.28	.009	7	11	11.31	3	<.01	25	.35	.07	.10	<1
93-10-27-7	<1	<1	3	4	<.1	5	1	27	.23	3	<5	<2	<2	471	<.2	2	<2	3	12.88	.006	2	6	1.51	<2	<.01	15	.17	.03	.08	<1
93-10-27-8	<1	<1	6	<1	.1	4	<1	36	.03	5	<5	<2	<2	233	<.2	2	<2	<2	21.19	.001	<2	4	10.29	2	<.01	26	.03	.06	.01	<1
93-10-27-9	1	<1	17	2	.1	8	<1	14	.17	11	<5	<2	<2	465	.3	2	5	2	19.29	.003	<2	3	1.04	<2	<.01	30	.11	.11	.03	<1
STANDARD C	17	58	39	126	7.0	65	29	1061	3.98	41	23	6	37	54	17.8	14	17	53	.50	.078	37	58	.89	191	.09	33	1.89	.06	.14	10

Sample type: PULP. Samples beginning 'RE' are duplicate samples.

SAMPLE#	Mo ppm	Cu ppm	Pb ppm	Zn ppm	Ag ppm	Ni ppm	Co ppm	Mn ppm	Fe %	As ppm	U ppm	Au ppm	Th ppm	Sr ppm	Cd ppm	Sb ppm	Bi ppm	V ppm	Ca %	P %	La ppm	Cr ppm	Mg %	Ba ppm	Ti %	B ppm	Al %	Na %	K %	W ppm
93-10-27-10	1	2	<2	<1	.1	7	1	9	.09	7	<5	<2	3	706	.3	<2	2	<2	12.87	.001	<2	9	.84	<2	<.01	108	.11	13.55	.07	<1
93-10-27-11	<1	1	2	<1	.1	6	<1	7	.02	3	<5	<2	<2	632	<.2	<2	2	<2	16.67	.001	<2	7	1.87	<2	<.01	30	.02	.69	.01	<1
93-10-27-12	1	<1	7	10	.1	10	<1	38	.06	8	<5	<2	<2	248	.3	<2	<2	<2	22.84	<.001	<2	9	13.39	8	<.01	27	.03	.51	.01	<1
93-10-27-13	<1	<1	5	1	<.1	5	<1	13	.01	5	<5	<2	<2	382	<.2	<2	2	<2	20.73	<.001	<2	5	7.54	<2	<.01	8	.01	.09	.01	<1
93-10-27-14	2	3	11	2816	<.1	13	<1	7	.05	4	<5	<2	<2	571	8.7	<2	<2	<2	15.32	<.001	<2	5	.97	<2	<.01	25	.04	2.10	.02	<1
93-10-28-1	1	6	4	42	.3	13	6	73	.17	7	<5	<2	<2	247	.5	<2	<2	2	21.66	.003	<2	6	13.07	<2	<.01	28	.12	.38	.02	1
93-10-28-2	1	2	5	8	.1	20	<1	112	.05	5	<5	<2	<2	66	<.2	<2	<2	<2	21.34	.001	<2	6	14.85	<2	<.01	12	.04	.38	.01	<1
RE 93-10-28-2	1	2	<2	7	.2	17	1	110	.05	4	<5	<2	<2	61	<.2	<2	<2	<2	21.13	.001	<2	5	14.71	<2	<.01	13	.04	.38	.01	<1
93-10-28-3	<1	2	<2	2	.1	10	<1	80	.03	5	<5	<2	<2	38	<.2	<2	2	<2	20.92	.002	<2	7	16.09	2	<.01	13	.03	.25	.01	<1
93-10-28-4	<1	7	6	4	.2	14	<1	112	.13	6	<5	<2	<2	43	<.2	<2	<2	2	22.07	.006	<2	7	15.67	2	<.01	24	.10	.12	.04	<1
93-10-28-5	<1	12	2	4	.2	16	<1	104	.07	6	<5	<2	<2	346	<.2	<2	2	<2	26.29	.009	<2	7	11.97	10	<.01	12	.03	.09	.01	<1
93-10-28-6	1	50	9	11	.2	83	2	119	.31	9	<5	<2	<2	82	<.2	2	<2	6	22.36	.014	<2	11	11.32	4	<.01	29	.22	.12	.08	<1
93-10-28-7	<1	9	6	6	<.1	18	2	117	.14	6	<5	<2	<2	149	<.2	2	<2	3	29.87	.014	2	6	6.99	4	.01	9	.09	.09	.04	<1
93-10-28-8	1	5	<2	2	.1	20	<1	152	.07	4	<5	<2	<2	711	<.2	<2	<2	<2	23.47	.004	2	5	13.28	30	<.01	18	.03	.10	.01	<1
93-10-28-9	<1	14	11	12	.2	20	5	197	.38	9	<5	<2	<2	353	<.2	<2	<2	8	19.63	.011	7	9	9.45	5	.01	61	.34	.14	.14	<1
93-10-28-10	<1	6	3	12	.1	36	5	262	.55	7	<5	<2	2	500	<.2	<2	<2	14	17.98	.011	9	12	13.20	75	.01	61	.69	.26	.24	<1
93-10-28-11	1	4	3	15	.1	26	8	220	.77	3	<5	<2	4	706	<.2	<2	<2	19	14.67	.020	12	23	8.29	78	.02	77	.93	.25	.46	<1
93-10-28-12	1	7	<2	15	<.1	29	8	171	1.07	6	<5	<2	3	484	<.2	2	<2	14	14.80	.015	10	56	7.97	18	.02	63	.97	.17	.32	<1
93-10-28-13	1	4	<2	16	<.1	38	10	226	1.48	6	<5	<2	6	347	.2	2	<2	19	9.71	.028	23	73	7.96	37	.04	57	.74	.30	.34	1
93-10-28-14	1	2	3	17	.1	40	7	221	1.45	7	<5	<2	4	549	<.2	2	<2	17	16.78	.025	19	45	7.96	34	.03	60	.75	.19	.36	<1
93-10-28-15	1	4	5	21	<.1	47	12	240	2.16	10	<5	<2	9	113	<.2	<2	<2	25	6.81	.041	34	65	6.15	34	.06	63	1.22	.63	.41	<1
93-10-28-16	2	21	13	10	.3	40	19	187	.64	10	<5	<2	2	261	<.2	2	<2	13	18.84	.015	9	17	8.00	9	.01	77	.60	.27	.27	<1
93-10-28-17	1	5	3	14	<.1	30	6	188	1.17	4	<5	<2	<2	148	<.2	<2	<2	15	16.67	.022	11	56	4.79	21	.03	41	.55	.29	.27	<1
93-10-28-18	1	3	2	14	.2	26	6	249	1.26	8	<5	<2	8	41	<.2	2	<2	17	6.84	.027	20	120	5.69	26	.04	45	.49	.41	.26	<1
93-10-28-19	3	328	13	33	.5	53	82	906	.33	9	<5	<2	<2	294	<.2	2	<2	17	21.88	.006	8	17	12.16	5	.01	28	.21	.14	.09	<1
93-10-28-20	1	32	7	19	.1	21	9	477	1.47	6	<5	<2	7	148	<.2	3	<2	18	8.39	.022	24	131	7.25	42	.04	70	.73	.20	.39	<1
93-10-28-21	<1	3	<2	11	.2	11	6	219	.61	6	<5	<2	3	536	<.2	3	<2	8	18.09	.011	12	30	3.45	14	.02	49	.38	.15	.22	<1
93-10-28-22	1	10	<2	21	.1	19	7	560	1.55	2	<5	<2	7	128	<.2	<2	<2	19	8.22	.022	38	115	7.56	39	.05	88	.94	.32	.50	<1
93-10-28-23	3	5	<2	34	.1	9	3	102	2.25	6	<5	<2	14	58	<.2	2	<2	22	1.70	.015	58	156	1.26	84	.10	84	1.09	.25	.66	1
93-10-28-24	1	4	<2	62	<.1	12	5	177	2.90	9	<5	<2	13	19	<.2	<2	<2	20	.50	.037	65	149	2.70	422	.20	198	3.16	.28	1.59	<1
93-10-29-1	1	<1	<2	5	.2	9	<1	54	.18	3	<5	<2	<2	171	<.2	<2	<2	<2	21.54	.002	3	11	15.37	19	.01	22	.19	.09	.09	<1
93-10-29-2	<1	2	<2	2	.1	5	<1	55	.06	3	<5	<2	<2	66	<.2	<2	<2	<2	22.26	.001	<2	4	17.08	6	<.01	6	.03	.04	.02	1
93-10-29-3	<1	3	<2	3	.1	8	<1	61	.05	4	<5	<2	<2	161	<.2	<2	<2	<2	22.97	.002	<2	4	16.55	6	<.01	<2	.02	.07	.01	<1
93-10-29-4	<1	5	2	4	.2	15	<1	64	.07	7	<5	<2	<2	83	<.2	<2	<2	<2	22.43	.002	<2	6	16.07	2	<.01	11	.04	.07	.01	<1
93-10-29-5	1	4	2	4	.2	26	<1	68	.10	3	<5	<2	<2	57	<.2	<2	<2	<2	22.76	.003	<2	7	17.39	<2	<.01	12	.06	.06	.03	<1
STANDARD C	18	62	38	130	7.0	68	33	1042	3.95	42	19	6	36	57	19.1	15	19	57	.54	.079	40	56	.94	196	.09	34	1.88	.06	.14	10

Sample type: PULP. Samples beginning 'RE' are duplicate samples.

SAMPLE#	Mo ppm	Cu ppm	Pb ppm	Zn ppm	Ag ppm	Ni ppm	Co ppm	Mn ppm	Fe %	As ppm	U ppm	Au ppm	Th ppm	Sr ppm	Cd ppm	Sb ppm	Bi ppm	V ppm	Ca %	P %	La ppm	Cr ppm	Mg %	Ba ppm	Ti %	B ppm	Al %	Na %	K %	W ppm
93-10-29-6	2	12	<2	22	<.1	30	3	92	.36	<2	<5	<2	2	57	.2	2	<2	5	27.31	.008	2	20	12.24	11	<.01	21	.30	.07	.15	1
93-10-29-7	<1	3	<2	5	<.1	<1	<1	112	.19	2	<5	<2	<2	118	<.2	<2	4	<2	30.04	.003	2	6	12.07	6	<.01	8	.02	.05	.01	<1
93-10-29-8	<1	8	10	10	<.1	22	2	120	.37	2	<5	<2	2	62	<.2	2	2	6	18.89	.009	5	10	9.75	9	.01	20	.22	.09	.11	<1
93-10-29-9	1	2	<2	1	.1	5	<1	31	.03	<2	<5	<2	<2	45	.3	<2	<2	<2	33.53	.001	<2	5	15.33	4	<.01	15	.01	.03	.01	<1
RE 93-10-29-9	1	1	<2	2	<.1	1	<1	30	.02	<2	<5	<2	<2	44	<.2	<2	3	<2	32.91	.001	<2	5	15.15	7	<.01	12	.01	.03	.01	<1
93-10-29-10	<1	1	<2	5	.1	8	<1	40	.03	<2	<5	<2	<2	37	<.2	<2	<2	<2	34.17	<.001	<2	5	15.58	6	<.01	10	.01	.03	.01	<1
93-10-29-11	<1	1	2	3	<.1	<1	2	37	.03	<2	<5	<2	<2	38	<.2	<2	6	<2	32.97	<.001	<2	8	14.38	5	<.01	6	.01	.04	.01	<1
93-10-29-12	<1	4	<2	3	<.1	3	<1	42	.05	3	<5	<2	<2	35	<.2	<2	2	<2	33.95	<.001	<2	7	15.65	6	<.01	7	.03	.04	.01	<1
93-10-29-13	<1	1	<2	4	.1	12	<1	41	.03	2	<5	<2	<2	34	<.2	<2	<2	<2	34.83	<.001	<2	6	15.87	8	<.01	6	.01	.05	.01	<1
93-10-29-14	1	1	<2	2	.1	10	<1	42	.04	<2	<5	<2	<2	32	.4	2	<2	<2	34.19	<.001	<2	8	15.71	<2	<.01	6	.01	.07	.01	<1
STANDARD C	18	63	39	130	7.5	66	32	1028	3.97	42	22	7	36	57	18.9	14	21	57	.52	.080	40	59	.92	196	.09	34	1.89	.06	.14	12

Sample type: PULP. Samples beginning 'RE' are duplicate samples.

GEOCHEMICAL ANALYSIS CERTIFICATE

Loring Laboratories Ltd. PROJECT 36287 File # 93-3682 Page 1

629 Beaverdam Road N.E., Calgary AB T2K 4W7

SAMPLE#	Mo ppm	Cu ppm	Pb ppm	Zn ppm	Ag ppm	Ni ppm	Co ppm	Mn ppm	Fe %	As ppm	U ppm	Au ppm	Th ppm	Sr ppm	Cd ppm	Sb ppm	Bi ppm	V ppm	Ca %	P %	La ppm	Cr ppm	Mg %	Ba ppm	Ti %	B ppm	Al %	Na %	K %	W ppm
93-11-1-1	<1	2	<2	2	<.1	6	<1	52	.06	<2	<5	<2	<2	26	<.2	<2	<2	<2	15.68	.001	<2	3	12.80	<2	<.01	6	.02	.10	.01	1
93-11-1-2	<1	3	2	43	.1	3	<1	53	.06	<2	<5	<2	<2	30	<.2	<2	<2	<2	16.20	.001	<2	6	13.23	3	<.01	6	.03	.06	<.01	1
93-11-1-3	1	5	7	6	.1	14	1	54	.07	<2	<5	<2	<2	28	<.2	<2	<2	2	15.46	.002	<2	4	12.58	4	<.01	9	.03	.10	.01	1
93-11-1-4	1	4	<2	3	<.1	5	<1	51	.14	<2	<5	<2	<2	32	<.2	<2	<2	<2	16.89	.001	<2	3	13.72	2	<.01	8	.02	.10	.01	1
RE 93-11-1-4	<1	4	2	5	.1	10	<1	50	.14	<2	<5	<2	<2	31	<.2	<2	<2	<2	16.08	.002	<2	3	13.05	2	<.01	9	.02	.09	<.01	1
93-11-1-5	<1	4	<2	5	.1	5	<1	52	.05	<2	<5	<2	<2	49	<.2	<2	<2	<2	18.24	.002	<2	3	12.89	6	<.01	7	.02	.07	.01	1
93-11-1-6	<1	8	<2	6	<.1	14	1	58	.10	<2	<5	<2	<2	33	<.2	<2	<2	2	16.41	.009	<2	4	13.13	2	<.01	8	.04	.09	.01	1
93-11-1-7	10	26	8	6	.1	52	4	55	.41	2	<5	<2	<2	35	<.2	<2	<2	6	15.45	.016	<2	5	12.49	3	<.01	14	.05	.12	.02	1
93-11-1-8	<1	6	<2	5	<.1	15	1	61	.07	<2	<5	<2	<2	32	<.2	<2	<2	2	16.56	.014	<2	7	13.46	2	<.01	7	.03	.07	<.01	<1
93-11-1-9	<1	25	3	8	.1	40	4	65	.35	<2	<5	<2	<2	36	<.2	<2	<2	4	13.00	.017	2	10	10.39	5	<.01	12	.20	.10	.09	1
93-11-1-10	<1	16	4	16	<.1	34	4	81	.42	<2	<5	<2	<2	32	<.2	<2	<2	4	12.95	.019	2	12	10.47	7	<.01	14	.27	.10	.11	<1
93-11-1-11	1	6	20	7	.1	13	2	49	.22	3	<5	<2	<2	219	<.2	<2	<2	3	12.88	.003	<2	10	9.71	5	<.01	36	.15	1.19	.11	<1
93-11-1-12	1	5	4	5	<.1	17	3	62	.34	<2	<5	<2	<2	169	<.2	<2	<2	3	14.61	.006	4	9	10.85	5	<.01	65	.33	.05	.20	1
93-11-1-13	<1	13	12	13	.1	37	13	85	1.00	<2	<5	<2	3	244	<.2	<2	<2	9	9.23	.016	6	20	7.10	18	.01	238	1.08	.10	.89	<1
93-11-1-14	<1	3	<2	3	<.1	3	<1	53	.10	<2	<5	<2	<2	93	<.2	<2	<2	2	16.73	.002	<2	14	13.62	2	<.01	15	.07	.06	.04	<1
93-11-1-15	<1	8	6	9	<.1	28	7	58	.54	<2	<5	<2	2	181	<.2	<2	<2	5	13.51	.006	3	12	10.66	10	.01	137	.70	.06	.51	1
93-11-1-16	<1	3	<2	2	.1	12	<1	50	.10	<2	<5	<2	<2	161	<.2	<2	<2	<2	16.16	.002	<2	20	12.60	2	<.01	19	.07	.13	.06	<1
93-11-1-17	<1	8	4	13	<.1	32	8	60	.67	<2	<5	<2	3	181	<.2	<2	<2	7	10.65	.016	3	19	8.76	14	.01	160	.88	.09	.65	<1
93-11-1-18	<1	3	3	2	.1	8	<1	45	.08	<2	<5	<2	<2	117	<.2	<2	<2	<2	16.34	.002	<2	13	12.52	2	<.01	15	.05	.39	.03	<1
93-11-2-1	<1	3	10	56	<.1	5	<1	48	.28	<2	<5	<2	<2	96	<.2	2	<2	<2	30.64	<.001	<2	3	.25	3	<.01	4	.04	.02	.02	<1
93-11-2-2	<1	3	9	2	.1	6	<1	48	.49	2	<5	<2	<2	86	<.2	2	<2	<2	34.27	<.001	<2	7	.16	2	<.01	3	.02	.01	<.01	1
93-11-2-3	<1	2	4	254	<.1	1	<1	48	.22	<2	<5	<2	<2	91	.2	2	<2	<2	34.27	<.001	<2	5	.17	2	<.01	<2	.01	.01	<.01	<1
93-11-2-4	<1	2	2	2	.2	6	<1	56	.21	2	<5	<2	<2	110	<.2	2	<2	<2	33.55	.001	<2	4	.21	3	<.01	2	.03	.01	<.01	1
93-11-2-5	<1	2	6	7	.2	3	<1	50	.36	<2	<5	<2	<2	103	<.2	<2	<2	<2	32.40	<.001	<2	3	.20	2	<.01	4	.03	.02	.02	1
93-11-2-6	<1	3	5	13	<.1	4	<1	54	.20	<2	<5	<2	<2	79	<.2	<2	3	<2	33.09	<.001	<2	3	.14	10	<.01	<2	.02	.01	<.01	1
93-11-2-7	<1	2	4	1	.1	5	<1	53	.25	2	<5	<2	<2	83	<.2	2	<2	<2	34.02	.001	<2	6	.14	2	<.01	2	.02	.01	.01	1
93-11-2-8	<1	2	3	1690	.2	3	<1	50	.04	<2	<5	<2	<2	63	2.4	4	<2	<2	32.82	<.001	<2	7	.09	<2	<.01	<2	<.01	<.01	<.01	<1
93-11-2-9	<1	2	3	7	.1	3	<1	48	.13	2	<5	<2	<2	103	<.2	<2	<2	<2	31.89	<.001	<2	2	.18	2	<.01	<2	.01	.01	<.01	1
93-11-2-10	<1	2	4	1	<.1	2	<1	52	.26	<2	<5	<2	<2	90	<.2	2	<2	<2	32.51	<.001	<2	2	.17	2	<.01	3	.02	.01	.01	<1
93-11-2-11	<1	2	<2	2	.1	<1	<1	52	.13	<2	<5	<2	<2	127	<.2	3	2	<2	31.42	<.001	<2	4	.24	2	<.01	2	.02	.02	<.01	1
93-11-2-12	<1	3	4	3	.1	4	1	44	.15	<2	<5	<2	<2	180	<.2	<2	<2	<2	29.32	.001	<2	8	.45	4	<.01	7	.07	.03	.04	1
93-11-2-13	<1	3	3	5	.1	3	1	69	.21	2	<5	<2	<2	149	<.2	<2	<2	<2	23.66	.002	<2	3	3.74	4	<.01	5	.04	.06	.03	1
93-11-2-14	<1	3	<2	8	.1	10	3	84	.38	<2	<5	<2	<2	154	<.2	<2	<2	2	17.19	.004	<2	7	7.52	8	<.01	26	.26	.08	.14	1
93-11-2-15	<1	3	2	2	.1	3	1	55	.17	2	<5	<2	<2	280	<.2	2	<2	<2	29.01	.001	<2	4	1.21	2	<.01	2	.02	.05	.01	1
93-11-2-16	<1	3	2	2	.1	2	<1	113	.29	<2	<5	<2	<2	106	<.2	<2	<2	<2	21.71	.001	<2	3	7.32	2	<.01	5	.03	.06	.01	<1
STANDARD C	18	60	38	127	7.2	66	31	1049	3.93	39	18	7	36	54	18.9	15	19	54	.51	.078	38	58	.89	194	.09	34	1.87	.08	.16	10

ICP - .500 GRAM SAMPLE IS DIGESTED WITH 3ML 3-1-2 HCL-HNO3-H2O AT 95 DEG. C FOR ONE HOUR AND IS DILUTED TO 10 ML WITH WATER.
THIS LEACH IS PARTIAL FOR MN FE SR CA P LA CR MG BA TI B W AND LIMITED FOR NA K AND AL.
- SAMPLE TYPE: PULP <u>Samples beginning 'RE' are duplicate samples.</u>

SAMPLE#	Mo ppm	Cu ppm	Pb ppm	Zn ppm	Ag ppm	Ni ppm	Co ppm	Mn ppm	Fe %	As ppm	U ppm	Au ppm	Th ppm	Sr ppm	Cd ppm	Sb ppm	Bi ppm	V ppm	Ca %	P %	La ppm	Cr ppm	Mg %	Ba ppm	Ti %	B ppm	Al %	Na %	K %	W ppm
93-11-2-17	<1	3	<2	4	.2	5	<1	94	.26	<2	<5	<2	<2	179	<.2	2	<2	<2	32.27	.001	<2	6	3.60	<2	<.01	7	.07	.04	.04	<1
93-11-2-18	1	2	<2	2	.1	<1	2	32	.04	2	<5	<2	<2	145	<.2	2	<2	<2	20.14	.001	<2	5	13.31	5	<.01	21	.03	.05	.01	<1
93-11-2-19	1	5	4	3	.1	<1	<1	34	.03	6	<5	<2	<2	95	<.2	<2	2	<2	18.95	.001	<2	9	13.77	7	<.01	23	.03	.05	.02	<1
93-11-2-20	<1	4	<2	14	.1	<1	<1	39	.03	2	<5	<2	<2	61	<.2	2	<2	<2	19.62	<.001	<2	13	14.61	2	<.01	23	.02	.05	.01	<1
93-11-2-21	<1	6	2	20	.1	<1	<1	31	.04	4	<5	<2	<2	79	<.2	<2	<2	<2	19.64	<.001	<2	5	13.61	2	<.01	16	.02	.07	.01	<1
93-11-2-22	<1	2	<2	1	.1	<1	<1	31	.01	3	<5	<2	<2	70	<.2	2	<2	<2	19.47	<.001	<2	8	13.89	<2	<.01	22	.01	.06	.01	<1
93-11-2-23	<1	2	3	1	.1	1	<1	28	.02	2	<5	<2	<2	514	<.2	3	<2	<2	20.02	.001	<2	8	13.04	<2	<.01	25	.02	.07	.01	<1
93-11-2-24	<1	4	2	1	.1	7	<1	47	.05	2	<5	<2	<2	117	<.2	<2	<2	<2	19.79	.001	<2	10	14.72	8	<.01	25	.03	.03	.03	<1
93-11-2-25	4	5	7	16	.1	4	3	892	1.16	3	<5	<2	4	4197	<.2	<2	<2	25	3.44	.013	7	324	2.71	356	.01	2	.12	4.12	.07	<1
93-11-2-26	<1	1	<2	6	.1	2	2	969	.29	2	<5	<2	<2	530	.2	<2	2	3	15.50	.002	3	28	5.18	8	<.01	9	.07	1.25	.02	<1
93-11-2-27	2	3	32	17	.1	3	5	1017	1.17	3	<5	<2	5	347	<.2	<2	<2	18	7.72	.016	8	103	3.61	18	.02	17	.38	3.04	.18	<1
93-11-3-1	1	2	7	2	<.1	3	<1	33	.07	4	<5	<2	<2	328	<.2	3	<2	<2	31.25	.002	<2	6	2.07	5	<.01	11	.07	.03	.04	<1
93-11-3-2	<1	1	5	<1	<.1	<1	<1	34	.04	<2	<5	<2	<2	315	<.2	<2	<2	<2	31.06	.001	<2	8	1.49	<2	<.01	11	.04	4.00	.02	<1
93-11-3-3	<1	7	7	16	.2	115	33	4124	21.59	20	<5	<2	6	168	<.2	<2	5	11	8.37	.062	13	12	.84	65	<.01	23	.41	.14	.11	<1
93-11-3-4	<1	<1	<2	10	.2	5	3	192	.56	3	<5	<2	<2	338	<.2	3	<2	3	32.12	.023	3	9	.49	30	<.01	28	.33	.07	.14	<1
RE 93-11-3-4	<1	3	<2	9	.1	5	1	179	.48	<2	<5	<2	<2	338	<.2	2	<2	2	31.91	.023	3	9	.49	27	<.01	28	.33	.07	.14	<1
93-11-3-5	<1	1	<2	6	.1	17	2	158	1.23	<2	<5	<2	<2	231	<.2	<2	<2	<2	33.92	.007	2	7	.48	25	<.01	12	.17	.04	.07	<1
93-11-3-6	<1	1	<2	4	.2	7	<1	139	2.19	<2	<5	<2	<2	198	<.2	<2	2	<2	33.69	.003	<2	6	.42	14	<.01	7	.08	.03	.04	<1
93-11-3-7	<1	3	8	9	<.1	9	1	168	2.74	<2	<5	<2	<2	204	<.2	<2	<2	2	29.73	.006	2	7	.56	26	<.01	10	.20	.05	.09	<1
93-11-3-8	<1	7	4	14	.1	15	5	261	1.03	5	<5	<2	3	215	<.2	2	3	4	21.45	.013	7	10	2.29	37	<.01	30	.42	.09	.17	<1
93-11-3-9	<1	5	6	16	.1	19	6	379	.99	3	<5	<2	3	226	.2	<2	<2	4	24.02	.018	8	15	2.71	49	<.01	33	.45	.09	.19	<1
93-11-4-1	<1	5	<2	29	.1	48	4	1649	21.01	10	<5	<2	7	115	<.2	<2	10	13	4.86	.066	9	17	2.13	62	<.01	45	.53	.12	.25	<1
93-11-4-2	<1	9	<2	25	.2	23	10	1088	5.06	3	<5	<2	4	305	<.2	<2	<2	8	19.79	.072	6	14	2.09	56	<.01	40	.67	.10	.29	<1
93-11-4-3	<1	9	<2	25	.1	15	6	186	.77	8	<5	<2	<2	231	<.2	<2	<2	2	33.56	.005	3	6	.75	58	<.01	15	.24	.05	.09	<1
93-11-4-4	<1	5	9	10	.2	22	8	191	.72	3	<5	<2	2	250	<.2	<2	<2	3	33.03	.005	3	7	.96	256	<.01	14	.27	.04	.10	<1
93-11-4-5	<1	2	<2	19	.1	23	9	262	1.13	<2	<5	<2	3	200	<.2	2	2	6	24.38	.013	5	15	1.40	20	<.01	28	.61	.07	.20	1
93-11-4-6	1	9	70	10	.2	38	11	163	3.30	11	<5	<2	<2	314	<.2	<2	<2	2	35.53	.004	3	10	.84	14	<.01	16	.21	.05	.09	<1
93-11-4-7	<1	7	<2	3	.1	4	1	164	.32	2	<5	<2	<2	214	<.2	<2	<2	<2	32.56	.003	3	5	.90	8	<.01	14	.12	.04	.05	<1
93-11-4-8	<1	<1	3	2	.1	3	1	103	.19	3	<5	<2	2	294	<.2	<2	<2	<2	35.14	.004	<2	3	.84	59	<.01	10	.09	.03	.04	<1
93-11-4-9	<1	<1	4	2	<.1	<1	1	117	.21	4	<5	<2	<2	304	<.2	<2	<2	<2	35.24	.003	<2	3	1.26	<2	<.01	10	.09	.03	.04	<1
93-11-4-10	<1	<1	5	2	.1	<1	<1	113	.22	2	<5	<2	<2	272	<.2	2	<2	<2	34.95	.002	<2	3	1.00	21	<.01	8	.10	.03	.04	<1
93-11-4-11	<1	4	3	6	.1	8	7	166	.47	<2	<5	<2	2	269	.2	<2	<2	2	30.91	.010	3	9	1.62	4	<.01	24	.31	.05	.14	<1
93-11-4-12	<1	<1	5	5	.1	6	4	163	.36	4	<5	<2	<2	212	<.2	<2	<2	2	32.55	.004	4	8	1.03	2	<.01	18	.21	.04	.09	<1
93-11-4-13	<1	1	17	7	.2	6	6	243	.57	<2	<5	<2	3	197	.2	2	<2	3	25.20	.008	5	10	2.18	2	<.01	20	.29	.05	.11	<1
93-11-4-14	<1	3	8	5	.1	3	3	204	.63	3	<5	<2	2	236	<.2	2	<2	2	30.10	.006	3	8	1.46	<2	<.01	17	.19	.04	.08	<1
STANDARD C	18	59	42	127	6.0	67	31	1051	3.93	42	15	7	36	56	18.8	15	17	55	.51	.078	38	58	.88	196	.09	33	1.87	.06	.14	10

Sample type: PULP. Samples beginning 'RE' are duplicate samples.

SAMPLE#	Mo ppm	Cu ppm	Pb ppm	Zn ppm	Ag ppm	Ni ppm	Co ppm	Mn ppm	Fe %	As ppm	U ppm	Au ppm	Th ppm	Sr ppm	Cd ppm	Sb ppm	Bi ppm	V ppm	Ca %	P %	La ppm	Cr ppm	Mg %	Ba ppm	Ti %	B ppm	Al %	Na %	K %	W ppm
93-11-4-15	<1	8	4	16	.2	29	12	476	1.50	2	<5	<2	2	129	<.2	<2	<2	5	16.50	.016	7	20	4.68	9	<.01	44	.67	.09	.23	1
93-11-4-16	<1	16	<2	12	.2	15	6	227	.76	2	<5	<2	<2	261	<.2	<2	<2	3	29.88	.007	2	8	.90	7	<.01	19	.44	.05	.12	2
93-11-4-17	<1	5	2	10	.1	13	6	279	.88	<2	<5	<2	<2	230	<.2	<2	<2	3	21.29	.012	3	16	2.27	7	<.01	25	.42	.07	.14	2
93-11-4-18	<1	6	3	21	.3	28	11	464	1.35	<2	<5	<2	2	322	<.2	<2	<2	6	19.71	.015	5	14	1.89	10	<.01	33	.72	.08	.21	1
93-11-8-1	<1	6	6	20	.2	25	10	443	1.51	<2	<5	<2	2	240	<.2	2	<2	5	17.30	.015	3	12	1.20	9	<.01	30	.67	.10	.20	1
93-11-8-2	2	15	5	21	.1	24	7	206	.94	<2	<5	<2	<2	199	<.2	<2	<2	5	20.64	.008	4	10	.86	12	<.01	25	.55	.09	.17	1
93-11-8-3	<1	1	3	15	.1	<1	1	124	.17	2	<5	<2	<2	473	.2	<2	<2	<2	19.98	.002	<2	2	5.62	3	<.01	14	.08	.20	.02	1
93-11-8-4	<1	15	8	25	.2	57	17	236	1.47	4	<5	<2	3	170	<.2	<2	<2	14	8.93	.025	9	24	6.99	92	.01	70	1.53	.83	.60	1
93-11-8-5	<1	2	2	6	.2	6	2	42	.47	<2	<5	<2	<2	556	<.2	<2	<2	4	13.90	.007	<2	8	1.89	22	.01	20	.37	.11	.19	<1
93-11-8-6	<1	4	<2	13	.1	17	5	65	.85	<2	<5	<2	2	509	.2	<2	<2	10	13.05	.015	5	17	2.48	20	.01	34	.68	.37	.33	1
93-11-8-7	<1	8	<2	17	.1	28	8	81	1.06	2	<5	<2	2	521	<.2	<2	<2	12	12.93	.016	6	20	4.43	46	.01	69	1.32	.66	.38	1
93-11-9-1	<1	3	4	2	.2	<1	1	73	.21	2	<5	<2	<2	56	<.2	<2	2	<2	16.76	.002	<2	4	12.53	3	<.01	26	.07	.05	.03	1
93-11-9-2	<1	4	14	16	.1	15	3	110	.68	2	<5	<2	<2	45	.2	<2	<2	2	16.56	.003	<2	8	11.82	4	<.01	34	.21	.07	.10	1
93-11-9-3	1	5	98	310	.1	123	16	102	4.28	3	<5	<2	<2	36	.5	<2	<2	2	13.47	.002	<2	19	10.02	4	<.01	25	.15	.05	.07	<1
93-11-9-4	1	8	68	1620	.2	120	11	130	2.84	3	<5	<2	<2	76	1.0	<2	<2	2	15.56	.003	<2	17	11.23	4	<.01	28	.20	.10	.10	<1
RE 93-11-9-4	1	8	68	1671	.2	123	12	132	2.92	4	<5	<2	<2	83	1.3	<2	<2	2	15.99	.003	<2	18	11.43	5	<.01	30	.22	.10	.10	<1
93-11-9-5	<1	5	2	16	.1	10	3	102	.34	<2	<5	<2	<2	523	<.2	<2	<2	4	10.98	.007	<2	7	6.77	17	<.01	41	.31	6.67	.16	1
93-11-9-6	1	7	5	20	.1	21	7	143	.87	2	<5	<2	<2	154	<.2	<2	<2	10	10.03	.008	3	18	6.69	12	.01	54	.83	7.73	.31	1
93-11-9-7	<1	6	3	7	.2	5	3	184	.42	2	<5	<2	<2	136	<.2	<2	<2	3	14.29	.005	2	6	8.81	19	<.01	51	.29	4.87	.15	1
93-11-9-8	1	5	4	4	.1	8	2	125	.32	3	<5	<2	<2	305	<.2	<2	<2	3	16.14	.004	<2	9	6.81	47	<.01	32	.15	2.34	.08	1
93-11-9-9	<1	13	3	20	.2	33	12	163	1.14	5	<5	<2	4	195	<.2	<2	<2	9	11.59	.004	3	22	8.12	27	.01	127	1.38	.13	.71	1
93-11-9-10	<1	5	3	4	.1	4	1	152	.56	2	<5	<2	<2	49	<.2	<2	<2	<2	15.70	.002	2	9	9.70	4	<.01	14	.07	4.54	.03	1
93-11-9-11	<1	8	2	10	.1	13	6	124	.50	3	<5	<2	2	224	<.2	<2	<2	5	14.97	.002	2	14	9.16	14	.01	70	.68	3.00	.34	1
93-11-9-12	2	9	2	16	<.1	46	12	64	2.42	<2	<5	<2	2	101	<.2	<2	<2	25	1.20	.005	8	139	.76	39	<.01	28	1.83	.98	.26	<1
93-11-9-13	4	93	7	22	.1	55	25	128	2.02	<2	<5	<2	<2	21	<.2	<2	<2	42	.21	.002	3	226	.74	57	.09	23	1.56	.17	.34	<1
93-11-10-1	1	9	3	13	.3	27	10	154	1.00	8	<5	<2	2	246	<.2	2	<2	5	23.22	.033	4	11	1.03	16	<.01	33	.45	.09	.18	1
93-11-10-2	<1	4	4	6	.1	8	3	80	.38	<2	<5	<2	<2	182	<.2	<2	<2	5	10.06	.008	2	12	6.86	7	.01	88	.43	8.67	.24	1
93-11-10-3	1	9	4	8	.1	18	6	123	.59	2	<5	<2	2	197	<.2	<2	<2	6	12.29	.008	3	10	7.85	20	.01	109	.58	5.89	.35	1
93-11-10-4	1	26	19	14	.1	35	18	95	1.09	5	<5	<2	2	374	<.2	<2	<2	10	12.45	.008	3	20	7.22	83	.01	112	1.00	1.09	.63	<1
93-11-10-5	<1	5	2	11	.3	20	7	81	.60	3	<5	<2	3	300	<.2	<2	<2	4	24.98	.006	3	11	2.65	12	<.01	79	.66	.08	.34	2
93-11-10-6	<1	2	3	4	.2	4	<1	38	.09	2	<5	<2	<2	231	<.2	3	<2	<2	34.18	.001	3	6	.99	7	<.01	10	.05	2.67	.03	1
93-11-10-7	1	7	6	26	<.1	7	4	117	1.62	<2	<5	<2	7	19	<.2	<2	2	13	.39	.016	16	203	.43	111	.14	4	.66	.28	.49	1
93-11-10-8	<1	3	4	125	.2	6	1	51	.08	4	10	<2	<2	50	<.2	4	2	<2	42.32	.001	<2	4	.65	2	<.01	2	.03	.02	.02	4
93-11-10-9	1	3	<2	7	.1	11	1	45	.07	3	<5	<2	<2	52	<.2	<2	<2	<2	21.99	.002	<2	6	14.31	3	<.01	12	.04	.06	.02	1
93-11-10-10	1	1	15	6	.1	1	1	55	.08	2	<5	<2	<2	63	<.2	<2	<2	<2	21.13	.002	<2	5	14.78	835	<.01	9	.03	.06	.02	1
STANDARD C	18	60	38	129	6.1	67	32	1023	3.94	43	16	7	36	55	19.2	14	18	54	.52	.081	38	59	.93	193	.09	32	1.87	.09	.16	9

Sample type: PULP. Samples beginning 'RE' are duplicate samples.

SAMPLE#	Mo ppm	Cu ppm	Pb ppm	Zn ppm	Ag ppm	Ni ppm	Co ppm	Mn ppm	Fe %	As ppm	U ppm	Au ppm	Th ppm	Sr ppm	Cd ppm	Sb ppm	Bi ppm	V ppm	Ca %	P %	La ppm	Cr ppm	Mg %	Ba ppm	Ti %	B ppm	Al %	Na %	K %	W ppm
93-11-10-11	1	1	<2	2	.1	5	<1	53	.05	2	<5	<2	<2	41	<.2	<2	<2	2	22.89	.002	<2	8	12.49	4	<.01	7	.01	.06	<.01	1
93-11-10-12	1	1	5	8	.1	3	<1	61	.06	3	<5	<2	<2	35	<.2	<2	<2	<2	19.11	.002	<2	4	14.69	5	<.01	7	.02	.05	.01	1
93-11-10-13	2	1	<2	4	.1	4	1	57	.05	3	<5	<2	<2	36	<.2	<2	<2	<2	22.10	.002	<2	2	12.00	<2	<.01	6	.01	.05	<.01	1
93-11-10-14	<1	<1	<2	2	.2	<1	<1	59	.05	2	<5	<2	<2	34	<.2	<2	<2	<2	19.94	.002	<2	5	14.26	<2	<.01	6	.02	.04	.01	<1
93-11-10-15	<1	<1	<2	1	.1	<1	<1	56	.03	3	<5	<2	<2	32	<.2	<2	<2	<2	19.67	.001	<2	4	15.16	<2	<.01	7	.01	.04	<.01	1
RE 93-11-10-15	<1	<1	2	2	<.1	<1	<1	58	.03	<2	<5	<2	<2	33	<.2	<2	<2	<2	19.86	.002	<2	3	15.35	<2	<.01	7	.01	.04	<.01	<1
93-11-15-1	<1	<1	<2	<1	.1	<1	<1	44	.04	3	<5	<2	<2	52	<.2	<2	2	<2	21.74	.001	<2	2	13.00	2	<.01	8	.02	.05	.01	<1
93-11-15-2	<1	5	<2	3	.1	5	1	43	.07	3	<5	<2	<2	49	<.2	3	<2	2	32.94	.001	<2	2	1.60	<2	<.01	2	.02	.02	.01	1
93-11-15-3	1	3	7	14	.1	8	1	32	.04	3	<5	<2	<2	51	<.2	<2	<2	<2	23.50	.002	<2	2	10.71	2	<.01	10	.04	.03	.01	1
93-11-15-4	<1	1	<2	2	.1	5	1	41	.05	3	<5	<2	<2	46	<.2	<2	<2	<2	27.94	.001	<2	4	7.66	2	<.01	7	.02	.03	.01	1
93-11-15-5	<1	<1	2	5	.1	<1	<1	41	.03	3	<5	<2	<2	43	<.2	<2	<2	<2	19.95	.001	<2	6	15.38	<2	<.01	12	.01	.04	<.01	<1
93-11-15-6	<1	<1	<2	2	.2	<1	<1	44	.04	2	<5	<2	<2	40	<.2	<2	<2	<2	20.00	.001	<2	5	15.42	2	<.01	8	.01	.04	.01	1
93-11-15-7	<1	1	<2	7	.1	2	<1	33	.04	2	<5	<2	<2	89	<.2	<2	<2	<2	19.64	.001	<2	4	14.86	16	<.01	13	.01	.01	.01	1
93-11-15-8	<1	1	<2	1	<.1	<1	<1	35	.02	2	<5	<2	<2	75	<.2	<2	<2	<2	20.35	.001	<2	5	15.66	2	<.01	12	.01	.01	.01	<1
93-11-15-9	<1	1	<2	1	.1	<1	<1	44	.04	2	<5	<2	<2	83	<.2	<2	<2	<2	20.20	.001	<2	11	15.43	5	<.01	13	.01	.02	.01	<1
93-11-15-10	<1	<1	<2	1	.1	<1	<1	49	.03	2	<5	<2	<2	92	<.2	<2	<2	<2	20.10	.001	<2	5	15.18	2	<.01	11	.01	.01	.01	<1
93-11-15-11	<1	1	<2	2	<.1	6	<1	46	.04	3	<5	<2	<2	93	<.2	<2	<2	<2	20.42	.001	<2	8	15.26	<2	<.01	10	.01	.04	.01	<1
93-11-15-12	<1	3	3	6	.1	8	<1	49	.04	2	<5	<2	<2	99	<.2	<2	<2	<2	19.20	.001	<2	4	14.63	2	<.01	11	.01	.02	.01	<1
93-11-15-13	1	9	2	3	<.1	30	2	54	.20	4	<5	<2	<2	108	<.2	<2	<2	3	18.54	.008	<2	12	14.11	4	<.01	36	.16	.02	.07	<1
93-11-15-14	1	11	4	4	.1	24	2	59	.21	4	<5	<2	<2	143	<.2	<2	<2	2	19.78	.006	<2	13	13.90	5	<.01	28	.13	.02	.06	<1
93-11-15-15	3	29	9	4	.9	41	3	58	.69	6	<5	<2	<2	155	<.2	<2	<2	5	18.09	.013	<2	14	13.59	6	<.01	51	.19	.02	.10	<1
93-11-15-16	15	18	6	5	.1	43	5	63	.28	5	<5	<2	<2	166	<.2	<2	<2	14	17.76	.013	<2	26	13.30	6	<.01	47	.15	.02	.07	<1
93-11-15-17	10	20	5	6	.1	44	5	57	.42	8	<5	<2	<2	193	<.2	<2	<2	7	17.15	.014	<2	21	12.75	5	<.01	47	.11	.02	.06	1
93-11-15-18	4	80	5	9	.1	75	3	58	.74	7	<5	<2	<2	162	<.2	<2	<2	6	17.39	.021	<2	27	13.10	5	<.01	52	.14	.03	.07	<1
93-11-15-19	1	33	3	8	.2	54	5	71	.36	4	<5	<2	<2	135	<.2	<2	<2	5	17.44	.016	2	29	13.35	8	<.01	54	.34	.04	.13	1
93-11-15-20	1	11	<2	4	<.1	32	6	63	.28	2	<5	<2	<2	103	<.2	<2	<2	3	17.32	.012	2	22	13.45	7	<.01	61	.30	.02	.12	<1
93-11-16-1	7	9	23	4	<.1	16	2	175	3.39	14	<5	<2	<2	180	<.2	2	<2	<2	27.26	.004	<2	15	1.07	2	<.01	7	.09	.03	.03	1
93-11-16-2	1	2	<2	33	<.1	4	1	107	.18	4	<5	<2	<2	314	.2	2	<2	2	33.10	.001	<2	5	.79	6	<.01	5	.05	.05	.02	1
93-11-16-3	1	1	16	33	<.1	<1	1	43	.12	2	<5	<2	<2	571	<.2	5	<2	<2	15.96	.002	<2	1	4.35	8	<.01	8	.06	.01	.02	1
93-11-16-4	<1	2	<2	3	.2	<1	<1	30	.03	2	<5	<2	<2	148	<.2	<2	<2	<2	24.93	.001	<2	8	8.62	2	<.01	7	.01	.63	.01	1
93-11-17-1	1	2	16	32	<.1	2	3	75	1.49	<2	<5	<2	24	13	<.2	5	2	18	.29	.012	68	101	.56	55	.06	23	.80	.11	.34	1
93-11-17-2	<1	5	<2	74	<.1	14	11	202	3.24	<2	<5	<2	<2	19	.2	<2	<2	74	.34	.068	20	133	2.57	374	.33	116	2.91	.39	1.61	<1
93-11-17-3	2	7	4	22	<.1	14	6	310	2.01	2	<5	<2	8	33	<.2	<2	<2	20	3.31	.025	39	138	3.20	57	.05	63	.96	.31	.49	<1
93-11-17-4	1	8	<2	32	<.1	68	15	360	2.65	3	<5	<2	7	50	<.2	<2	<2	24	7.80	.034	26	57	8.14	28	.05	79	1.72	.27	.58	1
93-11-17-5	1	30	<2	31	.1	30	10	296	1.96	2	<5	<2	2	204	<.2	<2	<2	18	11.56	.025	8	40	7.30	18	.02	69	1.39	.22	.46	<1
STANDARD C	17	58	38	125	7.1	70	30	1052	3.95	39	15	6	36	53	17.9	14	19	50	.50	.079	36	57	.89	190	.09	32	1.88	.08	.15	11

Sample type: PULP. Samples beginning 'RE' are duplicate samples.

SAMPLE#	Mo ppm	Cu ppm	Pb ppm	Zn ppm	Ag ppm	Ni ppm	Co ppm	Mn ppm	Fe %	As ppm	U ppm	Au ppm	Th ppm	Sr ppm	Cd ppm	Sb ppm	Bi ppm	V ppm	Ca %	P %	La ppm	Cr ppm	Mg %	Ba ppm	Ti %	B ppm	Al %	Na %	K %	W ppm
93-11-17-6	1	48	<2	18	<.1	36	10	309	5.51	9	<5	<2	5	161	<.2	<2	5	18	9.57	.019	9	66	8.76	16	.02	77	1.42	.23	.49	<1
93-11-17-7	1	100	12	34	.3	31	20	320	1.03	7	<5	<2	5	168	<.2	3	<2	20	12.90	.024	9	22	8.16	12	.02	98	1.72	.20	.49	<1
93-11-17-8	1	3	7	4	<.1	14	<1	178	.19	3	<5	<2	<2	46	<.2	2	<2	2	17.54	.003	2	6	14.62	7	<.01	28	.14	.03	.05	<1
93-11-17-9	1	8	3	8	.1	22	7	140	.45	7	<5	<2	2	45	<.2	<2	<2	4	17.00	.024	3	13	14.05	10	<.01	38	.43	.07	.15	<1
93-11-17-10	<1	5	2	4	.1	16	6	119	.20	6	<5	<2	<2	66	<.2	2	<2	2	18.22	.032	3	7	14.91	10	<.01	16	.16	.04	.06	<1
93-11-17-11	40	87	14	70	.2	106	9	106	.59	6	<5	<2	2	43	.3	2	<2	112	12.68	.027	2	23	10.53	10	<.01	45	.31	.13	.14	<1
93-11-17-12	1	5	4	4	<.1	20	<1	85	.08	3	<5	<2	<2	42	<.2	<2	<2	2	17.77	.003	<2	9	14.92	2	<.01	13	.09	.12	.04	<1
93-11-17-13	3	8	23	4	.1	13	2	98	.17	7	<5	<2	<2	87	<.2	3	<2	4	14.53	.009	<2	31	11.32	14	<.01	26	.16	.09	.08	1
93-11-17-14	3	5	29	4	<.1	23	3	55	.29	6	<5	<2	<2	56	.2	4	<2	5	17.22	.005	<2	18	13.40	5	<.01	48	.30	.10	.14	<1
93-11-17-15	1	2	4	3	<.1	11	1	37	.07	4	<5	<2	<2	44	<.2	2	<2	<2	17.28	.001	<2	10	14.06	2	<.01	13	.08	.05	.04	<1
93-11-17-16	<1	<1	6	2	<.1	3	<1	15	.03	3	<5	<2	<2	103	<.2	2	<2	<2	20.21	<.001	<2	6	13.18	4	<.01	52	.02	.14	.02	<1
93-11-18-1	2	<1	10	5	.1	6	<1	134	2.83	3	12	<2	<2	106	<.2	<2	<2	2	30.41	.001	<2	20	1.26	<2	<.01	3	.06	.05	.03	<1
93-11-18-2	1	<1	4	2	<.1	<1	<1	99	.18	4	7	<2	<2	186	<.2	<2	4	<2	30.75	<.001	<2	8	.38	<2	<.01	3	.02	.03	.01	<1
93-11-18-3	2	7	7	4	<.1	11	<1	123	.57	6	7	<2	<2	211	<.2	2	<2	<2	35.21	.004	<2	6	.48	<2	<.01	10	.07	.03	.03	<1
93-11-18-4	1	14	3	37	.3	44	6	335	5.12	<2	<5	<2	2	151	<.2	<2	2	9	18.53	.016	7	39	.76	18	<.01	28	.95	.15	.38	<1
93-11-18-5	<1	5	3	22	.1	27	11	428	2.20	7	<5	<2	3	214	<.2	<2	<2	7	20.07	.021	8	18	1.31	7	<.01	31	.78	.13	.31	<1
93-11-18-6	<1	4	5	8	.1	19	7	385	.95	6	<5	<2	<2	190	<.2	<2	<2	3	29.35	.013	5	7	.80	4	<.01	13	.24	.05	.12	<1
93-11-18-7	<1	6	<2	9	.1	21	6	201	.70	3	<5	<2	<2	311	<.2	<2	<2	3	28.95	.006	2	8	1.52	4	<.01	13	.30	.05	.13	<1
93-11-18-8	<1	8	<2	16	.1	26	9	256	1.41	5	<5	<2	<2	300	<.2	<2	<2	5	24.46	.009	3	12	2.09	11	<.01	19	.50	.05	.20	<1
93-11-18-9	<1	8	<2	31	<.1	36	16	452	2.16	6	<5	<2	4	223	.2	<2	<2	7	19.40	.019	5	20	1.35	12	<.01	26	.77	.08	.28	<1
93-11-18-10	<1	4	2	15	.1	19	4	426	2.06	5	5	<2	<2	162	<.2	<2	3	3	24.63	.009	3	26	.74	8	<.01	13	.30	.04	.14	<1
93-11-18-11	<1	5	4	15	.1	37	13	475	1.83	8	<5	<2	<2	256	<.2	<2	<2	4	26.91	.015	4	20	.97	95	<.01	21	.41	.08	.19	<1
93-11-18-12	<1	2	<2	38	.1	70	26	459	7.34	13	<5	<2	2	265	<.2	<2	<2	3	24.19	.006	3	21	.86	14	<.01	10	.23	.03	.10	<1
RE 93-11-18-12	<1	3	3	41	.2	76	26	480	7.66	13	6	<2	2	292	.5	<2	5	3	24.55	.007	3	21	.88	14	<.01	12	.25	.04	.12	<1
93-11-18-13	<1	1	<2	9	.3	77	9	629	14.25	11	<5	<2	4	146	.7	<2	<2	3	13.95	.022	4	28	3.48	8	<.01	17	.20	.02	.12	<1
93-11-19-1	3	6	2	8	.1	17	3	73	.99	6	<5	<2	3	40	.3	3	<2	5	13.21	.006	4	193	.13	35	<.01	7	.19	.01	.05	<1
93-11-19-2	1	4	5	9	.1	14	3	58	1.13	4	<5	<2	2	27	<.2	3	<2	3	9.20	.004	3	256	.09	16	<.01	5	.14	.01	.04	<1
93-11-19-3	<1	<1	<2	1	.1	3	<1	25	.02	3	<5	<2	<2	213	<.2	<2	<2	<2	36.79	.001	<2	7	.12	476	<.01	<2	.02	.01	<.01	<1
93-11-19-4	<1	<1	4	<1	.1	3	<1	36	.01	3	<5	<2	<2	171	<.2	2	<2	<2	38.64	<.001	<2	9	.21	193	<.01	<2	.01	.01	<.01	<1
93-11-19-5	<1	<1	<2	2	<.1	3	<1	25	.01	<2	<5	<2	<2	304	<.2	<2	<2	<2	36.40	<.001	<2	10	.61	17	<.01	3	.01	.01	<.01	<1
93-11-19-6	2	6	3	8	<.1	23	6	93	.65	2	<5	<2	2	60	<.2	3	<2	7	28.94	.011	3	35	.29	14	<.01	12	.30	.01	.13	<1
93-11-19-7	1	4	<2	12	.2	23	3	150	1.15	6	<5	<2	<2	71	<.2	<2	<2	9	25.74	.011	4	29	2.52	15	<.01	26	.62	.02	.22	<1
93-11-19-8	<1	12	<2	27	.1	63	14	250	1.73	6	<5	<2	5	46	<.2	<2	<2	19	10.49	.026	9	41	6.89	33	<.01	47	1.18	.04	.71	<1
93-11-19-9	<1	3	2	10	.1	14	3	138	.57	<2	<5	<2	2	69	<.2	<2	<2	6	27.95	.018	4	31	.29	4	<.01	10	.23	.01	.10	<1
93-11-19-10	<1	<1	<2	7	.1	1	<1	112	.27	<2	<5	<2	<2	372	.2	3	<2	2	36.69	.006	2	5	.25	4	<.01	<2	.07	.02	.03	<1
STANDARD C	18	57	37	126	6.7	67	31	1068	3.97	41	16	6	36	56	17.7	15	18	55	.51	.078	39	59	.91	193	.09	33	1.88	.06	.14	11

Sample type: PULP. Samples beginning 'RE' are duplicate samples.

SAMPLE#	Mo ppm	Cu ppm	Pb ppm	Zn ppm	Ag ppm	Ni ppm	Co ppm	Mn ppm	Fe %	As ppm	U ppm	Au ppm	Th ppm	Sr ppm	Cd ppm	Sb ppm	Bi ppm	V ppm	Ca %	P %	La ppm	Cr ppm	Mg %	Ba ppm	Ti %	B ppm	Al %	Na %	K %	W ppm
93-11-19-11	<1	8	4	15	<.1	26	9	580	1.86	4	<5	<2	<2	169	.2	<2	<2	6	29.05	.017	4	15	.47	62	<.01	15	.45	.03	.17	1
93-11-19-12	<1	8	4	13	.2	27	9	521	3.22	5	<5	<2	2	175	.3	<2	<2	5	28.36	.014	4	12	.51	23	<.01	11	.34	.02	.14	1
93-11-19-13	1	6	6	28	<.1	11	10	151	2.24	6	<5	<2	6	77	<.2	2	<2	4	6.71	.004	9	237	.16	45	.01	4	.16	.01	.02	<1
RE 93-11-19-13	1	6	7	26	.1	12	9	143	2.18	6	<5	<2	6	73	<.2	3	<2	4	6.56	.004	9	234	.16	46	.01	4	.15	.01	.03	<1
93-11-19-14	4	4	5	16	.1	13	10	130	1.67	8	<5	<2	2	66	<.2	3	<2	4	6.14	.003	5	323	.12	19	<.01	4	.23	.01	.05	<1
93-11-22-1	1	9	4	32	<.1	71	12	163	2.72	<2	<5	<2	<2	19	<.2	<2	<2	35	.89	.022	10	203	2.47	90	.11	58	1.54	.09	.59	<1
93-11-22-2	1	3	<2	39	.1	398	23	352	3.68	3	<5	<2	3	55	.2	<2	<2	45	7.18	.009	18	431	7.35	149	.16	63	1.46	.11	1.10	<1
93-11-22-3	1	6	5	19	.1	22	5	193	2.08	<2	<5	<2	9	47	<.2	3	<2	20	2.18	.027	22	175	2.39	33	.05	57	1.09	.15	.41	<1
93-11-22-4	1	4	3	16	<.1	29	6	226	1.51	<2	<5	<2	7	264	<.2	2	<2	15	8.17	.029	16	96	5.69	27	.03	40	.69	.07	.30	<1
93-11-22-5	1	12	2	24	<.1	37	12	216	1.33	2	<5	<2	2	625	<.2	2	<2	19	11.79	.023	10	32	6.59	20	.02	72	1.49	.12	.42	<1
93-11-22-6	2	32	6	21	<.1	24	17	419	.97	3	<5	<2	2	4143	<.2	<2	<2	19	12.47	.025	15	26	9.62	110	.02	96	1.47	.14	.50	<1
93-11-22-7	3	59	2	58	<.1	12	10	401	.49	4	<5	<2	<2	507	<.2	<2	<2	8	17.88	.015	8	18	11.33	16	.01	59	.75	.12	.14	<1
93-11-22-8	1	13	8	23	<.1	9	4	161	.28	3	<5	<2	<2	381	<.2	2	2	4	15.23	.008	4	12	5.40	6	.01	49	.39	.06	.07	1
93-11-22-9	<1	3	<2	2	<.1	<1	1	112	.06	<2	<5	<2	<2	42	<.2	<2	<2	<2	20.15	.003	<2	9	15.57	2	<.01	8	.03	.01	<.01	<1
93-11-22-10	1	47	7	4	.1	27	3	89	1.40	9	<5	<2	<2	101	<.2	<2	<2	2	17.61	.025	<2	16	13.71	16	<.01	17	.18	.02	.07	<1
93-11-22-11	2	50	11	12	<.1	51	2	64	.54	4	<5	<2	<2	50	<.2	<2	<2	4	14.02	.021	<2	48	10.67	38	<.01	41	.21	.03	.07	<1
93-11-22-12	1	22	7	21	.1	37	2	70	.25	3	<5	<2	<2	47	<.2	<2	2	3	18.22	.038	<2	32	10.30	16	<.01	15	.09	.02	.02	<1
93-11-22-13	1	23	8	20	<.1	47	3	75	.24	4	<5	<2	<2	43	<.2	<2	3	5	19.05	.015	<2	17	13.90	8	<.01	21	.15	.02	.04	1
93-11-22-14	6	41	16	17	.1	67	6	65	1.03	8	<5	<2	<2	45	.2	<2	<2	13	17.37	.022	<2	25	13.61	8	<.01	40	.22	.02	.06	1
93-11-22-15	<1	7	<2	2	.1	6	1	61	.08	3	<5	<2	<2	41	<.2	<2	4	<2	18.27	.007	<2	17	14.44	4	<.01	11	.05	.02	.02	1
93-11-22-16	2	3	<2	2	<.1	6	1	59	.05	2	<5	<2	<2	38	<.2	<2	2	<2	19.12	.003	<2	11	15.12	3	<.01	9	.02	.01	.01	<1
93-11-22-17	1	2	<2	1	.1	<1	1	53	.05	<2	<5	<2	<2	37	<.2	<2	4	<2	19.20	.002	<2	9	15.18	3	<.01	8	.03	.01	.01	<1
93-11-22-18	1	2	<2	1	<.1	<1	<1	50	.03	2	<5	<2	<2	43	<.2	<2	2	<2	19.43	.002	<2	9	15.39	3	<.01	11	.02	.02	<.01	1
93-11-22-19	<1	4	<2	1	.1	<1	<1	39	.03	2	<5	<2	<2	43	<.2	<2	3	<2	19.33	.001	<2	9	15.43	3	<.01	12	.01	.02	<.01	1
93-11-22-20	<1	2	<2	1	<.1	<1	<1	44	.03	<2	<5	<2	<2	48	<.2	<2	2	<2	19.47	.001	<2	6	14.74	3	<.01	10	.01	.01	<.01	<1
93-11-22-21	<1	2	3	1	.1	<1	<1	44	.03	2	<5	<2	<2	55	<.2	<2	3	<2	20.16	.001	<2	7	15.31	6	<.01	31	.03	.01	<.01	<1
93-11-22-22	<1	3	<2	4	<.1	<1	<1	104	.04	2	<5	<2	<2	61	<.2	<2	3	<2	20.72	.001	<2	6	14.34	6	<.01	31	.02	.01	<.01	<1
93-11-22-23	1	15	8	27	.1	42	13	133	1.73	6	<5	<2	3	57	.4	3	2	16	13.56	.026	6	74	2.76	23	<.01	32	.78	.03	.27	1
93-11-22-24	1	15	5	21	<.1	41	12	161	1.47	4	<5	<2	2	68	<.2	<2	<2	13	22.10	.032	5	34	.45	17	<.01	24	.62	.03	.29	<1
93-11-22-25	<1	19	8	34	.1	49	17	289	2.38	2	<5	<2	3	160	.3	<2	<2	7	17.09	.014	6	19	.37	24	<.01	23	.64	.05	.31	1
93-11-23-1	<1	13	9	53	.4	34	10	872	15.75	17	<5	2	2	120	1.4	<2	<2	13	5.77	.036	7	43	1.25	19	<.01	14	.36	.09	.13	<1
93-11-23-2	1	33	17	100	.2	30	11	41	3.39	8	<5	<2	6	66	.2	<2	<2	23	1.19	.045	13	38	.64	39	<.01	47	.77	.26	.32	<1
93-11-23-3	<1	8	6	34	.1	35	11	112	1.29	3	<5	<2	3	48	<.2	<2	2	12	8.21	.033	5	51	6.90	28	<.01	53	.68	.12	.41	1
93-11-23-4	<1	6	2	3	<.1	3	3	88	.29	3	<5	<2	<2	62	<.2	<2	2	4	18.10	.005	<2	12	14.19	7	<.01	23	.12	.04	.05	<1
93-11-23-5	<1	4	2	2	.1	<1	1	71	.13	3	<5	<2	<2	51	<.2	<2	<2	2	19.20	.003	<2	11	15.23	4	<.01	21	.09	.07	.03	<1
STANDARD C	18	63	39	130	7.0	66	32	1023	3.98	41	15	7	36	56	19.3	14	20	55	.51	.081	38	59	.90	198	.09	35	1.89	.09	.16	11

Sample type: PULP. Samples beginning 'RE' are duplicate samples.

SAMPLE#	Mo	Cu	Pb	Zn	Ag	Ni	Co	Mn	Fe	As	U	Au	Th	Sr	Cd	Sb	Bi	V	Ca	P	La	Cr	Mg	Ba	Ti	B	Al	Na	K	W
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	%	%	ppm	ppm	%	ppm	%	ppm	%	%	%	ppm
93-11-23-6	<1	8	4	4	.1	24	4	250	.73	3	<5	<2	<2	372	<.2	<2	<2	5	22.32	.007	4	14	7.37	8	<.01	26	.28	.05	.19	<1
93-11-23-7	1	30	5	3	<.1	30	4	88	.38	11	<5	<2	2	89	<.2	2	3	5	16.57	.012	4	9	13.62	4	<.01	45	.25	.05	.15	<1
93-11-23-8	<1	3	<2	<1	.1	4	4	70	.05	5	<5	<2	<2	53	<.2	<2	<2	<2	19.75	<.001	<2	2	16.27	8	<.01	25	.02	.03	.01	<1
93-11-23-9	1	13	<2	31	<.1	24	7	163	3.05	<2	<5	<2	7	32	<.2	<2	<2	21	.92	.022	4	93	1.05	39	.03	71	1.68	.61	.81	1
93-11-23-10	<1	19	<2	19	<.1	15	7	126	7.79	<2	<5	<2	15	61	<.2	3	<2	36	.78	.117	21	74	.72	32	.02	170	1.74	1.38	2.34	<1
93-11-23-11	3	7	<2	2	<.1	2	1	22	.43	<2	<5	<2	2	7	<.2	2	<2	4	.08	.002	4	189	.02	<2	.01	6	.06	5.26	.04	<1
93-11-23-12	2	6	<2	1	<.1	8	1	41	.60	<2	<5	<2	2	3	<.2	<2	<2	7	.08	.001	3	601	.01	<2	.01	<2	.02	6.83	.01	<1
93-11-24-1	<1	8	4	9	.1	18	9	213	1.12	5	<5	<2	<2	291	<.2	<2	<2	3	29.63	.007	3	12	1.12	54	<.01	15	.28	.07	.11	<1
93-11-24-2	<1	12	<2	25	<.1	35	12	308	2.16	8	<5	<2	3	175	<.2	<2	<2	7	20.29	.015	5	20	1.44	15	<.01	29	.77	.11	.25	<1
93-11-24-3	<1	9	<2	23	<.1	32	12	317	1.73	2	<5	<2	2	177	<.2	<2	<2	6	22.40	.014	5	14	1.43	16	<.01	30	.67	.07	.24	1
RE 93-11-24-3	<1	7	3	24	<.1	33	12	313	1.70	3	<5	<2	3	174	<.2	<2	<2	6	21.89	.015	5	13	1.41	15	<.01	31	.67	.07	.23	<1
93-11-24-4	<1	6	4	10	<.1	11	2	213	.43	7	<5	<2	<2	225	<.2	<2	<2	2	33.19	.005	3	7	.83	11	<.01	18	.21	.04	.09	<1
93-11-24-5	<1	5	2	7	<.1	16	6	203	.65	8	<5	<2	<2	219	.2	<2	2	2	32.63	.007	3	5	.97	12	<.01	18	.21	.04	.09	<1
93-11-24-6	<1	5	8	15	<.1	18	5	296	.82	3	<5	<2	<2	254	<.2	<2	<2	4	26.67	.014	6	11	1.75	15	<.01	25	.44	.05	.17	<1
93-11-24-7	<1	6	2	13	<.1	22	8	295	.87	7	<5	<2	<2	254	<.2	<2	<2	4	28.06	.011	6	10	1.81	20	<.01	27	.45	.05	.18	<1
93-11-24-8	<1	12	4	19	<.1	29	13	617	2.00	4	<5	<2	4	129	<.2	<2	<2	6	17.11	.026	8	28	3.07	7	<.01	38	.80	.07	.28	1
93-11-24-9	<1	10	<2	47	<.1	54	22	557	2.82	6	<5	<2	7	135	.2	<2	<2	13	9.26	.029	9	27	1.97	19	<.01	60	1.59	.17	.54	1
93-11-24-10	<1	7	3	12	<.1	21	7	316	.91	4	<5	<2	<2	270	<.2	<2	<2	3	30.16	.009	3	8	.91	9	<.01	17	.40	.04	.15	<1
93-11-24-11	<1	7	<2	8	<.1	13	2	197	.76	3	<5	<2	2	321	<.2	<2	<2	3	27.01	.006	2	6	1.16	5	<.01	12	.27	.03	.10	<1
93-11-24-12	<1	8	<2	10	.1	16	5	222	1.06	2	<5	<2	<2	310	<.2	<2	<2	3	26.15	.006	2	8	1.60	10	<.01	17	.34	.03	.13	<1
93-11-24-13	3	8	3	3	.1	9	<1	122	2.19	3	<5	<2	<2	192	<.2	2	<2	2	31.02	.004	<2	7	.83	6	<.01	9	.11	.03	.05	<1
93-11-24-14	<1	8	<2	1	<.1	5	<1	28	.08	4	<5	<2	<2	349	<.2	<2	<2	<2	18.48	<.001	<2	4	13.56	2	<.01	10	.07	.05	.03	<1
93-11-24-15	1	5	<2	3	<.1	5	1	54	.12	8	<5	<2	2	95	<.2	2	<2	<2	18.06	.001	<2	13	14.52	3	<.01	16	.09	.03	.04	<1
93-11-25-1	2	2	11	1	<.1	8	3	40	.14	4	<5	<2	<2	71	<.2	<2	<2	<2	17.74	.001	<2	10	14.67	<2	<.01	25	.10	.03	.05	<1
93-11-25-2	<1	4	<2	1	<.1	3	3	58	.01	3	<5	<2	<2	52	.2	<2	<2	<2	19.68	<.001	<2	4	16.47	4	<.01	11	.01	.02	<.01	<1
93-11-25-3	<1	6	<2	14	<.1	6	<1	61	.05	4	<5	<2	<2	47	<.2	<2	<2	<2	17.80	.001	<2	12	14.41	4	<.01	15	.02	.17	.01	<1
93-11-25-4	<1	4	<2	5	<.1	6	<1	83	.02	4	<5	<2	<2	236	<.2	3	<2	<2	29.78	.005	<2	2	4.87	7	<.01	10	.03	.07	.01	<1
93-11-25-5	<1	3	4	15	<.1	9	<1	77	.17	3	<5	<2	<2	202	<.2	<2	<2	<2	25.47	.003	<2	2	6.58	5	<.01	9	.03	.07	.01	<1
93-11-25-6	<1	12	6	3	.1	10	<1	78	.13	5	<5	<2	<2	303	<.2	<2	<2	<2	37.07	.010	<2	6	.97	5	<.01	9	.04	.07	.02	<1
93-11-25-7	<1	6	2	2	<.1	6	<1	280	.16	5	<5	<2	<2	133	<.2	<2	<2	<2	19.41	.006	2	2	13.22	2	<.01	12	.05	.05	.02	<1
93-11-25-8	1	13	6	22	<.1	42	14	269	1.30	3	<5	<2	5	327	<.2	2	<2	21	10.74	.028	12	24	7.33	20	.02	83	1.60	.33	.58	1
93-11-25-9	1	13	<2	24	<.1	42	11	304	1.67	2	<5	<2	6	239	<.2	<2	<2	25	9.36	.024	16	40	8.94	20	.03	82	1.82	.29	.76	1
93-11-25-10	3	10	5	17	.1	30	5	219	1.79	5	<5	<2	6	41	<.2	<2	<2	18	3.40	.021	18	298	3.55	33	.04	42	.97	.19	.46	1
93-11-25-11	1	9	<2	26	.1	45	11	384	2.93	4	<5	<2	11	34	<.2	<2	<2	26	5.46	.039	37	76	6.58	44	.08	53	1.28	.18	.56	<1
93-11-25-12	1	7	2	9	.1	10	3	237	1.53	<2	<5	<2	42	91	<.2	<2	<2	27	2.62	.037	71	279	2.07	37	.05	12	.35	.05	.29	<1
STANDARD C	18	59	37	126	6.7	66	30	1058	3.97	41	17	6	36	55	17.6	14	18	54	.51	.078	38	55	.89	193	.09	34	1.88	.06	.14	9

Sample type: PULP. Samples beginning 'RE' are duplicate samples.

SAMPLE#	Mo ppm	Cu ppm	Pb ppm	Zn ppm	Ag ppm	Ni ppm	Co ppm	Mn ppm	Fe %	As ppm	U ppm	Au ppm	Th ppm	Sr ppm	Cd ppm	Sb ppm	Bi ppm	V ppm	Ca %	P %	La ppm	Cr ppm	Mg %	Ba ppm	Ti %	B ppm	Al %	Na %	K %	W ppm
93-11-25-13	3	5	6	22	<.1	8	4	68	2.25	<2	<5	<2	39	10	<.2	3	<2	32	.26	.036	61	159	.78	34	.04	53	.90	.12	.42	1
93-11-25-14	1	4	6	18	<.1	6	3	52	1.92	<2	<5	<2	46	10	<.2	2	<2	31	.18	.031	61	159	.65	45	.06	30	.70	.10	.37	<1
93-11-25-15	3	5	5	27	<.1	9	5	64	2.34	<2	<5	<2	39	12	<.2	2	<2	33	.29	.057	64	183	.88	50	.06	53	1.03	.14	.50	<1
93-11-26-1	3	6	3	11	<.1	5	2	108	.95	<2	<5	<2	20	8	<.2	2	<2	13	.19	.005	37	204	.35	20	.05	11	.66	.08	.33	<1
93-11-26-2	1	2	2	5	.1	9	5	232	.76	<2	<5	<2	4	137	<.2	3	<2	13	7.33	.006	18	207	4.77	21	.03	15	.34	.08	.21	<1
93-11-26-3	3	4	3	7	.2	12	3	115	.65	2	<5	<2	3	276	<.2	5	<2	6	7.73	.008	6	217	2.46	13	.01	15	.24	.05	.12	<1
93-11-26-4	1	5	3	21	<.1	21	7	227	1.45	<2	<5	<2	5	151	.2	2	<2	16	9.76	.020	13	97	8.25	31	.05	38	.77	.04	.38	<1
93-11-26-5	1	8	2	4	.1	11	2	185	.16	3	<5	<2	<2	95	.2	<2	<2	2	21.29	.002	2	12	16.73	4	<.01	18	.07	.06	.03	<1
93-11-26-6	1	9	5	34	.1	80	16	301	2.51	7	<5	<2	6	109	.3	<2	<2	27	8.20	.038	25	52	8.79	39	.06	94	1.41	.05	.57	<1
93-11-26-7	1	7	6	30	<.1	67	14	246	2.49	5	<5	<2	6	131	.3	<2	<2	28	9.05	.032	25	34	9.99	30	.06	103	1.47	.09	.69	<1
93-11-26-8	1	21	2	17	.2	32	11	232	.93	3	<5	<2	3	95	<.2	<2	<2	16	13.16	.019	15	26	12.50	21	.02	89	1.25	.06	.49	<1
93-11-26-9	<1	7	<2	22	<.1	31	11	204	1.33	<2	<5	<2	3	240	<.2	<2	<2	25	11.88	.023	13	29	9.29	22	.02	110	1.30	.09	.68	<1
93-11-26-10	1	39	8	21	.1	44	25	220	1.21	7	<5	<2	3	177	<.2	<2	<2	21	12.39	.018	14	24	10.92	23	.02	149	1.60	.09	.72	<1
93-11-26-11	<1	8	4	20	.1	30	14	153	.90	3	<5	<2	2	468	<.2	2	<2	14	16.29	.019	9	16	8.59	17	.01	106	1.12	.06	.39	<1
93-11-26-12	<1	6	3	3	.2	12	3	96	.26	4	<5	<2	<2	49	<.2	<2	2	2	19.23	.006	2	9	16.12	5	<.01	27	.19	.02	.07	<1
93-11-26-13	1	5	2	10	.1	7	2	84	.12	3	<5	<2	<2	62	<.2	<2	<2	<2	20.26	.008	<2	12	16.47	5	<.01	13	.03	.02	.02	<1
93-11-26-14	1	9	2	3	.1	20	4	80	.17	3	<5	<2	<2	50	<.2	<2	<2	2	18.13	.008	<2	6	15.23	3	<.01	18	.12	.03	.04	<1
RE 93-11-26-14	1	9	2	3	.1	20	3	79	.17	3	<5	<2	<2	49	<.2	<2	<2	2	18.32	.007	<2	6	15.34	3	<.01	18	.12	.03	.05	<1
93-11-26-15	1	12	2	2	<.1	13	2	68	.09	<2	<5	<2	<2	56	<.2	<2	2	3	19.21	.016	<2	4	16.11	2	<.01	13	.03	.03	.02	<1
93-11-26-16	<1	7	<2	1	.2	10	1	59	.08	3	6	<2	<2	81	<.2	<2	<2	2	15.97	.003	<2	12	13.32	2	<.01	10	.03	.12	.02	1
93-11-26-17	1	6	<2	1	.1	8	<1	58	.06	2	5	<2	<2	74	<.2	<2	<2	<2	16.99	.004	<2	8	14.22	<2	<.01	10	.01	.38	.02	<1
93-11-26-18	<1	5	<2	1	.1	6	1	73	.05	2	6	<2	<2	52	<.2	<2	<2	<2	19.62	.003	<2	4	16.47	2	<.01	6	.01	.03	.01	1
93-11-26-19	1	7	<2	2	.1	8	1	57	.12	2	6	<2	<2	47	<.2	<2	2	<2	13.96	.003	<2	55	11.60	<2	<.01	6	.01	.70	.01	<1
93-11-26-20	<1	2	<2	<1	.1	<1	1	75	.05	2	<5	<2	<2	50	<.2	<2	<2	<2	20.13	.002	<2	7	16.83	2	<.01	8	.02	.04	.02	<1
93-11-26-21	<1	3	<2	2	.1	10	<1	55	.05	2	<5	<2	<2	68	<.2	<2	<2	<2	20.08	.002	<2	4	16.53	<2	<.01	13	.01	.17	.01	<1
93-11-26-22	<1	3	<2	1	.2	7	1	57	.03	3	5	<2	<2	67	<.2	<2	<2	<2	19.88	.001	<2	3	16.69	<2	<.01	13	.01	.04	.01	1
93-11-26-23	1	3	<2	1	.1	9	1	46	.08	3	<5	<2	<2	70	<.2	<2	3	<2	19.69	.002	<2	5	16.35	2	<.01	19	.05	.02	.02	<1
93-11-26-24	<1	2	<2	3	<.1	8	<1	47	.05	2	<5	<2	<2	292	<.2	<2	<2	<2	21.30	.001	<2	4	14.31	9	<.01	15	.02	.06	.02	<1
93-11-26-25	<1	2	<2	2	<.1	2	1	34	.06	3	<5	<2	<2	85	<.2	<2	<2	<2	18.49	.002	<2	2	14.94	2	<.01	23	.06	1.39	.03	<1
93-11-30-1	<1	10	<2	14	<.1	35	16	196	.96	3	<5	<2	2	76	<.2	<2	<2	13	10.71	.015	8	16	9.93	11	.01	68	1.31	.41	.53	<1
93-11-30-2	1	2	<2	5	.2	4	1	41	.14	4	<5	<2	<2	435	<.2	3	<2	<2	26.32	.001	<2	5	1.70	8	<.01	8	.07	.06	.02	1
93-11-30-3	1	1	<2	73	.1	3	<1	243	.52	3	<5	<2	<2	4486	.4	4	2	<2	31.30	.001	<2	3	1.54	37	<.01	3	.03	.04	.01	<1
93-11-30-4	<1	7	2	16	.1	21	7	350	1.07	3	<5	<2	<2	358	<.2	3	<2	4	28.02	.009	3	11	1.09	12	<.01	17	.58	.08	.16	1
93-11-30-5	1	32	120	22	.2	42	15	306	3.89	10	<5	<2	<2	229	.2	<2	<2	4	23.16	.013	2	18	1.25	54	<.01	14	.54	.20	.15	<1
93-11-30-6	<1	10	5	13	.1	21	7	276	1.09	2	<5	<2	<2	254	<.2	3	<2	3	28.34	.007	2	8	1.15	8	<.01	13	.46	.07	.12	<1
STANDARD C	18	60	38	128	7.1	66	31	1058	3.98	41	17	7	36	55	18.9	14	18	54	.52	.080	38	58	.90	192	.09	34	1.89	.08	.15	11

Sample type: PULP. Samples beginning 'RE' are duplicate samples.

SAMPLE#	Mo ppm	Cu ppm	Pb ppm	Zn ppm	Ag ppm	Ni ppm	Co ppm	Mn ppm	Fe %	As ppm	U ppm	Au ppm	Th ppm	Sr ppm	Cd ppm	Sb ppm	Bi ppm	V ppm	Ca %	P %	La ppm	Cr ppm	Mg %	Ba ppm	Ti %	B ppm	Al %	Na %	K %	W ppm
93-11-30-7	<1	7	7	16	<.1	26	10	413	1.18	3	<5	<2	4	275	.2	<2	<2	5	28.20	.015	4	16	1.69	12	<.01	15	.63	.07	.18	1
93-11-30-8	<1	7	9	21	.1	32	11	394	1.40	4	<5	<2	4	286	.2	<2	<2	6	28.97	.012	4	15	1.34	12	<.01	19	.80	.09	.22	1
93-11-30-9	<1	13	9	15	.2	42	12	323	1.56	5	<5	<2	3	346	.4	2	<2	5	31.00	.009	2	18	2.08	11	<.01	17	.65	.08	.16	1
93-11-30-10	<1	7	9	26	.1	49	19	771	2.04	<2	<5	<2	6	211	.3	<2	<2	9	20.21	.024	9	30	4.27	23	<.01	29	1.09	.10	.32	1
93-11-30-11	<1	6	7	23	.1	34	13	521	1.61	3	<5	<2	5	207	.2	3	<2	7	26.34	.015	7	21	2.12	18	<.01	21	.89	.09	.26	1
93-11-30-12	<1	1	2	7	.2	12	3	227	.36	2	<5	<2	<2	402	<.2	4	<2	2	38.09	.007	<2	8	.89	10	<.01	8	.25	.06	.08	1
RE 93-11-30-12	<1	2	3	7	.2	9	3	219	.33	3	<5	<2	2	401	.2	2	<2	2	38.38	.007	<2	7	.87	9	<.01	8	.23	.06	.08	1
93-11-30-13	<1	2	9	14	.1	12	3	238	.40	2	<5	<2	2	265	<.2	3	<2	2	36.53	.008	3	8	.94	5	<.01	13	.28	.10	.09	1
93-11-30-14	<1	5	7	11	.1	21	11	256	.96	6	<5	<2	3	302	<.2	2	<2	3	33.07	.009	3	8	.86	11	<.01	17	.41	.06	.12	1
93-11-30-15	<1	7	8	16	.2	21	9	479	1.14	4	<5	<2	5	340	.2	2	<2	5	31.55	.011	6	12	1.70	11	<.01	23	.61	.09	.20	1
93-12-1-1	<1	9	8	24	.1	35	12	306	1.46	2	<5	<2	5	232	.3	2	<2	8	27.24	.014	6	12	1.14	21	.01	23	.95	.10	.29	1
93-12-1-2	1	7	7	13	.1	22	8	236	.88	3	<5	<2	4	216	.2	2	<2	5	32.30	.004	3	10	.98	10	<.01	17	.55	.08	.17	1
93-12-1-3	<1	3	2	5	.2	9	2	112	.32	4	<5	<2	<2	251	<.2	4	<2	2	39.45	.002	<2	4	.41	5	<.01	9	.20	.04	.07	1
93-12-1-4	<1	6	4	13	.2	17	6	155	.68	4	<5	<2	2	319	<.2	<2	<2	4	33.58	.006	3	8	.92	22	<.01	15	.45	.05	.15	1
93-12-1-5	1	3	7	6	.1	10	3	128	.35	3	<5	<2	2	290	<.2	2	<2	2	36.05	.003	<2	6	.47	5	<.01	10	.22	.06	.08	1
93-12-1-6	1	12	11	25	.3	34	12	195	1.17	2	<5	<2	6	193	.6	2	<2	9	26.24	.016	5	21	1.48	45	.01	27	.88	.11	.29	2
93-12-1-7	1	4	4	5	.1	11	3	111	.57	5	<5	<2	<2	304	<.2	2	<2	2	37.68	.003	<2	5	.45	6	<.01	10	.20	.05	.08	1
93-12-1-8	<1	5	4	10	.1	18	5	140	.65	2	<5	<2	3	424	<.2	2	<2	4	31.48	.009	3	13	2.17	10	<.01	17	.46	.07	.17	1
93-12-1-9	<1	12	9	15	.2	26	8	153	1.31	2	<5	<2	4	424	.2	<2	<2	6	27.53	.011	2	22	2.82	14	<.01	20	.62	.09	.21	1
93-12-1-10	<1	9	4	23	.1	34	12	271	1.41	4	<5	<2	5	276	.2	2	<2	7	27.47	.011	4	13	1.54	23	<.01	27	.83	.11	.28	1
93-12-1-11	<1	34	7	11	.1	19	5	150	1.87	2	<5	<2	4	396	.3	<2	<2	4	30.23	.009	3	15	2.08	10	<.01	15	.47	.07	.16	1
93-12-1-12	1	4	6	4	.1	9	3	161	.45	6	<5	<2	<2	277	<.2	2	<2	2	37.78	.003	<2	5	.69	9	<.01	12	.20	.05	.08	1
93-12-1-13	<1	11	2	32	<.1	41	14	242	1.44	3	<5	<2	6	359	.2	<2	<2	11	22.04	.017	6	17	2.43	22	<.01	36	1.16	.15	.38	<1
93-12-1-14	<1	5	<2	10	.1	18	5	124	.70	4	<5	<2	3	302	.2	<2	<2	4	34.40	.004	2	7	.85	37	<.01	16	.36	.07	.14	1
93-12-1-15	<1	5	3	8	.1	12	4	140	.52	2	<5	<2	3	292	<.2	2	<2	3	33.75	.004	3	6	.95	47	<.01	15	.34	.06	.11	1
93-12-1-16	<1	8	3	21	.1	28	9	300	1.08	<2	<5	<2	5	253	.2	2	<2	7	27.57	.008	4	13	1.18	15	<.01	33	.83	.11	.32	1
93-12-1-17	<1	7	6	7	.1	13	3	141	.45	4	<5	<2	<2	254	<.2	<2	<2	3	35.15	.004	<2	7	.74	10	<.01	16	.31	.07	.12	1
93-12-2-1	<1	5	4	9	.1	13	4	232	.54	4	<5	<2	3	324	<.2	<2	<2	3	35.34	.005	4	7	.76	18	<.01	17	.34	.07	.12	1
93-12-2-2	<1	2	5	5	.1	10	3	237	.39	4	<5	<2	<2	328	<.2	2	<2	2	38.24	.006	<2	4	.39	77	<.01	11	.21	.05	.07	1
93-12-2-3	<1	7	7	16	.1	31	10	1446	1.29	<2	<5	<2	8	420	<.2	2	<2	6	26.29	.015	5	16	2.05	15	<.01	40	.80	.12	.32	1
93-12-2-4	<1	6	12	13	.2	27	9	1065	1.22	4	<5	<2	6	381	<.2	2	<2	6	27.60	.012	4	17	2.41	13	<.01	38	.71	.11	.29	1
93-12-2-5	<1	3	13	9	.1	20	6	299	1.34	<2	<5	<2	4	418	.2	<2	<2	4	27.99	.009	2	15	4.34	16	<.01	30	.49	.10	.20	1
93-12-2-6	<1	3	4	7	.1	15	5	286	.65	<2	<5	<2	3	445	.2	<2	<2	4	31.11	.008	3	13	3.60	19	<.01	28	.45	.09	.18	1
93-12-2-7	<1	2	9	10	.2	13	4	212	.47	<2	<5	<2	3	379	<.2	2	<2	3	32.51	.008	2	11	2.14	84	<.01	23	.36	.09	.16	1
93-12-2-8	<1	2	3	3	.1	7	2	172	.35	3	<5	<2	3	356	<.2	<2	<2	<2	31.46	.005	<2	6	3.22	26	<.01	15	.20	.06	.08	1
STANDARD C	19	64	43	132	7.0	68	31	1079	3.99	42	24	7	38	53	19.6	14	17	59	.50	.083	41	63	.90	202	.09	34	1.89	.06	.15	10

<u>Sample type: PULP. Samples beginning 'RE' are duplicate samples.</u>

SAMPLE#	Mo ppm	Cu ppm	Pb ppm	Zn ppm	Ag ppm	Ni ppm	Co ppm	Mn ppm	Fe %	As ppm	U ppm	Au ppm	Th ppm	Sr ppm	Cd ppm	Sb ppm	Bi ppm	V ppm	Ca %	P %	La ppm	Cr ppm	Mg %	Ba ppm	Ti %	B ppm	Al %	Na %	K %	W ppm
93-12-2-9	1	1	3	14	<.1	6	1	38	.09	3	9	<2	<2	857	<.2	2	<2	<2	14.42	.003	2	7	5.48	3	<.01	102	.09	.07	.02	<1
93-12-2-10	<1	2	3	2	<.1	4	1	89	.17	3	15	<2	<2	274	<.2	<2	<2	<2	34.58	.002	<2	8	.77	3	<.01	11	.09	.10	.04	1
93-12-2-11	<1	2	<2	3	<.1	2	<1	65	.09	3	21	<2	<2	303	<.2	<2	<2	<2	39.63	.001	<2	4	.22	2	<.01	5	.04	.05	.01	1
93-12-2-12	<1	2	5	2	<.1	3	<1	77	.14	2	19	<2	<2	323	<.2	3	<2	<2	39.03	.001	<2	7	.23	4	<.01	7	.06	.09	.02	1
93-12-2-13	<1	5	5	8	<.1	19	6	142	.62	2	6	<2	2	735	.2	<2	<2	4	30.62	.007	<2	9	.79	173	<.01	26	.38	.09	.18	1
93-12-2-14	<1	3	3	7	<.1	12	3	124	.36	3	6	<2	<2	919	<.2	<2	<2	3	31.90	.006	2	11	.77	27	<.01	23	.30	.07	.15	1
93-12-3-1	<1	14	9	12	<.1	56	12	213	1.50	2	<5	<2	2	547	<.2	2	<2	10	20.81	.011	4	22	6.29	30	<.01	72	1.14	.15	.49	1
93-12-3-2	<1	3	3	9	<.1	13	4	144	.44	2	<5	<2	<2	352	<.2	2	<2	3	27.15	.005	2	7	.50	13	<.01	19	.35	.06	.12	1
93-12-3-3	<1	5	50	6	<.1	16	4	128	3.56	3	<5	<2	<2	321	.4	<2	<2	2	27.49	.003	<2	14	.36	28	<.01	13	.22	.05	.09	1
93-12-3-4	<1	5	5	12	<.1	23	7	251	.87	3	<5	<2	<2	333	<.2	<2	<2	5	28.80	.006	5	13	.98	13	<.01	24	.49	.07	.17	1
93-12-3-5	5	18	63	6	<.1	111	34	231	3.12	23	<5	<2	<2	299	.4	<2	<2	<2	29.80	.007	2	9	.36	4	<.01	10	.12	.04	.05	1
93-12-3-6	<1	3	4	7	<.1	12	3	178	.35	2	5	<2	<2	349	<.2	<2	<2	2	34.74	.005	2	7	.38	7	<.01	20	.25	.06	.09	1
93-12-3-7	<1	5	6	5	.1	23	8	264	.83	3	<5	<2	<2	225	.2	<2	<2	3	26.85	.003	2	12	3.87	9	<.01	33	.33	.05	.16	1
93-12-3-8	<1	5	7	8	.1	18	5	91	.36	2	<5	<2	<2	62	<.2	2	<2	4	18.41	.007	2	18	14.38	12	<.01	31	.27	.04	.09	1
93-12-3-9	<1	19	5	37	<.1	72	23	160	1.27	<2	<5	<2	4	79	.2	<2	<2	15	14.72	.023	8	28	9.35	39	<.01	68	1.12	.11	.50	1
93-12-6-1	<1	9	10	247	<.1	199	59	385	3.41	9	<5	<2	2	489	.3	<2	<2	3	29.70	.006	3	10	1.93	10	<.01	13	.16	.04	.07	<1
93-12-6-2	<1	4	2	5	.1	130	65	217	1.11	4	<5	<2	2	551	.3	<2	<2	2	27.11	.006	3	11	5.27	27	<.01	12	.12	.04	.05	1
93-12-6-3	<1	6	6	4	<.1	25	6	87	.43	2	<5	<2	2	63	.3	<2	<2	3	18.20	.006	<2	19	18.95	19	<.01	30	.33	.13	.10	1
93-12-6-4	<1	5	9	9	<.1	22	9	57	.43	4	<5	<2	<2	66	<.2	<2	<2	2	18.68	.004	<2	13	18.49	8	<.01	34	.17	.05	.07	1
93-12-6-5	<1	4	<2	6	.1	19	6	44	.26	4	<5	<2	<2	58	.2	<2	<2	4	18.09	.005	<2	8	19.60	9	<.01	28	.24	.05	.08	<1
RE 93-12-6-5	<1	6	7	7	.1	21	6	46	.26	4	<5	<2	<2	60	<.2	<2	<2	4	19.11	.005	<2	9	22.02	9	<.01	32	.26	.05	.08	1
93-12-6-6	1	23	8	29	<.1	25	6	153	3.44	<2	<5	<2	8	64	.3	<2	<2	35	.91	.111	25	146	1.08	67	.04	107	1.96	.18	1.14	<1
93-12-6-7	<1	7	2	10	<.1	18	5	192	.53	2	<5	<2	<2	665	<.2	<2	<2	5	29.34	.014	2	15	.63	47	<.01	25	.48	.08	.18	1
93-12-6-8	<1	9	5	11	.1	21	6	199	.51	<2	<5	<2	<2	665	<.2	2	<2	4	29.00	.013	2	9	.81	41	<.01	23	.44	.09	.15	1
93-12-6-9	<1	10	<2	9	.1	23	6	194	.54	<2	<5	<2	2	629	.2	2	<2	4	28.40	.016	2	9	.84	24	<.01	24	.43	.10	.15	1
93-12-6-10	<1	3	<2	5	.1	6	1	72	.08	2	<5	<2	<2	57	<.2	<2	<2	<2	18.91	.003	<2	8	20.77	2	<.01	12	.05	.49	.01	1
93-12-6-11	<1	2	<2	3	.2	7	<1	65	.07	2	5	<2	<2	51	<.2	<2	<2	<2	19.31	.003	<2	7	22.70	<2	<.01	11	.03	.42	.01	1
93-12-6-12	<1	3	2	2	.1	6	1	60	.07	2	<5	<2	<2	74	<.2	<2	<2	<2	19.56	.003	<2	6	22.00	<2	<.01	8	.02	.46	.01	1
93-12-6-13	1	6	6	7	.1	32	9	75	.49	5	<5	<2	3	63	<.2	<2	<2	5	16.95	.006	2	17	17.71	6	.01	49	.69	.23	.31	1
93-12-6-14	<1	2	4	5	.1	7	1	65	.07	3	<5	<2	<2	192	<.2	<2	<2	<2	20.52	.003	<2	8	18.65	2	<.01	11	.04	.34	.02	1
93-12-6-15	<1	7	3	12	<.1	22	9	439	.99	2	<5	<2	2	277	.2	<2	<2	4	26.47	.020	5	13	1.07	35	<.01	16	.26	.05	.12	1
93-12-6-16	<1	8	<2	31	<.1	127	38	535	14.89	<2	<5	<2	8	100	<.2	<2	6	6	7.55	.021	4	32	.31	2	<.01	18	.29	.07	.16	<1
93-12-6-17	<1	3	<2	24	.1	53	8	678	8.53	2	<5	<2	5	278	.6	<2	<2	3	13.95	.014	4	18	.90	4	<.01	6	.13	.03	.06	1
93-12-6-18	1	4	3	2	.1	11	<1	35	.11	<2	<5	<2	<2	131	<.2	<2	<2	<2	17.17	.003	<2	18	17.84	21	<.01	13	.08	.09	.01	<1
93-12-7-1	1	14	4	2	.1	29	2	142	.22	4	5	<2	<2	103	.2	2	<2	2	23.27	.003	<2	69	11.54	5	<.01	17	.10	.37	.04	1
STANDARD C	19	65	37	131	7.0	69	31	1058	3.94	42	23	8	38	53	17.3	15	18	59	.47	.082	41	62	.92	201	.09	33	1.86	.06	.15	10

Sample type: PULP. Samples beginning 'RE' are duplicate samples.

SAMPLE#	Mo ppm	Cu ppm	Pb ppm	Zn ppm	Ag ppm	Ni ppm	Co ppm	Mn ppm	Fe %	As ppm	U ppm	Au ppm	Th ppm	Sr ppm	Cd ppm	Sb ppm	Bi ppm	V ppm	Ca %	P %	La ppm	Cr ppm	Mg %	Ba ppm	Ti %	B ppm	Al %	Na %	K %	W ppm
93-12-7-2	7	18	6	3	.1	33	2	63	.42	3	<5	<2	3	257	<.2	2	<2	9	26.44	.011	<2	28	1.63	5	<.01	13	.07	.11	.05	<1
93-12-7-3	1	7	3	4	<.1	32	5	91	.35	3	<5	<2	4	242	<.2	2	<2	3	30.72	.033	3	11	3.56	7	<.01	27	.25	.13	.10	1
93-12-7-4	1	14	16	35	<.1	34	4	141	.46	2	<5	<2	2	491	.3	3	<2	4	34.91	.025	2	15	1.45	23	<.01	32	.30	.73	.12	1
93-12-7-5	<1	7	9	51	.1	11	2	131	.13	3	<5	<2	2	312	.3	4	<2	<2	31.59	.019	<2	5	.94	7	<.01	10	.10	5.66	.05	1
93-12-7-6	1	<1	3	2	<.1	4	<1	37	.03	2	<5	<2	3	232	<.2	<2	<2	<2	22.59	.003	<2	8	19.66	2	<.01	16	.04	.18	.04	1
93-12-7-7	<1	1	4	5	<.1	7	1	41	.09	<2	<5	<2	2	214	<.2	<2	<2	<2	21.80	.004	<2	9	17.23	5	<.01	18	.10	.73	.05	1
93-12-7-8	1	2	5	4	<.1	12	2	34	.16	2	<5	<2	3	197	<.2	<2	<2	2	21.86	.003	<2	20	19.48	7	<.01	42	.25	.04	.09	<1
93-12-8-1	1	1	4	1	<.1	3	<1	13	.02	2	<5	<2	3	177	<.2	<2	<2	<2	25.65	.002	<2	11	16.19	2	<.01	13	.04	.03	.01	1
93-12-8-2	1	3	2	4	.2	7	3	36	.11	3	<5	<2	3	878	.4	3	<2	2	25.88	.004	<2	13	11.52	28	<.01	319	.13	.08	.05	2
93-12-8-3	1	1	6	1	<.1	2	<1	10	.01	2	<5	<2	2	464	<.2	3	<2	<2	37.15	.001	<2	6	2.47	3	<.01	126	.03	.52	.02	<1
93-12-8-4	2	2	2	1	<.1	<1	<1	13	.02	2	<5	<2	4	471	<.2	3	<2	<2	33.41	.002	<2	10	5.64	5	<.01	23	.03	.03	.01	<1
93-12-8-5	1	1	<2	1	<.1	3	<1	10	.02	2	<5	<2	3	725	<.2	3	<2	<2	37.25	.002	<2	6	2.61	3	<.01	42	.03	.02	.01	<1
93-12-8-6	<1	1	4	1	<.1	<1	<1	2	.01	<2	<5	<2	2	907	<.2	2	<2	<2	21.76	.001	<2	4	1.02	4	<.01	43	.02	.04	.03	<1
93-12-9-1	2	1	3	1	<.1	3	<1	18	.03	4	<5	<2	4	525	<.2	3	<2	<2	30.62	.002	<2	8	6.01	2	<.01	12	.03	.02	<.01	<1
93-12-9-2	<1	1	7	<1	.1	<1	<1	10	.02	<2	<5	<2	<2	516	<.2	3	<2	<2	37.33	.001	<2	9	.85	3	<.01	21	.02	.23	.01	2
93-12-9-3	1	<1	<2	2	<.1	2	<1	13	.02	<2	<5	<2	3	530	<.2	4	<2	<2	34.03	.001	<2	7	2.19	2	<.01	19	.02	1.83	.01	<1
93-12-9-4	1	1	8	<1	.1	2	<1	2	.02	4	<5	<2	4	842	<.2	3	<2	<2	20.34	<.001	<2	7	.17	2	<.01	15	.02	.05	.02	<1
93-12-9-5	<1	1	3	1	<.1	2	<1	7	.01	<2	<5	<2	<2	705	<.2	2	<2	<2	36.65	.001	<2	8	1.99	4	<.01	108	.05	.04	.02	2
RE 93-12-9-5	<1	1	3	1	<.1	<1	<1	8	.02	3	<5	<2	<2	708	<.2	2	<2	<2	38.00	.002	<2	10	2.14	4	<.01	113	.04	.04	.02	2
93-12-9-6	1	1	3	1	<.1	8	<1	17	.03	2	<5	<2	3	94	<.2	<2	<2	2	22.88	.003	<2	21	16.28	3	<.01	216	.09	.30	.03	1
93-12-9-7	1	<1	6	7	.1	2	<1	18	.02	<2	<5	<2	4	402	<.2	2	<2	<2	22.72	.002	<2	10	14.30	2	<.01	18	.02	.05	.02	1
93-12-9-8	1	2	5	3	<.1	6	<1	19	.03	2	<5	<2	3	185	<.2	<2	<2	2	21.41	.003	<2	16	17.14	<2	<.01	12	.04	.04	.01	1
STANDARD C	19	62	42	130	6.6	67	31	1074	3.95	42	18	7	36	52	16.8	15	19	57	.51	.087	38	61	.92	183	.08	38	1.87	.06	.14	10

Sample type: PULP. Samples beginning 'RE' are duplicate samples.

GEOCHEMICAL ANALYSIS CERTIFICATE

Loring Laboratories Ltd. PROJECT 36287 File # 93-3770 Page 1

629 Beaverdam Road N.E., Calgary AB T2K 4W7

SAMPLE#	Mo ppm	Cu ppm	Pb ppm	Zn ppm	Ag ppm	Ni ppm	Co ppm	Mn ppm	Fe %	As ppm	U ppm	Au ppm	Th ppm	Sr ppm	Cd ppm	Sb ppm	Bi ppm	V ppm	Ca %	P %	La ppm	Cr ppm	Mg %	Ba ppm	Ti %	B ppm	Al %	Na %	K %	W ppm
93-12-9-9	<1	<1	<2	<1	<.1	1	<1	<2	.05	<2	<5	<2	<2	595	<.2	<2	<2	<2	14.82	.001	<2	4	.38	3	<.01	12	<.01	.02	.01	<1
93-12-9-10	<1	3	<2	<1	.2	3	<1	6	.01	2	<5	<2	<2	805	<.2	2	<2	<2	41.65	<.001	<2	3	.75	2	<.01	25	.01	.90	<.01	1
93-12-9-11	1	2	2	62	.2	6	<1	6	.02	3	<5	<2	<2	593	1.2	4	<2	<2	47.68	.001	<2	9	.90	4	<.01	126	.02	.05	.02	1
93-12-9-12	2	1	<2	3	.2	11	<1	16	.02	4	<5	<2	<2	381	<.2	<2	<2	2	22.70	.001	<2	10	12.01	9	<.01	5	.02	.02	<.01	1
93-12-9-13	1	1	<2	2	.2	11	<1	10	.01	4	<5	<2	<2	292	<.2	4	<2	<2	36.50	.002	<2	8	4.49	4	<.01	262	.04	.06	.02	1
93-12-9-14	<1	1	<2	2	<.1	8	<1	2	<.01	3	<5	<2	<2	828	<.2	<2	<2	<2	53.96	.001	<2	7	1.25	3	<.01	6	.01	1.83	<.01	1
93-12-13-1	<1	9	4	30	<.1	22	4	7911	19.89	10	<5	<2	2	98	1.3	<2	<2	12	4.45	.076	6	20	1.90	65	<.01	54	.79	.16	.32	<1
93-12-13-2	<1	4	3	5	<.1	10	2	350	.80	3	<5	<2	<2	234	<.2	<2	<2	2	41.55	.005	2	6	.49	12	<.01	13	.24	.05	.08	<1
93-12-13-3	<1	2	<2	<1	.2	9	<1	42	.06	3	<5	<2	<2	85	<.2	<2	<2	<2	19.69	.002	<2	7	15.94	2	<.01	12	.04	2.45	.02	<1
93-12-14-1	<1	4	4	1	.2	11	1	81	.21	6	<5	<2	<2	76	<.2	<2	<2	<2	20.82	.033	<2	6	16.99	2	<.01	12	.03	.07	.03	1
93-12-14-2	1	20	5	9	.3	42	8	125	.79	6	<5	<2	2	153	<.2	<2	<2	9	16.51	.011	5	22	14.00	10	.01	122	1.22	.09	.55	<1
93-12-14-3	<1	11	3	3	.1	24	3	85	.16	5	<5	<2	<2	87	.2	<2	<2	2	21.30	.011	<2	14	17.53	3	<.01	16	.08	.09	.04	<1
93-12-14-4	<1	22	10	14	.2	42	13	145	.92	4	<5	<2	3	151	<.2	<2	<2	10	14.70	.015	7	21	13.12	12	.01	148	1.53	.13	.72	<1
93-12-14-5	1	6	3	3	.2	23	5	96	.22	5	<5	<2	<2	60	<.2	<2	<2	3	20.36	.010	<2	18	16.95	4	<.01	17	.16	.04	.06	<1
93-12-14-6	1	4	<2	2	.2	14	3	94	.22	5	<5	<2	<2	60	.2	2	<2	2	21.24	.005	<2	15	17.58	5	<.01	18	.16	.04	.05	1
93-12-14-7	4	8	37	46	<.1	5	7	<2	9.30	<2	300	<2	291	80	<.2	<2	11	39	.66	.132	1860	114	.67	19	.06	62	.62	.17	.21	<1
93-12-14-8	10	11	7	5	<.1	7	2	143	2.61	3	<5	<2	25	77	<.2	2	<2	47	.33	.007	74	72	.27	20	.01	80	.71	7.72	.32	<1
93-12-14-9	9	12	5	17	.1	19	5	103	6.17	2	5	<2	9	76	<.2	<2	<2	118	.33	.009	45	129	.38	43	.06	93	.76	3.81	.53	<1
93-12-14-10	<1	1	<2	6	.2	9	<1	39	.07	4	<5	<2	<2	184	<.2	<2	<2	<2	22.24	.002	<2	6	15.67	2	<.01	34	.05	.75	.02	1
93-12-14-11	<1	2	<2	4	.2	13	1	52	.07	5	<5	<2	<2	59	<.2	<2	<2	<2	19.92	.002	<2	8	16.75	2	<.01	11	.06	2.17	.02	1
93-12-15-1	1	7	4	15	.2	19	4	78	.50	8	<5	<2	<2	266	<.2	5	<2	2	50.59	.003	<2	7	.71	5	<.01	15	.23	.08	.08	1
RE 93-12-15-1	1	7	8	17	.2	16	3	76	.48	8	<5	<2	<2	261	<.2	4	<2	3	46.25	.003	<2	7	.69	5	<.01	14	.23	.08	.09	1
93-12-15-2	<1	3	3	9	.3	10	1	82	.22	5	<5	<2	<2	199	<.2	3	<2	<2	45.09	.003	<2	6	.54	3	<.01	5	.12	.04	.04	2
93-12-15-3	<1	3	<2	11	.1	7	2	70	.24	4	<5	<2	<2	210	<.2	4	<2	2	43.99	.003	<2	6	.59	4	<.01	9	.17	.06	.06	1
93-12-15-4	1	7	4	8	.2	8	3	71	.48	8	<5	<2	<2	212	<.2	4	<2	2	41.79	.002	<2	5	.54	4	<.01	9	.17	.03	.07	1
93-12-15-5	<1	4	2	6	.2	12	2	62	.35	4	<5	<2	<2	233	<.2	4	<2	2	44.79	.001	<2	5	.60	4	<.01	10	.20	.05	.08	1
93-12-15-6	<1	2	2	12	.1	3	1	71	.22	4	<5	<2	<2	217	<.2	2	<2	<2	37.99	.002	<2	4	2.58	2	<.01	2	.05	.07	.02	1
93-12-15-7	<1	2	3	3	.3	6	2	95	.50	5	5	<2	<2	160	<.2	4	<2	<2	45.35	.002	<2	4	1.75	<2	<.01	2	.04	.04	.02	1
93-12-15-8	<1	11	9	20	.3	35	13	135	.90	4	<5	<2	2	120	<.2	4	<2	6	28.00	.010	<2	18	4.33	9	<.01	31	.59	.09	.23	1
93-12-15-9	<1	5	<2	3	.4	8	3	99	.33	4	7	<2	<2	123	<.2	7	<2	3	29.26	.002	<2	10	6.48	3	<.01	9	.11	.11	.04	1
93-12-15-10	<1	2	<2	<1	.1	5	1	62	.15	2	<5	<2	<2	199	<.2	4	<2	<2	33.35	.001	<2	4	1.92	3	<.01	<2	.05	.06	.01	1
93-12-15-11	1	2	<2	2	.1	4	<1	62	.06	2	<5	<2	<2	55	<.2	<2	<2	<2	14.73	.001	<2	5	11.93	3	<.01	4	.02	6.31	.02	1
93-12-15-12	<1	2	<2	3	.3	8	1	72	.10	3	<5	<2	<2	56	<.2	<2	<2	<2	16.59	.002	<2	8	13.82	2	<.01	4	.02	3.23	.01	1
93-12-15-13	<1	2	<2	2	.1	4	<1	72	.10	2	<5	<2	<2	58	<.2	<2	<2	<2	16.28	.001	<2	8	13.65	3	<.01	5	.03	3.14	.02	1
93-12-15-14	1	4	2	4	.2	11	3	74	.24	3	<5	<2	<2	96	<.2	<2	<2	2	15.37	.003	<2	13	12.65	6	<.01	48	.33	.06	.20	1
STANDARD C	18	59	37	127	6.8	63	31	1063	3.96	40	17	7	34	54	18.8	14	21	55	.51	.080	37	58	.90	192	.09	33	1.88	.09	.16	11

ICP - .500 GRAM SAMPLE IS DIGESTED WITH 3ML 3-1-2 HCL-HNO3-H2O AT 95 DEG. C FOR ONE HOUR AND IS DILUTED TO 10 ML WITH WATER.
THIS LEACH IS PARTIAL FOR MN FE SR CA P LA CR MG BA TI B W AND LIMITED FOR NA K AND AL.
- SAMPLE TYPE: PULP   Samples beginning 'RE' are duplicate samples.

Loring Laboratories Ltd. PROJECT 36287 FILE # 93-3770

SAMPLE#	Mo ppm	Cu ppm	Pb ppm	Zn ppm	Ag ppm	Ni ppm	Co ppm	Mn ppm	Fe %	As ppm	U ppm	Au ppm	Th ppm	Sr ppm	Cd ppm	Sb ppm	Bi ppm	V ppm	Ca %	P %	La ppm	Cr ppm	Mg %	Ba ppm	Ti %	B ppm	Al %	Na %	K %	W ppm
93-12-15-15	<1	2	<2	4	.1	4	1	70	.12	3	<5	<2	<2	59	.2	<2	<2	<2	18.00	.002	<2	9	15.13	2	<.01	15	.09	.03	.05	1
93-12-15-16	1	4	<2	5	<.1	1	1	65	.12	2	<5	<2	<2	72	<.2	<2	<2	<2	17.88	.003	<2	9	14.91	3	<.01	15	.07	1.11	.04	1
RE 93-12-15-16	1	6	<2	4	<.1	2	<1	63	.11	3	<5	<2	<2	69	<.2	<2	<2	<2	17.51	.003	<2	8	14.52	2	<.01	14	.07	.99	.04	1
93-12-15-17	1	6	3	5	.1	15	2	63	.17	4	<5	<2	<2	81	<.2	<2	<2	2	16.87	.004	<2	16	14.00	4	<.01	19	.12	.98	.06	1
93-12-15-18	<1	5	<2	6	<.1	16	3	72	.22	4	<5	<2	<2	91	.2	<2	<2	2	18.48	.005	<2	11	15.40	4	<.01	27	.17	.55	.09	1
93-12-15-19	1	2	3	5	<.1	5	1	70	.14	2	<5	<2	<2	48	.2	<2	<2	<2	17.92	.002	<2	11	15.03	3	<.01	8	.04	2.13	.02	<1
93-12-16-1	1	7	12	36	<.1	9	6	568	.67	<2	<5	<2	3	394	.2	<2	<2	10	7.29	.021	8	153	3.15	20	.02	12	.47	4.36	.17	1
93-12-16-2	1	4	9	32	.2	11	5	557	1.19	<2	<5	<2	4	39	<.2	3	<2	21	2.91	.020	11	163	2.86	28	.04	14	.66	5.39	.21	<1
93-12-16-3	1	3	4	17	.1	8	4	730	.80	2	<5	<2	3	132	<.2	<2	<2	13	4.46	.016	9	146	2.48	32	.02	8	.34	5.51	.12	1
93-12-16-4	<1	11	<2	14	<.1	17	7	286	1.01	<2	<5	<2	4	236	<.2	<2	<2	13	9.27	.029	9	59	5.68	18	.02	45	1.06	.39	.52	<1
93-12-16-5	1	14	<2	4	<.1	10	3	216	.88	<2	<5	<2	2	194	<.2	3	<2	5	6.44	.009	5	217	3.17	8	<.01	24	.38	.34	.18	<1
93-12-16-6	1	7	3	3	.1	9	4	36	.47	3	<5	<2	3	42	<.2	2	<2	4	.61	.002	8	327	.11	10	.01	5	.10	.34	.08	<1
93-12-16-7	2	7	3	3	<.1	31	18	33	.61	2	<5	<2	2	180	<.2	4	<2	3	2.23	.002	7	293	.10	7	.01	3	.06	.81	.05	<1
93-12-16-8	1	49	8	2	<.1	9	2	32	.43	2	7	<2	44	24	<.2	3	<2	2	.28	.007	76	377	.07	9	.01	3	.06	.48	.05	<1
93-12-16-9	1	19	12	43	<.1	8	3	162	1.71	<2	9	<2	76	8	<.2	<2	2	11	.23	.055	61	157	.28	20	.15	15	.98	.44	.80	1
93-12-17-1	<1	13	3	41	.1	35	10	496	1.50	5	<5	<2	2	240	<.2	<2	<2	9	19.65	.022	5	14	1.07	32	<.01	29	.69	.15	.31	1
93-12-17-2	<1	4	5	7	.1	9	<1	63	1.15	5	<5	<2	<2	110	<.2	<2	<2	<2	16.71	.002	<2	10	13.49	4	<.01	13	.05	1.66	.03	<1
93-12-17-3	2	5	11	18	<.1	26	1	24	.12	4	<5	<2	<2	367	<.2	<2	<2	4	19.20	.006	<2	8	12.98	5	<.01	110	.12	2.12	.05	1
93-12-17-4	<1	2	5	3	<.1	<1	1	67	.13	4	<5	<2	<2	106	<.2	<2	<2	<2	20.22	.002	<2	9	16.61	3	<.01	29	.05	.21	.02	<1
93-12-17-5	<1	8	<2	15	.1	18	8	530	.97	4	<5	<2	<2	267	<.2	2	<2	4	35.30	.009	4	16	.91	18	<.01	16	.57	.11	.16	1
93-12-17-6	<1	15	2	35	.2	39	16	438	2.69	5	<5	<2	3	253	<.2	2	<2	10	18.20	.022	6	25	1.60	86	<.01	28	1.19	.20	.28	1
93-12-17-7	<1	12	<2	20	<.1	27	10	269	1.23	4	<5	<2	2	297	<.2	<2	<2	6	28.64	.009	3	10	1.55	12	<.01	17	.71	.09	.18	1
93-12-17-8	<1	8	2	30	.1	40	13	411	2.23	4	<5	<2	2	245	<.2	<2	<2	9	20.25	.018	4	23	1.43	124	<.01	26	1.04	.18	.26	<1
93-12-17-9	2	18	29	14	.1	28	6	340	2.36	9	<5	<2	<2	226	<.2	<2	<2	4	32.34	.020	5	13	.74	42	<.01	15	.46	.08	.14	1
93-12-17-10	2	10	11	22	.1	7	2	181	.85	9	<5	<2	<2	226	<.2	<2	<2	<2	42.10	.005	2	4	.56	6	<.01	5	.09	.05	.03	1
93-12-17-11	<1	1	3	22	.1	<1	<1	85	.12	2	<5	<2	<2	802	<.2	2	<2	<2	12.37	.002	<2	<1	3.30	11	<.01	7	.01	.02	.01	1
93-12-20-1	<1	1	2	1	.1	<1	<1	58	.05	3	<5	<2	<2	560	<.2	2	<2	<2	45.53	.001	<2	4	.44	21	<.01	<2	<.01	.01	.01	1
93-12-20-2	<1	1	<2	2	.1	<1	<1	65	.09	3	<5	<2	<2	209	<.2	3	<2	<2	45.19	.001	<2	3	.95	5	<.01	<2	.01	.03	<.01	1
93-12-20-3	<1	2	6	61	.3	1	1	57	.12	5	<5	<2	<2	787	.7	4	<2	<2	61.40	.002	<2	4	.79	252	<.01	<2	.04	.02	.03	1
93-12-20-4	<1	2	2	4	.2	7	1	30	.11	5	<5	<2	<2	383	<.2	4	<2	<2	40.36	.003	2	4	.59	75	<.01	3	.08	.03	.04	2
93-12-20-5	2	6	2	4707	.3	4	1	83	.37	3	<5	<2	<2	150	17.4	3	<2	<2	20.01	.001	<2	83	1.05	58	<.01	<2	.02	.03	<.01	<1
93-12-20-6	1	3	5187	24	.2	11	1	55	.20	18	<5	<2	<2	207	.2	9	<2	3	35.44	.001	<2	15	.85	79	<.01	<2	.03	.02	.01	1
93-12-20-7	<1	1	8	5	.2	1	1	60	.13	4	<5	<2	<2	163	.2	3	<2	2	42.86	.001	<2	2	1.94	24	<.01	<2	.01	.01	<.01	1
93-12-20-8	2	2	4	250	.1	5	1	52	.26	5	<5	<2	<2	571	.5	4	<2	2	19.50	.001	<2	44	1.36	4	<.01	14	.04	.04	.01	<1
93-12-20-9	<1	2	5	33	.1	2	1	76	.06	4	<5	<2	<2	366	<.2	2	<2	<2	46.01	<.001	<2	9	.35	6	<.01	<2	.03	.04	.01	2
STANDARD C	19	61	37	131	6.7	65	32	1024	3.97	41	14	7	37	55	19.7	19	20	56	.52	.082	38	59	.91	194	.09	34	1.89	.09	.16	10

Sample type: PULP. Samples beginning 'RE' are duplicate samples.

Appendix III : ICP Data from Northwest Alberta

Loring Laboratories Ltd. PROJECT 36287 FILE # 93-3770

SAMPLE#	Mo ppm	Cu ppm	Pb ppm	Zn ppm	Ag ppm	Ni ppm	Co ppm	Mn ppm	Fe %	As ppm	U ppm	Au ppm	Th ppm	Sr ppm	Cd ppm	Sb ppm	Bi ppm	V ppm	Ca %	P %	La ppm	Cr ppm	Mg %	Ba ppm	Ti %	B ppm	Al %	Na %	K %	W ppm
93-12-15-15	<1	2	<2	4	.1	4	1	70	.12	3	<5	<2	<2	59	.2	<2	<2	<2	18.00	.002	<2	9	15.13	2	<.01	15	.09	.03	.05	1
93-12-15-16	1	4	<2	5	<.1	1	1	65	.12	2	<5	<2	<2	72	<.2	<2	<2	<2	17.88	.003	<2	9	14.91	3	<.01	15	.07	1.11	.04	1
RE 93-12-15-16	1	6	<2	4	<.1	2	<1	63	.11	3	<5	<2	<2	69	<.2	<2	<2	<2	17.51	.003	<2	8	14.52	2	<.01	14	.07	.99	.04	1
93-12-15-17	1	6	3	5	.1	15	2	63	.17	4	<5	<2	<2	81	<.2	<2	<2	2	16.87	.004	<2	16	14.00	4	<.01	19	.12	.98	.06	1
93-12-15-18	<1	5	<2	6	<.1	16	3	72	.22	4	<5	<2	<2	91	.2	<2	<2	2	18.48	.005	<2	11	15.40	4	<.01	27	.17	.55	.09	1
93-12-15-19	1	2	3	5	<.1	5	1	70	.14	2	<5	<2	<2	48	.2	<2	<2	<2	17.92	.002	<2	11	15.03	3	<.01	8	.04	2.13	.02	<1
93-12-16-1	1	7	12	36	<.1	9	6	568	.67	<2	<5	<2	3	394	.2	<2	<2	10	7.29	.021	8	153	3.15	20	.02	12	.47	4.36	.17	1
93-12-16-2	1	4	9	32	.2	11	5	557	1.19	<2	<5	<2	4	39	<.2	3	<2	21	2.91	.020	11	163	2.86	28	.04	14	.66	5.39	.21	<1
93-12-16-3	1	3	4	17	.1	8	4	730	.80	2	<5	<2	3	132	<.2	<2	<2	13	4.46	.016	9	146	2.48	32	.02	8	.34	5.51	.12	1
93-12-16-4	<1	11	<2	14	<.1	17	7	286	1.01	<2	<5	<2	4	236	<.2	<2	<2	13	9.27	.029	9	59	5.68	18	.02	45	1.06	.39	.52	<1
93-12-16-5	1	14	<2	4	<.1	10	3	216	.88	<2	<5	<2	2	194	<.2	3	<2	5	6.44	.009	5	217	3.17	8	<.01	24	.38	.34	.18	<1
93-12-16-6	1	7	3	3	.1	9	4	36	.47	3	<5	<2	3	42	<.2	2	<2	4	.61	.002	8	327	.11	10	.01	5	.10	.34	.08	<1
93-12-16-7	2	7	3	3	<.1	31	18	33	.61	2	<5	<2	2	180	<.2	4	<2	3	2.23	.002	7	293	.10	7	.01	3	.06	.81	.05	<1
93-12-16-8	1	49	8	2	<.1	9	2	32	.43	2	7	<2	44	24	<.2	3	<2	2	.28	.007	76	377	.07	9	.01	3	.06	.48	.05	<1
93-12-16-9	1	19	12	43	<.1	8	3	162	1.71	<2	9	<2	76	8	<.2	<2	2	11	.23	.055	61	157	.28	20	.15	15	.98	.44	.80	1
93-12-17-1	<1	13	3	41	.1	35	10	496	1.50	5	<5	<2	2	240	<.2	<2	<2	9	19.65	.022	5	14	1.07	32	<.01	29	.69	.15	.31	1
93-12-17-2	<1	4	5	7	.1	9	<1	63	1.15	5	<5	<2	<2	110	<.2	<2	<2	<2	16.71	.002	<2	10	13.49	4	<.01	13	.05	1.66	.03	<1
93-12-17-3	2	5	11	18	<.1	26	1	24	.12	4	<5	<2	<2	367	<.2	<2	<2	4	19.20	.006	<2	8	12.98	5	<.01	110	.12	2.12	.05	1
93-12-17-4	<1	2	5	3	<.1	<1	1	67	.13	4	<5	<2	<2	106	<.2	<2	<2	<2	20.22	.002	<2	9	16.61	3	<.01	29	.05	.21	.02	<1
93-12-17-5	<1	8	<2	15	.1	18	8	530	.97	4	<5	<2	<2	267	<.2	2	<2	4	35.30	.009	4	16	.91	18	<.01	16	.57	.11	.16	1
93-12-17-6	<1	15	2	35	.2	39	16	438	2.69	5	<5	<2	3	253	<.2	2	<2	10	18.20	.022	6	25	1.60	86	<.01	28	1.19	.20	.28	1
93-12-17-7	<1	12	<2	20	<.1	27	10	269	1.23	4	<5	<2	2	297	<.2	<2	<2	6	28.64	.009	3	10	1.55	12	<.01	17	.71	.09	.18	1
93-12-17-8	<1	8	2	30	.1	40	13	411	2.23	4	<5	<2	2	245	<.2	<2	<2	9	20.25	.018	4	23	1.43	124	<.01	26	1.04	.18	.26	<1
93-12-17-9	2	18	29	14	.1	28	6	340	2.36	9	<5	<2	<2	226	<.2	<2	<2	4	32.34	.020	5	13	.74	42	<.01	15	.46	.08	.14	1
93-12-17-10	2	10	11	22	.1	7	2	181	.85	9	<5	<2	<2	226	<.2	<2	<2	<2	42.10	.005	2	4	.56	6	<.01	5	.09	.05	.03	1
93-12-17-11	<1	1	3	22	.1	<1	<1	85	.12	2	<5	<2	<2	802	<.2	2	<2	<2	12.37	.002	<2	<1	3.30	11	<.01	7	.01	.02	.01	1
93-12-20-1	<1	1	2	1	.1	<1	<1	58	.05	3	<5	<2	<2	560	<.2	2	<2	<2	45.53	.001	<2	4	.44	21	<.01	<2	<.01	.01	.01	1
93-12-20-2	<1	1	<2	2	.1	<1	<1	65	.09	3	<5	<2	<2	209	<.2	3	<2	<2	45.19	.001	<2	3	.95	5	<.01	<2	.01	.03	<.01	1
93-12-20-3	<1	2	6	61	.3	1	1	57	.12	5	<5	<2	<2	787	.7	4	<2	<2	61.40	.002	<2	4	.79	252	<.01	<2	.04	.02	.03	1
93-12-20-4	<1	2	2	4	.2	7	1	30	.11	5	<5	<2	<2	383	<.2	4	<2	<2	40.36	.003	2	4	.59	75	<.01	3	.08	.03	.04	2
93-12-20-5	2	6	2	4707	.3	4	1	83	.37	3	<5	<2	<2	150	17.4	3	<2	<2	20.01	.001	<2	83	1.05	58	<.01	<2	.02	.03	<.01	<1
93-12-20-6	1	3	5187	24	.2	11	1	55	.20	18	<5	<2	<2	207	.2	9	<2	3	35.44	.001	<2	15	.85	79	<.01	<2	.03	.02	.01	1
93-12-20-7	<1	1	8	5	.2	1	1	60	.13	4	<5	<2	<2	163	.2	3	<2	2	42.86	.001	<2	2	1.94	24	<.01	<2	.01	.01	<.01	1
93-12-20-8	2	2	4	250	.1	5	1	52	.26	5	<5	<2	<2	571	.5	4	<2	2	19.50	.001	<2	44	1.36	4	<.01	14	.04	.04	.01	<1
93-12-20-9	<1	2	5	33	.1	2	1	76	.06	4	<5	<2	<2	366	<.2	2	<2	<2	46.01	<.001	<2	9	.35	6	<.01	<2	.03	.04	.01	2
STANDARD C	19	61	37	131	6.7	65	32	1024	3.97	41	14	7	37	55	19.7	19	20	56	.52	.082	38	59	.91	194	.09	34	1.89	.09	.16	10

Sample type: PULP. Samples beginning 'RE' are duplicate samples.

SAMPLE#	Mo ppm	Cu ppm	Pb ppm	Zn ppm	Ag ppm	Ni ppm	Co ppm	Mn ppm	Fe %	As ppm	U ppm	Au ppm	Th ppm	Sr ppm	Cd ppm	Sb ppm	Bi ppm	V ppm	Ca %	P %	La ppm	Cr ppm	Mg %	Ba ppm	Ti %	B ppm	Al %	Na %	K %	W ppm
93-12-20-10	<1	2	222	6	.3	1	1	54	.15	4	<5	<2	<2	333	<.2	2	<2	<2	38.14	.001	<2	2	.51	7	<.01	5	.03	.02	.01	<1
93-12-20-11	1	2	5	6	.3	2	1	6	.14	6	<5	<2	<2	519	<.2	2	<2	<2	30.40	.002	<2	1	.41	2	<.01	8	.04	.02	.01	<1
93-12-20-12	<1	2	3	1	.3	2	1	10	.11	7	<5	<2	<2	198	<.2	<2	<2	<2	32.59	.001	<2	5	3.01	2	<.01	4	.04	.02	.01	<1
RE 93-12-20-12	<1	2	4	<1	.2	1	1	8	.10	2	<5	<2	<2	202	<.2	<2	<2	<2	33.40	.001	<2	6	2.99	2	<.01	5	.03	.02	.01	<1
STANDARD C	18	63	37	115	6.7	64	29	1052	4.00	39	19	6	37	55	17.4	13	19	51	.49	.079	37	66	.89	196	.09	32	1.89	.08	.16	10

Sample type: PULP. Samples beginning 'RE' are duplicate samples.

GEOCHEMICAL ANALYSIS CERTIFICATE

Loring Laboratories Ltd. PROJECT 36384 File # 94-0454

629 Beaverdam Road N.E., Calgary AB T2K 4W7

SAMPLE#	Mo ppm	Cu ppm	Pb ppm	Zn ppm	Ag ppm	Ni ppm	Co ppm	Mn ppm	Fe %	As ppm	U ppm	Au ppm	Th ppm	Sr ppm	Cd ppm	Sb ppm	Bi ppm	V ppm	Ca %	P %	La ppm	Cr ppm	Mg %	Ba ppm	Ti %	B ppm	Al %	Na %	K %	W ppm
94-01-20-01	<1	2	1064	1122	.3	5	<1	105	9.71	12	<5	<2	4	28	2.8	<2	<2	<2	7.57	.003	<2	22	10.65	4	<.01	15	.04	.03	.02	<1
94-01-20-02	4	6	30	15601	<.1	36	2	136	.44	5	<5	<2	4	62	36.5	<2	2	2	14.15	.004	<2	11	13.63	4	<.01	11	.08	.04	.04	<1
94-01-20-03	2	<1	675	37633	.1	17	<1	180	4.98	4	<5	<2	5	24	64.8	2	<2	<2	14.45	.001	<2	15	14.21	4	<.01	11	.03	.03	.01	2
94-01-20-04	6	17	246	99999	<.1	48	4	106	1.55	25	8	<2	5	23	<.2	<2	5	4	9.97	.006	<2	17	10.31	5	<.01	24	.16	.05	.10	1
94-01-20-05	2	<1	732	1246	<.1	18	<1	135	7.11	3	<5	<2	4	33	3.2	<2	<2	<2	14.88	.002	<2	23	15.51	2	<.01	12	.04	.03	.02	<1
94-01-20-06	1	1	12	255	<.1	21	<1	134	1.53	2	<5	<2	10	192	.4	<2	<2	3	34.45	.008	<2	3	.32	47	<.01	5	.03	.01	.02	<1
94-01-20-07	2	24	31	101	.2	105	26	34	8.48	12	<5	<2	5	45	.3	<2	<2	7	2.54	.056	2	38	1.54	6	<.01	71	.82	.20	.54	<1
94-01-20-08	1	5	4	19	.1	13	<1	97	.11	5	<5	<2	3	38	<.2	<2	3	2	15.99	.002	2	4	15.29	17	<.01	<2	.05	.03	.02	<1
94-01-20-09	3	3	3	118	.3	10	<1	96	.13	5	<5	<2	4	247	<.2	<2	<2	<2	19.32	.003	<2	11	13.74	6	<.01	5	.04	.02	.02	<1
94-01-20-10	1	2	19	1435	.1	17	<1	132	.17	3	<5	<2	4	36	4.0	<2	<2	<2	18.13	.003	<2	3	17.82	2	<.01	4	.01	.03	.01	<1
94-01-24-01	3	1	2	27	.2	14	<1	22	.06	5	<5	<2	4	44	.2	<2	<2	<2	19.07	.001	<2	10	16.53	9	<.01	333	.15	.08	.04	<1
94-01-24-02	2	2	<2	19	.2	14	2	20	.07	8	<5	<2	4	78	<.2	<2	<2	<2	19.01	<.001	<2	5	17.69	4	<.01	7	.05	.02	.02	<1
94-01-24-03	<1	3	4	16	.5	10	<1	16	.06	7	<5	<2	9	322	<.2	2	<2	<2	32.76	.002	<2	2	.48	6	<.01	5	.05	.01	.03	1
94-01-24-04	3	1	5	9	.2	21	1	25	.23	4	<5	<2	4	71	<.2	<2	<2	2	18.34	.003	<2	8	13.87	6	<.01	15	.30	.05	.13	<1
RE 94-01-24-04	3	3	<2	8	.2	19	1	28	.24	6	<5	<2	3	73	<.2	<2	<2	2	19.01	.004	<2	8	14.34	5	<.01	18	.32	.05	.14	<1
94-01-24-05	<1	1	<2	7	.2	7	<1	11	.03	5	<5	<2	9	256	<.2	<2	2	<2	36.44	.001	<2	1	.68	2	<.01	11	.04	.01	.02	<1
94-01-24-06	<1	1	<2	5	.4	12	<1	8	<.01	9	<5	<2	4	349	.2	<2	<2	<2	17.53	<.001	<2	1	7.52	4	<.01	6	<.01	.01	<.01	<1
94-01-24-07	<1	8	14	17	.2	74	17	74	3.31	10	<5	<2	4	80	<.2	2	<2	7	6.76	.007	2	24	.79	9	<.01	106	.90	.16	.61	1
94-01-24-08	2	<1	5	7	.2	11	<1	20	.06	3	6	<2	4	84	<.2	<2	3	<2	20.45	.001	<2	4	17.37	<2	<.01	8	.07	.02	.03	<1
94-01-24-09	2	4	<2	4	.2	8	<1	17	.03	3	<5	<2	3	308	<.2	<2	<2	<2	19.81	<.001	<2	7	14.15	5	<.01	<2	.03	.01	.01	<1
94-01-24-10	2	1	11	16	.1	10	3	13	.03	4	<5	<2	3	54	.2	<2	2	<2	19.65	.002	<2	6	15.81	277	<.01	8	.05	.01	.02	<1
94-01-24-11	3	3	<2	7	.2	7	<1	25	.09	7	<5	<2	4	129	.3	<2	<2	<2	25.47	.002	<2	6	10.90	28	<.01	3	.04	.01	.01	<1
94-01-31-01	1	2	4	5	.2	2	<1	10	.02	5	<5	<2	7	235	.3	<2	<2	<2	34.30	.001	<2	8	1.94	13	<.01	4	.02	.01	<.01	<1
94-01-31-02	1	4	21	118	.1	19	12	481	1.46	13	<5	<2	8	325	.2	<2	2	2	36.60	.034	2	5	.62	72	<.01	7	.14	.02	.05	<1
94-01-31-03	<1	2	9	42	.3	6	1	194	.32	5	<5	<2	9	841	<.2	<2	<2	<2	39.87	.010	2	4	.56	219	<.01	6	.06	.02	.02	<1
94-01-31-04	1	1	11	3	.1	1	<1	135	.30	5	5	<2	7	347	<.2	<2	<2	<2	38.63	.002	<2	3	.63	64	<.01	4	.03	.03	.01	<1
94-01-31-05	1	2	4	151	.2	7	<1	71	.41	6	5	<2	9	296	1.3	<2	<2	3	43.05	.001	2	3	.37	70	<.01	5	.02	.02	.01	<1
94-02-01-01	<1	1	2	5	.1	16	<1	33	.14	8	<5	<2	5	263	<.2	<2	<2	2	30.16	.001	2	3	3.63	10	<.01	20	.09	.05	.04	<1
94-02-01-02	1	4	<2	6	.3	5	2	231	1.05	10	<5	<2	7	59	.7	<2	3	3	38.13	.009	4	8	.26	7	<.01	13	.12	.02	.07	<1
94-02-01-03	2	3	3	3	.1	6	<1	97	.10	6	<5	<2	3	29	<.2	<2	<2	<2	19.72	.002	<2	6	18.39	3	<.01	3	.02	.02	<.01	<1
94-02-01-04	1	<1	7	3	.2	13	<1	107	.16	6	<5	<2	2	29	<.2	<2	<2	<2	20.12	.002	<2	3	19.02	2	<.01	<2	.03	.02	.01	<1
STANDARD C	20	61	37	129	6.7	72	31	1011	3.96	42	19	7	35	56	18.3	15	20	55	.45	.094	38	59	.90	195	.09	33	1.88	.06	.14	11

ICP - .500 GRAM SAMPLE IS DIGESTED WITH 3ML 3-1-2 HCL-HNO3-H2O AT 95 DEG. C FOR ONE HOUR AND IS DILUTED TO 10 ML WITH WATER.
THIS LEACH IS PARTIAL FOR MN FE SR CA P LA CR MG BA TI B W AND LIMITED FOR NA K AND AL.
- SAMPLE TYPE: PULP <u>Samples beginning 'RE' are duplicate samples.</u>

Appendix IV : Gold Assay Results (Northeast Alberta)

To: MR. ANDREW TURNER,
42 Edgedale Court N.W.,
Calgary, Alberta
T2A 2R1

File No. 36287-2
Date February 28, 1994
Samples Pulp
MDA PROJECT M93-04-032

Certificate of Assay
LORING LABORATORIES LTD.

Page # 1

SAMPLE NO.	PPB GOLD
"Gold Analyses"	
93-10-20-01	<5
02	<5
03	<5
04	<5
05	8
06	<5
07	<5
08	<5
09	<5
10	<5
11	<5
12	<5
13	<5
14	<5
93-10-21-01	<5
02	<5
03	<5
04	<5
05	<5
06	<5
07	<5
08	<5
09	<5
10	<5
11	<5
12	<5
13	5
14	<5
15	<5
16	<5

I Hereby Certify that the above results are those assays made by me upon the herein described samples....

Rejects retained one month.
Pulps retained one month
unless specific arrangements
are made in advance.

Assayer

To: MR. ANDREW TURNER,
42 Edgedale Court N.W.,
Calgary, Alberta
T2A 2R1

File No. 36287-2
Date February 28, 1994
Samples Pulp
MDA PROJECT M93-04-032

Certificate of Assay
LORING LABORATORIES LTD.

SAMPLE NO.	PPB GOLD
93-10-21-17	<5
18	<5
19	57
20	<5
21	<5
22	<5
23	<5
24	<5
93-10-22-01	<5
02	<5
03	<5
04	<5
05	<5
06	<5
07	<5
08	<5
93-10-25-01	<5
02	<5
03	<5
04	<5
05	<5
06	<5
07	<5
08	<5
09	<5
10	5
11	<5
12	<5
13	<5
14	<5
15	5
16	<5

I Hereby Certify that the above results are those assays made by me upon the herein described samples....

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T2A 2R1

File No. 36287-2
Date February 28, 1994
Samples Pulp
MDA PROJECT M93-04-032

Certificate of Assay
LORING LABORATORIES LTD.

SAMPLE NO.	PPB GOLD
93-10-25-17	<5
18	<5
19	<5
20	<5
21	<5
22	<5
23	<5
24	<5
25	<5
93-10-26-01	<5
02	<5
03	<5
04	<5
05	<5
06	<5
07	<5
08	<5
09	<5
10	<5
11	<5
12	15
13	<5
14	<5
15	<5
16	<5
93-10-27-01	<5
02	<5
03	<5
04	<5
05	<5
06	<5
07	<5

I Hereby Certify that the above results are those assays made by me upon the herein described samples....

Rejects retained one month.
Pulps retained one month unless specific arrangements are made in advance.

Assayer

To: MR. ANDREW TURNER,
42 Edgedale Court N.W.,
Calgary, Alberta
T2A 2R1

File No. 36287-2
Date February 28, 1994
Samples Pulp
MDA PROJECT M93-04-032

Certificate of Assay
LORING LABORATORIES LTD.

SAMPLE NO.	PPB GOLD
93-10-27-08	<5
09	<5
10	<5
11	<5
12	<5
13	<5
14	<5
93-10-28-01	<5
02	5
03	<5
04	<5
05	<5
06	<5
07	<5
08	<5
09	<5
10	<5
11	<5
12	<5
13	<5
14	6
15	<5
16	<5
17	<5
18	<5
19	37
20	<5
21	<5
22	<5
23	<5
24	<5
93-11-02-25	<5

I Hereby Certify that the above results are those assays made by me upon the herein described samples....

Rejects retained one month.
Pulps retained one month
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Assayer

To: MR. ANDREW TURNER,
42 Edgedale Court N.W.,
Calgary, Alberta
T2A 2R1

File No. 36287-2
Date February 28, 1994
Samples Pulp
MDA PROJECT M93-04-032

Certificate of Assay
LORING LABORATORIES LTD.

Page # 5

SAMPLE NO.	PPB GOLD
93-11-02-26	6
27	<5
93-11-09-12	<5
13	<5
93-11-10-07	<5
93-11-17-01	<5
02	<5
03	<5
04	<5
05	<5
06	<5
07	<5
08	<5
09	<5
10	<5
11	<5
12	<5
13	<5
14	<5
15	<5
16	<5
93-11-18-01	<5
02	<5
03	<5
04	<5
05	<5
06	<5
07	<5
08	<5
09	<5
10	<5
11	<5

I Hereby Certify that the above results are those assays made by me upon the herein described samples....

Rejects retained one month.
Pulps retained one month
unless specific arrangements
are made in advance.

Assayer

TO: MR. ANDREW TURNER,
42 Edgedale Court N.W.,
Calgary, Alberta
T2A 2R1

File No. 36287-2
Date February 28, 1994
Samples Pulp
MDA PROJECT M93-04-032

Certificate of Assay
LORING LABORATORIES LTD.

SAMPLE NO.	PPB GOLD
93-11-18-12	<5
13	<5
93-11-19-01	<5
02	<5
03	<5
04	<5
05	<5
06	<5
07	<5
08	<5
09	<5
10	<5
11	<5
12	<5
13	<5
14	<5
93-11-22-01	<5
02	<5
03	<5
04	<5
05	<5
06	<5
07	<5
08	<5
09	<5
10	<5
11	<5
12	<5
13	<5
14	<5
15	<5
16	<5

I Hereby Certify that the above results are those assays made by me upon the herein described samples....

Rejects retained one month.
'ulps retained one month
unless specific arrangements
are made in advance.

Assayer

To: MR. ANDREW TURNER,
42 Edgedale Court N.W.,
Calgary, Alberta
T2A 2R1

File No. 36287-2
Date February 28, 1994
Samples Pulp
MDA PROJECT M93-04-032

Certificate of Assay
LORING LABORATORIES LTD.

SAMPLE NO.	PPB GOLD
93-11-22-17	<5
18	<5
19	<5
20	<5
21	<5
22	<5
23	<5
24	<5
25	<5
93-11-23-09	<5
10	<5
11	<5
12	<5
93-11-25-09	<5
10	<5
11	<5
12	<5
13	<5
14	<5
15	<5
93-11-26-01	<5
02	35
03	<5
04	<5
05	<5
06	<5
07	<5
08	<5
09	<5
93-12-06-16	<5
17	<5
18	<5

I Hereby Certify that the above results are those assays made by me upon the herein described samples....

Rejects retained one month.
Pulps retained one month
unless specific arrangements
are made in advance.

Assayer

To: MR. ANDREW TURNER,
42 Edgedale Court N.W.,
Calgary, Alberta
T2A 2R1

File No. 36287-2
Date February 28, 1994
Samples Pulp
MDA PROJECT M93-04-032

Certificate of Assay
LORING LABORATORIES LTD.

SAMPLE NO.	PPB GOLD
93-12-14-07	<5
08	<5
09	<5
10	<5
11	<5
93-12-16-01	<5
02	<5
03	<5
04	<5
05	<5
06	<5
07	<5
08	<5
09	<5
93-12-17-01	<5
02	<5
03	<5
04	<5
05	<5
06	<5
07	<5
08	<5
09	<5
10	<5
11	<5

I Hereby Certify that the above results are those assays made by me upon the herein described samples....

Rejects retained one month.
Pulps retained one month
unless specific arrangements
are made in advance.

Assayer

Appendix V : List of Wells Examined and Geological Logs

WELL LOCATIONS	CORED INTERVAL(S) (feet)	SAMPLE NUMBERS
within study area (Northeast Alberta)		
07-11-67-06W4	1305m - 1331.75	n/s
10-11-67-12W4	4768-4821	93-12-16-04/09
13-17-67-23W4	253' from 14 intervals	93-11-23-01/12
11-26-69-10W4	2124-2284	93-12-15-01/19
	3342-3482	
05-25-69-20W4	381' from 13 intervals	93-12-06-01/09
07-08-71-11W4	1905-55, 2049-99	93-11-02-01/17
06-26-72-11W4	1902-2020	93-10-14-01/15
10-24-72-17W4	890-1706	93-12-03-08/09
09-25-73-05W4	777m - 794.4m	93-12-06-10/14
03-30-74-10W4	1846-2026	93-10-15-01/14
		93-10-18-01-12
01-28-75-03W4	2195-2323	93-10-12-01/23
02-34-75-11W4	3196-3245	93-10-13-01/10
10-22-76-01W4	1851-1939	93-11-10-08/15
01-25-76-01W4	1700-1790	93-11-05-01/06
07-24-76-18W4	1927-57, 3728-78	93-11-10-01/07
	3830-40, 4630-41	
03-07-77-07W4	726m - 744m	93-11-01-11/18
11-12-77-10W4	2901-11	93-11-03-01/02
06-10-77-25W4	3453-68, 5251-5352	93-11-09-01/13
	6107-20	
07-13-78-01W4	1570-1660	93-11-02-18/23
03-25-78-02W4	1733-1913	93-10-29-09/14
		93-11-01-01/10
05-34-78-06W4	2800-24	93-12-16-01/03
08-17-78-07W4	2263-73, 3022-32	93-11-02-24/27
15-29-79-05W4	1045-55, 1060-85	93-11-03-03/09
10-32-79-07W4	1212-1731	93-11-04-01/18
		93-11-08-01/07
10-05-80-02W4	1713-1773	93-10-29-01/08
06-36-82-12W4	1665-93, 3100-25	93-12-13-01/03
04-20-83-04W4	1492-1507	93-12-07-01/03
10-08-83-06W4	562m - 625m	n/s
16-27-85-11W4	2277-2296	93-12-07-04/05
14-09-86-07W4	896-1793	93-11-24-01/15
		93-11-25-01/15
06-30-86-13W4	2315-2420	93-12-14-01/06
07-11-87-17W4	460-2853 (?)	93-11-26-01/25
		93-11-30-01/15
		93-12-01-01/17
		93-12-02-01/14

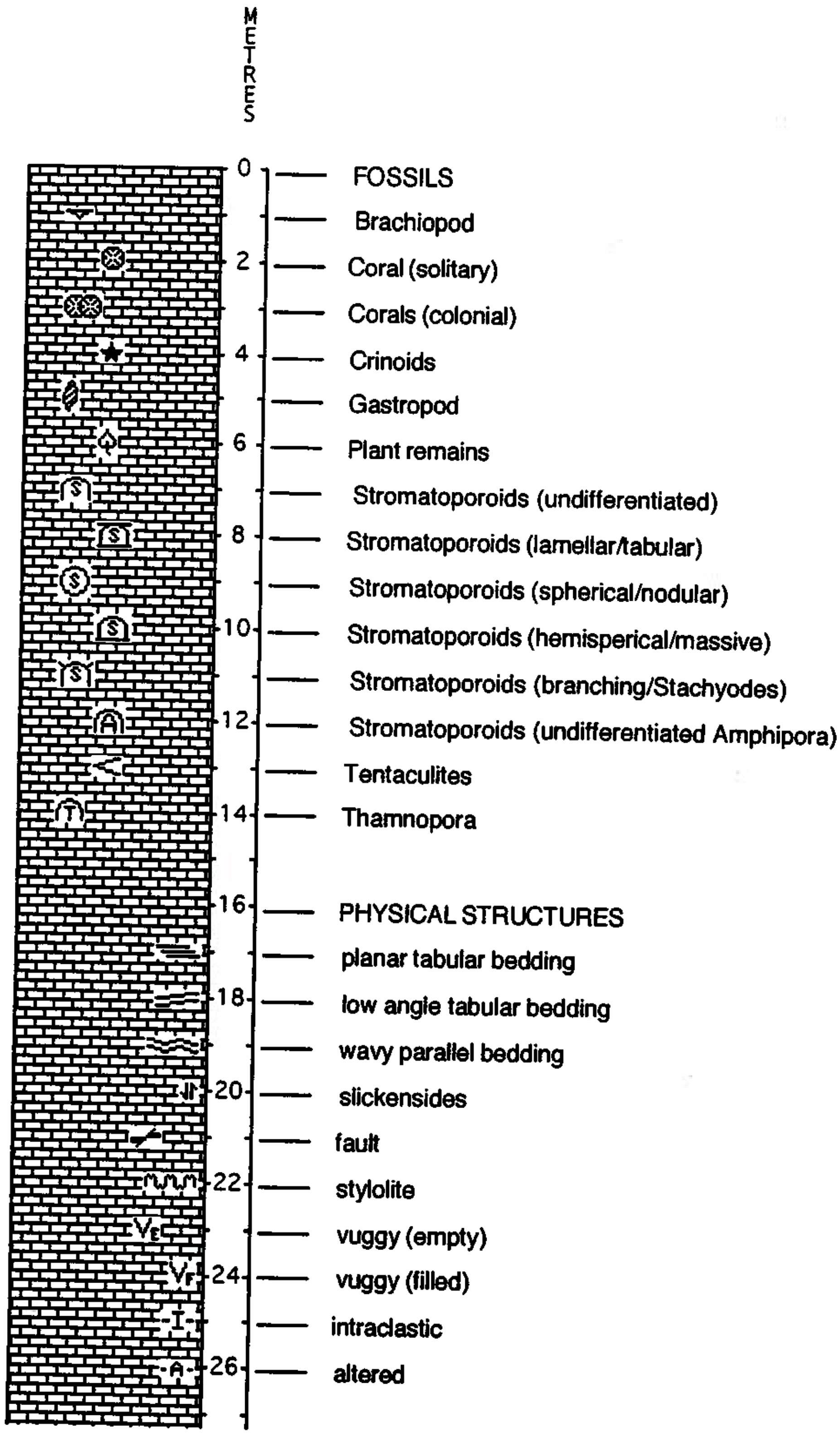
WELL LOCATIONS	CORED INTERVAL(S) (feet)	SAMPLE NUMBERS
within study area (Northeast Alberta)		
07-11-87-17W4	(continued)	93-12-03-01/07
10-32-88-15W4	2530-2580	93-12-07-06/08
08-20-89-09W4	34-1142	93-10-25-01/25
		93-10-26-01/16
		93-10-27-01/14
		93-10-28-01/24
02-32-89-12W4	711-13m, 600-13m,	93-12-14-08/11
	345m - 400m	93-12-17-05/11
06-13-91-15W4	643-78, 2290-2305	93-12-17-01/04
10-16-91-18W4	2798-3003	93-11-15-07/20
04-32-93-10W4	11-883	93-10-20-01/14
		93-10-21-01/24
		93-10-22-01/08
09-34-94-14W4	1994-2000	93-12-14-07
12-07-95-08W4	129.6m - 310.95m	93-11-17-01/16
		93-11-18-01/13
13-31-96-06W4	355-362, 477-873	93-11-22-01/25
03-16-97-16W4	1358-84, 2793-2847	93-12-06-16/18
06-02-97-19W4	802m - 820.55m	93-11-16-01/04
	1067m - 1104m	
12-06-99-08W4	375-540	93-11-19-01/14
14-02-99-22W4	3445-3486	
07-06-100-17W4	2865-95, 2936-86,	93-12-09-01/04
	3002-39	
07-10-100-24W4	377.25m - 425.25m	n/s
03-35-101-22W4	2986-3106	93-12-09-05/08
02-10-102-23W4	879m - 910.25m	93-12-08-01/06
16-27-102-24W4	2607-2818	93-12-09-09/14
outside study area (Northwest Alberta)		
from Rob Kletti (pres. comm.)		
06-34-120-13W5	2612-2735	93-12-20-08/12
10-07-99-08W6	2254-84	93-12-20-01/02
16-34-100-06W6	1921-39	93-12-20-03/04
10-22-120-01W6	4033-93	93-12-20-05/07
from Marc Dubord (1987)		
10-05-68-02W5	5518-69, 5865-905	n/s
	6721-6744	
04-23-89-12W5	5148-5401	94-01-31-02/04
		94-02-01-01/02
16-34-118-21W5	3950-4305	94-01-20-01/05

WELL LOCATIONS	CORED INTERVAL(S) (feet)	SAMPLE NUMBERS
outside study area (Northwest Alberta)		
00/07-32-109-08W6	5782-836, 5841-75,	94-01-24-06/11
	5925-49, 5975-6025	94-01-31-01
02/07-32-109-08W6	5760-5820	94-01-24-01/05
13-20-107-09W6	1585-1734,	94-01-31-05
	6200-6377	94-02-01-03/04
09-05-114-08W6	4868-4928, 5513-73	94-01-20-06/10

LIST OF ICONS

Ground: 0.00 m KB: 0.00 m

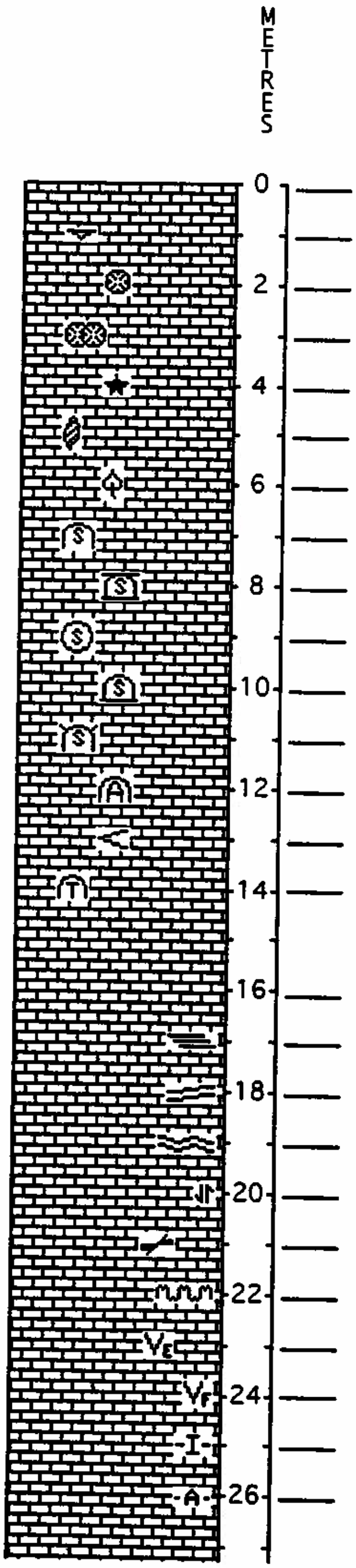
Remarks: - date and depth drilled
- core intervals (stored at the ERCB)
- size and state of core



LIST OF ICONS

Ground: 0.00 m KB: 0.00 m

Remarks:
- date and depth drilled
- core intervals (stored at the ERCB)
- size and state of core



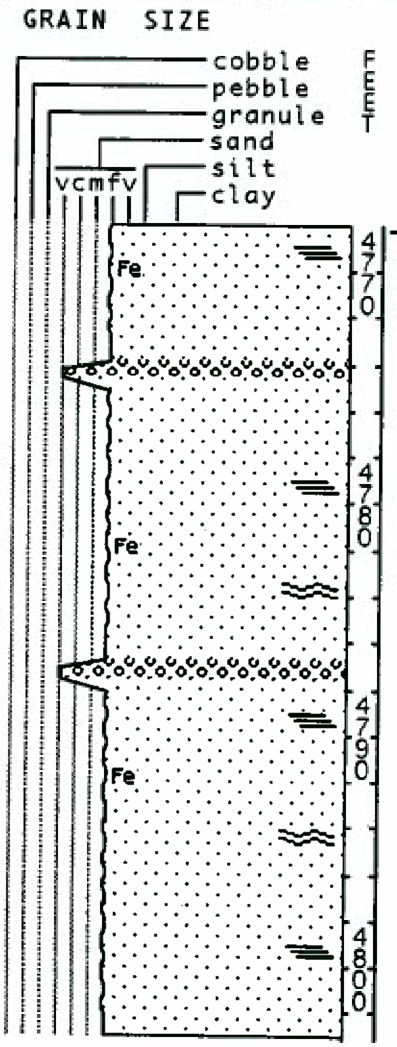
FOSSILS
- Brachiopod
- Coral (solitary)
- Corals (colonial)
- Crinoids
- Gastropod
- Plant remains
- Stromatoporoids (undifferentiated)
- Stromatoporoids (lamellar/tabular)
- Stromatoporoids (spherical/nodular)
- Stromatoporoids (hemisperical/massive)
- Stromatoporoids (branching/Stachyodes)
- Stromatoporoids (undifferentiated Amphipora)
- Tentaculites
- Thamnopora

PHYSICAL STRUCTURES
- planar tabular bedding
- low angle tabular bedding
- wavy parallel bedding
- slickensides
- fault
- stylolite
- vuggy (empty)
- vuggy (filled)
- intraclastic
- altered

MCD CHIEFCO LABIE
10-11-67-12w4

Ground: 0.00 ft KB: 1962.00 ft

Remarks: - drilled in 1967 to a T.D. of 1482.2m (4873')
- cored from 4768' to 4803' [La Loche Fm.]
- core is not slabbed and is 3 1/2" in diameter



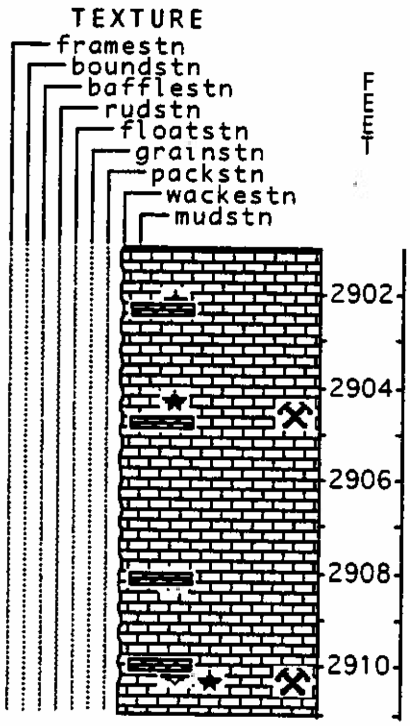
Sandstone [4768' - 4803']
- light grey with minor amounts of red-brown Fe-staining
- clean, quartzitic sand
- coarse grained
- fairly well sorted with minor coarse granular to conglomeratic zones
- wavy parallel and planar parallel bdg.
- salt saturated
(not sampled, see 7-11-67-6W4)

La Loche Fm.

PAC MAY RIVER
11-12-77-10w4

Ground: 0.00 ft KB: 2077.00 ft

Remarks:
- drilled in 1958 to a T.D. of 1095.8m (3595')
- cored from 1295' to 1310' [undetermined Cretaceous Fm.], and from 2901' to 2911' [Keg River Fm.]
- core is not slabbed and is 3 1/4" in diameter

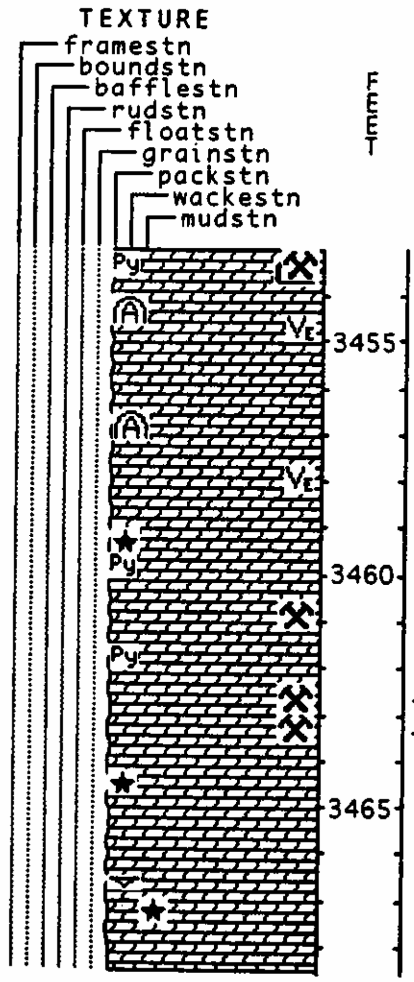


Limestone [2901' - 2911'] Keg River Fm. (?)
- dark chocolate brown to greyish-brown
- finely xl.ine
- nodular texture with thin (1-5cm), well laminated, wavy, organic-rich, fossiliferous interlayers
- with crinoid and brachiopod fossil fragments
- samples 93-11-03-01 and 93-11-03-02

IMP PELICAN HILLS
6-10-77-25w4

Ground: 0.00 ft KB: 2615.70 ft

Remarks: - drilled in 1957 to the basement at a T.D. of 1865.4m (6120')
- cored from 3453' to 3468' [Woodbend Gr. ?], from 5251' to 5352' [Prairie Evaporite Fm. - Keg River Fm.], and from 6107' to 6120' [Xl.ine Basement]
- core is 3" in diameter



Dolostone and Dolomitic Limestone [3453' - 3468.5'] Woodbend Group (?)

- medium grey, to brownish-grey
- bedding defined by thin wavy laminations
- crinoid ossicles and breachiopod shell fragments throughout, and amphipora toward the top
- the top 7-8' of the interval are vuggy: ~3-5%, 2-20mm, irregular in shape, empty
- blebby pyrite occurs throughout, up to 2-3%, with irregular shapes as large as10-25mm with traces of sphalerite (?)
- samples 93-11-09-01 (3453.5') down to 93-11-09-04 (3463.3')

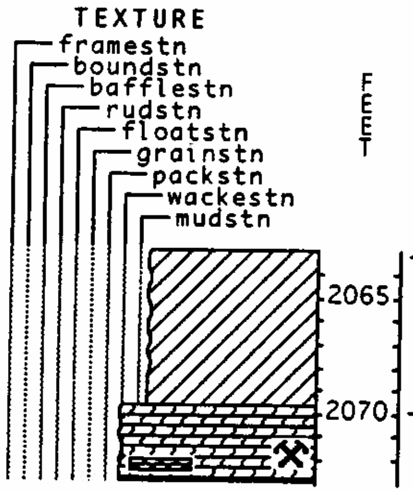
(98ppm Pb, 310ppm Zn and 123ppm Ni)

(68ppm Pb, 1620ppm Zn and 120ppm Ni)

R O CORP ET AL LEISMER
8-17-78-7w4

Ground: 1801.00 ft   KB: 1813.00 ft

Remarks: - drilled in 1958 to a T.D. of 932.7m (3060')
- cored from 960' to 1101' [undetermined Cretaceous Fm.], from 2263' to 2273' [top of the Keg River Fm.], and from 3020' to 3032' [Granite Wash Fm.]
- core is not slabbed and is 3 1/4" in diameter



Anhydrite [2063' - 2069.7']
- grey, massive

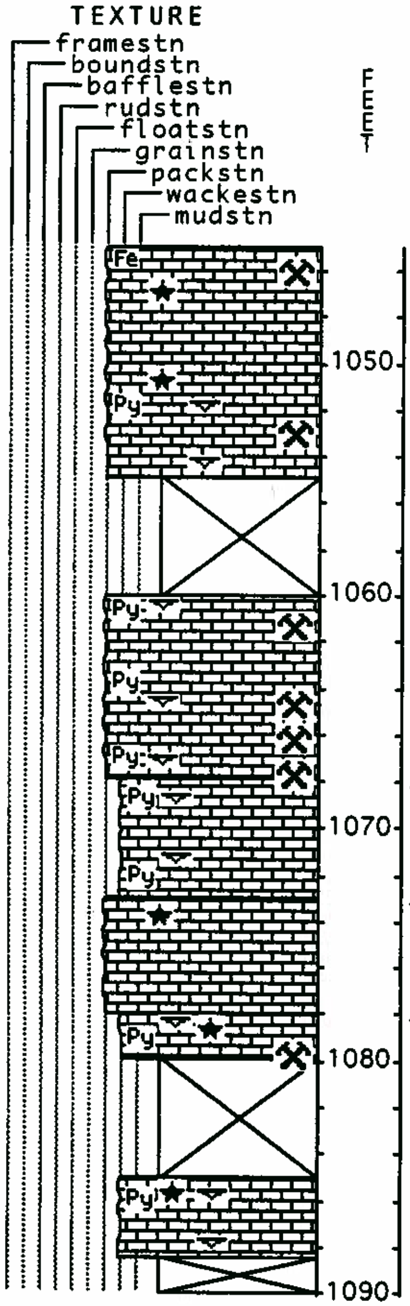
Dolostone [2069.7' - 2073']
- light greyish tan
- medium to coarsely xl.ine
- slight mottling
- massive appearance, with minor thin carbonaceous laminae
- sample 93-11-02-24

Keg River Fm.

RICHFIELD-BOHN LAKE 1
15-29-79-5w4

Ground: 0.00 ft KB: 1614.00 ft

Remarks: - drilled in 1956 to a T.D. of 734.6m (2410')
- cored from 1045' to 1090' [Beaverhill Lake Fm.]
- core is not slabbed and is 3 1/4" in diameter



Beaverhill Lake Fm.
calumet mbr. (?)

Nodular Limestone [1045' - 1068']
- grey and greyish-tan
- argillaceous
- very finely xl.ine
- nodular texture
- abundant crinoids and thick shelled brachiopods
- tr-1% blebby py (blebs up to 1.5cm)
- samples 93-11-03-03 (1046') down to 93-11-03-08 (1067.7')

Argillaceous Limestone [1068' - 1073'] or Calcareous Shale
- dark greenish-grey
- very finely xl.ine
- fossiliferous (crinoids and brachiopods)
- tr-1% blebby py

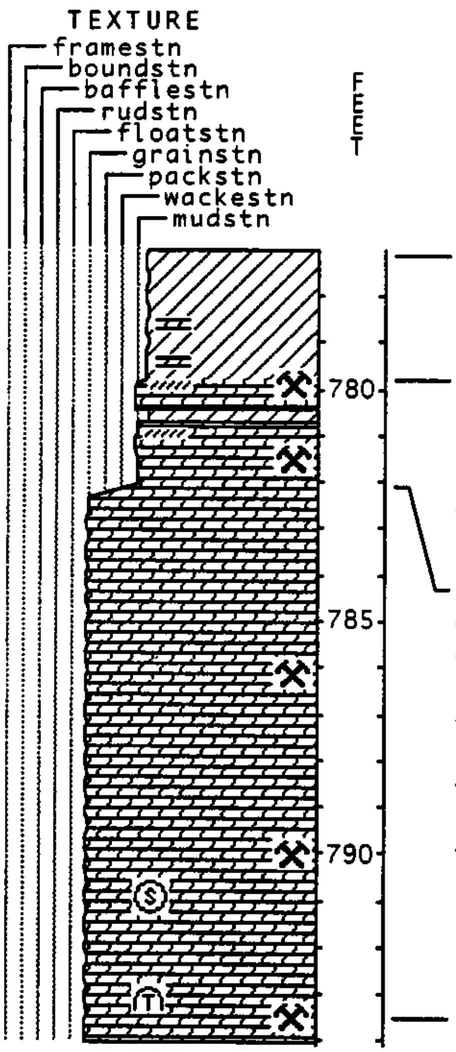
Nodular Limestone [1073' - 1078']
- as above

Argillaceous Limestone [1078' - 1088.5']
- as above
- sample 93-11-03-09

AMOCO KIRBY
9-25-73-5w4

Ground: 0.00 ft   KB: 2243.00 ft

Remarks: - drilled in 1980 to a T.D. of 845m (2772')
- cored from 455m to 478.5m [McMurray Fm.],
  and from 777m to 794.4m [top of the Keg River Fm.]
- core is not slabbed and is 4" in diameter



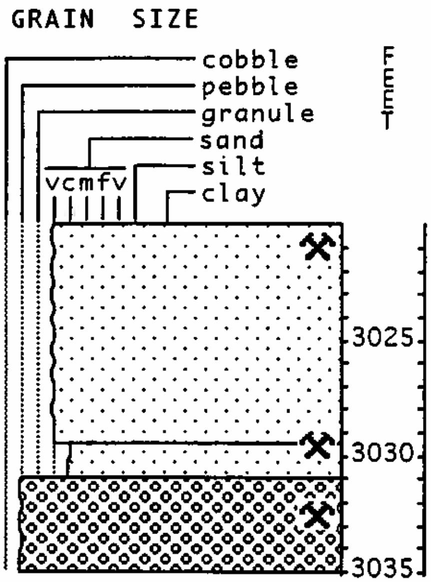
Anhydrite and Gypsum [777m - 779.75m]
- grey to brownish-grey
- massive with irregular dolomitic laminations

Interbeded Dolostone and Anhydrite [779.75m - 782m]   Keg River Fm.
- Dolostones are tan to greyish-tan (slightly argillaceous)
- thinly bedded to laminated
- slightly motled texture due to thin dark grey to black discontinuous laminations and blebs

Dolostone and Dolomitic Limestone [782m - 794m]
- dark tan to light brown
- massive appearance, occasional whispy laminations visible
- medium to coarse xl.inity with a sucrosic texture
- slight vugginess developed toward the bottom of the interval
- rare stromatoporoids visible (occasional Thamnopora toward the bottom of the interval)

samples 93-12-06-14 (793.5') up to 93-12-06-10 (779.8')

R O CORP ET AL LEISMER
8-17-78-7w4



Sandstone [3020' - 3029.5'] La Loche Fm.

- Fe-stained, dark redish brown, with some pale green clay alteration
- coarse grained to granular (upto 20% - 1-5mm)
- primarily quartzitic with ~10% lithic material
- sample 93-11-02-25

Quartzite [3029.5' - 3031']

- light pink
- coarse grained
- very minor lithic component
- sample 93-11-02-26

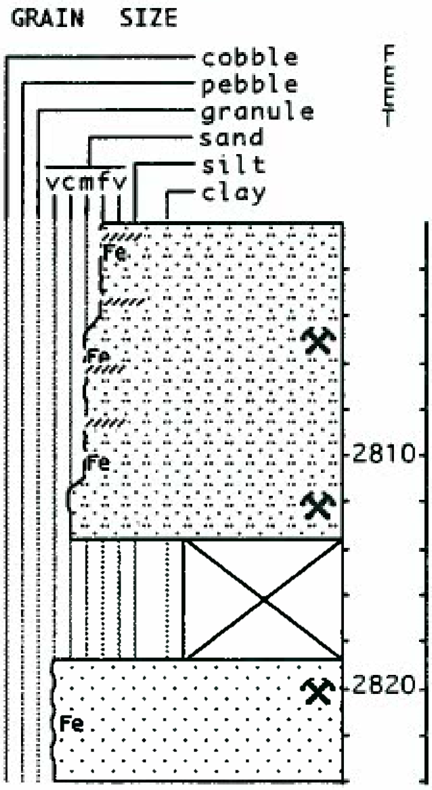
Conglomerate [3031' - 3035']

- reish-brown
- granular sandy matrix with up to 40%, 5-15mm, quartz, feldspar and lithic (granitic) clasts
- sample 93-11-02-27

MERRIL-ARAB CHARD
5-34-78-6w4

Ground: 0.00 ft KB: 1826.00 ft

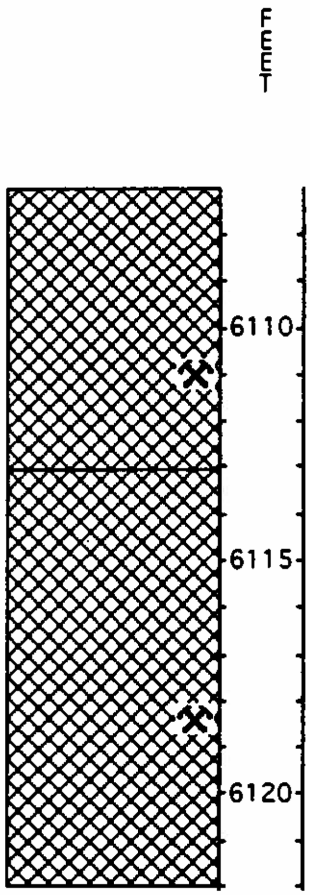
Remarks: - drilled in 1957 to a T.D. of 873.6m (2866')
- cored from 1055' to 1065', 1075' to 1095', 1196' to 1208' and 1213' to 1216' [undetermined Cretaceous Fm.s], and from 2800' to 2824' [Red Beds/Granite Wash (?)]
- core is slabbed and is 3" in diameter



Silty Sandstone [2800' - 2813.5'] Basal Red Beds
- light grey (fresh) to red-brown (altered)
- patchy Fe-staining (80% of interval)
- bedding obscure
- primarilly a fining upward, fine grained to silty sand with up to 40% coarse sand grains and granules (1-8mm) toward the base
- minor nodular Anhydrite
- slightly dolomitic matrix
- samples 93-12-16-01 and 02

Sandstone [2819' - 2824'] Granite Wash (?)
- light tan to light brown
- Fe-stained (less than above)
- very coarse grained to granular
- massively bedded
- poorly sorted
- poorly consolidated and leached appearance
- sample 93-12-16-13

IMP PELICAN HILLS
6-10-77-25w4



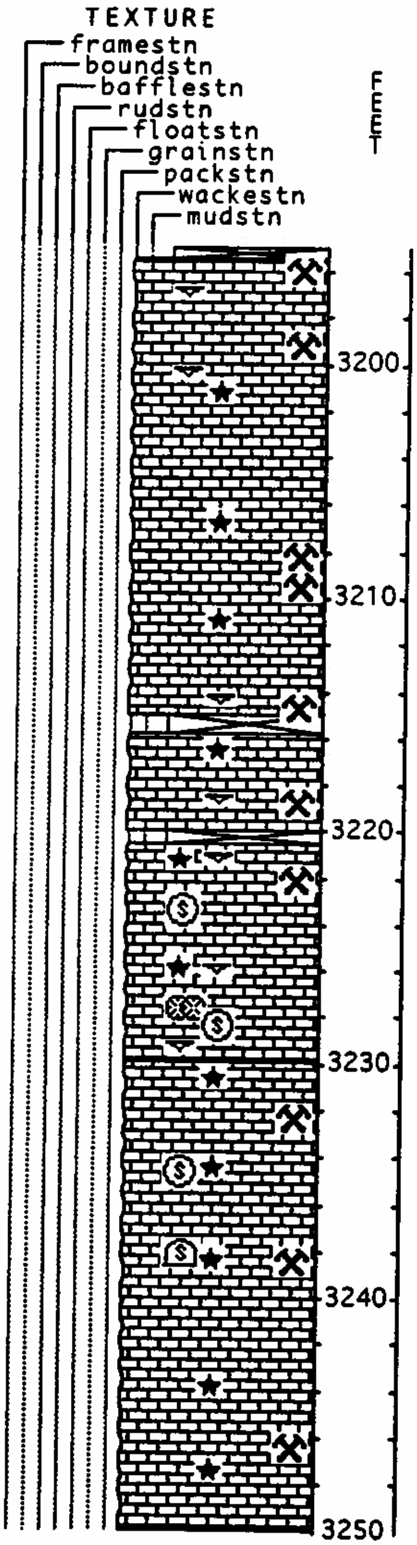
Foliated Feldspar-Rich Garnetiferous Granite [6107' - 6113']
- overall reddish color
- 40-50% K-Feldspar; relatively unaltered
- fol'n varies from 0° to 20° to C.A.
- sample 93-11-09-12

Foliated Mafic-Rich Garnetiferous Granite [6113' - 6122']
- as above, except 40-50% Hbld. (∴very dark)
- sample 93-11-09-13

FINA CAL AM WAPPAU
2-34-75-11w4

Ground: 0.00 ft KB: 2153.90 ft

Remarks: - drilled in 1966 to a T.D. of 1254.6m (4116')
- cored from 1457' to 1645' [undetermined Cretaceous Fm.], and from 3196' to 3245' [Keg River Fm.]
- core is not slabbed and is 3" in diameter



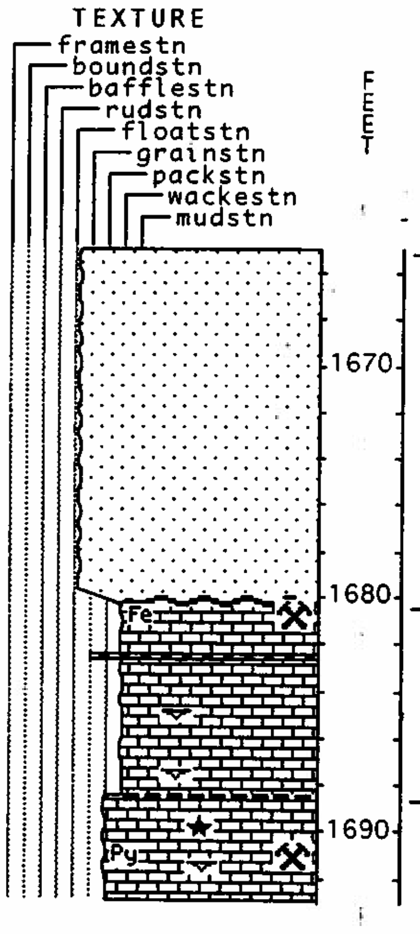
Nodular Limestone [3196' - 3248']
- varying amounts of bioturbation represented by the trace fossil Thallasanoides produces the nodullar appearance (increasing with depth)
- nodules are grey-brown in a darker brown matrix
- both the nodules and the matrix react vigorously with 10% HCl and release a faint bituminous smell (?)
- localised concentrations of Brachiopod shell fragments and Crinoid ossicles (crinoidal debris being more abundant toward the bottom of the interval)
- minor vuggy porosity with infilling of white calcite and halite (10 samples)
- no fracturing or faulting or brecciation
- samples 93-10-13-01 down to 93-10-13-10

Keg River Fm.
- fossil fragments indicative of zones of greatest bioturbation

R O CORP ET AL DIVIDE
6-36-82-12w4

Ground: 2444.00 ft KB: 2455.00 ft

Remarks: - drilled in 1957 to a T.D. of 1080.5m (3545')
- cored from 1552' to 1693' [McMurray Fm. + 12' BH.LK. Fm.], and from 3100' to 3125' [Prairie Evap. Fm.]
- core is not slabbed. 1st core is 2 7/8" in diameter, 2nd core is 3 1/2" in diameter



Sandstone [1665' - 1680.3'] — McMurray Fm.
- med.-grained, poorly consolidated, massive, and bitumen stained to saturated

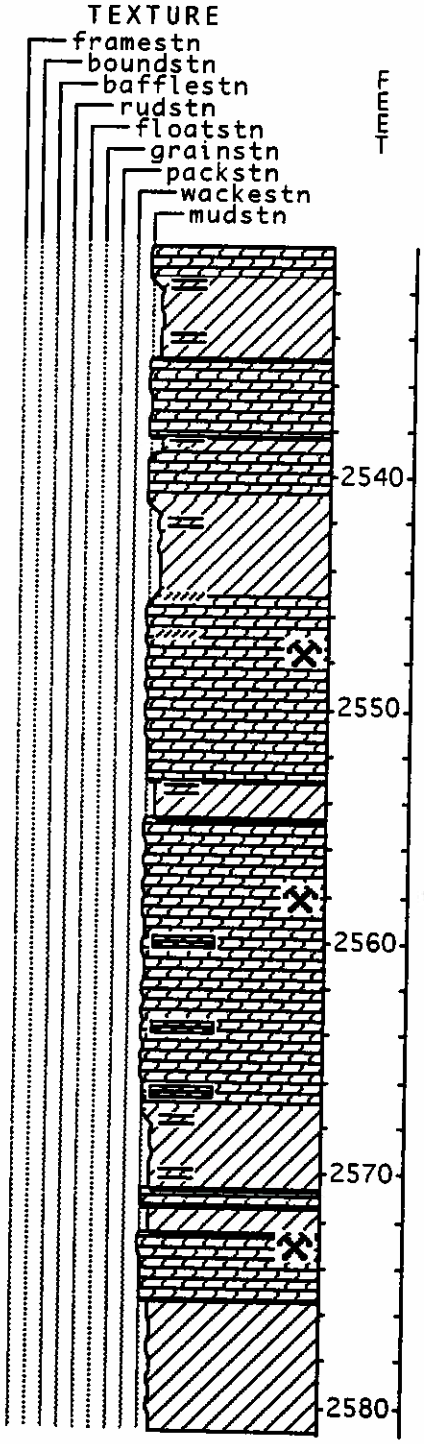
Argillaceous Limestone [1680.3' - 1689.5'] — Beaverhill Lake Fm.
- medium to dark greenish-grey
- thin wavy bedding
- occasional brachiopod shells throughout with a thin coquina at 1682.5'
- minor Fe-staining below u/c (sample 93-12-13-01)

Nodular Limestone [1688.5' - 1693']
- ligh to medium greyish-tan color
- Nodular texture produced by a contrast between a poorly consolidated, clay-rich matrix, and a well consolidated, clay-poor, bioturbated, micritic Limestone
- abundant brachiopod and crinoid debris
- trace pyrite (sample 93-12-13-02)

CHAMPLIN PAN AM MACKAY
10-32-88-15w4

Ground: 1755.00 ft KB: 1766.00 ft

Remarks: - drilled in 1967 to a T.D. of 896.1m (2940')
- cored from 2530' to 2580' [Keg River Fm.]
- core is not slabbed and is 4 3/8" in diameter



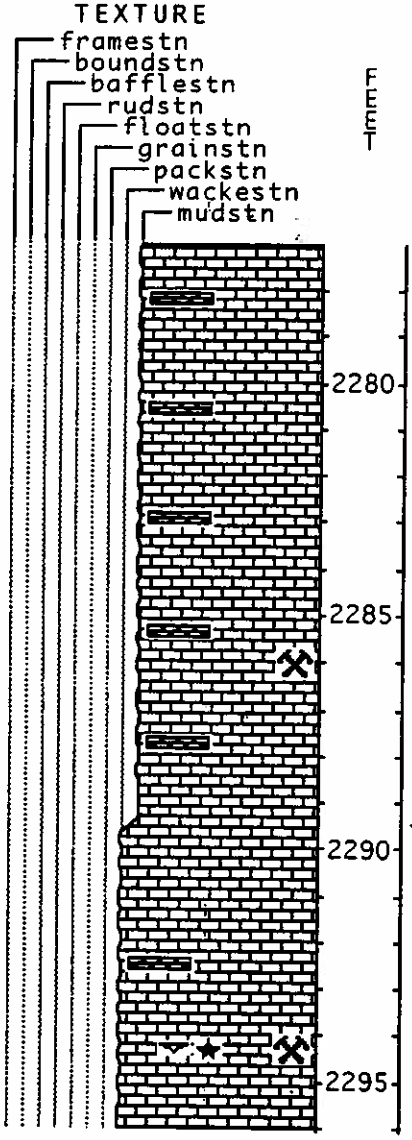
Interbeded Dolomite and Anhydrite [2530' - 2580'] Keg River Fm. (?)

- 40% Anhydrite, grey and massive with occasional dolomitic laminations and irregular patches
- 60% Dolomite
  - tan
  - well laminated to very thinly bedded with occasional very dark brown to black carbonaceous laminae
  - non-fossiliferous
  - minor vuggy porosity (salt filled)
  - salt saturated
  - patches with up to 40% small (1 5mm) euhedral, acicular Anhydrite xl.s
- samples 93-12-07-06 (2547.5'), 07 (2558'), and 08 (2573')

TEXCAN CS HORSE
16-27-85-11w4

Ground: 1716.00 ft   KB: 1724.20 ft

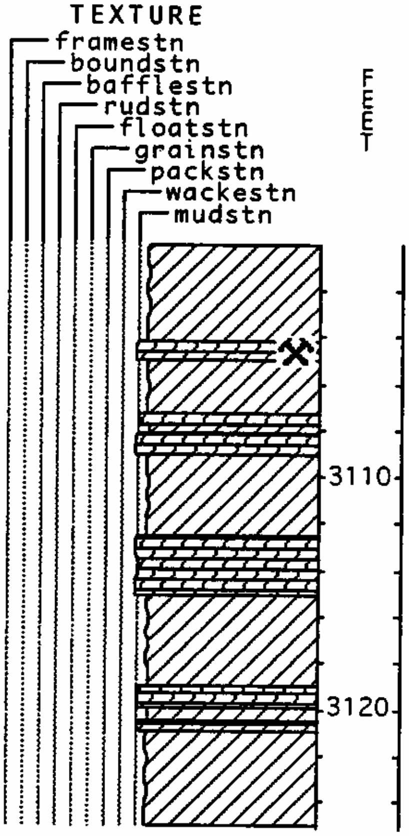
Remarks: - drilled in 1969 to a T. D. of 779.1m (2556')
- cored from 2277' to 2296' [Keg River Fm.]
- core is slabbed and is 2 1/4" in diameter



Carbonaceous Limestone [2277' - 2289.3']
- dark brown to black color with lighter tan colored specs and discontinuous laminae
- well laminated
- laminae wrapped around 1-2cm, chocolate brown, rounded, micritic nodules
- sample 93-12-07-04

Nodular Limestone [2289.3' - 2296']
- as above, but 60-70% micritic Nodules
- nodules are fractured (2-4cm x .5cm) with Salt infilling
- sample 93-12-07-05

R O CORP ET AL DIVIDE
6-36-82-12w4

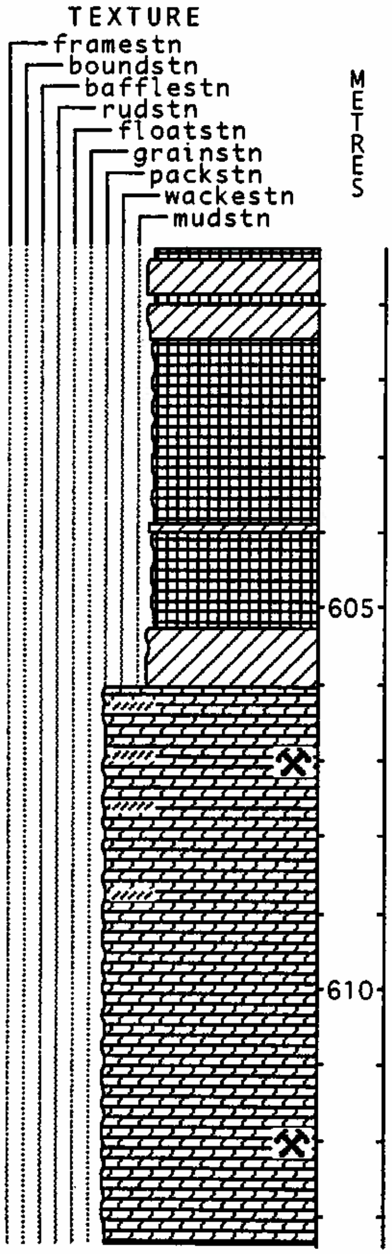


Interbedded Anhydrite and Dolomite [3100' - 3125']

Prairie Evaporite Fm. (?)

- Anhydrite is dark grey and massive, with increasing amounts of recrystalized gypsum toward the base of the interval
- Dolostones are tan colored, finely xl.ine, thinly bedded to laminated and non-fossiliferous
- sample 93-12-13-03

SUNCOR CLARKE PREV
2-32-89-12w4



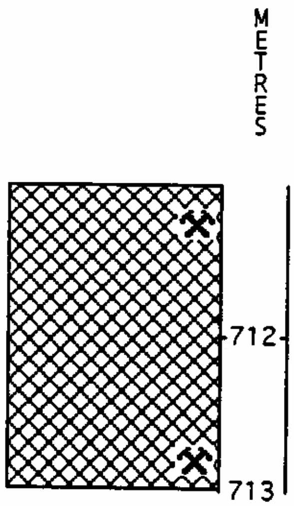
Interbedded Salt [600.25m - 606.05m] and Anhydrite — Prairie Evaporite Fm.

- Salt is massive, very coarsely xl.ine and dirty brown
- Anhydrite is massive and dark grey

Dolostone [606.05m - 613.35m] — Keg River Fm.

- tan to light grey
- coarsely xl.ine
- massive appearance
- bedding variable between 60 and 90* to C.A.
- non-fossiliferous
- samples 93-12-14-10 and 11

SUNCOR CLARKE PREV
2-32-89-12w4

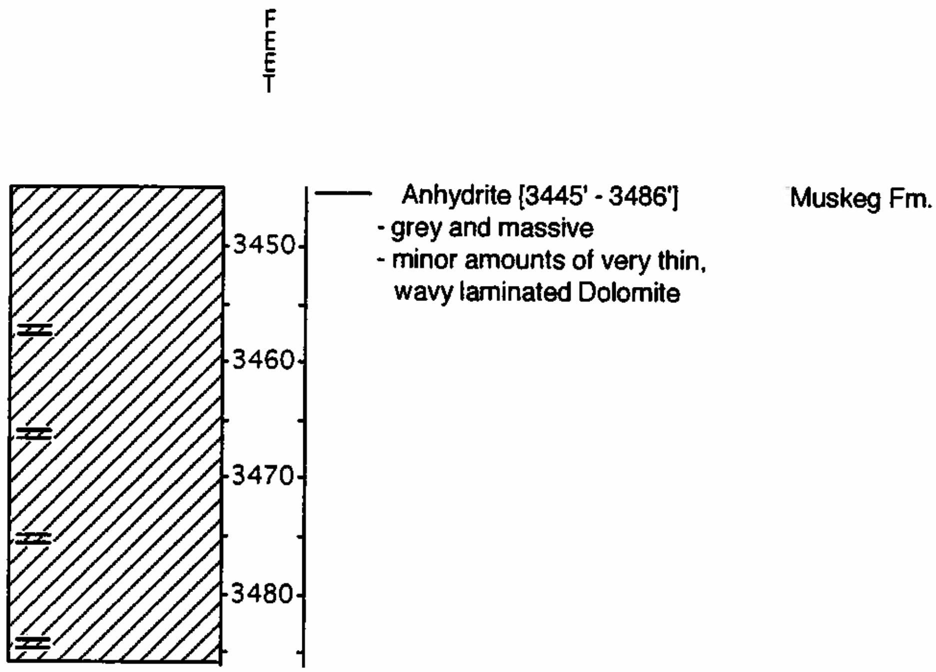


Granite Gneiss [711m - 713m]
- well foliated (wavy)
- 50-60* to C.A.
- granitic composition
- coarsely xl.ine
- leached and Fe-stained
  (salt saturated - filling
  vugs and fractures)
- samples 93-12-14-08 and 09

SUN ET AL JEAN LAKE
14-2-99-22w4

Ground: 2166.00 ft KB: 2179.00 ft

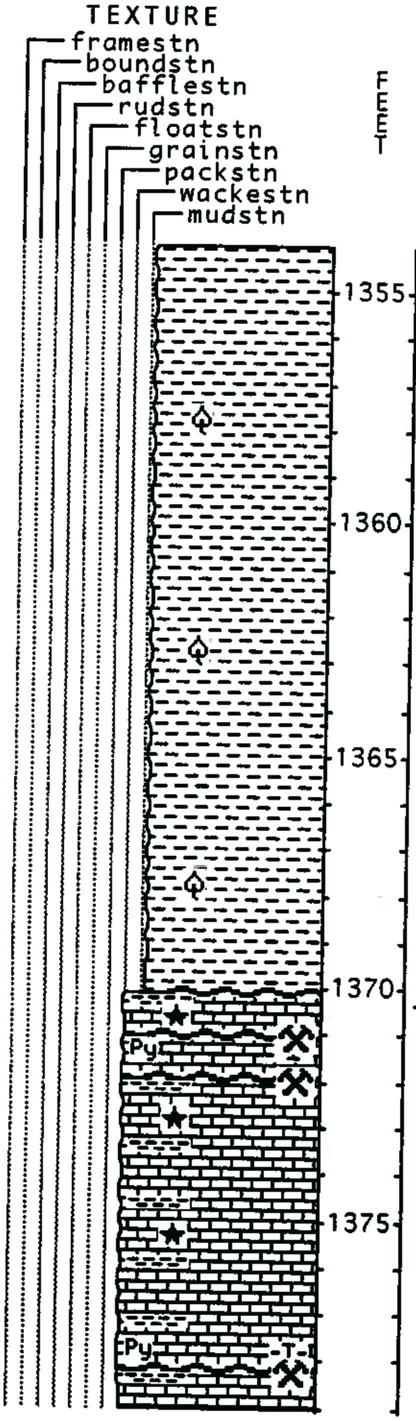
Remarks: - drilled in 1970 to a T.D. of 1158.2m (3800')
- cored from 3445' to 3486' [Muskeg Fm.]
- core is not slabbed and is 3 1/2" in diameter



REGENT BIRCH
3-16-97-16w4

Ground: 2180.00 ft KB: 2191.00 ft

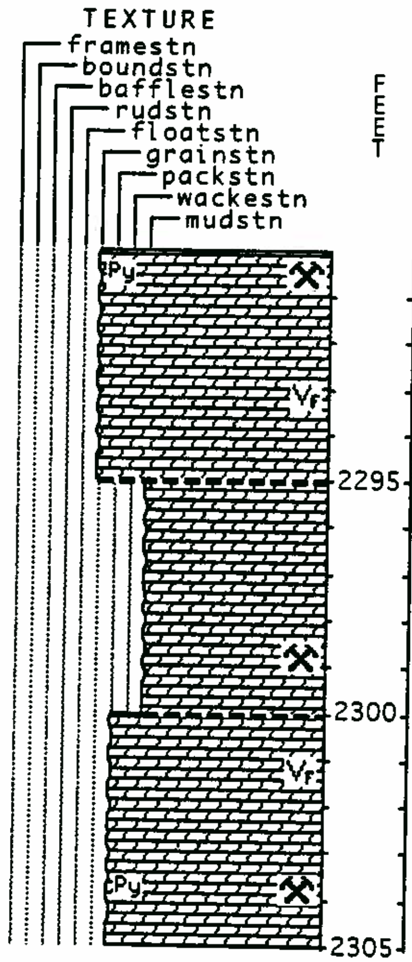
Remarks: - drilled in 1957 to a T.D. of 935.7m (3070')
- cored from 546' to 566' [Cretaceous Fm.], 1247' to 1379' [Cretaceous Fm. - top of Beaverhill Lake Fm.], and from 2793' to 2847' [Prairie Evap. Fm.]
- core is not slabbed and is 3 3/8 in diameter



Mudstone [1354' - 1370'] Wabiscaw Fm.
- dark brownish-grey
- thinly bedded
- irregularily oriented from 60°-90° to C.A.
- abundant coaly plant material

Limestone [1370' - 1379'] Beaverhill Lake Fm.
- grey to brownish grey
- finely xl.ine
- wavy to chaotic bedding
- abundant crinoid debris
- Intraclastic zones associated with u/c's, covered by up to 1.5cm of py
- samples 93-12-06-15 (1378.5'), 16 (1372'), and 17 (1371')

RICHFIELD MACKAY RIVER
6-13-91-15w4



Dolostone [2290' - 2295']

Keg River Fm.

- dark brown
- coarsely xl.ine
- massive appearance
- up to 30% large (.5 - 3cm) vugs which can be empty or filled with salt, gypsum, or very dark brown bitumenous Dolomite and Py
- sample 93-12-17-02 contains a 2cm py filled vug from ~2290.5'

Laminated Dolostone [2295' - 2300']

- tan to light brown
- thin parallel to wavy laminations
- occasional 10-15cm very dark brown, slightly bitumenous zone
- non-fossiliferous
- sample 93-12-07-03

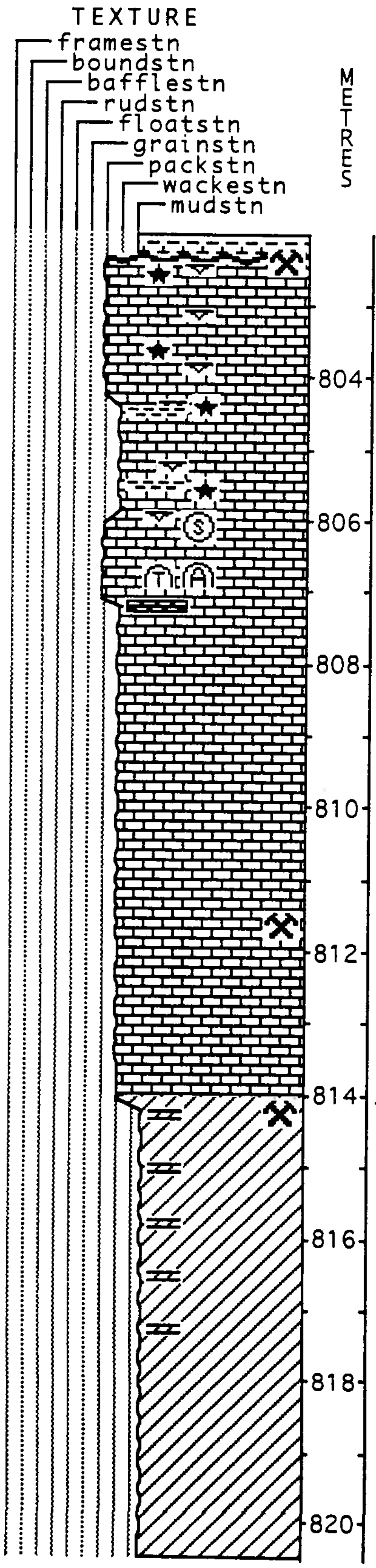
Dolostone [2300' - 2305']

- chocolate brown color
- irregular wavy bedding
- <10% large salt and dark bitumenous dolomite filled vugs
- trace dis. py (93-12-17-04)

DOME HOME LIEGE
6-2-97-19w4

Ground: 0.00 m KB: 2654.50 m

Remarks: - drilled in 1986 to the basement to a T.D. of 1232m (4042')
- cored from 802.0m to 820.55m [bottom of Beaverhill Lake Fm. - Pr. Evap. Fm.], and from 1067.0m to 1104.0m [Pr. Evap. Fm. - Keg R. Fm.]
- core is not slabbed and is 4" in diameter



Calcareous Shale [802.0m - 802.3m] — Beaverhill Lake Fm. firebag mbr.
- dark greenish grey

Limestone [802.3m - 804.2m] — Slave Point Fm. (?)
- greyish brown
- finely xl.ine
- nodular texture
- with numerous brachiopods and crinoid debris
- sample 93-11-16-01 (802.35m)

Argillaceous Limestone [804.2m - 805.8m]
- dark grey
- thin,wavy bedding
- brachiopods and crinoid debris

Limestone [805.8m - 807.05m]
- tan brown
- massively bedded
- stromatoporoid-rich

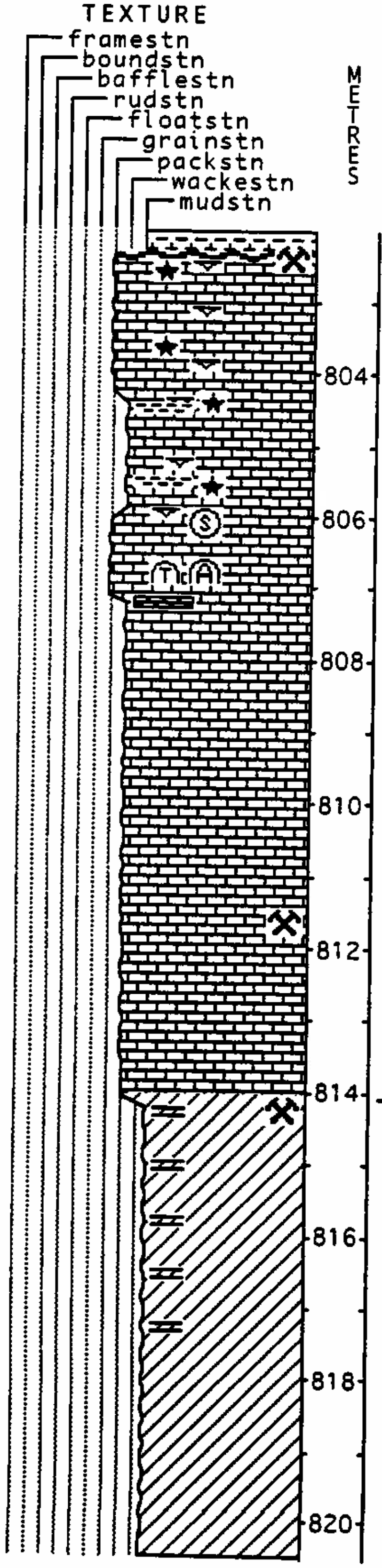
Limestone [807.05m - 814.0m]
- tan
- finely xl.ine
- thinly bedded to laminated
- non-fossiliferous
- sample 93-11-16-02 (811.6m)

Anhydrite/Dolomite [814.0m - 820.5m] — Prairie Evaporite Fm.
- light greyish tan
- very finely xl.ine
- homogeneous mixture of Anhydrite and Dolomite
- sample 93-11-16-03 (814.2m)

6-2-97-19w4

Ground: 0.00 m KB: 2654.50 m

Remarks: - drilled in 1986 to the basement to a T.D. of 1232m (4042')
- cored from 802.0m to 820.55m [bottom of Beaverhill Lake Fm. - Pr. Evap. Fm.], and from 1067.0m to 1104.0m [Pr. Evap. Fm. - Keg R. Fm.]
- core is not slabbed and is 4" in diameter



Calcareous Shale [802.0m - 802.3m] — Beaverhill Lake Fm. firebag mbr.
- dark greenish grey

Limestone [802.3m - 804.2m] — Slave Point Fm. (?)
- greyish brown
- finely xl.ine
- nodular texture
- with numerous brachiopods and crinoid debris
- sample 93-11-16-01 (802.35m)

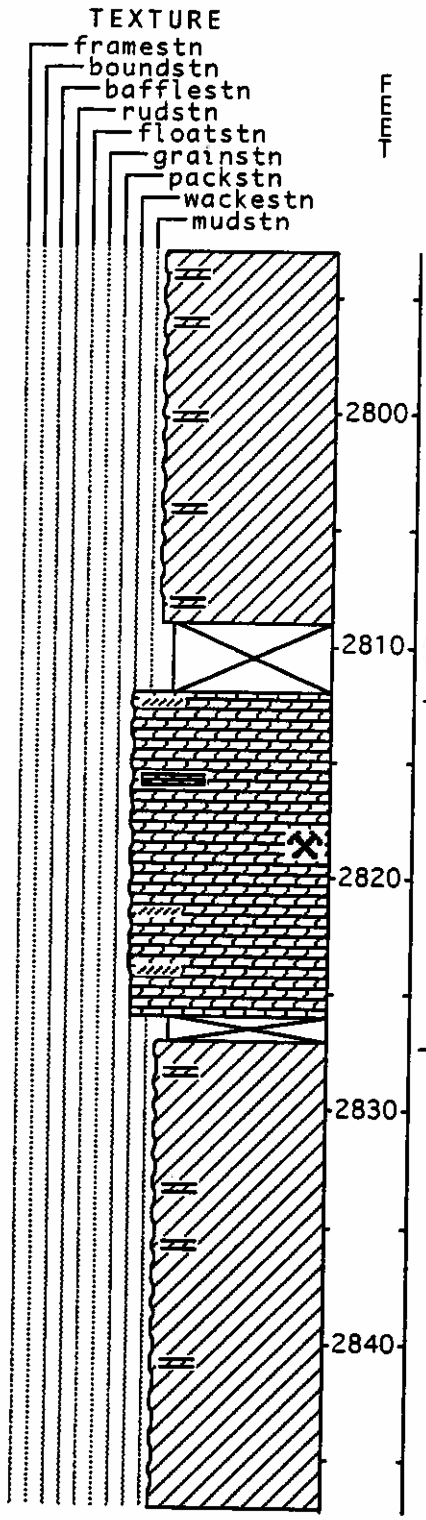
Argillaceous Limestone [804.2m - 805.8m]
- dark grey
- thin,wavy bedding
- brachiopods and crinoid debris

Limestone [805.8m - 807.05m]
- tan brown
- massively bedded
- stromatoporoid-rich

Limestone [807.05m - 814.0m]
- tan
- finely xl.ine
- thinly bedded to laminated
- non-fossiliferous
- sample 93-11-16-02 (811.6m)

Anhydrite/Dolomite [814.0m - 820.5m] — Prairie Evaporite Fm.
- light greyish tan
- very finely xl.ine
- homogeneous mixture of Anhydrite and Dolomite
- sample 93-11-16-03 (814.2m)

REGENT BIRCH
3-16-97-16w4



Interbedded Anhydrite and Dolostone [2793' - 2812']
- grey Anhydrite and tan Dolomite
- wavy, thin interbeds to laminations

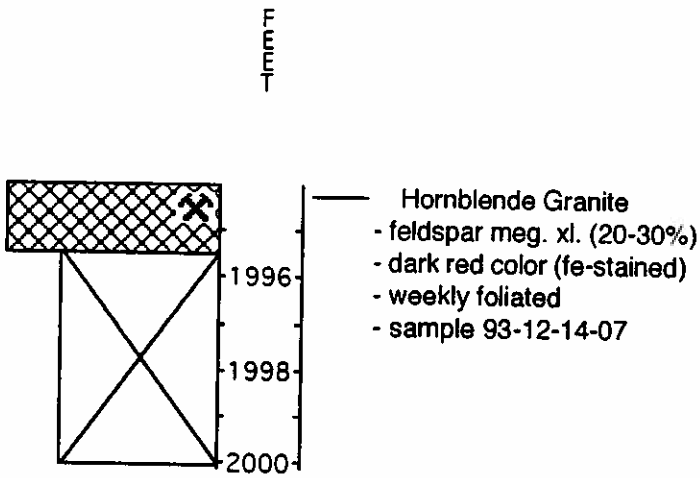
Dolomite [2812' - 2826']
- light tan to dark brown
- well laminated
- minor carbonaceous laminae
- coarsely xl.ine
- non-fossiliferous
- minor thin (<1cm) anhydrite interbeds
- sample 93-12-06-18

Anhydrite [2827' - 2847']
- grey and massive
- occasional patches of Gypsum
  and Dolomitic laminae

BAYSEL BIRCH HILLS
9-34-94-14w4

Ground: 0.00 ft   KB: 1373.00 ft

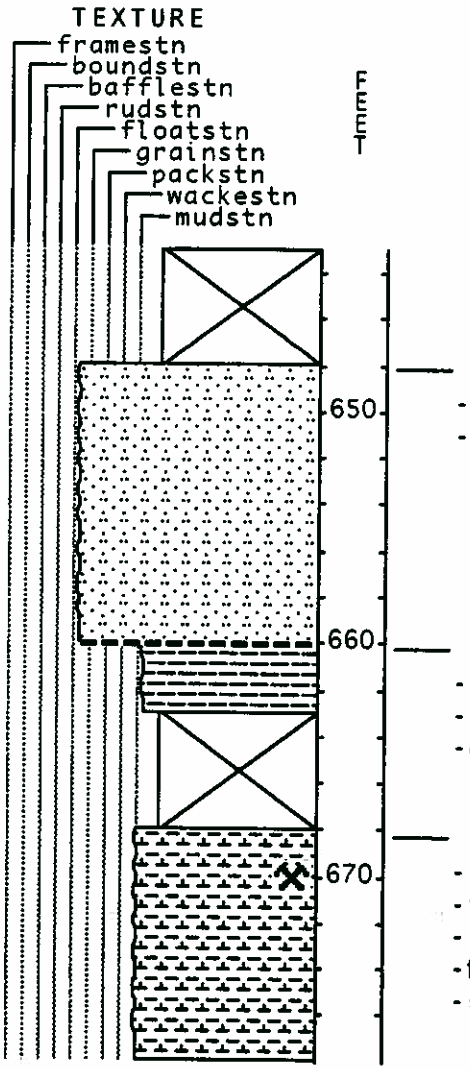
Remarks: - drilled in 1957 to a T.D. of 609.6m (2000')
- cored from 463' to 609' [undetermined Cretaceous Fm.s], and from 1994' to 2000' [Xl.ine Basement]
- core is not slabbed and is 3 1/2" in diameter



RICHFIELD MACKAY RIVER
6-13-91-15w4

Ground: 1546.50 ft   KB: 1554.00 ft

Remarks:
- drilled in 1957 to a T.D. of 721.2m (2366')
- cored from 454' to 539' [? Cretaceous Fm.], from 643' to 678' [McMurray Fm. - Beaverhill Lake Fm. (?)], and from 2290' to 2305' [Keg River Fm.]
- core is partially slabbed and is 3 1/2" in diameter



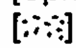
Silty Sandstone [648' - 660']   McMurray Fm.
- very dark brown to black, bitumen saturated
- very fine grained

Mudstone [660' - 663']
- light grey
- non-calcareous
- contains organic material

Calcareous Shale [668' - 678']   Beaverhill Lake Fm. (?)
- light to medium grey
- v. finely xl.ine
- non-fossiliferous
- fissile
- sample 93-12-17-01

Note: Two disks are provided with this report. One disk is formatted for a Macintosh computer and contains the AppleCORE litholog files and Microsoft Excel data files in a self-extracting archive file (M93-04-032.SEA). The second disk is formatted by MS-DOS for an IBM compatible computer and contains the Microsoft Excel data files.

It should be noted that during the production of the lithologs several new icons were created which may not correspond to those within a different version of the AppleCORE program. The ASCII codes that have been edited are as follows:

Physical Structures:	ASCII code	228 - Vuggy (empty)	[V_E]
		229 - Vuggy (filled)	[V_F]
		230 - Intraclastic	[-I-]
		231 - Altered	[-A-]
Lithologic Accessories:	ASCII code	283 - Spalerite	[Sph]
		287 - Disseminations	
		288 - Hematite	[Hem]
		289 - Galena	[Gal]
Fossils:	ASCII code	391 - Thamnopora	

For more information on the AppleCORE software contact Dr. Michael J. Ranger through the Ichnology Research Group at the University of Alberta (ph: (403) 492-3267 or 492-1117)