BRITISH COLUMBIA

Ministry of Energy and Mines
Energy and Minerals Division
Geological Survey Branch

GEOCHEMISTRY OF ALKALINE LAKE WATERS OF THE NORTHERN KECHIKA TROUGH, BRITISH COLUMBIA (NTS 94M/2, 3, 4, 5, 6, 12; 104P/8, 9, 10, 15, 16)

By Stephen J. Cook[1], Wayne Jackaman[1],
Peter W. Friske[2], Stephen J. Day[2], Gwendy E. M. Hall[2]
and Anna M. Coneys

[1] British Columbia Geological Survey Branch
[2] Geological Survey of Canada

GSC OPEN FILE 3704

OPEN FILE 1999-6

Canadian Cataloguing in Publication Data
Main entry under title:
Geochemistry of alkaline lake waters of the northern Kechika Trough, British Columbia (NTS 94M/2, 3, 4, 5, 6, 12; 104P/8, 9, 10, 15, 16)

(GSC open file ; 3740)
(Open file, ISSN 0835-3530 ; 1999-6)

Includes bibliographical references: p.
ISBN 0-7726-3884-5

1. Water - Composition - British Columbia - Kechika River Region. 2. Sediments (Geology) - British Columbia - Kechika River Region. 3. Geochemistry - British Columbia - Kechika River Region. 4. Geology, Economic - British Columbia - Kechika River Region. I. Cook, S. J. (Stephen John). II. British Columbia. Geological Survey Branch. III. Geological Survey of Canada. IV. Series: Open file (Geological Survey of Canada) ; 3704. V. Series: Open file (British Columbia. Geological Survey Branch) ; 1999-6.

QE515.G46 1999 551.9'09711'85 C99-960164-4

VICTORIA
BRITISH COLUMBIA
CANADA
MARCH 1999

ABSTRACT

Open File 1999-6 presents new analytical results for a regional lake water geochemical survey conducted in 1996 in the northern Kechika Trough area of northern British Columbia. The survey, covering parts of the Rabbit River (NTS 94M) and McDame (NTS 104P) map areas, encompasses an approximately 5000 square kilometre-area of known high mineral potential for sedimentary-exhalative style zinc-lead-barium deposits. Exploration has been limited here by extensive drift cover and poor bedrock exposure.

The survey was conducted in conjunction with a lake sediment geochemical survey, analytical data for which has been previously released (Cook *et al.*, 1997c). Surface waters were collected, at every second sediment site, from a total of 235 sites at an average density of approximately one site per 21.3 square kilometres. The waters were filtered and acidified, and analyzed for a suite of (i) major elements by inductively coupled plasma-atomic emission spectroscopy (ICP-AES), and (ii) trace elements by inductively coupled plasma-mass spectrometry (ICP-MS) at the Geological Survey of Canada, Ottawa, Ontario. The standard Regional Geochemical Survey (RGS) suite of elements (U, F, sulphate, pH) was also measured in all water samples. Several additional constituents including total alkalinity, conductivity and total dissolved solids were also determined.

The alkaline lake waters in this area are characterized by high concentrations of calcium and magnesium, and by high pH, relative to lakes in some other flat-lying parts of B.C., such as the Nechako Plateau. Preliminary discussion of data for several elements indicate that the survey results confirm the locations of some currently known prospects. In addition, the element distribution maps given here are complemented by a series of ratio maps which may assist in identifying areas of potential porphyry-style alteration and mineralization.

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INTRODUCTION

Open File 1999-6 presents new trace element and major element analytical data for surface waters from 223 lakes in the northern Kechika Trough of north-central British Columbia. The North Gataga survey was conducted in 1996 by the British Columbia Geological Survey Branch and the Geological Survey of Canada over the course of a regional lake sediment geochemical survey (Cook *et al.*, 1997) covering all or part of eleven 1:50,000 NTS map areas in the Rabbit River (NTS 94M) and McDame (NTS 104P) areas of northern B.C.: 94M/2 (*unnamed*), 94M/3 (Scoop Lake), 94M/4 (Turnagain River), 94M/5 (Aeroplane Lake), 94M/6 (Gemini Lakes), 94M/12 (Tatisno Mountain), 104P/8 (Badwood River), 104P/9 (Mustela Creek), 104P/10 (*unnamed*), 104P/15 (Lutz Creek) and 104P/16 (Lower Post). A total of 235 sites were sampled over an area of approximately 5000 square kilometres at an average density of approximately one site per 21.3 square kilometres (Table 1).

Geochemical data for 39 trace elements such as copper, zinc, nickel, molybdenum and rare earth elements by ICP-MS are provided here, in addition to 6 major elements such as calcium, magnesium and potassium by ICP-AES. Total dissolved solids (TDS), conductivity and alkalinity data are reported, and previously-published data for pH, sulphate, uranium and fluoride at 445 sites (Cook *et al.*, 1997c) are also included in this report. These results, together with similar data from the Interior Plateau area (Cook *et al.*, 1999) represent the first application of ICP-MS hydrogeochemistry to Regional Geochemical Survey (RGS) lake sediment surveys in British Columbia. This report is a companion volume to Open File 1997-15 "Regional Lake Sediment and Water Geochemistry of the Northern Kechika Trough" (Cook *et al.*, 1997c), and to Open File 1996-18 "Geochemistry of the Gataga Mountain Area" (Jackaman *et al.*, 1996).

The subdued topography, poor drainage and abundance of lakes in the northern Kechika Trough make lake sediments and waters ideal sample media for geochemical exploration surveys. Sediment is an effective tool to delineate regional geochemical patterns and anomalous metal concentrations related to mineral occurrences, and most examples of the successful application of lake sediment geochemistry to Cordilleran mineral exploration come from the Nechako Plateau area in central B.C. Lake waters, on the other hand, have not been widely used. A small suite of water determinations (U, F, sulphate, pH) is routinely included in regional lake sediment geochemical reports, and there are currently more than 40,000 sets of such stream and lake water analyses in the RGS database. Analytical results and field observations compiled by the RGS program in British Columbia are used in the development of a high-quality geochemical database suitable for mineral exploration, resource assessment, geological mapping and regional environmental studies.

The North Gataga Project is a multidisciplinary investigation of bedrock geology, glacial history, and lake sediment geochemistry of the northern Kechika Trough. Mineral exploration of this area has been limited by extensive drift cover, poor exposure and, until the recent detailed bedrock mapping of Ferri *et al.* (1995a,b; 1996a,b; 1997a,b), a low-resolution geological database of a regional nature. Past exploration in this region has centred primarily on sedimentary exhalative lead-zinc-barium targets, and on skarn/porphyry targets such as the Boya prospect (MINFILE 94M 016/021). The North Gataga survey area follows the northward extension of Devonian-Mississippian Earn Group rocks exposed within the southern Kechika Trough. The Earn Group contains the greatest potential in this belt for hosting sedimentary-exhalative (sedex) zinc-lead-barite deposits, the primary exploration target in the area. New baseline geochemical data should prove useful in stimulating new exploration for these and other mineral deposit types.

OPEN FILE FORMAT

Open File 1999-6 is divided into the following sections:

- Introduction, survey methodology and quality control
- Preliminary data interpretation and discussion
- Listings of field variables and analytical data (Appendix A)
- Listings of analytical duplicate data (Appendix B)
- Summary statistics (Appendix C)
- Element distribution, geology and sample location maps (Appendix D)

Analytical and field data are included as an ASCII file on a 3.5-inch high density diskette, located in the back pocket of this report. Data for each sample are listed in comma-delimited fields over one data record. Document files detailing format specifications and survey details are also included. No large sample location map is included here; corresponding North Gataga lake sediment Open Files (Cook *et al.*, 1997b,c) should be consulted for more detailed 1:100,000 scale sample location maps.

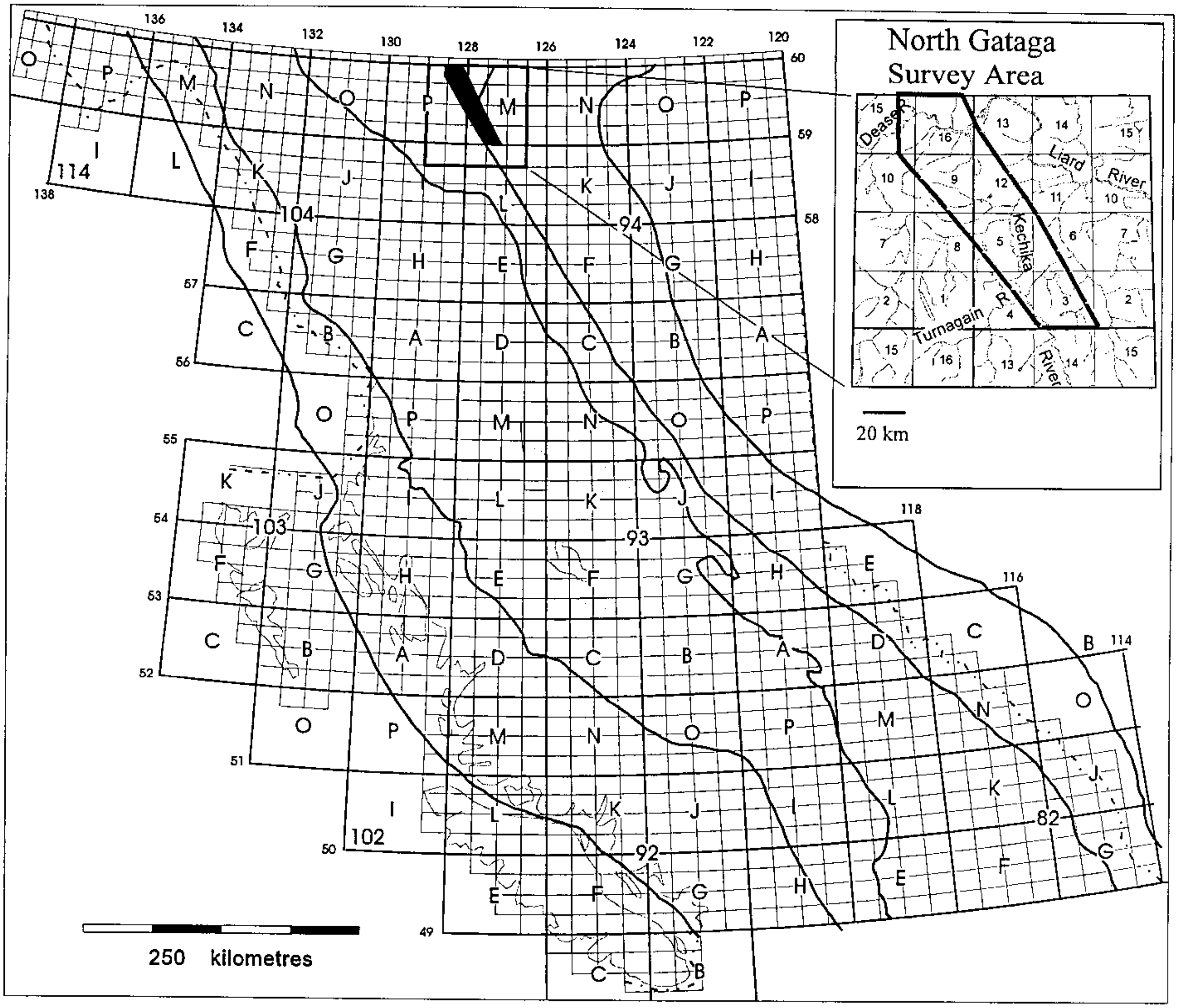

Figure 1. Location of the North Gataga regional lake water survey area in the Rabbit River (NTS 94M) and McDame (NTS 104P) map areas in the northern Kechika Trough, British Columbia. Areas of prior lake sediment and water surveys (1993-1996) in the Nechako Plateau area are also shown (lightly shaded areas). More detailed location maps of the North Gataga survey area showing bedrock geology, physiographic features and MINFILE occurrences are given in Appendix D.

DESCRIPTION OF THE SURVEY AREAS

LOCATION AND ACCESS

The North Gataga survey area (parts of NTS map areas 94M/2, 3, 4, 5, 6, 12; 104P/8, 9, 10, 15, 16) covers an area of about 5000 square kilometres. It comprises a northwest-southeast trending strip, approximately 150 km long and 30 km wide, between 59° and 60° north latitude located immediately south of the B.C. - Yukon border in north-central British Columbia. The town of Watson Lake, YT is located just north of the survey area. The Alaska Highway crosses the northern part of the survey area near the northern B.C. community of Lower Post, but most of the survey area is accessible only by air.

PHYSIOGRAPHY AND SURFICIAL GEOLOGY

The North Gataga survey area is located at the northern terminus of the Rocky Mountains, where the rugged Muskwa Ranges descend in elevation to the low-lying Liard Plain of the northern Plateau. The survey area is bounded in the north by the British Columbia-Yukon border, and in the southwest by the Rocky Mountain Trench and the Cassiar Mountains (Kechika Ranges). The Trench disappears into the Liard Plain in the northern part of the map area. Scoop Lake, Horneline Creek and the Rabbit River mark the approximate south and southeastern boundaries. Refer to Appendix D-4 for further physiographic information for the survey area.

The southern third of the survey area lies within the bounds of the Rabbit Plateau, the hilly northernmost subdivision of the Muskwa Ranges, but much of the northwestern part of the area is within the Liard Plain (Holland, 1976). This relatively low-lying area of minimal relief generally lies between about 610 to 762 m (2000 to 2500 feet) elevation within the survey area. In the north, topography is dominated by Tatisno Mountain (max. elevation: 1278 m), situated along the northeastern border of the survey area. Topography in the more rugged Rabbit Plateau area to the south ranges from about 762 to 1524 m (2500 to 5000 feet) elevation. Most of the exposed bedrock in the survey area occurs in this region (Ferri *et al.*, 1997a,b), which is transitional between the Liard Plain and the higher peaks of the Muskwa Ranges. Chee Mountain (max. elevation: 1380 m) is a prominent ridge in this area, but unnamed peaks and ridges in the southernmost part of the survey area reach elevations of 1660 m (5448 feet) and 1530 m (5020 feet) in the vicinity of Horneline Lake.

The Liard River flows easterly through the northern part of the survey area. The Kechika River, a tributary of the Liard, meanders through much of the southern part of the survey area. A notable feature of the North Gataga survey area relative to prior surveys in the Nechako Plateau is the absence of very large lakes (>5 km²). The area is heavily wooded, with dense second-growth forest predominant in old burns east of the Kechika River.

The surficial geology and glacial history of the survey area have been described by Gabrielse (1962, 1963), Mathews *et al.* (1975) and Thurber Consultants (1981). The area is extensively drift-covered, and bedrock exposures are scarce; Ferri *et al.* (1997a) estimated rock exposures to be limited to about 1 per cent of the project area. Till is the most widespread Quaternary deposit. Glacial movement was dominantly in an east to northeasterly direction through the northern part of the survey area, and drumlinized till plains are a common surficial feature. Deglaciation features such as eskers and kettles are common in the northern part of the survey area. Terraces are present in major valleys, many of which are deeply incised into the drift cover and underlying bedrock.

BEDROCK GEOLOGY

Bedrock geology of this part of the Rabbit River and McDame map areas was first mapped at 1:250,000 scale by Gabrielse (1962, 1963). Recent bedrock mapping of Ferri *et al.* (1997b, 1998) coincides with the area covered by this lake sediment and water survey. It is the northernmost of the three bedrock mapping areas in the Gataga region recently mapped at a 1:50,000 scale by Ferri *et al.* (1997a,b; 1996a,b; 1995a,b), and is used as the geological base for this report (Appendix D-3).

The North Gataga survey is a directed survey following a belt of rocks of perceived high mineral potential. The survey follows the northward extension of Devonian-Mississippian Earn Group rocks seen within the southern Kechika Trough. The Earn Group is the most significant unit in this belt for hosting sedimentary-exhalative (sedex) zinc-lead-barite deposits, the primary exploration target in the area. The following account of the regional geology of the Kechika Trough was taken from Ferri *et al.* (1997a).

The Kechika Trough is a long-lived early to middle Paleozoic sedimentary off-shelf basin (Figure 2) containing numerous sedimentary exhalative barium-lead-zinc deposits of different ages. It is linked with the Selwyn Basin to the north, with which it shares a similar stratigraphy and tectonic history. The Trough is characterized by deep-water successions of dark fine-grained siliciclastics, carbonates and chert. These, together with periodic extensional tectonism, were conducive to the periodic formation of sedimentary exhalative deposits.

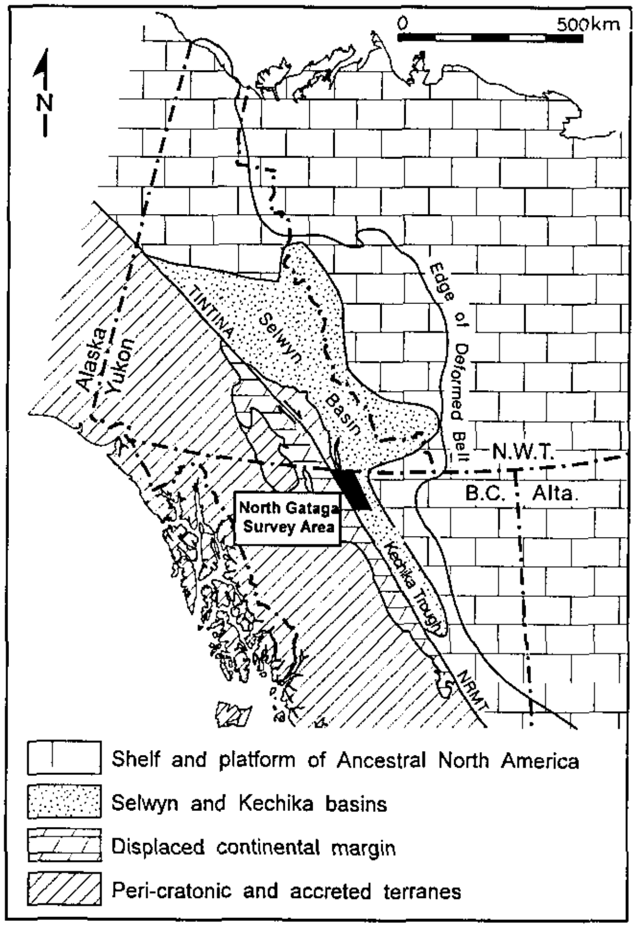

Figure 2. Simplified geological map of the northern Canadian Cordillera showing the shelf to off-shelf boundary during Ordovician to Silurian time, and location of the North Gataga survey area within the Kechika Trough (from Ferri *et al.*, 1997a; modified from Cecile and Norford, 1991). NRMT - Northern Rocky Mountain Trench.

Layered rocks of the survey area range in age from Proterozoic rocks of the Hyland Group to Tertiary-Quaternary basalts of the Tuya Formation. Some intrusive rocks are also present, the largest being several gabbroic bodies in the Gemini Lakes region. Most of the area, however, consists of a variety of Cambrian to Devonian-Mississippian siliciclastic and carbonate sedimentary units, such as the Upper Cambrian-Lower Ordovician Kechika Group, the Upper Ordovician-Middle Devonian Road River Group, and the Upper Devonian-Mississippian Earn Group. Ferri *et al.* (1997a) provide detailed descriptions of all sedimentary units within the survey area; pertinent points regarding a few units with potential to host sedex mineralization are summarized below:

•The Ordovician-Middle Devonian *Road River Group* is widely exposed in the southern part of the survey area south of Chee Mountain. It comprises a lower sequence of black shale, siliceous shale, chert and minor limestone, and an upper sequence of dolomitic siltstone. Ferri *et al.* (1997a) state that the lower Road River Group closely resembles the Earn Group in lithology. Regionally, this lower sequence has the potential to host significant sedex mineralization.

•The Upper Devonian-Mississippian *Earn Group*, the most important sedex-hosting unit in the Kechika Trough, is exposed in the southern part of the survey area. The Earn Group comprises blue grey to dark grey or black argillite, cherty argillite, siltstone and slate. Exposures here are not as extensive as those mapped to the immediate south by Ferri *et al.* (1996a,b).

•The Lower or Middle Paleozoic *Kitza Creek facies* are characterized by dark grey to black carbonaceous siltstone to silty argillite and shaly slate. These rocks primarily occur in the Kitza Creek area together with dolomitic siltstone of the Road River Group, but contact and age relationships are uncertain. Lithologically, Kitza Creek facies rocks resemble parts of both the Road River and Earn Groups (Ferri *et al.*, 1997a).

MINERAL DEPOSITS

There are only a few known mineral deposits within the bounds of the North Gataga survey area (Appendices D-3 and D-4). They include: (i) sedimentary exhalative barite and lead-zinc-barite deposits, (ii) porphyry molybdenum/copper-tungsten skarn deposits and (iii) sulphide vein mineralization. Only a short commentary on these mineral localities is given here; more detailed descriptions are provided by Ferri *et al.* (1997a), MINFILE listings and relevant assessment reports.

Sedimentary exhalative (sedex) lead-zinc-barite deposits have long been the main focus of mineral exploration in the Kechika Trough and adjacent Selwyn Basin. Numerous such deposits of various ages have been discovered. These include the Driftpile Creek and Cirque (Stronsay) deposits of the Gataga District to the south, and the Tom and Jason deposits of the Macmillan Pass district to the north, all of which are hosted by Devonian-Mississippian Earn Group strata. Sedex deposits of Cambro-Ordovician (Anvil District) and Silurian (Howard's Pass) ages are also found. MacIntyre (1992, 1991) provides overviews of the regional setting of these deposits. The main sedex mineral prospect within the bounds of the survey area is the Kechika River barite showing (MINFILE 94M 023), discovered during the 1996 bedrock mapping program. This stratiform barite-pyrite deposit, at least 4 m thick, is located within Earn Group rocks about 9 km northwest of the Gemini Lakes (Ferri *et al.*, 1997a).

The twin showings of the Boya prospect are located on Boya Hill, about 10 km southwest of Graveyard Lake. Tungsten-molybdenum skarn and porphyry mineralization occurs at the Main Face showing (MINFILE 94M 021), where quartz stockworks and veins within late Early Cretaceous quartz-biotite-feldspar porphyries and adjoining metasedimentary rocks host molybdenite and minor scheelite. Chalcopyrite, scheelite and molybdenite-bearing skarn occurs at the West Hill showing (MINFILE 94M 016).

Sulphide vein mineralization occurs in the Red River (Red-MINFILE 94M 020) and Kitza Creek (Kitza-MINFILE 94M 018) areas, and along the Liard River near Lower Post (Roman-MINFILE 104P 072). Both the Red and Kitza Creek showings, which were discovered in the early 1980's, are hosted at least in part by Kitza Creek facies rocks. Mineralization at the Red showing consists of sphalerite, galena, chalcopyrite and pyrite within quartz breccia zones and veins. At the Kitza occurrence, several dozen quartz-calcite veins contain tetrahedrite, sphalerite, barite and galena. The Kitza occurrence coincides with an extensive zone of anomalous zinc, cadmium, nickel and other elements in lake sediments, and is discussed further in a later section of this report. The Roman showing, comprising both vein and possible stratiform sulphide mineralization, is hosted by Earn Group rocks. The veins may represent a link to potential sedex mineralization. Rainsford (1984) suggested that the Roman veins may be part of a sedimentary exhalative feeder system, while Miller and Harrison (1981) suggested that the Kitza veins may be related to dewatering of the host rocks.

PREVIOUS GOVERNMENT GEOCHEMICAL SURVEYS IN THE REGION

The North Gataga lake water survey covers the same area and complements the results of lake sediment geochemical data reported in Open File 1997-15, "Regional Lake Sediment and Water Geochemistry of the Northern Kechika Trough" (Cook *et al.*, 1997c). Results for uranium, fluoride, sulphate and pH in waters were also reported at this time.

The survey area bridges the gap between two prior publicly-available regional geochemical surveys located to the north and south (Appendix D-4). To the south, the North Gataga survey area adjoins a British Columbia Geological Survey Branch stream sediment and water geochemical survey conducted in 1995 in the more rugged terrain of the Gataga Mountain area (Jackaman *et al.*, 1996). This was the first RGS-style survey to report multi-element ICP-MS stream water data. A spring water geochemistry survey was also conducted in this area by Lett *et al.* (1996). To the north, the survey area is bound at the Yukon border by the Geological Survey of Canada regional lake sediment survey of the Watson Lake map area (NTS 105A; Friske *et al.*, 1994). Regional Geochemical Survey (RGS) stream sediment data for the McDame map area (NTS 104P) is also available for the northern portion of the survey area (NGR, 1979). Mineral exploration companies have also conducted lake sediment surveys in the area.

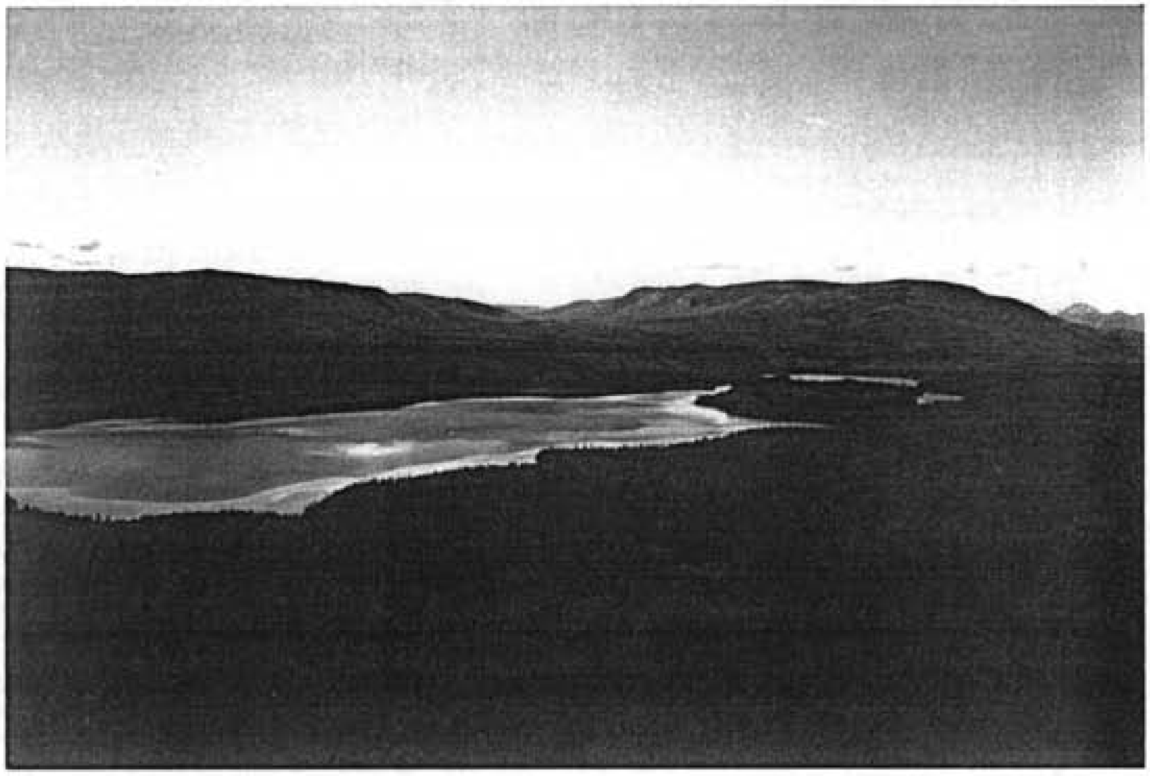

Photo 1. Graveyard Lake, looking south-southwest toward Chee Mountain (July, 1996).

Photo 2. Typical landscape in the more rugged southern portion of the North Gataga survey area: looking northeast toward Horneline Lake and Horneline Creek (July, 1996).

SURVEY METHODOLOGY

SAMPLE COLLECTION

Helicopter-supported regional water sampling was conducted by the authors in conjunction with lake sediment sample collection during July 1996. In the original sediment survey (Cook *et al.*, 1997b,c), a sediment and water sample were systematically collected at each of 445 sites using a float-equipped Bell 206 helicopter (Photo 1). Results reported here are based on an additional water sample which was collected at every second site for ICP-MS determination of trace elements. In all, surface water samples for trace element analysis were obtained from 235 sites on more than 200 different lakes (Table 1), at an average sampling density of approximately 1 site per 21.3 square kilometres.

Survey	Region	Collection Year	Area (square km)	Site Density	Lakes	Sites
Fawnie	*Nechako*	1993	1862.6	7.9	189	237
Pinchi	*Nechako*	1995	3584.2	16.5	199	217
Babine	*Nechako*	1996	3406	19.4	163	176
N. Gataga	*Kechika*	1996	5000	21.3	223	235
		Totals:	13852.8	16.0	774	865

Table 1. Summary of multi-element regional lake water geochemical surveys conducted in British Columbia up to 1996. Sampling density is in sites per square kilometre. Nechako-area lake water data from Open File 1999-5 (Cook *et al.*, 1999).

REGIONAL SAMPLING STRATEGIES

On the basis of results of prior orientation studies (Cook, 1993), regional lake sediment and water surveys in British Columbia incorporate some departures from standard sampling strategies used elsewhere in Canada for the National Geochemical Reconnaissance (NGR) program (Friske, 1991; Friske and Hornbrook, 1991), particularly pertaining to overall site density and the number of sites sampled in each lake. First, every lake in each survey area was sampled, rather than sampling only a selection of lakes at a fixed density (*i.e.* one site per 13 km^2). In practice, some small ponds were not sampled due to unfavourable landing conditions. Samples are not generally collected from the centres of very large and deep lakes (> 10 km^2; > 40 m deep), such as Babine Lake.

Secondly, centre-basin sediments and waters were obtained from all major known or inferred sub-basins to investigate the considerable sediment trace element variations which may exist among sub-basins of the same lake. Consequently, sediment and water data is reported for more than one site in some of the larger lakes. Lake bathymetry maps in unpublished reports of the Fisheries Branch, B.C. Ministry of Environment, Lands and Parks (Balkwill, 1991) are routinely consulted prior to sampling such lakes in order to aid in site location.

SITE COLLECTION PROCEDURES

Lake water samples were collected at each site in 250-millilitre high-density polyethylene (HDPE) Nalgene bottles using a custom-designed sampling apparatus consisting of two HDPE water bottle holders secured to a 1-metre length of wooden dowel. Waters were sampled from approximately 15 centimetres below the lake surface to avoid collection of surface scum, and precautions were taken to minimize the collection of suspended solids. In small shallow ponds, the sediment sample was not collected until the water samples were obtained.

Two 250-millilitre water samples were collected:

1) One sample, at each site, for the determination of the standard RGS analytical suite (pH, uranium, fluoride, sulphate), which is routinely determined for all RGS stream and lake water samples in British Columbia. These have been previously reported for the North Gataga survey area by Cook *et al.* (1997b).

2) A second lake water sample, at every second site, for multi-element ICP-MS determination of trace element constituents. Total dissolved solids (TDS), conductivity and total alkalinity were also determined on this sample.

In a recent study by Hall (1998), HDPE bottles have been found to be far superior in cleanliness to others made of Teflon (FEP), polyethylene terephalate copolyester (PETG) and polypropylene. Furthermore, HDPE bottles purchased "precleaned" have been shown to contribute more contaminants than their less expensive counterparts employed here.

FIELD OBSERVATIONS

A variety of field variables and observations pertaining to sample media, site and local terrain were recorded at each site using Geological Survey of Canada lake sediment cards (Garrett, 1974). A rough estimate of the amount of suspended solids in water samples was noted. Other observations include the depth, colour and composition of corresponding sediment samples, general area relief and potential sources of contamination. Water depth was measured at each site using a float-mounted depth sounder. Field observations are reproduced here as part of Appendix A.

Site locations were marked on 1:50000 scale NTS topographic maps in the field, transferred to master basemaps, and later digitized at the British Columbia Geological Survey Branch to obtain Universal Transverse Mercator (UTM) site coordinates (NAD27). Variables such as site geology, which reflects the dominant geological unit of the lake catchment, and lake area were coded after sample collection. Site geology was taken from Ferri *et al.* (1997b), and manually verified to ensure that lake watersheds corresponded to the coded geological unit. Common lake names used on NTS topographic maps were included where applicable. Element maps in Appendix D incorporate a NAD27 topographic base, but both NAD27 and NAD83 UTM site coordinates are included in the data listings in Appendix A.

SAMPLE PREPARATION AND PRESERVATION

No further preservation procedures were performed on routine raw lake water samples collected at each site for analysis of the RGS suite of elements. Waters were kept cool following collection, and shipped to the Analytical Sciences Laboratory, Victoria, for insertion of control standards and distilled water blanks into the analytical suite.

Surface water samples for trace element analysis separated into two half-portions. One portion (125 ml) of each sample was field filtered to 0.45 microns using Millipore Type HA cellulose nitrate filters (47 mm) and a Nalgene filtration apparatus with hand pump, in order to remove organic and inorganic particulate matter. The remaining unfiltered portion (125 ml) was retained for determination of total dissolved solids (TDS), conductivity and total alkalinity.

Filtered waters were transferred to new 125-millilitre Nalgene high-density polyethylene (HDPE) bottles and acidified to approximately pH=2 with 1 ml of 8M Ultrex nitric acid (50:50) as per standard methods for analysis of metals (APHA/AWWA/WEF, 1992). All samples were kept cool following collection and preservation, and shipped to the Geological Survey of Canada, Ottawa, for insertion of control standards and distilled water blanks prior to analysis.

SAMPLE ANALYSIS

RGS-SUITE WATERS

Routine unfiltered lake water samples were analyzed for the standard RGS water analytical suite of pH, uranium, fluoride and sulphate at CanTech Laboratories, Inc., Calgary. Stated detection limits are given in Table 2.

•Hydrogen ion activity (pH) was measured, on a separate sample aliquot, with a Fisher Accumet pH meter with glass-calomel combination electrode (GCE).

• Uranium was determined by laser-induced fluorescence (LIF) using a Scintrex UA-3 uranium analyzer. A complexing agent, known commercially as Fluran and composed of sodium pyrophosphate and sodium monophosphate (Hall, 1979), is added to produce a uranyl pyrophosphate species which fluoresces when exposed to the laser. As organic matter in the sample can cause unpredictable behaviour, a standard addition method is used. A total of 500 microlitres of Fluran solution was added to a 5 millilitre sample and allowed to stand for 24 hours, as the reaction of uranium with the complexing agent may be delayed or sluggish. At the end of this period fluorescence readings were made with the addition of 0.0, 0.2 and 0.4 ppb uranium. For high-concentration samples, the additions were 0.0, 2.0 and 4.0 ppb uranium. All readings are taken against a sample blank.

• Fluoride was determined by ion selective electrode (ION). A 20 millilitre aliquot of the sample was mixed with 20 millilitres of TISAB II (total ionic strength adjustment buffer) buffer solution. Fluoride was determined with an Orion fluoride electrode in conjunction with a Corning ion meter.

• Sulphate was determined by a turbidimetric method (TURB). A 50 millilitre aliquot was mixed with barium chloride and an isopropyl alcohol-HCl-NaCl reagent, and turbidity of the resulting barium sulphate solution measured with a spectrophotometer at 420 nanometres.

ICP SUITE WATERS: MAJOR ELEMENTS

Filtered and acidified water samples were analyzed for major elements using inductively coupled plasma-atomic emission spectroscopy (ICP-AES) at the Analytical Chemistry Laboratory of the Geological Survey of Canada, Ottawa, Ontario. Data for six major elements aluminum, calcium, magnesium, potassium, sodium and silicon, as well as iron, were determined using a Perkin-Elmer Optima ICP emission spectrometer and standard ICP-AES protocols.

ICP SUITE WATERS: TRACE ELEMENTS

Filtered and acidified water samples were analyzed for trace elements using inductively coupled plasma-mass spectrometry (ICP-MS) at the Analytical Method Development Laboratory of the Geological Survey of Canada, Ottawa, Ontario. Waters were analyzed for a suite of 41 elements using a VG PlasmaQuad 2+ ICP mass spectrometer and direct nebulization.

The isotopes used for measurement comprise: ^{7}Li, ^{9}Be, ^{27}Al, ^{47}Ti, ^{51}V, ^{52}Cr, ^{54}Fe, ^{57}Fe, ^{55}Mn, ^{59}Co, ^{60}Ni, ^{62}Ni, ^{63}Cu, ^{65}Cu, ^{66}Zn, ^{75}As, ^{77}Se, ^{78}Se, ^{82}Se, ^{85}Rb, ^{88}Sr, ^{89}Y, ^{98}Mo, ^{107}Ag, ^{114}Cd, ^{121}Sb, ^{133}Cs, ^{138}Ba, ^{139}La, ^{140}Ce, ^{141}Pr, ^{144}Nd, ^{147}Sm, ^{153}Eu, ^{159}Tb, ^{160}Gd, ^{163}Dy, ^{165}Ho, ^{166}Er, ^{174}Yb, ^{175}Lu, ^{205}Tl, ^{208}Pb and ^{238}U. The following interelement interference corrections were made, for: CO_2 on Ti; ClO on V; ArC on Cr; ArN and Cr on Fe; CaOH on Co; CaO and CaOH on Ni; CaOH and TiO on Cu; TiO on Zn; ArCl and CaO_2 on As; ArCl, Ar-Ar, Cl-Cl and CaO_2 on Se; MoO and Sn on Cd; La and Ce on Ba; BaO on Eu; NdO on Tb; Dy, SmO and NdO on Gd; SmO on Dy; SmO on Ho; NdO and SmO on Er; EuO on Tm; GdO on Yb; and TbO on Lu. Samples were analyzed in groups of 8-10, bracketed by standard solutions to monitor and correct for drift by interpolation. Recalibration was performed when/if drift became significant (e.g. >10%). Internal standards were not employed for several reasons: (1) many would be required to cover the large range in element mass and ionization potential under examination here; (2) no improvement in precision or accuracy has been found (actually degradation has been observed) using internal standards (e.g. Sc, In, Bi) in this GSC laboratory where elements are being measured at ng l^{-1} concentrations in waters of such low TDS content; and (3) addition of internal standards at the usual $\mu g\ l^{-1}$ concentrations leads to addition of analyte elements being measured at ng l^{-1} levels. Method detection limits are based on that concentration of analyte equivalent to three times the standard deviation of 12 blanks taken through the same filtering, preservation and analysis procedures as the samples. These blanks are collated from different projects and hence these values represent detection limits reflecting the procedures of sample collection, processing and analysis.

To provide the reader with a sense of precision and accuracy of this method, Appendix B (Table 2) presents the values obtained by direct ICP-MS for two in-house control samples, Ottawa River and Ottawa Tap, and the international reference water SLRS-2 (actually sampled at a different location and time on the Ottawa River). These data have been collected over a two-year period in various projects where the three bulk samples were used to monitor accuracy and precision. Hence the mean values for Ottawa River and Ottawa Tap represent as many as 135 and 116 direct analyses, respectively. Further details can be found in Hall *et al.* (1996).

Data for 39 elements are reported here; silver and selenium data have been excluded due to inadequate detection limits and hence poor precision. Reported analytical detection limits and calculated method detection limits are listed in Table 2. Method detection limits are defined as the mean + 3s values determined from replicate analyses of distilled water blanks.

In addition to the foregoing, five other water samples from three sites (three routine samples, two field duplicates) were analyzed by ICP-MS at Activation Laboratories, Ancaster, Ontario using a Perkin Elmer Elan 6000 inductively coupled plasma-mass spectrometer and a Perkin Elmer AS91 autosampler. Data for 21 elements for each sample are reported in Appendix A; elements for which no data is reported for these samples are denoted by '-1' in the data listings. Readers are referred to Cook *et al.* (1999) for a more complete account of ICP-MS analytical procedures at this laboratory.

OTHER DETERMINATIONS

Conductivity and total dissolved solids (TDS) were determined on an aliquot of raw unfiltered North Gataga lake water samples in the field lab using a Corning Checkmate 90 conductivity/TDS meter. Total alkalinity (T-Alk) was also determined by titration on each sample using a LaMotte alkalinity test kit.

TABLE 2. SURVEY SUMMARY TABLE

Analytical Suite	Method	Sites	Field Dups	Control Standards	DW Blanks	Field Samples	Total Samples
Major	ICP-AES	235*	26	17	21	261	299
Trace	ICP-MS	235*	26	17	21	261	299
RGS suite	-	445	26	27	27	471	525

* *waters from 3 sites analyzed at different laboratory and, in the case of the major elements, by ICP-MS.*

TABLE 3. ANALYTICAL AND METHOD DETECTION LIMITS

	Element	Symbol	Method	Analytical Det. Limit *ppb*	Method Det. Limit *ppb*
Major Elements	Aluminum[1]	Al	ICP-MS	0.5	1.96
	Aluminum[2]	Al	ICP-MS	2	2
	Calcium	Ca	ICP-AES	5	183.7
	Magnesium	Mg	ICP-AES	2	69
	Potassium	K	ICP-AES	20	69.2
	Silicon	Si	ICP-AES	10	50.4
	Sodium	Na	ICP-AES	20	20
Trace Elements	Lithium	Li	ICP-MS	0.005	0.027
	Beryllium	Be	ICP-MS	0.005	0.016
	Titanium	Ti	ICP-MS	0.5	0.5
	Vanadium	V	ICP-MS	0.1	0.1
	Chromium	Cr	ICP-MS	0.3	0.3
	Iron	Fe	ICP-MS	10	55.89
	Iron[3]	Fe	ICP-AES	3	3
	Manganese	Mn	ICP-MS	0.1	0.17
	Cobalt	Co	ICP-MS	0.05	0.05
	Nickel	Ni	ICP-MS	0.2	0.2
	Copper	Cu	ICP-MS	0.1	1.29
	Zinc	Zn	ICP-MS	0.5	1.13
	Arsenic	As	ICP-MS	0.1	0.1
	Rubidium	Rb	ICP-MS	0.05	0.05
	Strontium	Sr	ICP-MS	0.5	0.72
	Yttrium	Y	ICP-MS	0.01	0.01
	Molybdenum	Mo	ICP-MS	0.05	0.05
	Cadmium	Cd	ICP-MS	0.05	0.05
	Indium	In	ICP-MS	0.01	0.01
	Antimony	Sb	ICP-MS	0.01	0.01
	Cesium	Cs	ICP-MS	0.01	0.01
	Barium	Ba	ICP-MS	0.2	0.58
	Lanthanum	La	ICP-MS	0.01	0.01
	Cerium	Ce	ICP-MS	0.01	0.01
	Praseodymium	Pr	ICP-MS	0.005	0.005
	Neodymium	Nd	ICP-MS	0.005	0.006
	Samarium	Sm	ICP-MS	0.005	0.013
	Europium	Eu	ICP-MS	0.005	0.005
	Terbium	Tb	ICP-MS	0.005	0.005
	Gadolinium	Gd	ICP-MS	0.005	0.005
	Dysprosium	Dy	ICP-MS	0.005	0.008
	Holmium	Ho	ICP-MS	0.005	0.005
	Erbium	Er	ICP-MS	0.005	0.005
	Thulium	Tm	ICP-MS	0.005	0.005
	Ytterbium	Yb	ICP-MS	0.005	0.005
	Lutetium	Lu	ICP-MS	0.005	0.005
	Thallium	Tl	ICP-MS	0.005	0.005
	Lead	Pb	ICP-MS	0.01	0.034
	Uranium	U	ICP-MS	0.005	0.005
RGS Suite*	Uranium	U	LIF	0.05	0.07
	Fluoride	F	ION	20	18.8
	Sulphate	SO4	TURB	1 ppm	1
	pH	pH	GCE	0.1	-
Other	TDS		ELECTRODE	mg/l	
	Conductivity		ELECTRODE	uS	
	T-Alkalinity		ITRATION	ppm	

**for RGS suite, U and F results < d.l. set to 1/2 d.l.*

[1] Al determined by ICP-MS as part of major element suite

[2] Al determined by ICP-MS as part of trace element suite

[3] Fe determined by ICP-AES as part of major element suite

Photo 3. Preparing for a lake sediment and water sampling flight using a float-equipped helicopter

Photo 4. Regional lake sediment and water sampling in the Northern Kechika Trough

QUALITY CONTROL PROCEDURES AND RESULTS

METHODOLOGY

Variations in element concentrations in lake waters and sediments may be due to regional geological and geochemical variations (different bedrock lithologies and surficial materials, absence or presence of mineralization, limnological variations), within-site variations (combined sampling, preparation and analytical variations), or analytical variation alone. As noted by Fletcher (1981), a high degree of analytical precision is of limited importance if the sample collection and preparation error is so great as to be indistinguishable from the regional geochemical variation.

The ability to discriminate real geochemical trends from those resulting from sampling, preparation and analytical variation is of considerable importance in the interpretation of all geochemical data. It is particularly so in the case of water samples, where absolute concentrations and analytical detection levels of trace elements are often in the 0.001 ppb range. These low concentration levels offer a much greater scope for potential contamination during sample collection, transport, preparation and analysis than exists with sediments, where natural element concentrations may be several orders of magnitude greater.

Control reference standards and, in some occasions, analytical duplicates are inserted into (i) RGS-suite and (ii) ICP water sample suites to monitor and assess accuracy and precision of analytical results. Control reference standards are used to assess analytical accuracy. Sampling and analytical variation can be quantified using estimates of precision within and between sample sites determined by utilizing field and analytical duplicate data.

In accordance with standard National Geochemical Reconnaissance (NGR) and Regional Geochemical Survey (RGS) quality control procedures, each block of 20 waters (Figure 3) to be analyzed for the routine RGS analytical suite (uranium, fluoride, sulphate, pH) contains:

- •Seventeen routine samples,
- •One field duplicate sample,
- •One distilled water blank,
- •One control reference standard

This is a modification of the protocol typically used for lake and stream sediments (*e.g.* Cook *et al.*, 1998; Cook and Jackaman, 1994). Locations of blanks and control reference standards are selected prior to sampling. Field duplicate sites, however, are chosen randomly during fieldwork. At these sites two water samples are collected simultaneously by the sampler, while sediment duplicates are obtained from the rear of the helicopter with successive drops of the torpedo sampler. Field duplicates are used to monitor combined sampling, preparation and analytical precision, and are a measure of within-site variation. After collection, distilled water blanks are inserted into the sample suite prior to analysis to monitor analytical contamination. They are inserted into the locations otherwise occupied by blind, analytical, duplicates in the corresponding sediment analytical suites.

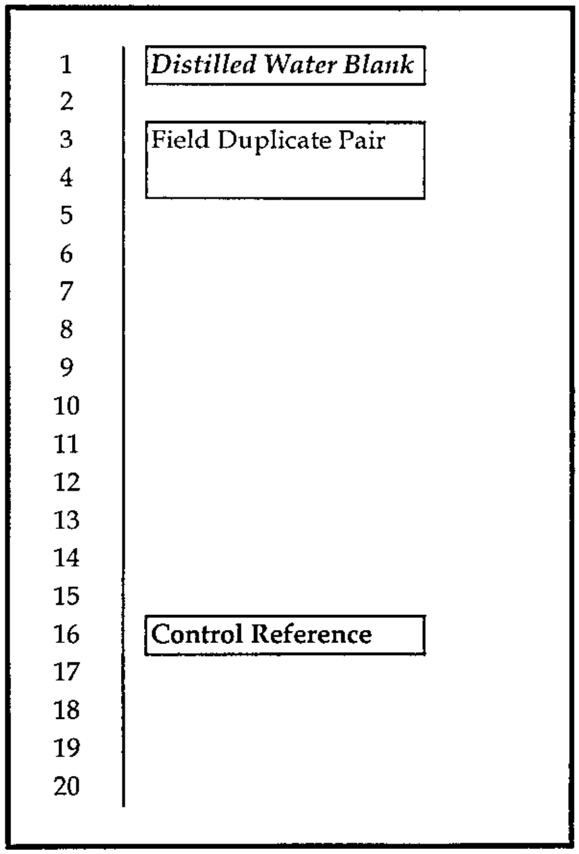

Figure 3. Typical RGS sample collection and analytical scheme for routine waters (RGS suite: U, F, SO4, pH) used during combined lake sediment and water surveys. The 20-sample collection block incorporates 17 routine samples, a field duplicate sample, a distilled water blank and a control reference standard. The design is unchanged here for collection of samples for ICP analysis, other than that waters were obtained at only every second of the routine sites.

Quality control methods used here for ICP-AES and ICP-MS analysis of major and trace elements are substantially the same as with the RGS suite, except that water samples were collected at every second site, rather than at each site as with the routine RGS analytical suite.

COMBINED SAMPLING AND ANALYTICAL PRECISION: FIELD DUPLICATE SAMPLES

Analytical results for field duplicate pairs in North Gataga area lake waters are reported in the data listings (Rep 10 and 20) in Appendix A. Scatterplots of field duplicate pairs for uranium, fluoride, sulphate and pH (Figure 4; N=26), for calcium, magnesium, potassium, sodium, aluminum and silicon (Figure 5; N=24) and for barium, zinc, lead, molybdenum and other trace elements (Figure 6; N=24) indicate a high degree of combined sampling, preservation and analytical precision for these elements. North Gataga field duplicate data for uranium, fluoride, sulphate and pH was previously reported by Cook *et al.* (1997).

Median per cent relative standard deviation (% RSD) and precision values (Table 4) were obtained for field duplicates by calculating % RSD and precision for each pair and then ranking the results. Most of the major elements by ICP-AES exhibit a high degree of combined precision, with median RSD values in the range 0.0 - 2.1%. Absolute concentrations of aluminum (by ICP-MS) in waters are much lower, and this element exhibits considerably greater variation in precision results. Aluminum median RSD values are 19.9% and 0.0% for the major element and trace element suites, respectively.

Median %RSD and precision results for 19 trace elements by ICP-MS (Table 4) show a high degree of combined sampling, preservation and analytical reproducibility for field duplicate pairs. Precision is particularly good, for instance, for barium, copper, molybdenum, nickel, arsenic and uranium. Conversely, combined sampling, preservation and analytical precision is somewhat poorer for iron, zinc and lead. Considerably better precision for iron was achieved on field duplicates analyzed by ICP-AES as part of the major element suite. Lead concentrations among field duplicates are very low, only marginally greater than the detection limit of 0.01 ppb in most cases. Nineteen elements (Co, Y, Cd, In, Cs, La, Ce, Pr, Sm, Eu, Tb, Gd, Dy, Ho, Er, Tm, Yb, Lu and Tl) are not included in Table 4 because concentrations of all or most of these elements in the field duplicate pairs are less than detection limits. Similarly, precision results shown for several other elements in Table 4 appear better than they really are due to their very low concentration levels, with several pairs of results below detectable limits. In particular, nickel, titanium and aluminum each have 8-10 pairs of results below detection limits, and chromium and neodymium each have 13 pairs below detection limits; consequently, RSD and precision results of 0.0% for these elements are somewhat misleading.

Routine RGS-suite field duplicate water samples (N=26 pairs) also show precise results (Table 4). Median per cent RSD values for sulphate and pH are both 0.0%, suggesting that combined field sampling and analytical reproducibility is very good. Median per cent RSD values for field duplicate uranium and fluoride determinations are 2.1% and 2.3%, respectively.

TABLE 4. MEDIAN RSD AND PRECISION RESULTS FOR FIELD DUPLICATE PAIRS

	Element	Symbol	Median % RSD	Median Precision
Major Elements *(N=24)*	Aluminum[1]	Al	19.9	39.7
	Aluminum[2]	Al	0.0	0.0
	Calcium	Ca	0.0	0.0
	Magnesium	Mg	0.0	0.0
	Potassium	K	2.1	4.3
	Silicon	Si	0.0	0.0
	Sodium	Na	0.0	0.0
Trace Elements *(N=24)*	Lithium	Li	0.9	1.8
	Beryllium	Be	6.4	12.9
	Titanium	Ti	0.0	0.0
	Vanadium	V	0.0	0.0
	Chromium	Cr	0.0	0.0
	Iron	Fe	15.7	31.4
	Iron[3]	Fe	3.6	7.3
	Manganese	Mn	4.5	9.0
	Nickel	Ni	0.0	0.0
	Copper	Cu	0.0	0.0
	Zinc	Zn	16.5	33.1
	Arsenic	As	0.0	0.0
	Rubidium	Rb	3.4	6.9
	Strontium	Sr	0.8	1.7
	Molybdenum	Mo	2.5	4.9
	Antimony	Sb	7.5	15.1
	Barium	Ba	1.8	3.5
	Neodymium	Nd	0.0	0.0
	Lead	Pb	28.3	56.6
	Uranium	U	3.0	5.9
RGS Suite *(N=26)*	Uranium	U	2.1	4.3
	Fluoride	F	2.3	4.6
	Sulphate	SO4	0.0	0.0
	pH	pH	0.0	0.0
Other *(N=24)*	TDS		0.7	1.5
	Conductivity		0.7	1.4
	T-Alkalinity*		1.7	3.3

**N=26 pairs*

[1] Al determined by ICP-MS as part of major element suite
[2] Al determined by ICP-MS as part of trace element suite
[3] Fe determined by ICP-AES as part of major element suite

ANALYTICAL PRECISION: ANALYTICAL DUPLICATE SAMPLES

Analytical duplicate samples are not routinely included in the water analytical scheme (Figure 3), as they are with regional sediment samples (*e.g.* Cook *et al.*, 1997c). However, ICP-MS analytical duplicate data for 21 randomly chosen samples are reported in Appendix B.

In addition to the foregoing, analytical precision was determined for conductivity and total dissolved solids (TDS) measurements using the Corning Checkmate 90 conductivity/TDS meter. Ten replicate analyses were conducted, in successive 45-second increments, on each of four randomly selected North Gataga lake water samples and an aliquot of distilled water. Results for each are summarized in Appendix B. Analytical precision of conductivity and TDS determinations on distilled water are ±6.63% and ±6.05%, respectively. Analytical precision results for natural waters are greater, in the range ±0.12 - 0.64% for conductivity and ±0.24 - 0.83% for TDS.

ANALYTICAL ACCURACY AND PRECISION: CONTROL REFERENCE STANDARDS

Per cent relative standard deviation (% RSD) values calculated from replicate analyses of control reference standards for the North Gataga survey are shown in Table 5. These results convey the level of analytical precision achieved at various concentration levels for all elements. RSD results < 10% are highlighted by grey shading. Mean ± 1s results for each standard are also shown.

Five control standards (N=17 insertions) were used in both the ICP-AES and ICP-MS analytical suites. All are natural waters, consisting of three internal GSB water standards, a National Research Council certified reference standard (SLRS-3) and a National Water Research Institute certified reference standard (TM-28). Analytical data for NRC standard SLRS-3 (n=4 insertions) compare favourably with available certified values (NRC, 1994), indicating a high degree of analytical accuracy for most constituents. For example, North Gataga ICP-MS analyses of SLRS-3 returned mean iron concentrations of 99.0 ± 10.7 ppb, which corresponds closely with the certified value of 100 ± 2 ppb iron. Other trace element results for SLRS-3 also agree closely with most certified values. For example, mean determinations of 0.13 ± 0.01 ppb antimony, 0.78 ± 0.05 ppb arsenic and 13.85 ± 0.12 ppb barium compare closely with certified values of 0.12 ± 0.01 ppb antimony, 0.72 ± 0.05 ppb arsenic, and 13.4 ± 0.6 ppb barium, respectively. Similarly, mean copper and zinc concentrations of 1.43 ± 0.10 ppb and 1.00 ± 0.08 ppb, respectively, compare closely with certified values of 1.35 ± 0.07 ppb copper and 1.04 ± 0.09 ppb zinc.

Analytical data for National Water Research Institute certified standard TM-28, which has higher element concentrations than SLRS-3, also compare favourably with accepted values (NWRI, 1994). For example, North Gataga analyses of TM-28 (n=3 insertions) returned mean zinc and iron (ICP-AES) concentrations of 21.67 ± 2.47 and 34.0 ± 1.0 ppb, respectively, which correspond closely with certified value of 19.1 ± 4.9 ppb zinc and 31.5 ± 8.6 ppb iron. Other ICP-MS trace element results for TM-28 also agree closely with the values. For example, mean determinations of 3.22 ± 0.13 ppb lead, 3.50 ± 0.20 ppb arsenic, 16.93 ± 1.04 ppb barium and 2.84 ± 0.22 ppb molybdenum compare closely with certified values of 2.9 ± 1.3 ppb lead, 3.0 ± 1.3 ppb arsenic, 15.6 ± 4.0 ppb barium and 2.7 ± 1.2 ppb molybdenum, respectively.

The three internal water standards (Graveyard, Chutanli, CH-1) were obtained in 1996 as bulk water samples from several lakes of varying physical and chemical characteristics. Graveyard was obtained from Graveyard Lake, a large lake in the North Gataga survey area. The other two standards, and standard 3031 used here in the RGS suite, were obtained from various lakes in the Nechako Plateau area of central British Columbia. These standards have not yet been fully characterized, but results reported here are in agreement with preliminary accepted values based on all ICP-MS determinations of these waters. For example, replicate analyses of standards Chutanli and CH-1 returned mean results of 2 ± 0 ppb and 4.3 ± 0.6 ppb aluminum, respectively (Table 5) versus preliminary accepted values of 2.2 ± 1.2 ppb and 5.1 ± 0.8 ppb aluminum achieved here. Similarly, replicate analyses of the same two standards returned mean arsenic concentrations of 1.83 ± 0.06 ppb and 0.10 ± 0.0 ppb, respectively, versus preliminary accepted values of 1.73 ± 0.10 ppb and 0.10 ± 0.2 ppb arsenic. As a further example, mean barium concentrations of 15.00 ± 0.44 ppb and 2.77 ± 0.29 ppb reported here for standards Chutanli and CH-1 (Table 5) compare well with preliminary accepted values of 13.78 ± 0.52 ppb and 3.00 ± 0.20 ppb.

As a measure of the analytical precision of ICP-MS control standards results, relative standard deviation (% RSD) values determined from replicate analyses of each of the five standards are shown in Table 5. Those RSD values less than 10% are here denoted by shading. Among those elements determined with the greatest precision are barium (% RSD: 2.9-10.4% for all five standards), zinc (% RSD: 0-8.2% for four of five standards), arsenic (% RSD: 0-6.5% for all five standards) and copper (% RSD: 0-7.5% for four of five standards). In the case of iron, which was determined by both ICP methods, somewhat greater precision was obtained, in most cases, with ICP-AES as opposed to ICP-MS results. Higher RSD values and correspondingly poorer precision are generally associated with those elements commonly occurring near the limits of analytical detection. In the case of molybdenum, for example, % RSD results vary in the range 1.8-7.9% for four mean concentrations of 0.19 ppb to 2.84 ppb, but are 37.5% for a water (CH-1) reporting a mean concentration of only 0.08 ppb molybdenum.

Major element analytical data for NRC standard SLRS-3 (n=4 insertions) compare favourably with available certified values (NRC, 1994), indicating a high degree of analytical accuracy for most constituents. For example, ICP-MS analyses of SLRS-3 in both the major element and trace element suites returned mean aluminum concentrations of 32.0 ± 1.4 ppb and 31.8 ± 2.6 ppb, respectively. These results correspond closely with the certified value of 31 ± 3 ppb aluminum. Major element ICP-AES results for SLRS-3 (Table 5) also agree closely with certified values. These include mean results of 6275 ± 95.7 ppb calcium (certified value: 6000 ± 400 ppb), 1800 ± 0 ppb magnesium (certified value: 1600 ± 200 ppb), 745 ± 17.3 ppb potassium (certified value: 700 ± 100 ppb) and 2725 ± 95.7 ppb sodium (certified value: 2300 ± 200 ppb).

Similarly, ICP-MS analyses of standard TM-28 (n=3 insertions) in both the major element and trace element suites returned mean aluminum concentrations of 86.3 ± 6.1 ppb and 90.0 ± 6.2 ppb, respectively. These results correspond closely with the certified value (NWRI, 1994) of 82 ± 24 ppb aluminum. Major element ICP-AES results for TM-28 (Table 5) also agree with published accepted values, although not as closely as do the SLRS-3 results. These include mean results of 7533 ± 116 ppb calcium (accepted value: 6800 ppb), 1700 ± 0 ppb magnesium (accepted value: 1400 ppb) and 340 ± 17 ppb potassium (accepted value: 300 ppb).

As a measure of the analytical precision of ICP-AES control standards results, relative standard deviation (% RSD) values determined from replicate analyses of each of the five standards are shown in Table 5. RSD values for most major elements are less than 10%, and are highlighted in Table 5 by shading. For example, % RSD results for calcium do not exceed 2.6% for the five standards, and % RSD results for potassium do not exceed 5.6%. The least precise results are those for silicon, with % RSD results in the range 14.7-23.5%.

Four natural waters and a spiked internal standard were used as RGS suite control standards (N=27 insertions). Three of the four natural waters (Graveyard, Chutanli, CH-1) were also used in the ICP-MS analytical suite. Although accepted values have not yet been formally defined for these standards, as mentioned above, summary analytical results (Table 5) compare favourably with results for the same standards achieved in other analytical batches. For example, replicate analyses of standards CH-1, 3031 and Chutanli in a separate batch during the same year returned mean results of 26.8 ± 5.7 ppm, 11.0 ± 1.2 ppm and 2.8 ± 0.5 ppm sulphate, versus mean results of 25.8 ± 3.7 ppm, 9.6 ± 0.9 ppm and 5.6 ± 0.9 ppm sulphate, respectively reported here for the North Gataga suite. Similarly, replicate analyses of the same three standards returned mean fluoride concentrations of 92.8 ± 33.9 ppb, 290 ± 7.1 ppb and 46.0 ± 0.0 ppb versus mean results of 108 ± 4.5 ppb, 292 ± 13.0 ppb and 47.2 ± 1.8 ppb fluoride reported here.

Regarding analytical precision for the RGS suite of elements, 5 - 7 replicate analyses of each returned relative standard deviation (% RSD) values (Table 5) of 5.3 - 16.0% for uranium (4 of 5 standards), 3.8 - 7.1% for fluoride (4 of 5 standards) and 5.6 - 16.0% for sulphate (4 of 5 standards). As with ICP-MS water results, precision is generally poorer for those results near analytical detection limits. For example, the mean fluoride concentration of standard STD-3 is only 21.7 ppb, near the limit of detection (20 ppb), and the corresponding %RSD value is 25.7%.

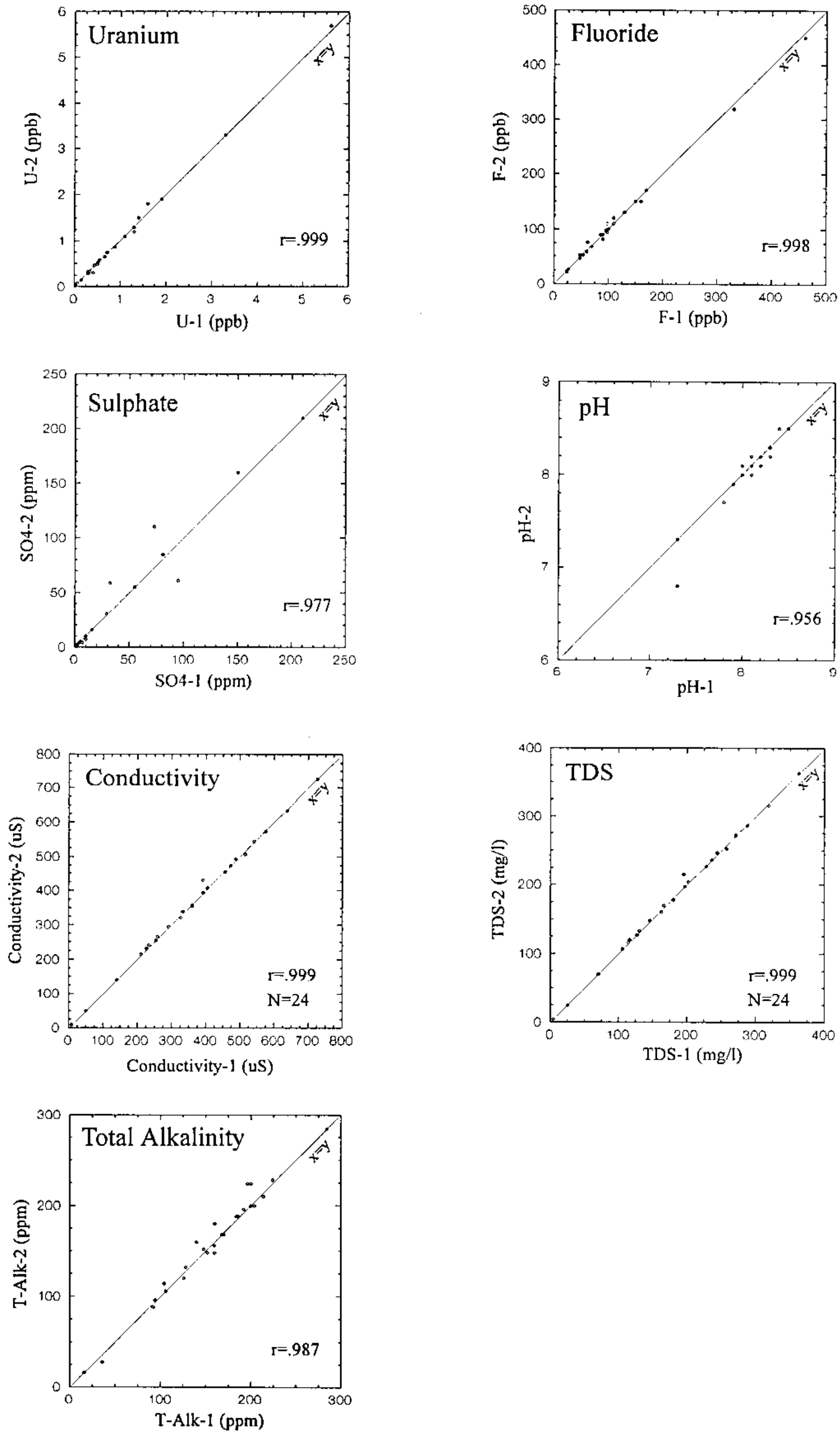

Figure 4. Scatterplots of field duplicate pairs (N=26) for North Gataga area lake waters: uranium, fluoride, sulphate and pH, and conductivity, TDS and total alkalinity. Data for uranium, fluoride, sulphate and pH has previously been reported by Cook *et al.* (1997c). Only 24 field duplicate pairs are available for conductivity and TDS.

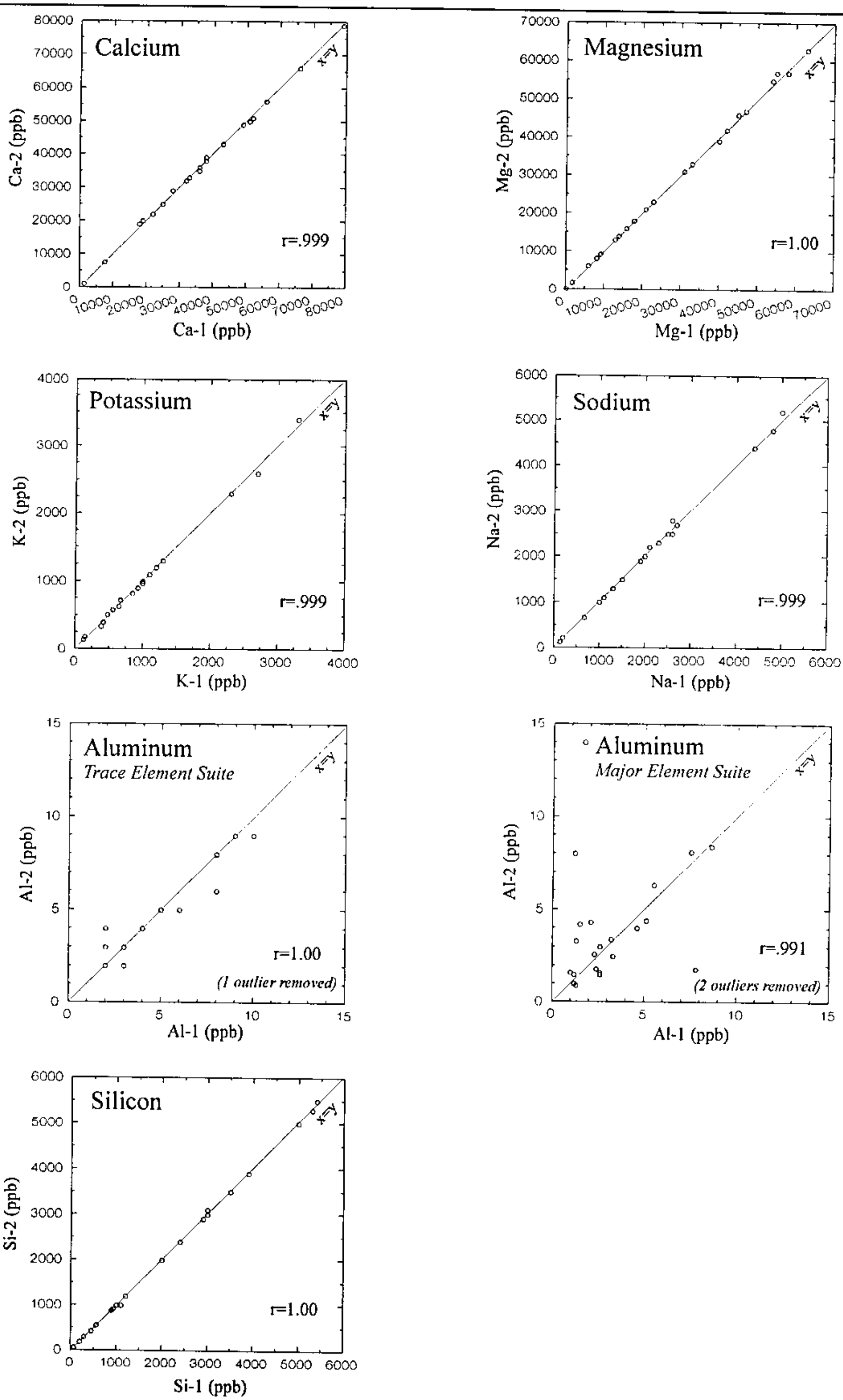

Figure 5. Scatterplots of field duplicate pairs (N=24) for major elements by ICP-AES (excepting aluminum) in North Gataga area lake waters: calcium, magnesium, potassium, sodium, aluminum and silicon. Scatterplots of two separate sets of ICP-MS aluminum determinations are shown. Note that two field duplicate pairs analyzed in part at a different lab are not shown here (4263/264 and 4465/466), but are included in the data listings in Appendix A.

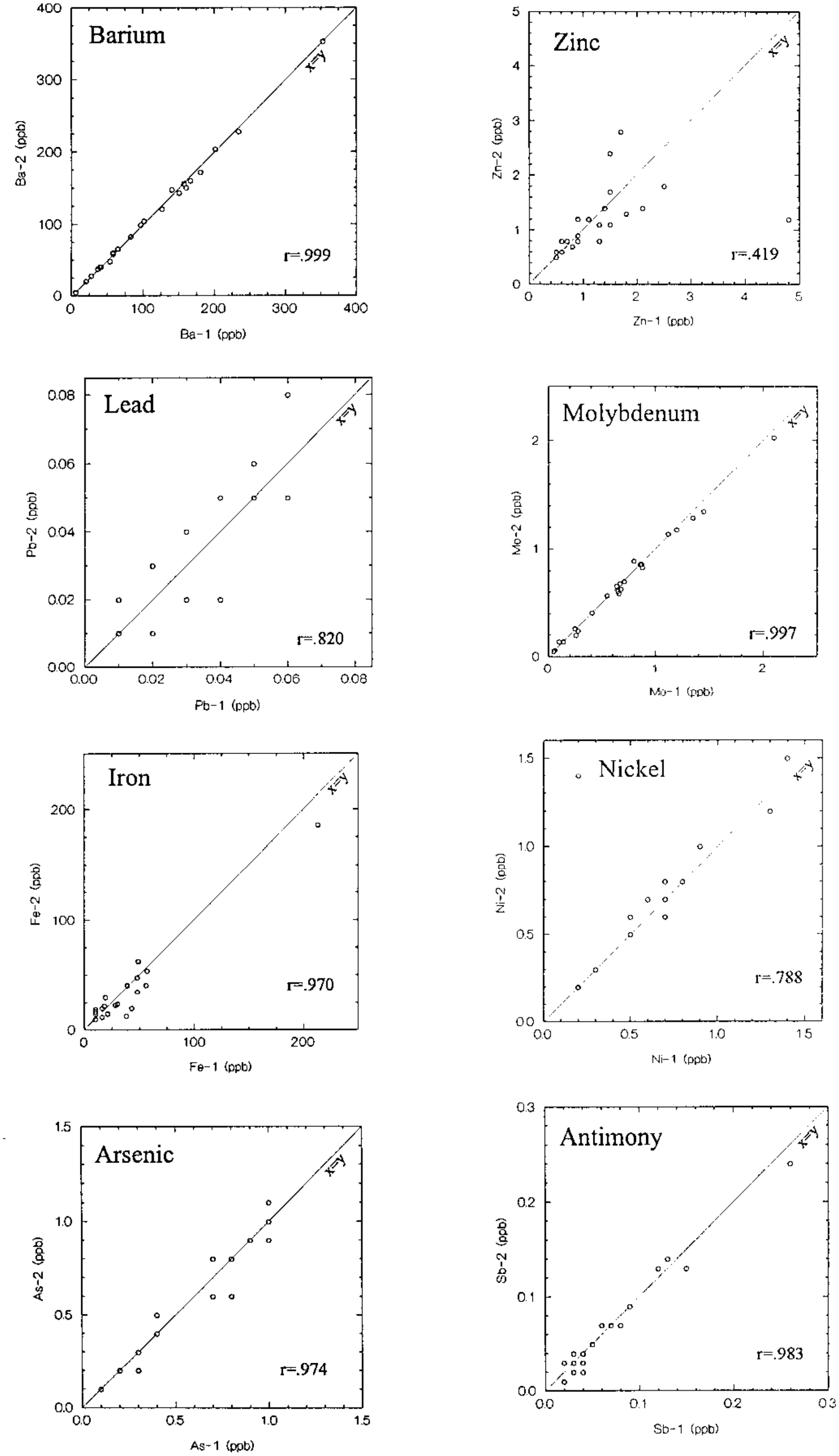

Figure 6. Scatterplots of field duplicate pairs (N=24) for selected trace elements by ICP-MS in North Gataga area lake waters: barium, zinc, lead, molybdenum, iron, nickel, arsenic and antimony. Two field duplicate pairs analyzed in part at a different lab, but not shown here (4263/264 and 4465/466), are included in the data listings in Appendix A.

TABLE 5. CONTROL STANDARDS RESULTS

	Element	Symbol	Method	SLRS-3 (n=4) Mean (ppb)	± 1s (ppb)	RSD (%)	Graveyard (n=4) Mean (ppb)	± 1s (ppb)	RSD (%)	Chutanli (n=3) Mean (ppb)	± 1s (ppb)	RSD (%)	CH-1 (n=3) Mean (ppb)	± 1s (ppb)	RSD (%)	TM-28 (n=3) Mean (ppb)	± 1s (ppb)	RSD (%)
Major Elements	Aluminum[1]	Al	ICP-MS	32.0	1.4	**4.4**	2.4	1.3	**55.1**	1.5	0.3	**21.9**	5.9	0.2	**2.9**	86.3	6.1	**7.1**
	Aluminum[2]	Al	ICP-MS	31.8	2.6	**8.3**	2.3	0.5	**22.2**	2.0	0.0	**0.0**	4.3	0.6	**13.3**	90.0	6.2	**6.9**
	Calcium	Ca	ICP-AES	6275	95.7	**1.5**	51000	816.5	**1.6**	22333.3	577.4	**2.6**	12000	0.0	**0.0**	7533.3	115.5	**1.5**
	Magnesium	Mg	ICP-AES	1800	0.0	**0.0**	37750	500.0	**1.3**	6266.7	57.7	**0.9**	3600	0.0	**0.0**	1700	0.0	**0.0**
	Potassium	K	ICP-AES	745	17.3	**2.3**	1125	50.0	**4.4**	1033.3	57.7	**5.6**	2366.7	57.7	**2.4**	340	17.3	**5.1**
	Silicon	Si	ICP-AES	2175	320.2	**14.7**	4625	895.8	**19.4**	3166.7	635.1	**20.1**	5300	1039.2	**19.6**	670	157.2	**23.5**
	Sodium	Na	ICP-AES	2725	95.7	**3.5**	3275	50.0	**1.5**	3633.3	57.7	**1.6**	3400	0.0	**0.0**	3333.3	57.7	**1.7**
Trace Elements	Lithium	Li	ICP-MS	0.502	0.052	**10.4**	9.751	0.350	**3.6**	0.430	0.017	**3.8**	1.544	0.113	**7.3**	7.138	0.526	**7.4**
	Beryllium	Be	ICP-MS	0.006	0.002	**33.3**	0.005	0.000	**0.0**	0.009	0.005	**54.5**	0.005	0.000	**0.0**	1.715	0.091	**5.3**
	Aluminum	Al	ICP-MS	31.8	2.6	**8.3**	2.3	0.5	**22.2**	2.0	0.0	**0.0**	4.3	0.6	**13.3**	90.0	6.2	**6.9**
	Titanium	Ti	ICP-MS	1.18	0.19	**16.1**	1.20	0.18	**15.2**	0.97	0.06	**6.0**	1.27	0.32	**25.4**	1.90	0.10	**5.3**
	Vanadium	V	ICP-MS	0.28	0.05	**18.2**	0.18	0.15	**85.7**	0.67	0.06	**8.7**	0.23	0.15	**65.5**	0.67	0.06	**8.7**
	Chromium	Cr	ICP-MS	0.30	0.00	**0.0**	0.50	0.40	**80.0**	0.40	0.10	**25.0**	0.33	0.06	**17.3**	0.87	0.12	**13.3**
	Iron	Fe	ICP-MS	99.0	10.7	**10.8**	10.0	0.0	**0.0**	12.3	4.0	**32.8**	13.0	5.2	**40.0**	45.0	6.6	**14.6**
	Iron[3]	Fe	ICP-AES	110.0	0.0	**0.0**	3.0	0.0	**0.0**	62.7	101.6	**162.2**	7.0	1.0	**14.3**	34.0	1.0	**2.9**
	Manganese	Mn	ICP-MS	3.85	0.26	**6.9**	0.13	0.05	**40.0**	7.03	0.15	**2.2**	0.20	0.10	**50.0**	8.13	0.49	**6.1**
	Cobalt	Co	ICP-MS	0.05	0.00	**0.0**	0.05	0.00	**0.0**	0.05	0.00	**0.0**	0.05	0.00	**0.0**	3.30	0.24	**7.3**
	Nickel	Ni	ICP-MS	0.75	0.10	**13.3**	0.43	0.29	**67.6**	0.23	0.06	**24.7**	0.20	0.00	**0.0**	21.33	1.63	**7.6**
	Copper	Cu	ICP-MS	1.43	0.10	**6.7**	0.33	0.05	**15.4**	0.40	0.00	**0.0**	0.60	0.00	**0.0**	6.83	0.51	**7.5**
	Zinc	Zn	ICP-MS	1.00	0.08	**8.2**	0.50	0.00	**0.0**	0.50	0.00	**0.0**	0.73	0.06	**7.9**	21.67	2.47	**11.4**
	Arsenic	As	ICP-MS	0.78	0.05	**6.5**	0.78	0.05	**6.5**	1.83	0.06	**3.1**	0.10	0.00	**0.0**	3.50	0.20	**5.7**
	Rubidium	Rb	ICP-MS	1.58	0.15	**9.4**	0.75	0.07	**8.8**	0.50	0.01	**2.3**	2.30	0.14	**5.9**	0.29	0.02	**7.3**
	Strontium	Sr	ICP-MS	32.80	2.98	**9.1**	419.63	26.40	**6.3**	152.73	1.10	**0.7**	35.33	3.49	**9.9**	123.37	9.36	**7.6**
	Yttrium	Y	ICP-MS	0.12	0.01	**7.8**	0.01	0.00	**0.0**	0.01	0.00	**0.0**	0.01	0.00	**0.0**	0.01	0.00	**0.0**
	Molybdenum	Mo	ICP-MS	0.19	0.01	**7.4**	1.25	0.02	**1.8**	0.63	0.03	**4.0**	0.08	0.03	**37.5**	2.84	0.22	**7.9**
	Cadmium	Cd	ICP-MS	0.05	0.00	**0.0**	0.05	0.00	**0.0**	0.05	0.00	**0.0**	0.05	0.00	**0.0**	1.48	0.12	**7.8**
	Indium	In	ICP-MS	0.01	0.00	**0.0**	0.01	0.00	**0.0**	0.01	0.00	**0.0**	0.01	0.00	**0.0**	0.01	0.01	**43.3**
	Antimony	Sb	ICP-MS	0.13	0.01	**10.9**	0.02	0.00	**22.2**	0.07	0.01	**8.7**	0.06	0.02	**33.3**	4.09	0.35	**8.6**
	Cesium	Cs	ICP-MS	0.01	0.00	**0.0**	0.01	0.00	**0.0**	0.01	0.00	**0.0**	0.01	0.00	**0.0**	0.01	0.00	**0.0**
	Barium	Ba	ICP-MS	13.85	1.12	**8.1**	39.03	2.14	**5.5**	15.00	0.44	**2.9**	2.77	0.29	**10.4**	16.93	1.04	**6.1**
	Lanthanum	La	ICP-MS	0.24	0.02	**6.2**	0.01	0.00	**0.0**	0.01	0.00	**0.0**	0.01	0.00	**0.0**	0.01	0.00	**0.0**
	Cerium	Ce	ICP-MS	0.28	0.01	**5.4**	0.01	0.00	**0.0**	0.01	0.00	**0.0**	0.01	0.00	**0.0**	0.01	0.00	**0.0**
	Praseodymiu	Pr	ICP-MS	0.056	0.006	**10.4**	0.005	0.000	**0.0**	0.005	0.000	**0.0**	0.005	0.000	**0.0**	0.005	0.000	**0.0**
	Neodymium	Nd	ICP-MS	0.242	0.027	**11.3**	0.005	0.000	**0.0**	0.008	0.003	**39.8**	0.008	0.005	**65.0**	0.006	0.002	**36.5**
	Samarium	Sm	ICP-MS	0.042	0.005	**11.8**	0.006	0.001	**18.2**	0.005	0.000	**0.0**	0.005	0.000	**0.0**	0.005	0.001	**10.8**
	Europium	Eu	ICP-MS	0.006	0.002	**24.0**	0.005	0.000	**0.0**	0.005	0.000	**0.0**	0.005	0.000	**0.0**	0.005	0.000	**0.0**
	Terbium	Tb	ICP-MS	0.005	0.001	**9.5**	0.005	0.000	**0.0**	0.005	0.000	**0.0**	0.005	0.000	**0.0**	0.005	0.000	**0.0**
	Gadolinium	Gd	ICP-MS	0.036	0.008	**22.1**	0.005	0.000	**0.0**	0.005	0.000	**0.0**	0.005	0.000	**0.0**	0.005	0.000	**0.0**
	Dysprosium	Dy	ICP-MS	0.023	0.007	**33.0**	0.005	0.000	**0.0**	0.005	0.000	**0.0**	0.005	0.000	**0.0**	0.005	0.000	**0.0**
	Holmium	Ho	ICP-MS	0.005	0.000	**0.0**	0.005	0.000	**0.0**	0.005	0.000	**0.0**	0.005	0.000	**0.0**	0.005	0.000	**0.0**
	Erbium	Er	ICP-MS	0.010	0.003	**29.5**	0.005	0.000	**0.0**	0.005	0.000	**0.0**	0.005	0.000	**0.0**	0.005	0.000	**0.0**
	Thulium	Tm	ICP-MS	0.005	0.000	**0.0**	0.005	0.000	**0.0**	0.005	0.000	**0.0**	0.005	0.000	**0.0**	0.005	0.000	**0.0**
	Ytterbium	Yb	ICP-MS	0.013	0.004	**33.0**	0.005	0.000	**0.0**	0.005	0.000	**0.0**	0.005	0.000	**0.0**	0.005	0.000	**0.0**
	Lutetium	Lu	ICP-MS	0.005	0.000	**0.0**	0.005	0.000	**0.0**	0.005	0.000	**0.0**	0.005	0.000	**0.0**	0.005	0.000	**0.0**
	Thallium	Tl	ICP-MS	0.005	0.000	**9.5**	0.005	0.000	**0.0**	0.005	0.000	**0.0**	0.005	0.000	**0.0**	0.005	0.000	**0.0**
	Lead	Pb	ICP-MS	0.06	0.01	**16.7**	0.04	0.01	**16.5**	0.01	0.00	**0.0**	0.01	0.00	**0.0**	3.22	0.13	**3.9**
	Uranium	U	ICP-MS	0.043	0.006	**13.8**	2.406	0.102	**4.2**	0.045	0.004	**8.4**	0.005	0.000	**0.0**	2.093	0.131	**6.2**

	Element	Symbol	Method	STD-3 (n=7) Mean (ppb)	± 1s (ppb)	RSD (%)	Graveyard (n=5) Mean (ppb)	± 1s (ppb)	RSD (%)	Chutanli (n=5) Mean (ppb)	± 1s (ppb)	RSD (%)	CH-1 (n=5) Mean (ppb)	± 1s (ppb)	RSD (%)	3031 (n=5) Mean (ppb)	± 1s (ppb)	RSD (%)
RGS Suite	Uranium	U	LIF	0.12	0.01	**9.1**	0.34	0.02	**7.3**	0.06	0.01	**16.0**	0.03	0.02	**51.3**	0.10	0.01	**5.3**
	Fluoride	F	ION	21.7	5.6	**25.7**	100.0	7.1	**7.1**	47.2	1.8	**3.8**	108.0	4.5	**4.1**	292.0	13.0	**4.5**
	Sulphate	SO4	TURB	7.3	2.1	**29.3**	85.2	4.8	**5.6**	5.6	0.9	**16.0**	25.8	3.7	**14.3**	9.6	0.9	**9.3**
	pH	pH	GCE	6.8	0.9	**13.7**	1.4	0.0	**3.2**	1.9	0.0	**0.0**	7.5	0.1	**1.1**	1.9	0.0	**0.0**

RSD < 10%

[1] Al determined by ICP-MS as part of major element suite
[2] Al determined by ICP-MS as part of trace element suite
[3] Fe determined by ICP-AES as part of major element suite

MONITORING ANALYTICAL CONTAMINATION: DISTILLED WATER BLANKS

Distilled water blanks are metal-free waters inserted into analytical suites to monitor for any potential analytical contamination of the samples. Table 6 gives results of several total dissolved solids (TDS) and conductivity measurements which were conducted, at random intervals, on aliquots of distilled water used over the course of TDS and conductivity measurements of North Gataga lake waters. Conductivity and TDS here do not exceed 1.57 uS and 0.78 mg/l, respectively. In addition to the foregoing, ten successive replicate analyses of a separate distilled water aliquot returned mean conductivity and TDS determinations of 0.93 ± 0.03 uS and 0.46 ± 0.01 mg/l, respectively. The very low total dissolved solids (TDS) and conductivity results verify the deionized nature of the distilled water used in this survey.

A total of 21 distilled water blanks were inserted into each of the ICP-AES and ICP-MS analytical suites. Four types of blanks were used: 1) filtered and acidified blanks *(n=6)*, 2) filtered and unacidified blanks *(n=6)*, 3) unfiltered, unacidified blanks *(n=5)*, and 4) unfiltered, unacidified GSC laboratory blanks *(n=4)*. Filtration and acidification of blanks was conducted in the field lab using the same procedures employed with routine water samples. All blanks, with the exception of the four GSC laboratory blanks, were inserted into the analytical suite prior to samples reaching the lab, ensuring that the analysts were unaware of their location.

Median and mean concentrations of trace elements and other elements in distilled waters are reported in Table 7. Analysis of distilled water blanks in ICP-AES, ICP-MS and RGS analytical suites revealed no analytical contamination problems, with the possible exception of low-level iron. Median results and method detection limits (MDL: x + 3SD) calculated for each of the four types of blanks used in the survey are also shown in Table 7. In each case, analysis of blanks inserted in the ICP-AES analytical suite for major elements determination returned median concentrations below or near the stated limits of analytical detection for sodium, potassium, silicon and aluminum. However, median calcium and magnesium concentrations of filtered blanks, whether acidified or not, are approximately 15 x greater (Ca: 65-70 ppb; Mg: 30 ppb) than corresponding levels in unfiltered blanks (Ca: 5 ppb; Mg: 2 ppb; Table 7). This indicates that filtration of North Gataga lake waters has introduced small amounts of calcium and magnesium into the samples prior to analysis, although these levels are insignificant relative to regional median concentration levels of 39000 ppb and 22000 ppb, respectively.

Analysis of blanks inserted in the ICP-MS analytical suite returned median concentrations below or near the stated limits of analytical detection for almost all elements (Table 7). Mean and median results for iron in the blanks were somewhat greater, at 16 ppb and 20.7 ppb, respectively, compared to a detection limit of 10 ppb. In contrast, iron determined as part of the ICP-AES suite returned median concentrations at or below the analytical detection limit of 3 ppb. Median results and method detection limits calculated for each of the four types of blanks (Table 7) indicate that for most elements, there is little appreciable difference in median results for each type of blank. There are a few exceptions, although results cannot be considered significant due to the relatively small number of blanks used. For example, slightly greater zinc concentrations are present in the filtered acidified blanks (Median: 0.90 ppb) than the other three types of blanks (Median: 0.50 ppb for each), perhaps indicating some addition of minute amounts of zinc during acidification or filtration. Similarly, median barium concentrations in both types of filtered blanks (0.80 and 0.58 ppb) exceed median concentrations of the unfiltered blanks (0.2 ppb for each).

Analysis of distilled water blanks (N=27 insertions) in the RGS suite of waters returned median concentrations of 0.02 ppb uranium, 10 ppb fluoride and 1 ppm sulphate, at or below the stated limits of analytical detection (Table 7). All blanks used in the RGS suite were unacidified and unfiltered.

TABLE 6. TOTAL DISSOLVED SOLIDS (TDS) AND CONDUCTIVITY MEASUREMENTS OF DISTILLED WATER USED IN NORTH GATAGA ANALYTICAL SUITES

	pH	Cond. (uS)	TDS (mg/l)
1)	5.8	1.50	0.72
2)	5.7	1.40	0.69
3)	5.7	1.57	0.78
4)	5.8	1.17	0.56
5)	5.8	0.86	0.43
6)	5.7	0.97	0.48

TABLE 7. DISTILLED WATER BLANKS: MEDIAN AND MEAN ANALYTICAL RESULTS

	Element	Symbol	Method	Analytical Det. Limit ppb	Median (N=21) ppb	Mean (N=21) ppb	*Overall Method Det. Limit* ppb	Median[1] (N=6) ppb	*MDL[1]* ppb	Median[2] (N=6) ppb	*MDL[2]* ppb	Median[3] (N=5) ppb	*MDL[3]* ppb	Median[4] (N=4) ppb	*MDL[4]* ppb
Major Elements	Aluminum[1]	Al	ICP-MS	0.5	0.5	0.7	*2.0*	0.7	*1.4*	0.5	*2.9*	0.5	*0.5*	0.5	*2.1*
	Aluminum[2]	Al	ICP-MS	2	2	2	*2*	2	*2*	2	*2*	2	*2*	2	*2*
	Calcium	Ca	ICP-AES	5	20	41.4	*183.7*	70	*168.5*	65	*252.4*	5	*5*	5	*5*
	Magnesium	Mg	ICP-AES	2	10	17.5	*69*	30	*57.7*	30	*88.6*	2	*2*	2	*16*
	Potassium	K	ICP-AES	20	20	29.1	*69.2*	30	*66.7*	20	*68.2*	20	*81.7*	20	*72.5*
	Silicon	Si	ICP-AES	10	10	18.6	*50.4*	15	*65.8*	20	*46.8*	10	*42.8*	10	*45*
	Sodium	Na	ICP-AES	20	20	20	*20*	20	*20*	20	*20*	20	*20*	20	*20*
Trace Elements	Lithium	Li	ICP-MS	0.005	0.005	0.008	*0.027*	0.010	*0.044*	0.006	*0.019*	0.005	*0.005*	0.005	*0.014*
	Beryllium	Be	ICP-MS	0.005	0.005	0.006	*0.016*	0.005	*0.024*	0.005	*0.015*	0.005	*0.005*	0.005	*0.005*
	Titanium	Ti	ICP-MS	0.5	0.5	0.5	*0.5*	0.5	*0.5*	0.5	*0.5*	0.5	*0.5*	0.5	*0.5*
	Vanadium	V	ICP-MS	0.1	0.1	0.1	*0.1*	0.1	*0.1*	0.1	*0.1*	0.1	*0.1*	0.1	*0.1*
	Chromium	Cr	ICP-MS	0.3	0.3	0.3	*0.3*	0.3	*0.3*	0.3	*0.3*	0.3	*0.3*	0.3	*0.3*
	Iron	Fe	ICP-MS	10	16	20.7	*55.9*	15.5	*62.0*	18.5	*62.6*	15.0	*57.3*	19.0	*46.6*
	Iron[3]	Fe	ICP-AES	3	3	3	*3*	3	*3*	3	*3*	3	*3*	3	*3*
	Manganese	Mn	ICP-MS	0.1	0.1	0.10	*0.17*	0.1	*0.1*	0.1	*0.2*	0.1	*0.1*	0.1	*0.1*
	Cobalt	Co	ICP-MS	0.05	0.05	0.05	*0.05*	0.05	*0.05*	0.05	*0.05*	0.05	*0.05*	0.05	*0.05*
	Nickel	Ni	ICP-MS	0.2	0.2	0.2	*0.2*	0.2	*0.2*	0.2	*0.2*	0.2	*0.2*	0.2	*0.2*
	Copper	Cu	ICP-MS	0.1	0.1	0.26	*1.29*	0.10	*2.22*	0.10	*0.24*	0.30	*0.90*	0.10	*0.10*
	Zinc	Zn	ICP-MS	0.5	0.5	0.59	*1.13*	0.90	*1.51*	0.50	*0.50*	0.50	*0.50*	0.50	*0.50*
	Arsenic	As	ICP-MS	0.1	0.1	0.1	*0.1*	0.1	*0.1*	0.1	*0.1*	0.1	*0.1*	0.1	*0.1*
	Rubidium	Rb	ICP-MS	0.05	0.05	0.05	*0.05*	0.05	*0.05*	0.05	*0.05*	0.05	*0.05*	0.05	*0.05*
	Strontium	Sr	ICP-MS	0.5	0.5	0.52	*0.72*	0.5	*0.64*	0.5	*0.92*	0.5	*0.5*	0.5	*0.5*
	Yttrium	Y	ICP-MS	0.01	0.01	0.01	*0.01*	0.01	*0.01*	0.01	*0.01*	0.01	*0.01*	0.01	*0.01*
	Molybdenum	Mo	ICP-MS	0.05	0.05	0.05	*0.05*	0.05	*0.05*	0.05	*0.05*	0.05	*0.05*	0.05	*0.05*
	Cadmium	Cd	ICP-MS	0.05	0.05	0.05	*0.05*	0.05	*0.05*	0.05	*0.05*	0.05	*0.05*	0.05	*0.05*
	Indium	In	ICP-MS	0.01	0.01	0.01	*0.01*	0.01	*0.01*	0.01	*0.01*	0.01	*0.01*	0.01	*0.01*
	Antimony	Sb	ICP-MS	0.01	0.01	0.01	*0.01*	0.01	*0.01*	0.01	*0.01*	0.01	*0.01*	0.01	*0.01*
	Cesium	Cs	ICP-MS	0.01	0.01	0.01	*0.01*	0.01	*0.01*	0.01	*0.01*	0.01	*0.01*	0.01	*0.01*
	Barium	Ba	ICP-MS	0.2	0.2	0.25	*0.58*	0.25	*0.80*	0.2	*0.58*	0.2	*0.2*	0.2	*0.2*
	Lanthanum	La	ICP-MS	0.01	0.01	0.01	*0.01*	0.01	*0.01*	0.01	*0.01*	0.01	*0.01*	0.01	*0.01*
	Cerium	Ce	ICP-MS	0.01	0.01	0.01	*0.01*	0.01	*0.01*	0.01	*0.01*	0.01	*0.01*	0.01	*0.01*
	Praseodymium	Pr	ICP-MS	0.005	0.005	0.005	*0.005*	0.005	*0.005*	0.005	*0.005*	0.005	*0.005*	0.005	*0.005*
	Neodymium	Nd	ICP-MS	0.005	0.005	0.005	*0.006*	0.005	*0.005*	0.005	*0.005*	0.005	*0.005*	0.005	*0.007*
	Samarium	Sm	ICP-MS	0.005	0.005	0.006	*0.013*	0.005	*0.005*	0.006	*0.015*	0.005	*0.005*	0.008	*0.017*
	Europium	Eu	ICP-MS	0.005	0.005	0.005	*0.005*	0.005	*0.005*	0.005	*0.005*	0.005	*0.005*	0.005	*0.005*
	Terbium	Tb	ICP-MS	0.005	0.005	0.005	*0.005*	0.005	*0.005*	0.005	*0.005*	0.005	*0.005*	0.005	*0.005*
	Gadolinium	Gd	ICP-MS	0.005	0.005	0.005	*0.005*	0.005	*0.005*	0.005	*0.005*	0.005	*0.005*	0.005	*0.005*
	Dysprosium	Dy	ICP-MS	0.005	0.005	0.005	*0.008*	0.005	*0.005*	0.005	*0.009*	0.005	*0.010*	0.005	*0.005*
	Holmium	Ho	ICP-MS	0.005	0.005	0.005	*0.005*	0.005	*0.005*	0.005	*0.005*	0.005	*0.005*	0.005	*0.005*
	Erbium	Er	ICP-MS	0.005	0.005	0.005	*0.005*	0.005	*0.005*	0.005	*0.005*	0.005	*0.005*	0.005	*0.005*
	Thulium	Tm	ICP-MS	0.005	0.005	0.005	*0.005*	0.005	*0.005*	0.005	*0.005*	0.005	*0.005*	0.005	*0.005*
	Ytterbium	Yb	ICP-MS	0.005	0.005	0.005	*0.005*	0.005	*0.005*	0.005	*0.005*	0.005	*0.005*	0.005	*0.005*
	Lutetium	Lu	ICP-MS	0.005	0.005	0.005	*0.005*	0.005	*0.005*	0.005	*0.005*	0.005	*0.005*	0.005	*0.005*
	Thallium	Tl	ICP-MS	0.005	0.005	0.005	*0.005*	0.005	*0.005*	0.005	*0.005*	0.005	*0.005*	0.005	*0.005*
	Lead	Pb	ICP-MS	0.01	0.01	0.013	*0.034*	0.01	*0.029*	0.01	*0.01*	0.01	*0.057*	0.01	*0.01*
	Uranium	U	ICP-MS	0.005	0.005	0.005	*0.005*	0.005	*0.005*	0.005	*0.005*	0.005	*0.005*	0.005	*0.005*
RGS Suite**	Uranium*	U	LIF	0.05	0.02	0.03	*0.07*								
	Fluoride*	F	ION	20	10	10.7	*18.8*								
	Sulphate	SO4	TURB	1 ppm	1	1	*1*								
	pH	pH	GCE	0.1	5.80	5.78	-								
Other	TDS														
	Conductivity														
	T-Alkalinity														

Method Detection Limits (MDL) calculated from different types of distilled water blanks:

1 Filtered, acidified
2 Filtered, unacidified
3 Unfiltered, unacidified
4 GSC Lab blanks

ICP-MS Method Detection Limit (MDL): x + 3SD of all 21 blanks
*Results < d.l. set to 1/2 d.l.; for all other elements, results < d.l. set to d.l.
**RGS suite results based on 27 distilled water blanks

[1] Al determined by ICP-MS as part of major element suite
[2] Al determined by ICP-MS as part of trace element suite
[3] Fe determined by ICP-AES as part of major element suite

Photo 5. Looking northeast toward the Gemini Lakes in the central part of the North Gataga area (July, 1996).

Photo 6. Typical small alkaline lakes and ponds in the flat-lying northern part of the North Gataga survey area (June, 1996; photo courtesy of F. Ferri).

PRELIMINARY DATA INTERPRETATION

This section presents summary data and preliminary interpretations for field variables and selected water geochemical results. Data interpretation is of a preliminary nature only. Discussions on the distribution and abundance of RGS-suite analytical determinations (Figure 8), Total Alkalinity and related determinations (Figure 9), major element cations such as calcium and magnesium (Figure 10) and trace elements such as zinc and barium (Figure 11) are intended to highlight regional geochemical patterns that may be of interest to mineral explorationists. They are not intended to replace detailed environmental studies for site-specific areas. Refer to the appropriate 1:50000 scale NTS topographic maps for lake and place names.

FIELD VARIABLES

Distribution of lake water sites by geological unit in the North Gataga survey area is shown in Appendix D-3 and, schematically, in Figure 7. Unit designations are those of Ferri *et al.* (1997b). The following discussion pertains only to those 235 sites for which corresponding ICP-MS trace element water data is included in this report. The watersheds of most sites are within Paleozoic sedimentary rocks of the Kechika Trough, but there was insufficient geological information available to code 110 (46.8%) of the sites (*Q: alluvium, glacial deposits*) located in the poorly-exposed northern part of the survey area. Of Paleozoic sedimentary units, the Road River Group contains the greatest number of sample sites (27; 11.5%). A further 21 sites (8.9%) drain Proterozoic rocks of the Hyland Group, while 20 sites (8.5%) drain siliceous facies rocks of the Kechika Group. Five sites drain Earn Group rocks.

The majority of sites (79.1%) are in lakes of pond size or smaller (*e.g.* < 0.25 km^2). Approximately 12% of the sites are in lakes in the range 0.25 to 1 km^2, but only 2 sites (0.9%) are in large lakes (*e.g.* > 5 km^2), which are not common in the survey area. Lake depth (median: 4 metres) was measured here with a float-mounted depth sounder. Shallow lakes are very common, and more than one-third (38.7%) of all sites have depths of 2 metres or less (Figure 7b). A majority of the sites (83.4%) have depths of 10 metres or less. The deepest site recorded here was 35 metres, but only 16 sites (6.8%) have water depths of more than 20 metres.

More than two-thirds (68.5%) of sites were classed as being in areas of low relief, with a further 25.5% classed as areas of medium relief. Only 6% of water sites were categorized as being in areas of high relief, mostly in the southern part of the survey area. Field observations indicate that potential sources of anthropogenic contamination within the survey area are minimal. Road building and logging activity is largely absent, and camp sites were recorded on the shores of only five (2.1%) sites.

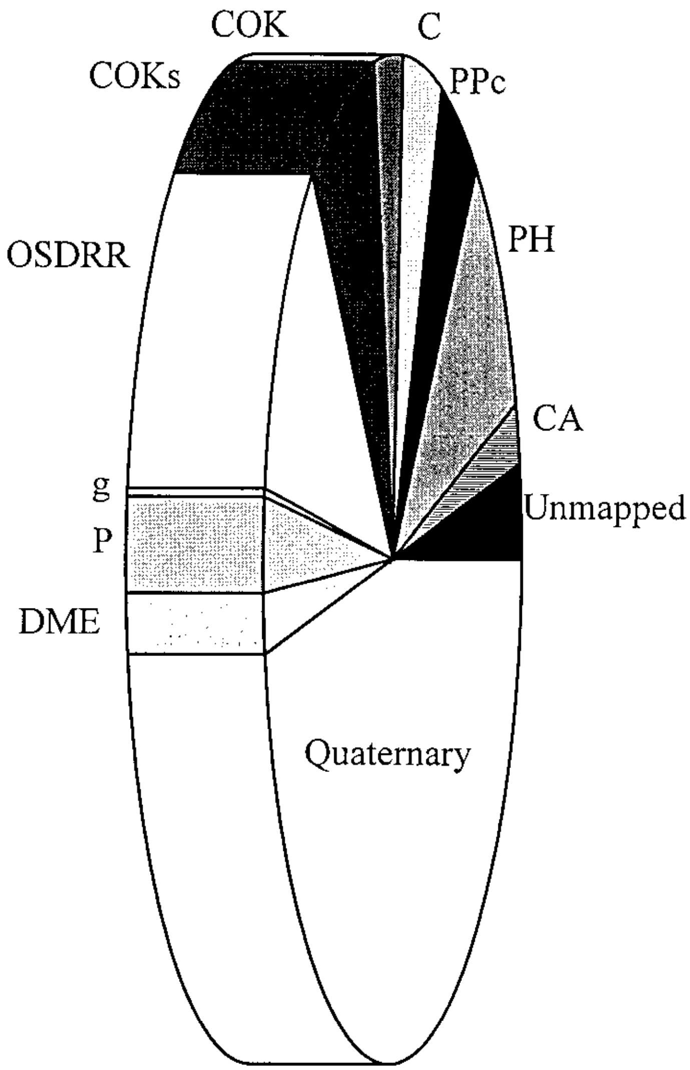

Figure 7. Distribution of 235 lake water sites, by geological unit, in the North Gataga survey area. Refer to Appendices A and D-3 for descriptions of units, which here are shown counter-clockwise from oldest (CA) to youngest (Quat).

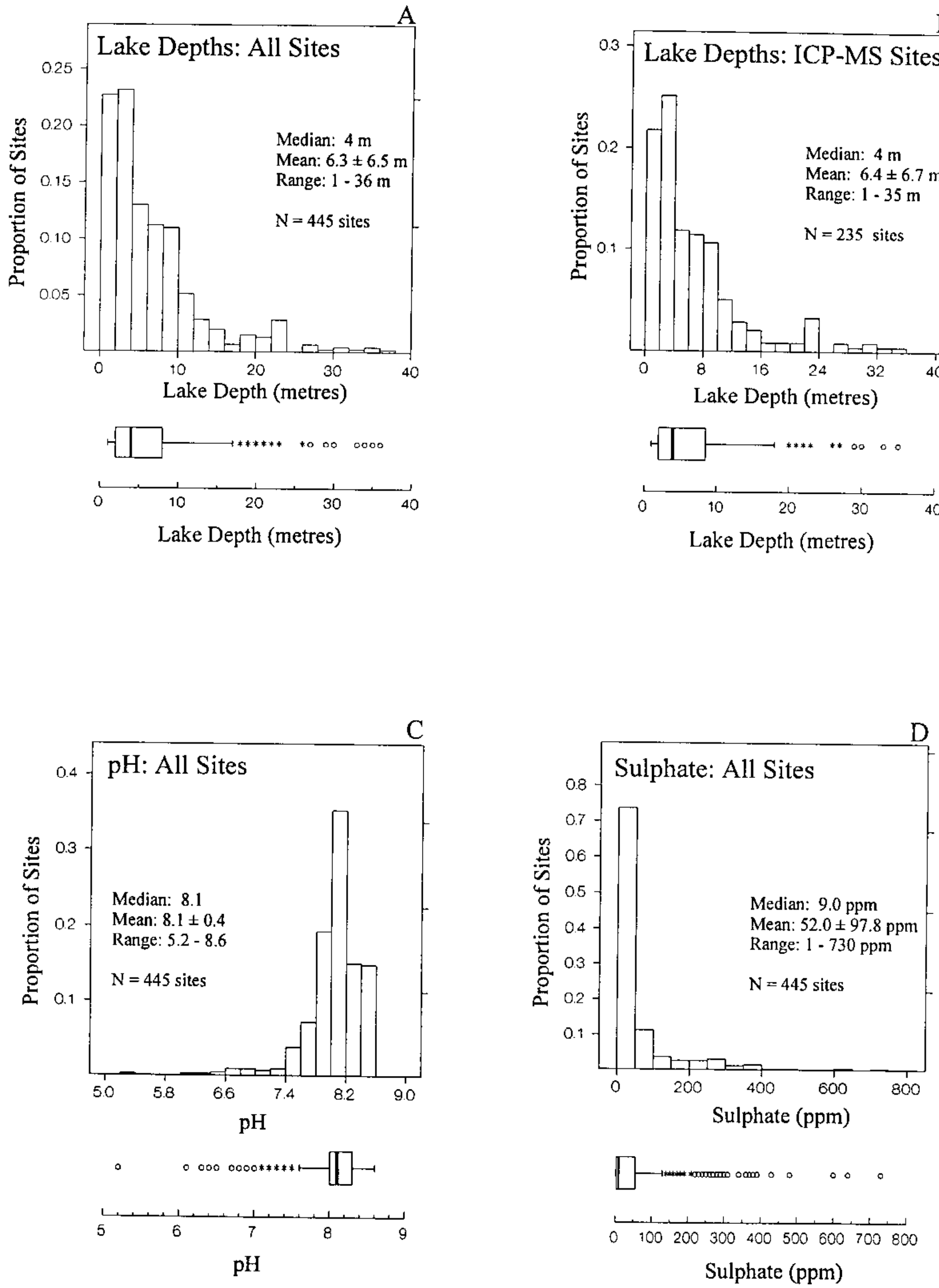

Figure 8. Histograms and boxplots showing distribution of a) lake depth (445 sites), b) lake depth (235 sites with trace element data), c) lake water pH (445 sites), and d) sulphate in lake waters (445 sites) in the North Gataga survey area. Sulphate and pH data was previously reported for all 445 sites by Cook *et al.* (1997c). Fifty per cent of the data lies within the box; the lower and upper bounds of each box define the first quartile and third quartile of data, respectively.

WATER GEOCHEMISTRY: RGS SUITE

WATER pH

The pH of surface lake waters in the North Gataga survey area are in the range 5.2 - 8.6. However, most lake waters here are alkaline, and median pH is 8.1 for both the full (445 sites; Figure 8) and smaller (235 sites) data sets. All remarks here pertain to the full pH data set (Cook *et al.*, 1997c). Only a very small proportion of sites (13 of 445; 2.9%) exhibit a pH of 7.0 or less, and only one site has a pH of less than 6.0. Conversely, a full 90% of the sites exhibit a pH of 7.8 or greater.

Median pH of lake waters draining most units is in the range 8.0 - 8.2. However, the median pH of waters draining Cassiar terrane rocks (CA) is slightly more alkaline (median: 8.4). The lake waters in the 'unmapped' area are the only ones in the North Gataga survey area to exhibit a near-neutral median pH (7.3). Of the few sites which exhibit neutral to acidic pH values of 7.0 or less, nearly all occur within the 'unmapped' area (min: 6.1) or in that part of the survey area overlain by Quaternary sediments (Q; min: 5.2). More specifically, clusters of low-pH sites occur in two areas:

- The southeast corner of the survey area (NTS 94M/02 and 03), particularly that area southeast of Horneline Lake, where pH values as low as 6.1 are among several sites with near-neutral or lower lake water pH values. These sites are underlain by 'unmapped' units, Hyland Group rocks or Cambrian siliciclastic rocks.

- An approximately 14 km-long east-west trending area extending from the Kitza Creek area to Sunshine Lake (NTS 94M/12; 104P/09). Four of the lakes within this region, underlain by Quaternary sediments, have a pH of 7.0 or less. In particular, two ponds located to the south and north of Sunshine Lake have the lowest (site 4440; ph=5.2) and third-lowest (site 4353; pH=6.3) pH levels in the North Gataga survey area, respectively.

Among other clusters of near-neutral pH in the lower ten percentiles (5.2-7.7) of the data set are sites in the Kitza Creek area, several sites located between Hare Lake and the Gemini lakes which also have elevated sediment gold concentrations, and the area northwest of Graveyard Lake to the Kechika River. A similar cluster of near-neutral pH in the northwestern part of the survey area is in the area between Black Angus Creek and Kloye Creek.

SULPHATE

Median sulphate concentration in North Gataga lake waters is 9 ppm for both full (445 sites; Figure 8) and smaller (235 sites) data sets, greater than median values of 0.6 - 4 ppm sulphate reported in previous surveys of the Nechako Plateau area to the south (Cook *et al.*, 1997b; Cook and Jackaman, 1994). The maximum sulphate concentration here is 730 ppm. As with pH, all remarks here pertain to the full sulphate data set.

The highest median sulphate concentration occurs in lake waters associated with Devonian Earn Group rocks (DME; median: 280 ppm). Relatively high median sulphate concentrations are also present in lakes draining Kitza Creek facies (P; 170 ppm) and Road River Group rocks (OSDRR; 100 ppm), among other units. By way of contrast, the median sulphate concentration in the large number of lakes underlain by Quaternary sediments is only 3 ppm. In fact, there are very few sites with sulphate concentrations above background levels in that relatively flat-lying third of the survey area extending from Kitza and Wadin Creeks to the Yukon border.

In the more rugged southeastern two-thirds of the survey area, elevated sulphate concentrations >95th percentile (280 ppm) occur above several units, most notably rocks of the Road River Group (OSDRR; max: 730 ppm), the Kechika Group (COK; max: 600 ppm), the Kitza Creek facies (P; max: 360 ppm) and the Hyland Group (PH; max: 640 ppm), among others. These and other sites cluster in two distinct areas:

- The eastern and southern flanks of Chee Mountain (NTS 94M/03), where ten sites with elevated sulphate values occur in a zone extending from the Boya Creek-Pup Lake area in the north, to the upland area between Moose and Scoop lakes in the south. These sites are underlain by rocks of the Road River, Kechika and Earn Groups. The highest sulphate value in the survey area (site 4095; 730 ppm) occurs in the northern part of this zone; the third-highest (site 4087; 600 ppm) is in the southern part of the zone near Scoop Lake.

- Three widely-spaced sites (NTS 94M/04 and 05) straddling the Kechika River northwest of the Boya prospects. Three of the top seven sulphate values in the survey area (380-640 ppm) occur here. Of these, two sites are underlain by low-grade metamorphic rocks of the Aeroplane Lake Panel, and the third by Upper Proterozoic rocks of the Hyland Group.

Other areas with elevated sulphate concentrations in lake waters include the Kitza Creek area (up to 360 ppm), and two oxbow lakes on the eastern side of the Kechika River valley (360-370 ppm).

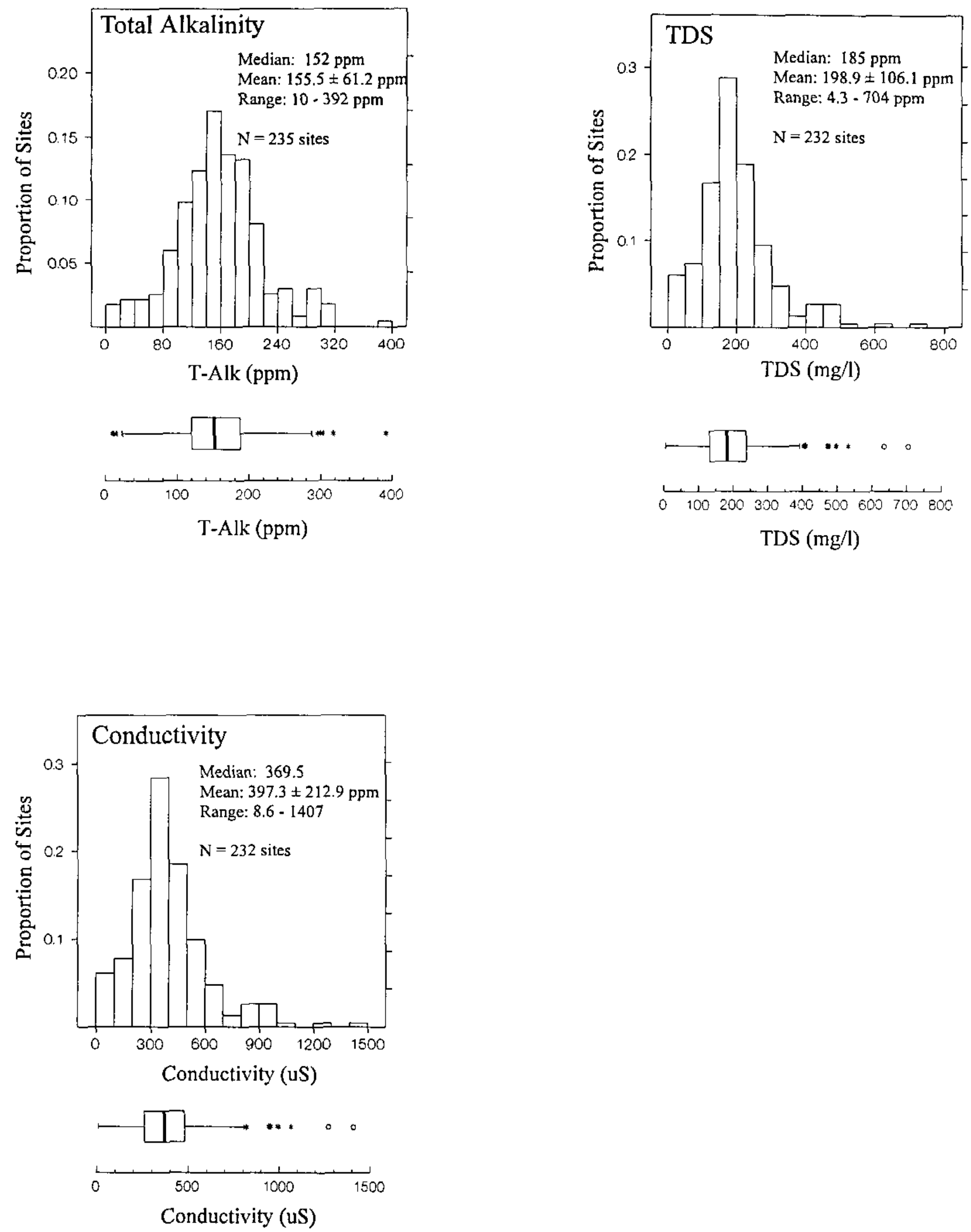

Figure 9. Histograms and boxplots showing distribution of a) Total Alkalinity (n=235 sites), b) Total Dissolved Solids (TDS) and c) Conductivity (n=232 sites each) in lake waters of the North Gataga survey area. Note that these determinations are only made for those sites here with corresponding ICP-MS trace element data.

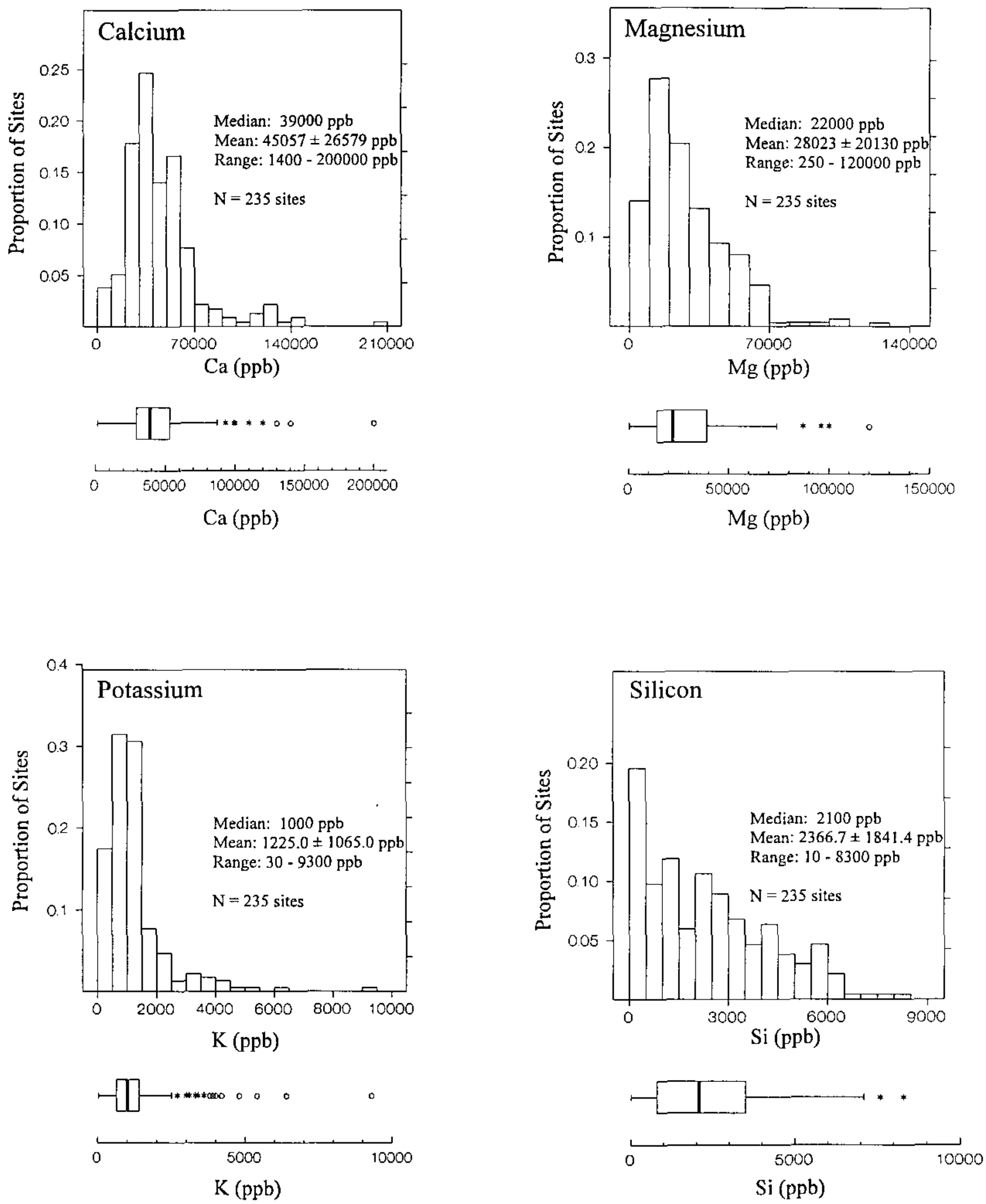

Figure 10. Histograms and boxplots showing distribution of a) calcium, b) magnesium, c) potassium and d) silicon by ICP-AES (n=235 sites for each) in filtered and acidified lake waters of the North Gataga survey area.

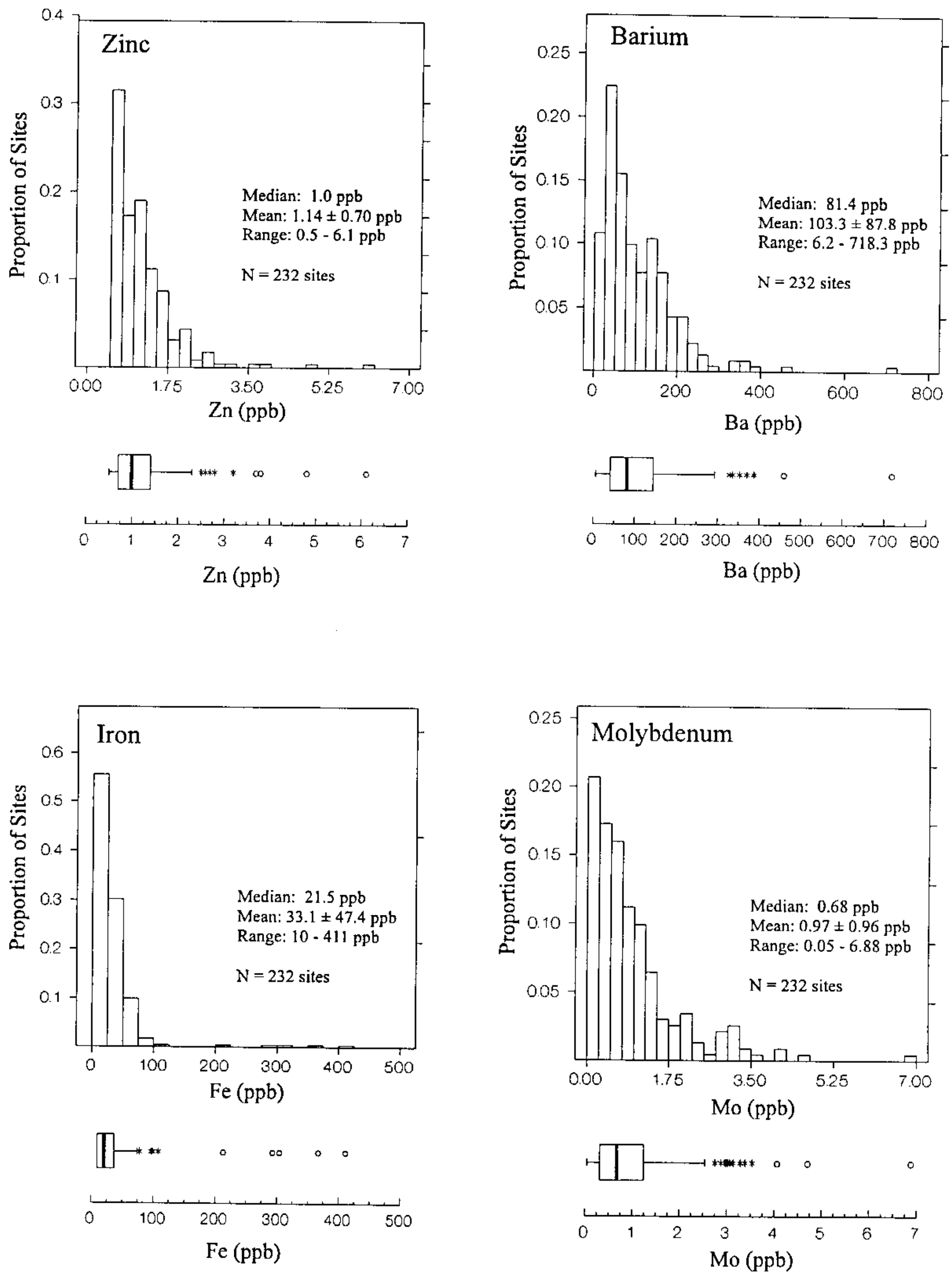

Figure 11. Histograms and boxplots showing distribution of a) zinc, b) barium, c) iron and d) molybdenum by ICP-MS (n=232 sites for each) in filtered and acidified lake waters of the North Gataga survey area. Only Geological Survey of Canada laboratory trace element determinations (n=232 sites) are included here.

USE OF LAKE WATERS IN MINERAL EXPLORATION

ORIGIN OF LAKE WATERS

Lake waters originate from a combination of sources including groundwater seepage, stream water input, sheet runoff and snow melt. Several factors influence the composition of natural lake waters (Rose *et al.*, 1979):

1) dissolution of rock and unconsolidated surficial materials in the watershed;
2) presence or absence of oxidizing sulphide minerals, or their dispersed remnants in till or other surficial materials;
3) seasonal and within-lake limnological variations, such as thermal stratification of the water column and the depletion of oxygen at depth in eutrophic lakes;
4) rain water composition;
5) climatic factors;
6) age, or residence time, of both lake water and inflowing ground waters;
7) geochemical environment, such as pH, which affects whether trace elements remain in solution or are adsorbed onto suspended organic matter, clay-sized particles or iron oxides;

LAKE WATERS AND REGIONAL GEOCHEMICAL EXPLORATION

Lake waters have been used as a regional geochemical exploration medium in northern North America for forty years since Kleinkopf (1960) showed that the distribution of elevated levels of copper and molybdenum in Maine lake waters coincided with known copper-molybdenum mineralization. Nevertheless, lake waters have not been widely used in mineral exploration in glaciated regions of northern or western Canada. Until recently this has been due, at least in part, to the inability of commercially-available analytical methods to accurately determine trace elements at the ppb and sub-ppb levels at which they typically occur in surface waters. Furthermore, the very low levels of trace elements in most water samples are prone to external contamination if not handled with care in the field environment, and the samples must be analyzed relatively soon after collection in order to minimize compositional changes during storage (Miller, 1979).

Nevertheless, collection of lake waters in regional-scale helicopter-borne geochemical surveys offer several advantages over collection of stream or lake sediments. Several benefits of lake water geochemical surveys were recently outlined by Cameron *et al.* (1997) for parts of the Northwest Territories, and these are largely applicable to British Columbia as well. Lakes are abundant in the Interior Plateau of British Columbia, and they are relatively quick and simple to sample with a float-equipped helicopter. Necessary preparation in the form of filtering and acidification can be completed in the field, negating the need for commercial sample preparation, and the advent of commercially-available multi-element ICP-MS instrumentation has increased the range of available trace elements and reduced their detection levels to much more useful levels. Sources of variation in regional lake water geochemical surveys over any given area may be minimized by sampling only surface waters, which are typically dilute and oxidizing, and by filtering all samples to 0.45 microns to remove the ubiquitous suspended mineral and organic particulate matter, which may have very variable metal contents. In addition, acidification of the filtered water keeps dissolved metals in solution rather than being adsorbed to the sides of the sample container.

Lake water geochemical surveys were widely used for uranium exploration during the 1970's (Rose *et al.*, 1979; Dyck, 1979; Taufen, 1997), and have also been successfully applied in case studies and regional exploration surveys for base metals in the Northwest Territories (Cameron, 1977; Cameron *et al.*, 1997). There is however only limited regional water geochemical data available for the Cordillera. Most publicly-funded regional lake sediment geochemical surveys in both British Columbia (*e.g.* Cook *et al.*, 1998) and the rest of Canada (*e.g.* Friske and Hornbrook, 1991), in which lake waters are also sampled, have been restricted to determination of only a few constituents such as pH, uranium, fluoride and sulphate. Development of ICP-MS preconcentration techniques such as those outlined for REEs and trace elements by Hall and McConnell (1994) and Hall *et al.* (1996) for regional water surveys in Newfoundland and Nova Scotia will likely lead to more widespread use of lake water geochemistry in mineral exploration.

Those readers further interested in the use of surface water geochemistry in mineral exploration should consult reviews of Rose *et al.* (1979), Miller (1979) and Taufen (1997). A brief discussion of the major element and trace element composition of North Gataga-area lake waters is given in the following sections.

WATER GEOCHEMISTRY: MAJOR ELEMENTS

Major element cation composition of North Gataga-area lake waters, based on median concentrations, follows the order: Ca > Mg > Si > Na > K > Fe > Al

Only major element cations are reported here for North Gataga-area lake waters; with the exception of sulphate, no major anions such as chloride or bicarbonate were determined. The following discussion highlights significant trends in the distribution of the major elements calcium, magnesium, silicon, sodium, potassium, iron and aluminum, and is not intended as exhaustive. Histograms and boxplots showing the distribution of some of these elements are shown in Figure 9. A brief synopsis of the bedrock sources, dominant aqueous species and lake water stability constraints for each is provided. Geochemical results here are compared with Canadian and British Columbia water quality guidelines for protection of aquatic life. Interested readers are referred to Environment Canada (1987) and Nagpal *et al.* (1995) for further information on approved and working criteria for drinking water, freshwater aquatic life, livestock and irrigation.

CALCIUM AND MAGNESIUM

Calcium is one of the most abundant constituents of natural waters, and is primarily derived from the weathering of sedimentary carbonate rocks such as limestone and dolomite, gypsum and, to a lesser extent, from calcium silicate minerals such as anorthite (Berner and Berner, 1987), which are less subsceptible to weathering than sedimentary carbonates. Magnesium in waters is chiefly derived from the weathering of magnesium silicate minerals such as amphiboles, pyroxenes and olivine, with a lesser proportion derived from dolomite weathering. Together, dissolved calcium and magnesium in water are the primary controls on hardness. Calcium concentrations in hard-water lakes typically decrease during the warm summer months, as $CaCO_3$ is precipitated with rising water temperatures (Environment Canada, 1987). However, the more-soluble dissolved magnesium compounds are less likely to be precipitated.

Median calcium concentrations in the North Gataga survey area (Figure 10) is 39000 ppb, approximately 2-4x that of Nechako Plateau-area lake waters (Cook *et al.*, 1999). The highest median calcium concentrations here are above Earn Group (120000 ppb) and Kitza Creek facies (83000 ppb) rocks. Summary statistics by lithology are not reported in Appendix C for these units, which have fewer than 10 sites. However, the highest median calcium concentration reported in Appendix C is for lakes above Road River Group rocks (55000 ppb). Most elevated calcium concentrations > 95th percentile (100000 ppb) in the North Gataga survey area (max: 200000 ppb) occur in the southern part of the survey area east and southeast of Chee Mountain. The distribution of elevated calcium concentrations in waters here show a strong association with the mapped distribution of Earn Group and Road River Group strata in this area. A few additional sites with elevated calcium levels also occur in the Kitza Creek area northwest of the Kechika River, where sediments of several small lakes contain highly elevated concentrations of zinc, antimony, nickel, molybdenum and other elements (Cook *et al.*, 1997c).

Median magnesium concentration here is also very high at 22000 ppb (Figure 10). Subdivided by lithology, the highest median magnesium levels are those above Cassiar Terrane (56000 ppb; n=5 sites) and Earn Group (41000 ppb; n=5 sites) rocks. Highest median magnesium concentrations reported in Appendix C are those of lakes draining Aeroplane Lake Panel (40000 ppb) and Road River Group (37000 ppb) rocks. All elevated magnesium concentrations > 95th percentile (64000 ppb) here (max: 120000 ppb) occur, like calcium, in the southern part of the survey area. Some sites coincide with the distribution of elevated calcium concentrations in the area east and southeast of Chee Mountain, but other high-magnesium sites near Twin Island Lake, Wadin Creek and other areas shown no discernible patterns.

There are no Canadian or British Columbia water quality guidelines for calcium, magnesium and protection of freshwater aquatic life. No sites reported here exceed the 500 mg/L (500 ppm) magnesium taste threshold for average people (Environment Canada, 1987; Nagpal *et al.*, 1995), or the 1000 mg/L (1000 ppm) limit for livestock watering.

SILICON

Silicon is the second most common element in the crust, but its abundance in natural waters is limited by the weathering resistance of silica, or quartz (SiO_2), a common constituent of many rocks. Consequently most dissolved silicon, as silicic acid (H_4SiO_4), is instead derived from weathering of aluminosilicate minerals such as feldspars, micas and clay minerals (Environment Canada, 1987). It follows that geological variations may control differences in the silicon content of natural waters. Berner and Berner (1987) reported that the weathering of recent volcanic rocks released twice the silicon, as silica, of crystalline intrusive and metamorphic rocks, and almost four times the silica of detrital sedimentary rocks. This was attributed to the presence of more readily-weathered anorthite, pyroxenes and glass in the volcanics. Seasonal assimilation and sedimentation of dissolved silicon by lacustrine diatoms is the primary control on its removal from the water column (Wetzel, 1983).

Median silicon concentration in North Gataga-area lake waters are 2100 ppb (max: 8300 ppb), similar to those of most Nechako Plateau-area lake waters reported by Cook *et al.* (1999). A histogram and boxplot showing the silicon distribution here is shown in Figure 10. Subdivided by lithology, the greatest median silicon levels occur in those five sites draining rocks of the Cassiar Terrane (4500 ppb). Median silicon concentrations for other units are considerably lower. That for Kitza Creek facies rocks (n=7 sites) is 2900 ppb, for example, and the greatest median concentration reported in Appendix C is for those sites draining undivided Quaternary sediments (2500 ppb). Correspondingly, all sites with elevated lake water silicon concentrations > 95th percentile (5700 ppb) are located in the northern part of the survey area, where an extensive cover of till and other unconsolidated sediments obscures the underlying bedrock. These sites occur as part of an approximately 40 km x 10 km northwest-southeast trending belt extending roughly from the Sunshine Lake area in the south to the Dease River in the north. This area is underlain almost entirely by unconsolidated Quaternary glacial sediments, excepting only a few scattered outcrops of Mississippian-Permian Mount Christie Formation chert, and various Proterozic, rocks mapped by Ferri *et al.* (1997b, 1998). The zone of anomalous silicon in water is coincident with elevated levels of barium, Ba/Sr and, to a lesser extent iron, manganese and ytterbium in waters. It also coincides with zones of elevated manganese, iron and, to a lesser extent, bromine in lake sediments (Cook *et al.*, 1997c).

There are no Canadian or British Columbia water quality standards for silicon.

SODIUM

Most lake water sodium of natural origin is derived from weathering of sodium plagioclase, feldspathoids and evaporitic minerals such as halite (NaCl). Sodium concentrations in natural waters are greater than those of potassium because, in part, sodium-plagioclase feldspars weather more readily than potassium feldspars. Furthermore, highly soluble dissolved sodium compounds tend to remain in solution and resist adsorption (Environment Canada, 1987).

Median sodium concentrations in North Gataga-area waters (2000 ppb) are similar to those of silicon. This level is marginally greater than median sodium concentrations from most surveys of Nechako Plateau-area lake waters (Cook *et al.*, 1999). The maximum sodium concentration here is 23000 ppb. As with magnesium and silicon, the highest median sodium concentrations occur in lakes underlain by Cassiar Terrain rocks (6700 ppb), although these only account for five sites in the entire survey area. Otherwise, the highest median sodium concentrations reported in Appendix C is that draining Aeroplane Lake Panel rocks (3200 ppb). Elevated lake water sodium concentrations > 95th percentile (4800 ppb) occur as several small clusters of sites in the southern part of the survey area.

There are no Canadian or British Columbia water quality guidelines for sodium dealing with the protection of freshwater aquatic life (Environment Canada, 1987; Nagpal *et al.*, 1995), but concentrations in drinking water should not exceed 200 mg/L (200 ppm). No sites reported here exceed this level.

POTASSIUM

Almost 90% of potassium in natural waters is derived from the weathering of silicate minerals, particularly potassium feldspars and biotite (Berner and Berner, 1987). Potassium abundance in natural waters is lower than that of calcium, magnesium and sodium because (i) primary potassium silicate minerals are more resistant to chemical weathering, and (ii) once liberated, potassium ions are relatively more likely to be adsorbed onto surfaces of clay minerals such as illite and vermiculite (Environment Canada, 1987; Hem, 1989). Consequently, the sodium:potassium ratio in natural waters is typically in the range 2:1 to 3:1 (Environment Canada, 1987). Potassium in waters does not reflect underlying bedrock lithologies to the same extent as the other major cations because there is little overall difference between average potassium concentrations of sedimentary and igneous rocks. From a geochemical exploration perspective, weathering of potassium-rich minerals such as biotite, K-feldspar and sericite in extensive potassic or phyllic hydrothermal alteration zones associated with porphyry copper deposits might be expected to be an important local source of potassium in surface waters. The use of K/Na ratios in locating epigenetic mineralization (Boyle, 1974) is described in a later section.

A histogram and boxplot depicting the distribution of potassium in North Gataga lake waters is shown in Figure 10. The median potassium concentration of these waters is 1000 ppb, considerably greater than the range of 226 - 636 ppb reported for Nechako Plateau- area lake waters in central B.C. (Cook *et al.*, 1999). Subdivided by geology, highest median potassium concentrations here are in sites draining Cassiar Terrane rocks (1900 ppb), Aeroplane

Lake panel calcareous phyllite and schist (1500 ppb), Kitza Creek facies sedimentary rocks (1500 ppb), Earn Group sedimentary rocks (1300 ppb) and Road River Group sedimentary rocks (1200 ppb). Elevated potassium concentrations > 95th percentile (3300 ppb) in North Gataga-area lake waters (max: 9300 ppb) are mostly confined to the southern part of the survey area, where several clusters of 2-3 sites each occur in the Scoop Lake, Graveyard Lake and Davie Creek areas. Two sites with elevated potassium also occur in the area between the Boya Main Face prospect and the Kechika River. Interestingly, only one of the four sites with coincident K/Na ratio values in the upper five percentiles of the data set is among these, in this case a site immediately north of Graveyard Lake. The other three sites with coincident elevated potassium and K/Na values occur as single scattered sites in the central part of the survey area. One is located near the Red lead-zinc-copper showing on the Red River; the other two sites are situated in drift-covered areas near the Rocky Mountain Trench: one south of the Red River, and a second west of Dooza Lake.

There are no Canadian water quality guidelines for permissible potassium levels in natural waters with respect to freshwater aquatic life.

IRON

Iron is the fourth most abundant element in the crust, and is present in a wide variety of silicate, oxide and sulphide minerals in most igneous, sedimentary and metamorphic rocks. It may be released into the surficial environment from, among these many other sources, the weathering of pyrite (FeS_2). Pyrite occurs in coal, black shales and a wide variety of mineral deposit types, including the pyritic haloes associated with phyllic alteration zones of porphyry-style deposits, and it oxidizes rapidly under surficial weathering conditions. The behaviour of iron in natural waters is governed, in part, by pH and redox conditions. In oxic surface waters iron is generally present in the ferric (Fe^{3+}) state, but at relatively low concentrations levels owing to its low solubility at the pH range 5-8 typical of many surface lake waters (Wetzel, 1983; Environment Canada, 1987; Hem, 1989). Nevertheless, much of the total iron present in lake waters occurs as suspended particles of hydrated ferric hydroxide ($Fe(OH)_3$). These are removed, in the case of this study, by filtering the water samples to 0.45 microns prior to analysis.

Iron results by both ICP-AES and ICP-MS (Figure 11) methods are shown in Appendix D. The following discussion is based on ICP-AES iron determinations, but the distribution of sites with elevated iron levels is substantially similar in both cases. Median iron concentration in North Gataga-area lake waters is 5 ppb, which is much lower than median results of 35 - 78.5 ppb iron reported for three Nechako Plateau-area lake water surveys by Cook *et al.* (1999). Subdivided on lithology, the highest median Fe concentration reported in Appendix C (units with at least 10 sites) is that above Hyland Group rocks (10 ppb). Relatively high median Fe levels also occur in the few lakes draining Earn Group rocks and the 'unmapped' area (11 ppb, in each case). Many of the highest iron concentrations > 95th percentile (75 ppb) in North Gataga-area waters (max: 470 ppb) occur in the northern part of the survey area, in the drift-covered region bounded by the Sunshine Lake area and Black Angus Creek. This area is roughly coincident with similar zones of elevated barium, Ba/Sr, manganese and other elements in waters, and with elevated manganese and, to a lesser extent, bromine in lake sediments. The remaining sites with elevated iron levels occur singly in scattered lakes with the exception of a group of three adjacent sites (100-360 ppb iron) located about 10 km southeast of Graveyard Lake. These sites are inferred to be underlain by metasedimentary rocks of the Upper Proterozoic Hyland Group.

Canadian and British Columbia water quality guidelines for the protection of freshwater aquatic life (Environment Canada, 1987; Nagpal *et al.*, 1995) specify that iron levels should not exceed 0.3 mg/L (300 ppb). Lake water iron levels reported here exceed 300 ppb at 4 sites.

ALUMINUM

Aluminum is the third most abundant element in the crust, and aluminosilicate minerals are common constituents of all types of rocks. Among these are clay minerals associated with the hydrothermal alteration zones which accompany many types of epigenetic mineral deposits. Aluminum speciation in natural waters is governed partly by pH, and aluminum hydroxide ($Al(OH)_4^-$) is the dominant species in lakes with pH >6.5, a range which would include most central British Columbia lakes. Aluminum solubility increases greatly, however, at more acidic pH levels of 5-6 (Environment Canada, 1987).

Separate aluminum results by ICP-MS were determined on both the major element and trace element suites. The following discussion is based on results determined as part of the major element suite only. Median aluminum concentration here is 2.6 ppm, considerably lower than median concentrations of 6.6 - 34.2 ppb aluminum reported for Nechako-Plateau area surveys (Cook *et al.,* 1999). The relatively low background aluminum concentrations in North Gataga-area waters are likely a result of the much more alkaline pH levels of these lakes relative to other parts of central

British Columbia. Subdivided on lithology, relatively high median aluminum concentrations (Appendix C) occur in lakes draining Kechika Group siliceous facies (6.1 ppb) and Aeroplane Lake Panel (5.0 ppb) rocks. Elevated aluminum concentrations >95th percentile (36.0 ppb) in North Gataga-area waters (max: 190 ppb) occur throughout the survey area in scattered groups of mostly 2-3 sites each, most of which have relatively low pH values of 7.7 or less. Most such sites are in the north half of the survey area, where they are underlain by unconsolidated Quaternary glacial sediments. More specifically, four areas of anomalous aluminum values are highlighted here, from south to north, on the basis of low pH and coincident element ratio results,:

•Two sites in the southern part of the survey area, located about 12 km southeast of Graveyard Lake, contain 37-130 ppb aluminum (including the second-highest value) and have surface water pH in the range 6.7-7.0. These waters also contain anomalous iron (100-360 ppb), zinc (2.6-3.7 ppb) and lead (0.23-0.26 ppb) concentrations; the site with the higher aluminum result also contains elevated (>95th percentile) Ba/Sr and Rb/Sr results. They are inferred to be underlain by Proterozoic Hyland Group metasedimentary rocks.

•Two sites east of the Kechika River and north of the Gemini lakes, underlain by Road River Group and Kechika Group siliceous facies rocks, contain 47-190 ppb aluminum (pH range: 7.3-7.4). The greater of the two is the highest aluminum result in the North Gataga survey area, and is coincident with elevated K/Na and Rb/Sr values. In addition, the two lakes are among a group of sites with the highest sediment gold concentrations in the North Gataga survey area (Cook *et al.*, 1997c).

•Two widely-separated sites (4406 and 4455) in the Sunshine Lake region in the northern half of the survey area contain 63-95 ppb aluminum in water (pH range: 7.4-7.7). The sites are also coincident with elevated levels of K/Na, Rb/Sr and, at the second of the two sites, Ba/Sr.

•Three closely-spaced sites in the northwestern part of the survey area, between Black Angus and Trepanier creeks, contain 46-97 ppb aluminum in waters (pH range: 7.3-7.4). The lakes are situated at the Northern Rocky Mountain Trench and are underlain by unconsolidated glacial sediments. All three sites have coincident anomalous Rb/Sr values in the upper five percentiles of the North Gataga data set. In addition, one of the sites has elevated K/Na, and the other two have elevated Ba/Sr values. Whether these or any other high-aluminum lake waters might indicate the presence of zones of buried intrusive-related hydrothermal alteration is unknown.

Canadian and British Columbia water quality guidelines for the protection of aquatic life specify that dissolved aluminum levels should not exceed 0.1 mg/L (100 ppb) in waters with pH of 6.5 or greater (Environment Canada, 1987; Nagpal *et al.*, 1995). Without any reference to sites with low pH values < 6.5, lake water aluminum levels reported here exceed 100 ppb at only two sites (130 ppb, 190 ppb) in the North Gataga survey area. The pH levels at these two sites are in the range 7.0-7.3.

WATER GEOCHEMISTRY: TRACE ELEMENTS

Trace elements are, by convention, considered as those elements which are usually present at concentration levels of <0.1 mg/L (<0.1 ppm, or <100 ppb). The following discussion highlight significant trends in the distribution of selected trace elements (zinc, lead, barium, copper, molybdenum, arsenic, antimony and nickel) in North Gataga-area waters, and is not intended as exhaustive. Histograms and boxplots showing the distribution of some of these elements, as well as iron by ICP-MS, are given in Figure 11.

A brief synopsis of the bedrock sources, dominant aqueous species and lake water stability constraints for each of the selected elements is provided. Readers are referred to Canadian and British Columbia water quality guidelines of Environment Canada (1987) and Nagpal *et al.* (1995), respectively, for further information on approved and working criteria for drinking water, freshwater aquatic life, livestock and irrigation for these and other elements. Note that guidelines cited here may be for the total concentration of an element in a raw sample; all water data reported here are for filtered samples.

ZINC

Zinc entering the surficial environment from the weathering and oxidation of sphalerite (ZnS) may occur in both dissolved and suspended forms (Environment Canada, 1987). It is a relatively mobile element at lower pH, and generally occurs at higher concentrations in natural waters than copper and many other trace elements. In dissolved form, zinc may be present as the divalent cation Zn^{2+}, or as zinc carbonate or hydroxide. However, zinc is readily adsorbed by soluble and insoluble organic matter, hydrous iron and manganese oxides and clay minerals, which serve to remove zinc from solution in the presence of suspended and colloidal particles (Rose *et al.*, 1979; Environment Canada, 1987, Kabata-Pendias and Pendias, 1992).

The median zinc concentration of North Gataga-area lake waters is 1.0 ppb (max: 6.1 ppb). The relatively low zinc concentrations here are likely due to the highly alkaline character of the lake waters. A histogram and boxplot of the distribution of zinc in these waters is shown in Figure 11. On the basis of lithology, the five water sites above Earn Group rocks have the highest median zinc content (2.3 ppb). Sites draining the Road River Group have a median zinc concentration of 1.4 ppb. These results are shown in Appendix C for those lithological units with at least ten associated sites. Most elevated lake water zinc concentrations > 95th percentile (2.3 ppb) occur as single sites in the southern and central parts of the survey area. The single greatest zinc concentration (6.1 ppb) is situated above Cambrian siliciclastic rocks about 8 km northwest of Horneline Lake. In addition, there are some groupings of sites which warrant further mention. First, three sites with zinc concentrations in the range 2.5-3.8 ppb form a linear trend to the east and southeast of Chee Mountain, where they drain Earn Group and Road River Group sedimentary rocks. These sites are in part coincident with elevated zinc concentrations in lake sediments reported by Cook *et al.* (1997c). Secondly, two sites about 12 km southeast of Graveyard Lake contain 2.6-3.7 ppb zinc in addition to elevated aluminum, iron and, in one case, anomalous Ba/Sr and Rb/Sr results. However, sediment at these sites contain only moderately elevated zinc levels. They are inferred to be underlain by Proterozoic Hyland Group metasedimentary rocks. In addition to the foregoing, there is a single site with elevated zinc in waters (3.2 ppb) in the Kitza Creek area, a region of hummocky hills and incised creek valleys just northwest of the Kechika River, which coincides with an area of highly elevated zinc in lake sediments. The corresponding sediment sample at this particular site had one of the lower zinc concentrations (565 ppm) in the area, but concentrations up to 5800 ppm were reported from other lakes here, which are underlain by Kitza Creek facies black slates and argillites. Readers are referred to Cook *et al.* (1997c) for more information on the zinc content of lake sediments in this area.

Canadian and British Columbia water quality guidelines for protection of freshwater aquatic life specify a maximum level of 0.03 mg/L (30 ppb) total zinc (Environment Canada, 1987; Nagpal *et al.*, 1995). There are no sites in either survey area which exceed this concentration.

LEAD

Lead released into the surficial environment by the weathering of minerals such as galena (PbS) and, to a lesser extent, anglesite ($PbSO_4$) and cerrusite ($PbCO_3$) occurs dissolved in surface waters as soluble Pb^{2+} and hydroxide and carbonate complexes. Most, however, is associated with suspended sediments (Hem, 1989). Lead is relatively immobile; it is poorly soluble and is readily adsorbed from the water column by suspended particulate organic matter, manganese-iron oxides and clays (Rose *et al.*, 1979; Environment Canada, 1987).

The median lead concentrations in North Gataga-area lake waters is 0.02 ppb (max: 0.49 ppb). The highest median lead concentrations are found in lakes underlain by Proterozoic Hyland Group rocks and the unmapped area (0.04 ppb in each case), but otherwise there are few appreciable differences in median lead content among geological units here. Elevated lake water lead concentrations > 95th percentile (0.08 ppb) here occur mostly as scattered sites throughout the survey area. The lake with the highest lead concentration (site 4055; 0.49 ppb) drains Cambrian siliciclastic rocks southeast of Horneline Lake. Anomalous lead concentrations are also present in sediment at this site (19 ppm). The most significant cluster of elevated lead values are at three sites (0.14-0.26 ppb lead) about 12 km southeast of Graveyard Lake. Waters at two of these three sites also contain elevated zinc, aluminum, iron and, in one case, anomalous Ba/Sr and Rb/Sr results.

Canadian and British Columbia water quality lead guidelines for protection of freshwater aquatic life vary with increasing water hardness. For example, Environment Canada (1987) recommended guidelines specify a range of maximum concentrations, from 1 ug/L (1 ppb) total lead in soft water (0-60 mg/L as $CaCO_3$) up to 7 ug/L (7 ppb) total lead in very hard water (>180 mg/L as $CaCO_3$). Maximum British Columbia guidelines range from 3 ug/L (3 ppb) total lead in very soft water up to 330 ug/L (330 ppb) total lead in extremely hard water (Nagpal *et al.*,1995). There are no sites in the North Gataga survey area which exceed the 1 ppb Environment Canada total lead limit.

BARIUM

Barium is released into the surficial environment by the weathering of barite ($BaSO_4$), witherite ($BaCO_3$) and potassium feldspar. However, its mobility in natural waters is limited by the relative insolubility of these barium sulphate and carbonate minerals, and by its adsorption by metal oxides and hydroxides (Environment Canada, 1987; Hem, 1989).

A histogram and boxplot showing the distribution of barium in North Gataga lake waters is given in Figure 11. The median barium concentrations in these waters is 81.5 ppb (max: 718.3 ppb). This level is approximately 2-5x greater than median barium concentrations of 15-30 ppb reported from Nechako Plateau-area lake water surveys (Cook *et al.*, 1999). Subdivided by geology, highest median barium concentrations are in lake sites underlain by Quaternary glacial sediments (145.1 ppb) and, to a lesser extent, the unmapped area (133.4 ppb) in the southeastern part of the survey area.

All elevated lake water barium concentrations > 95th percentile (242.9 ppb) here occur in the northern part of the survey area. They form an approximately 31 km x 18 km zone of barium-rich waters which extends from the Sunshine Lake area in the southeast to the Black Angus Creek area in the northwest. The zone is roughly coincident with similar areas of elevated silicon, iron, ytterbium and Ba/Sr in water, and manganese in lake sediments. The two highest barium concentrations in this zone are found in the Sunshine Lake area (718.3 ppb) and the Nancy Lake area (459.4 ppb). They are coincident with elevated Ba/Sr and, in one instance, elevated silicon values.

British Columbia water quality guidelines for protection of freshwater aquatic life specify a maximum level of 1 mg/L (1 ppm, or 1000 ppb) total barium (Nagpal *et al.,* 1995). There are no water sites in the North Gataga survey area which exceed this concentration level.

COPPER

Copper derived from the weathering and oxidation of, for example, the copper sulphide ore minerals chalcopyrite ($CuFeS_2$), bornite (Cu_5FeS_4) and chalcocite (Cu_2S), is of intermediate mobility in the surficial environment at pH < 6.5 (Environment Canada, 1987). Dissolved copper may occur as simple cations or as various hydroxide, carbonate or chloride complexes. However, their mobility is tempered by an affinity to adsorption by hydrous iron and manganese oxides and clays, and by complexing with organic matter (Kabata-Pendias and Pendias, 1992). Rose *et al.* (1979) stated that dissolved copper content of fresh waters was only rarely effective as a geochemical exploration method because of its limited solubility at typical pH levels.

The median copper concentration of North Gataga lake waters (0.2 ppb) is low relative to median concentrations of 0.811-1.336 ppb reported for some Nechako Plateau-area water surveys (Cook *et al.*, 1999). This is attributed to the alkaline nature of the lake waters and, possibly, to relatively lower bedrock copper levels in this area. Subdivided by lithology, the highest median copper concentrations are found in lakes in the unmapped area (0.5 ppb) in the southeastern part of the survey area, in areas underlain by slate and limestone of the Kechika Group (0.5 ppb), and in lakes draining the Hyland Group (0.4 ppb).

Many elevated copper concentrations > 95th percentile (0.8 ppb) in the North Gataga survey area (max: 2.1 ppb) occur as scattered sites showing few discernible patterns. However, a loosely-defined southeast-northwest trending belt of five sites with elevated copper levels is present in the southeastern part of the survey area, extending from the area boundary to Graveyard Lake. These sites drain several different geological units, and are distinguished by relatively low pH values (range 7.0-7.5 for four of five sites). At least one site is coincident with anomalous levels of zinc, lead, iron, aluminum, K/Na, Rb/Sr or Ba/Sr. Elevated copper concentrations are also found in lake sediments in this area (Cook *et al.*, 1997c), but individual anomalous sediment and water sites here do not coincide.

Canadian and British Columbia water quality copper guidelines for freshwater aquatic life vary with increasing water hardness. For example, Environment Canada (1987) recommended guidelines specify a range of maximum concentrations, from 2 ug/L (2 ppb) total copper in soft and medium water (0-60 and 60-120 mg/L, respectively, as $CaCO_3$) up to 6 ug/L (6 ppb) total copper in very hard water (>180 mg/L as $CaCO_3$). Maximum British Columbia guidelines are based on an equation of (0.094*Hardness)+2 for all waters (Nagpal *et al.*,1995). Irrespective of water hardness, only one site in the North Gataga survey area exceeds the 2 ppb Environment Canada limit (site 4029; 2.1 ppb), and none exceed the 6 ppb limit for very hard water.

MOLYBDENUM

Molybdenum is a relatively rare element in natural waters, with an average surface concentration of about 0.8 ppb in lakes and rivers (Wetzel, 1983). It occurs as the sulphide molybdenite (MoS_2) in porphyry-style molybdenum and copper deposits, and is also a constituent of skarns, pegmatites, quartz veins and several other deposit types (Boyle, 1974), as well as black shales. Although molybdenite oxidizes slowly during surficial weathering (Habata-Pendias and Pendias, 1992), dissolved molybdenum is highly mobile, staying in solution under a wide range of surface conditions. Unlike copper, for example, molydenum is soluble at more alkaline pH levels, and at pH>5 occurs in oxic lake waters as the molybdate anion (MoO_4^{2-}). Its stability here is controlled by adsorption and coprecipitation by suspended hydrous iron and aluminum oxides present in the water column (Environment Canada, 1987; Hem, 1989).

A histogram and boxplot showing the distribution of molybdenum in North Gataga lake waters is given in Figure 11. The median molybdenum concentration in these waters is 0.68 ppb, a level considerably greater than the median concentrations of 0.08-0.27 ppb molybdenum reported for some Nechako Plateau-area water surveys by Cook *et al.* (1999). Subdivided by geology, lakes with the highest median molybdenum concentrations are those underlain by Kechika Group (1.81 ppb), Earn Group (1.29 ppb) and Hyland Group (1.04 ppb) rocks. Note that the latter two statistics are not reported in Appendix C, as summary statistics by geology are only given for those units with at least ten sites.

Most elevated molybdenum concentrations > 95th percentile (3.01 ppb) in the North Gataga area (max: 6.88 ppb) occur in the southern part of the survey area, where most are clustered on the east side of Chee Mountain (3.02-6.88 ppb) and in the Moose Lake area (3.03-4.07 ppb). These sites drain Road River, Kechika and Earn Group rocks. Sites in both areas also have largely coincident levels of elevated calcium, conductivity, TDS, hardness, nickel and, to a lesser extent, zinc.

British Columbia water quality standards for molybdenum specify a limit of 2 mg/L (2000 ppb) for protection of freshwater aquatic life (Nagpal *et al.*, 1995). There are no sites in the North Gataga survey area which exceed this concentration.

ARSENIC

Arsenic is a natural constituent of many types of mineral deposits, and is widely used as a pathfinder element in geochemical exploration. The main sources of arsenic in waters and sediments are arsenic-bearing minerals such as sulphides (e.g. arsenopyrite $FeAsS$), arsenides (e.g. niccolite $NiAs$) or other sulphur minerals (e.g. orpiment As_2S_3) which are present in bedrock or surficial sediments. Arsenic concentrations in natural fresh waters are typically in the range 1.0-10 ppb (Azcue, 1995). The stable form of arsenic in oxygen-rich surface waters is arsenate (AsO_4^{3-}). Arsenic concentrations in waters are generally very low, largely due to (i) its affinity for adsorption to hydrous iron and aluminum oxides, clays and organic matter, and (ii) its tendency to combine with sulphur to form metal sulphides in anoxic bottom sediments (Hem, 1989; Kabata-Pendias & Pendias, 1992).

The median arsenic concentration of North Gataga-area lake waters is 0.3 ppb, a level equivalent to median arsenic concentrations of 0.20-0.30 ppb reported for Nechako Plateau-area lake water surveys (Cook *et al.*, 1999). Subdivided by lithology, highest median arsenic concentrations occur in lakes draining Cassiar Terrane (0.8 ppb; 5 sites), Kechika Group (0.7 ppb; 8 sites) and Road River Group (0.5 ppb; 27 sites) rocks. Almost all elevated lake water arsenic concentrations > 95th percentile (1.0 ppb) in the North Gataga survey area (max: 4.0 ppb) occur in the Graveyard Lake-Boya Creek area. These seven sites (1.2-4.0 ppb arsenic) are located north and west of Graveyard Lake, and northwest and west of Chee Mountain, largely encircling the two Boya skarn and porphyry-style deposits. They drain mostly Proterozoic Hyland Group metasedimentary rocks, although other geological units are also represented. Elevated antimony concentrations are also present at some of these sites. The single greatest arsenic concentration (4.0 ppb) in the North Gataga survey area is in a small pond, on the west side of the Kechika River, draining calcareous phyllite and schist of the Aeroplane Lake panel. It has been suggested that textural annealing of phyllite and limestone near this site might be related to a buried heat source (F. Ferri, personal communication, 1998).

Canadian and British Columbia water quality guidelines for protection of freshwater aquatic life specify a maximum level of 0.05 mg/L (50 ppb) total arsenic (Environment Canada, 1987; Nagpal *et al.*, 1995). There are no sites here which approach or exceed this concentration level.

ANTIMONY

Antimony is a relatively mobile element, and most antimony present in surface waters likely occurs in solution as stable antimonites and antimonates (Environment Canada, 1987).

Median antimony concentration in North Gataga-area lake water is 0.04 ppb. Subdivided by geology, the highest median antimony concentrations in the North Gataga survey area occur in lakes draining Kechika Group strata (0.12 ppb). High median antimony concentrations are also found in waters draining Hyland Group (0.08 ppb) and Road River Group (0.07 ppb) strata. Most elevated lake water antimony concentrations > 95th percentile (0.19 ppb) occur in the southern half of the survey area, principally in the Graveyard Lake-Boya Creek area north and northwest of Chee Mountain. Elevated antimony concentrations at four sites in this area (0.22-0.29 ppb), which broadly encircle the two Boya skarn and porphyry-style deposits, generally coincide with a more extensive area of elevated arsenic values. Other clusters of elevated antimony in water are also present east of Chee Mountain (0.23-0.37 ppb), and near Horneline Creek just south of Horneline Lake (0.50-0.61 ppb). In addition to these groupings, the greatest single antimony concentration here (site 4006; 1.25 ppb) occurs in a sinuous lake near the southeastern margin of the survey area, just west of the Rabbit River. The antimony level here, inferred to drain Hyland Group rocks, is approximately 30x greater than the 0.04 ppb median background. It is also similar to that of Pinchi Lake in the Nechako Plateau of central B.C., where several sites throughout this relatively large lake contain in the range 1.09-1.29 ppb antimony in water (Cook *et al.*, 1999).

An area where elevated antimony concentrations in waters are largely absent is the Kitza Creek area in the central part of the survey area, where corresponding lake sediments contain anomalous antimony concentrations (Cook *et al.*, 1997c).

British Columbia water quality guidelines for the protection of freshwater aquatic life specify a maximum level of 30 ug/L (30 ppb) total antimony (Nagpal *et al.*, 1995). There are no sites in the North Gataga water survey area which either approach or exceed this concentration level.

NICKEL

Nickel is released into surface waters by the weathering of iron-rich silicate minerals in mafic and ultramafic igneous rocks, and of nickel-bearing sulphide minerals such as pentlandite ($(Fe,Ni)_9S_8$) and niccolite (NiAs). However, nickel is relatively immobile in most near-neutral and alkaline surface waters above pH 6.0 due to its adsorption to and coprecipitation with hydrous oxides of iron and manganese (Environment Canada, 1987; Hem, 1989), resulting in higher concentrations in sediment relative to water.

Median nickel concentration of North Gataga-area lake waters is 0.4 ppb (max: 12.1 ppb). Subdivided by geology, highest median nickel concentrations are in lakes draining Earn Group (2.4 ppb; 5 sites) and Kechika Group (1.3 ppb; 8 sites) sedimentary rocks. In addition, median nickel concentrations of 0.7 ppb are found in lake waters draining rocks of the Hyland and Road River Groups (Appendix C). Most elevated lake water nickel concentrations > 95^{th} percentile (0.19 ppb) occur in the southern half of the survey area, principally the area east and southeast of Chee Mountain (5 sites; 2.4-12.1 ppb nickel), and the Moose Lake area (4 sites; 2.2-4.7 ppb nickel). Most of these sites are, in both areas, underlain by either Road River Group or Earn Group rocks. The single greatest North Gataga nickel concentration (12.1 ppb) is in the former area, in a small pond just north of Pup Lake. The sediment at this site contains 400 ppm nickel (Cook *et al.*, 1997c).

Distribution of anomalous nickel sites here is roughly similar to that of molybdenum and, to a lesser extent, manganese and zinc. However, the site distribution bears a greater similarity with that of elevated calcium, conductivity, TDS, hardness, sulphate and SO_4/TDS. In addition to the foregoing, two sites with elevated nickel in water values (5.4-8.6 ppb) are also present in the Kitza Creek area in the central part of the survey area, where elevated nickel concentrations are found in lake sediments.

As with copper and lead, Canadian and British Columbia water quality nickel guidelines for protection of freshwater aquatic life vary with increasing water hardness. For example, Environment Canada (1987) and British Columbia (Nagpal *et al.*, 1995) recommended guidelines specify a range of maximum concentrations, from 25 ug/L (25 ppb) total nickel in soft water (0-60 mg/L as $CaCO_3$) up to 150 ug/L (150 ppb) total nickel in very hard water (>180 mg/L as $CaCO_3$). There are no sites in the North Gataga survey area where nickel concentrations exceed even the 25 ppb limit.

OTHER DETERMINATIONS

TOTAL DISSOLVED SOLIDS AND CONDUCTIVITY

TDS is the total amount of solids (in mg/L) remaining when a water sample is evaporated to dryness (Drever, 1988), and is an index of the amount of dissolved constituents, regardless of origin (McNeely *et al.*, 1979). When used in the context of fresh waters (*e.g.* TDS < 1000 mg/L), it is roughly equivalent to salinity. Conductivity, expressed in uS, is the ability of a solution to pass an electrical current. It is an approximate measure of the salinity of a water sample (Drever, 1988), as conductivity increases with increasing ionic concentration.

Median TDS of North Gataga-area waters is 185 mg/L (max: 704 mg/L; Figure 8); median conductivity is 369 uS (max: 1407 uS). These background levels are almost 6x greater than median TDS and conductivity levels reported by Cook *et al.* (1999) for the Nechako Plateau area of central B.C. Subdivided by geology, the greatest median TDS (392 mg/l) and conductivity (782 uS) results are from lakes draining Earn Group argillite, siltstone and slate. Lakes draining Kitza Creek facies and Cassiar Terrane rocks also have elevated median TDS levels, at 300 mg/l and 293 mg/l, respectively. Conversely, the lowest median TDS (48.5 mg/l) and conductivity (96.4 uS) results here are from lakes draining the unmapped area in the southeastern corner of the survey area.

The distribution of sites with elevated TDS and conductivity levels > 95th percentile (407 mg/l TDS; 815 uS conductivity) are largely identical to those with elevated concentrations of calcium, the most-abundant ion in North Gataga-area lake waters. All of these sites are in the southern part of the survey area, and most of these are located in the area east and southeast of Chee Mountain, where they drain primarily Earn Group and Road River Group strata. In addition there are three sites with elevated TDS and conductivity levels, near the Kechika River and Twin Island Lake, which contain slightly lower calcium concentrations.

TOTAL ALKALINITY

Alkalinity refers to the quantity and types of compounds present in water, principally dissolved carbon dioxide species, which serve to buffer pH, increasing it from neutral to alkaline. The most important of these are bicarbonates, carbonates and hydroxides, although other bases such as borates, phosphates or silicates may be present. Total alkalinity is a measure of the strong acid necessary to neutralize the combined bicarbonate, carbonate and hydroxl ions in a litre of water (Wetzel, 1983).

Although bicarbonate, carbonate and hydroxide alkalinity were not determined in this study, the alkalinity of most natural waters can be attributed to dissolved bicarbonate and carbonate with little risk of error (Hem, 1989). In the case of moderately hard waters, such as those of the North Gataga area, nearly all the base is typically present as bicarbonate (Wetzel, 1983). Under such conditions, bicarbonate alkalinity is sometimes used interchangeably with total alkalinity.

Median total alkalinity of North Gataga-area waters is 152 ppm (max: 392 ppm; Figure 9). Subdivided by geology, greatest median total alkalinity values are found in lakes draining Cassiar Terrane (226 ppm) and Aeroplane Lake panel (200 ppm) rocks. The highest total alkalinity value (392 ppm) is in a small lake near Twin Island Lake and Davie Creek, draining calcareous phyllite and schist of the Aeroplane Lake panel. However, most sites with total alkalinity values > 95th percentile (268 ppm) occur in a roughly northeast-southwest trending linear belt, extending northeast from the Northern Rocky Mountain Trench and located between the Red River and Wadin Creek in the central part of the survey area. There is little outcrop exposed north of the Red River, and the area is underlain by unconsolidated Quaternary glacial sediments. However, the high-alkalinity sites are parallel to, and within, an esker complex which is the major physiographic feature of this area.

HARDNESS

Hardness of water refers to the concentration of ions, primarily of calcium and magnesium, that will react with a sodium soap to precipitate an insoluble residue (Drever, 1988). Hardness is determined here, by calculation, as the sum of the calcium and magnesium concentrations:
Hardness (mg/L equivalent $CaCO_3$) = 2.497 Calcium (mg/L) + 4.118 Mg (mg/L) *(APHA/AWWA/WEF, 1992)*

Hardness is conventionally expressed as either soft (0-60 mg/L $CaCO_3$), moderately hard (61-120 mg/L $CaCO_3$), hard (121-180 mg/L $CaCO_3$) or very hard (>180 mg/L $CaCO_3$; Hem, 1989). Waters in the North Gataga area can be characterized as very hard (median: 211.6 mg/L equivalent $CaCO_3$), and hardness levels as high as 894.7 mg/L equivalent $CaCO_3$ are locally present. Elevated hardness levels > 95th percentile (468.7 mg/L equivalent $CaCO_3$) generally follow those of calcium, magnesium, TDS and conductivity outlined above. These sites occur primarily (i) to the east and southeast of Chee Mountain, where they are mostly associated with Road River Group and Earn Group strata, and (ii) near the Kechíka River, between the Kechika River barite prospect and Davie Creek.

ELEMENT RATIO MAPS

Several maps showing the distribution of various element in water ratios are shown at the end of Appendix D. These ratio maps may assist in identifying areas of porphyry-style alteration and mineralization (K/Na, Ba/Sr, Rb/Sr) or, more generally, areas of oxidizing sulphide minerals (SO_4/Ca, SO_4/TDS).

K/Na

Potassium-rich aluminosilicate minerals such as biotite, K-feldspar and sericite are commonly present in potassic and phyllic hydrothermal alteration zones associated with porphyry-style copper or copper-molybdenum deposits. Calcium-bearing primary silicates such as plagioclase are susceptible to alteration by these hydrothermal fluids, and Boyle (1974) suggested that use of potassium/sodium (K/Na) ratios might be helpful in gauging proximity to many types of epigenetic base and precious-metal ore deposits, provided that albitization was absent. A Lake water K/Na distribution map is given in Appendix D. Elevated K/Na ratios in the upper five percentiles of data occur as numerous single sites in the survey area, with few discernible patterns. Three such sites are located east and southeast of Chee Mountain in an area of elevated zinc values. Several sites in the north part of the survey area are coincident with elevated aluminum concentrations and relatively low pH values.

Ba/Sr

Elevated barium-strontium (Ba/Sr) ratios were reported by Olade *et al.* (1975) for rocks hosting the Valley Copper, Lornex and Bethlehem/JA copper-molybdenum deposits of the Highland Valley in south central British Columbia. Highest Ba/Sr ratios, in excess of 1.0, were reported from mineralized zones relative to lower ratios in peripheral areas. Formation of these dispersion haloes were attributed by Olade *et al.* (1975) to the preferential destruction of plagioclase by hydrothermal fluids, and subsequent leaching of the relatively more soluble-strontium in those areas of most intense hydrothermal activity. In the North Gataga area most elevated Ba/Sr ratios greater than the 95th percentile occur in a large zone in the northern half of the survey area. This zone roughly coincides with sites reporting elevated levels of barium, silicon, iron, manganese and other elements in waters. Elevated levels of iron and manganese in lake sediments also occur in this region (Cook *et al.*, 1997c).

Rb/Sr

Elevated rubidium and rubidium/strontium ratios in hydrothermally-altered rocks may also, like barium/strontium, be useful in porphyry copper deposit exploration (Rose *et al.*, 1979), as rubidium concentrations tend to increase toward mineralization in potassium-rich alteration zones (Boyle, 1974). Primary Rb/Sr haloes were described for Highland Valley porphyry copper-molybdenum deposits by Olade and Fletcher (1975). The presence of elevated rubidium concentrations and Rb/Sr ratios near mineralization is attributed to the preferential enrichment of rubidium in potassic alteration zones typically located near the centres of porphyry-style systems near mineralization. The preferential enrichment of strontium in calcium alteration minerals such as epidote and calcite in the more peripheral propylitic and argillic alteration assemblages is attributed to the concomitant alteration and destruction of Ca-plagioclase, and the subsequent leaching of the associated strontium in those areas of most intense hydrothermal activity.

A Rb/Sr ratio map for the North Gataga area is given in Appendix D. Elevated Rb/Sr values greater than the 95th percentile occur mostly as single scattered sites throughout the survey area. However, there are three closely-spaced sites in the northwestern part of the survey area, between Black Angus and Trepanier creeks, which contain elevated levels of aluminum in addition to high Rb/Sr values. These waters have relatively neutral pH values of 7.3-7.4. Two of these sites also have elevated Ba/Sr, and one has elevated K/Na.

SO_4/Ca and SO_4/TDS

High sulphate concentrations in surface waters may have a variety of potential sources. They may result from the oxidation of potentially economic sulphide occurrences (Cameron, 1977), but they may also originate from the oxidation of disseminated pyrite in coal, or from the dissolution of sedimentary gypsum horizons (Rose *et al.*, 1979), giving rise to apparent sulphate anomalies which may also be associated with elevated calcium concentrations. Sulphate derived from sulphide oxidation may be distinguished from those in more saline waters derived from marine evaporites by their lower calcium and chlorine concentrations (Dall'Aglio and Tonani, 1973). To this end, SO_4/Ca and SO_4/TDS ratio maps are shown in Appendix D. Most elevated SO_4/Ca and SO_4/TDS ratios > 95th percentile occur in the southern part of the survey area. The following discussion will focus primarily upon the distribution of sites with elevated SO_4/TDS, which form clusters in three areas: i) the area east and southeast of Chee Mountain, ii) the ridge between Aeroplane Lake and the Kechika River, and iii) the Kitza Creek area.

Lake waters in the area to the east and southeast of Chee Mountain contain elevated levels of several elements in addition to high SO_4/TDS and SO_4/Ca values, most notably zinc, nickel, molybdenum, calcium, magnesium and uranium. In the case of the second area, high SO_4/TDS values and, more specifically, a large zone of high SO_4/Ca values occur in lakes on and around the south end of an unnamed ridge between Aeroplane Lake and the Kechika River. Much of this area is underlain by limestone, calcareous phyllite and schist of the Aeroplane Lake panel, and by slate and limestone of the Kechika Group. Regarding the third zone of elevated SO_4/TDS values in the Kitza Creek area, these sites occur nearby other sites with elevated zinc, nickel and K/Na in waters. These sites also closely coincide with somewhat larger zones of elevated zinc, nickel and molybdenum in lake sediments (Cook *et al.*, 1997c).

SUMMARY

A regional lake water geochemical survey, the North Gataga survey, was conducted during 1996 in the northern Kechika Trough over parts of the Rabbit River (NTS 94M) and McDame (NTS 104P) map areas. The survey covers 235 sites and is a contribution to the ongoing objective of completing Regional Geochemical Survey lake sediment and water geochemical coverage of selected areas of central B.C. Together with results of the corresponding lake sediment geochemical survey previously completed in this area (Cook *et al.*, 1997c), results of this survey confirm the locations of known mineral prospects (*e.g.* Kitza prospect) and outline prospective areas for potential sedimentary exhalative-style zinc-lead-barium mineralization. Some areas of particular interest to explorationists include:

• Elevated zinc, nickel, antimony, molybdenum and manganese in waters in the Chee Mountain area (NTS 94M/03) in the southern part of the survey area. Elevated levels of several elements are also present in corresponding lake sediments.

• Elevated barium, iron, manganese, silicon and europium in waters defining a large zone in the northern part of the survey area. Elevated levels of iron and manganese also occur in sediments here. There is little outcrop in this region, which is covered by unconsolidated Quaternary sediments.

• Elevated zinc and nickel in waters of the Kitza Creek area (NTS 94M/12). Elevated concentrations of metals in waters here, which drain black slates and argillites of the Kitza Creek facies, do not occur at as many sites as do the corresponding sediment anomalies in this area.

Geochemical results presented here are intended to highlight regional geochemical trends for mineral exploration purposes, and should not be used as a substitute for site-specific environmental studies. Owing to analytical imprecision which may result from the very low concentrations of many trace elements in lake waters, and to any potential seasonal variations, it is recommended that re-sampling of the original water site be part of any follow-up exploration surveys.

ACKNOWLEDGMENTS

Survey design and implementation was by the authors. Geochemical analyses were conducted by the following laboratories:

•Geological Survey of Canada, Ottawa, Ontario
Analytical Method Development Laboratory
(Trace Elements by ICP-MS)

•Geological Survey of Canada, Ottawa, Ontario
Analytical Chemistry Laboratory
(Major Elements by ICP-AES)

•CanTech Laboratories Inc., Calgary, Alberta
(RGS Suite)

•Activation Laboratories Ltd., Ancaster, Ont.
(Miscellaneous ICP-MS analyses)

Survey duties were divided as follows:
Survey Design: *Cook*
Sample Collection: *Cook, Jackaman, Friske, Day, Coneys*
TDS & related determinations: *Cook, Friske, Day, Coneys*
Trace and Major Element Analyses: *Hall*
Quality Control: *Cook*
Data Interpretation: *Cook*
Statistics: *Jackaman*
Geochemical Map Production: *Cook*
Open File Production and Coordination: *Cook, Jackaman*

The authors thank Hilda Reimer, cook at the Graveyard Lake base camp, for the fine meals provided during the field program. Helicopter services were provided by Frontier Helicopters, Watson Lake, YT. Watson Lake Flying Services Ltd. provided transport between Watson Lake and the base camp. The cooperation of the North Gataga bedrock mapping team of F. Ferri, C. Rees, J. Nelson and A. Legun contributed a great deal to the success of the project. The manuscript benefited from comments by M. McCurdy and F. Ferri, who also provided the geological and digital topographic basemaps used here.

Water analyses were completed under the direction of J. Vaive (ICP-MS) and P. Belanger (ICP-AES), Geological Survey of Canada, Ottawa. H.F.N. Wong and G.J. Wyatt provided office assistance at various times, and I. Sharpe, B.C. Ministry of Environment, Lands and Parks, Smithers, supplied some of the distilled water used in the survey.

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of the Northern Kechika Trough
(94M/2, 3, 4, 5, 6, 12; 104P/8, 9, 10, 15, 16)

Open File 1999-6

Appendix A

Field Observations and Analytical Data

Notes :

- All samples except five analyzed by ICP-AES (Analytical Chemistry Laboratory) or ICP-MS (Analytical Method Develoj Geological Survey of Canada, Ottawa, Ontario. The other five samples (4226, 4239, 4263, 4449, 4465) were analyzed by Laboratories, Ancaster, Ontario. Three of these samples (4226, 4239, 4449) are routine site samples and are included her maps. The remaining two samples (4263 and 4465) are part of field duplicate pairs, and are denoted in data listings as Re

- Two Al (by ICP-MS at two labs) and Fe (ICP-AES and ICP-MS) determinations are reported here. Al results for three sar (4029, 4363, 4364) rather than ICP-MS at the GSC Analytical Chemistry Laboratory are denoted by an asterisk (*) in the d data is reported by the Analytical Chemistry Laboratory for one sample (4497), which is denoted here by '-1' in the data li samples analyzed at Activation Laboratories only, the Al results are reported here as part of both suites, whereas Fe results set and are denoted by '-1' in both data listings.

- Activation Laboratories Mg results (5 sites) have been rounded off by one decimal point to conform with GSC laboratory r

TABLE 1. REFERENCE GUIDE TO BEDROCK GEOLOGY: NORTH GATAGA SURVEY (geology after Ferri *et al.*, 1997b)

ANCESTRAL NORTH AMERICA

CENOZOIC
QUATERNARY

Q	*Glacial deposits and post-glacial alluvium.*

TERTIARY TO QUATERNARY

Tuya Formation

TQT	*Fresh, massive and fragmental basalt. Dark grey-brown to dark green, plagioclase-olivine-phyric. Locally vesicular or glassy. Minor basaltic tuff, with angular basalt fragments.*

PALEOZOIC
MISSISSIPPIAN TO PERMIAN

Mount Christie Formation

MPMC	*Grey to buff-weathering, pale to dark grey chert. Locally pale salmon pink or green. Thinly to thickly bedded. Minor argillite. Locally found stratigraphically above Earn Group.*

UPPER DEVONIAN TO MISSISSIPPIAN

Earn Group

DME	*Pale grey to blue-grey weathering, dark grey to black argillite, cherty argillite, siltstone and slate. Generally carbonaceous. Thinly to thickly bedded. Locally calcareous, ranging to black, fetid, platy to blocky argillaceous limestone (possibly related to Kitza Creek facies). Rare bedded barite: pale grey, fine to medium grained, with fine pyrite laminations, and associated with grey slate with barite and pyrite nodules.*

UPPER ORDOVICIAN TO MIDDLE DEVONIAN

Road River Group

OSDRR	*Upper part: 'Silurian Siltstone': Buff-brown to orange-weathering, grey to greenish-grey siltstone, dolomitic siltstone. Commonly bioturbated, with wispy or mottled texture, or thinly laminated. Locally coarser grained, becoming fine sandstone which may be cross-laminated. Generally well and thinly to thickly bedded, with interbeds of grey slate or argillite, which predominate in some areas. Minor grey limestone; grey to grey-brown banded chert; sooty black slate or argillite; grey, fine-grained sandstone to quartzite, locally calcareous.*

Lower part: Recessive, grey to blue-grey weathering, carbonaceous, grey to black shale to slate and argillite, partly siliceous; siltstone, cherty siltstone and chert; grey to bluish-grey limestone. Thinly to moderately thickly bedded.

UPPER CAMBRIAN AND ORDOVICIAN

COKR	*Undifferentiated Kechika and lower Road River groups.*

UPPER CAMBRIAN TO LOWER ORDOVICIAN

Kechika Group

COK	*Pale grey to creamy-buff weathering, thinly and regularly interbedded grey to dark grey laminated slate, calcareous slate and fine-grained limestone, slaty or platy limestone, silty limestone. On weathering, generally soft, friable, with shiny lustre. Fine to medium-grained, thickly bedded grey limestone predominates locally.*

COKs (between Graveyard Lake and Kechika River): *Siliceous facies. Well and thinly interbedded, grey to orange-buff weathering, pinkish-grey, hard, fine to medium-grained calcareous siltstone to fine sandstone with good cross-stratified wavy laminae and micaceous partings; grey calcareous slate and silty slate; pale to mid-grey silty limestone or dolostone. Dark grey, platy micritic limestone to argillaceous limestone north of Gemini Lakes.*

CAMBRIAN

C	*Grey to rusty-brown weathering, grey micaceous slate, silty slate, siltstone; locally calcareous or dolomitic. Pale to mid-grey to maroon, thinly to thickly bedded, laminated micaceous sandstone, quartz sandstone and lesser greywacke; locally with calcareous matrix, cross-laminations, argillite clasts. Quartz-, quartzite- and chert-pebble conglomerate, with calcareous matrix tending to sandy limestone (possibly Middle Cambrian). Grey, fine to medium-grained, massive to platy limestone. Minor grey to red-brown chert, cherty argillite or siltstone.*

UPPER PROTEROZOIC AND CAMBRIAN

PC	*Undivided Hyland Group and Cambrian rocks.*

PROTEROZOIC

UPPER PROTEROZOIC

Hyland Group

PH	*Grey, olive-green-grey, red-brown to maroon, laminated slate, phyllite, argillite, silty slate and siltstone. Generally associated or interbedded with buff to grey to white, thickly bedded to massive, micaceous sandstone, quartzite and granule to pebble conglomerate, locally with blue quartz and ca. 10% feldspar clasts, and minor greywacke. Grey to brown-weathering, dark grey finely crystalline, massive to platy limestone (northern and western Chee Mountain). Grey, massive, medium-grained crystalline limestone and sandy limestone, and thinly interbedded limestone and chert (Boya Hill). Pale grey to cream, fine-grained dolomitic limestone (Red River). Coarse greywacke and quartz- and chert-pebble conglomerate and breccia (Liard Plain).*

PHh: *Hornfelsed rocks, on Boya Hill.* PHv: *Orange-brown weathering, green to brown tuff and lapilli tuff with calcareous matrix, on Boya Hill.*

INFORMAL UNITS OF UNCERTAIN AGE

ORDOVICIAN TO MISSISSIPPIAN

Kitza Creek Facies

P	*Generally calcareous, dark grey to black, carbonaceous siltstone to silty argillite, shaly slate. Associated with buff to grey-weathering, thinly to thickly bedded dark grey to black, platy to blocky, silty to argillaceous fetid limestone. Minor, thinly bedded to massive, calcareous or non-calcareous quartz sandstone to sandy limestone, pale grey calcareous tuff, black chert. Thick sections on Kitza Creek and lower Red River of black slate and argillite with thin beds of dolomitic siltstone.*

UPPER PROTEROZOIC(?) TO LOWER PALEOZOIC

Aeroplane Lake Panel

Low grade metamorphic rocks.

PPc	*Calcareous phyllite and schist. Grey, finely laminated to thinly bedded calcareous and graphitic phyllite to schist, locally crenulated. Thin interbeds of silty limestone to marble. Minor thin sandy phyllite and quartz sandstone. Grades into calcareous slate and limestone. Areas of non-calcareous phyllite. Possibly correlative with Kechika Group.*
PPs	*Siliceous schist and quartz sandstone. Grey to dark grey, crenulated slate to phyllite to schist, up to biotite grade, with layers of micaceous quartz sandstone, greywacke and siltstone. Minor dark grey, platy to massive limestone. Similar to Proterozoic or Cambrian units.*
PPl	*Limestone, phyllite and sandstone. Grey, recrystallized limestone to marble with thin layers of crenulated muscovite-chlorite schist, phyllite and greenish-grey calc-silicate. Minor dark blue-grey feldspathic sandstone to granule conglomerate. Similar to Hyland Group carbonates on Chee Mountain.*

CASSIAR TERRANE

UPPER PROTEROZOIC(?) TO PALEOZOIC

CA	*Grey, moderately to thickly bedded, quartz-feldspar sandstone, and phyllite; possibly Ingenika Group. Grey to orange-weathering, grey to green, massive to finely laminated dolomitic siltstone, cherty siltstone, siltstone and chert. Grey to buff-yellow, silty limestone to calcareous siltstone. Grey, coarse-grained calcareous or non-calcareous quartz sandstone, slate.*

INTRUSIVE ROCKS

LATE CRETACEOUS TO EARLY TERTIARY(?)

KTg	*Speckled grey, medium-grained hornblende granite, with small quartz phenocrysts.* KTp: *Pale yellow-green, altered, quartz-plagioclase porphyry (rhyodacite?) dike.*

CRETACEOUS(?)

p	*Feldspar, feldspar-biotite, and quartz-feldspar porphyry, in or near Aeroplane Lake panel. Pink to buff-yellow feldspar and brown biotite phenocrysts in blue-grey-pink, fine-grained, weakly calcareous groundmass. Post-metamorphic; possibly Cretaceous.*

EARLY CRETACEOUS

EKp	*Dikes, sills and small stocks on Boya Hill. Speckled grey to mauve-grey, fine to medium-grained, quartz-biotite-feldspar porphyry and quartz porphyry. Generally altered. Quartz monzonite to granodiorite composition; locally aplitic.*

EARLY PALEOZOIC(?)

g	*Gabbro. Orange-brown weathering, speckled green and white, non-foliated, equigranular, medium to coarse-grained, with pyroxene, hornblende and biotite.*

TABLE 2. REFERENCE GUIDE TO FIELD OBSERVATIONS (modified after Garrett, 1974)

MAP	1:50,000 NTS map sheet number			
SAMPLE ID	Sample number			
UTM ZONE	UTM Zone number			
UTM EAST	UTM East coordinate (provided for both NAD27 and NAD83)			
UTM NORTH	UTM North coordinate (provided for both NAD27 and NAD83)			
REP	Replicate sample status:			
	0	Routine sample		
	10	First sample of a field duplicate pair		
	20	Second sample of a field duplicate pair		
FORM	Geological units: Indicates the major geological unit of the lake catchment area			
SIZE	Lake area classification (square kilometres):			
	0	Pond (< 0.25)	2	1 - 5 km²
	1	.25 - 1 km²	3	> 5 km²
DEPTH	Sample depth (metres):			
		Recorded to the nearest metre		
RELIEF	General relief of the lake catchment area:			
	L	Low: flat lying plain		
	M	Medium: gently rolling hills		
	H	High: steep slopes		

COMP	Mechanical con	
	S	Sand: s
	F	Fines: : sedime
	O	Organi undeco
	G	Gel (g) organic
CONT	Presence of hun the lake shore:	
	W	Work s
	C	Camp (
	F	Fuel ca
	G	Gossan
COLOUR	Sediment colou	
	Tn	Tan
	Yw	Yellow
	Gr	Green
	Gy	Grey
	Or	Orange
	Br	Brown
	Bl	Black
SUSP	Suspended load	
	L	Light
	H	Heavy
DATE	Sample collectic	
LAKE NAME	Common lake n: topographic and	

Field Observations and RGS-Suite Water Data

Map	Sample ID	UTM Zone	UTM East NAD 27	UTM North Nad 27	UTM East Nad 83	UTM North Nad 83	REP	Form	Size	Depth	Relief	Sediment Comp	Contam	Sediment Colour	Susp	Date	Lake Name	pH 0.1 GCE	SO4 1 ppm TURB	F 20 ppb ION	U 0.05 ppb LIF
94M03	964002	9	604262	6565049	604166	6565233	0	PH	0	1	H	G		BL	L	0707		7.9	42	250	0.95
94M03	964004	9	613787	6559935	613693	6560120	0	PH	2	6	M	O		TN/GY	L	0707		8.0	7	68	0.58
94M03	964006	9	613273	6558113	613178	6558298	0	PH	2	5	M	O		TN/BR	L	0707		8.0	8	76	0.59
94M03	964008	9	613126	6557247	613031	6557432	0	PH	1	2	M	G		GY/BR	L	0707		8.1	8	70	0.60
94M03	964010	9	613799	6551488	613704	6551673	0	PH	0	1	M	O		BR	L	0707		7.7	22	100	0.14
94M02	964011	9	616878	6550553	616783	6550738	10	UNMAPPED	0	4	H	G		GR/BR	L	0707		7.3	1	24	0.02
94M02	964012	9	616878	6550553	616783	6550738	20	UNMAPPED	0	4	H	G		GR/BR	L	0707		6.8	1	22	0.02
94M02	964014	9	621469	6543746	621374	6543930	0	UNMAPPED	1	23	M	G		BR/BL	L	0707		7.1	5	72	0.06
94M02	964016	9	623460	6542513	623365	6542698	0	UNMAPPED	0	12	M	O		TN/BR	L	0707		8.1	17	50	0.70
94M02	964019	9	625145	6548777	625051	6548961	0	UNMAPPED	0	4	H	G		BR	L	0707		6.7	1	26	0.05
94M02	964022	9	623867	6549149	623772	6549333	0	UNMAPPED	1	5	M	G		TN/BR	L	0707		6.8	1	36	0.02
94M02	964025	9	617378	6559787	617283	6559972	10	UNMAPPED	0	7	L	O		BR	L	0707		8.1	4	48	0.33
94M02	964026	9	617378	6559787	617283	6559972	20	UNMAPPED	0	7	L	O		BR	L	0707		8.2	4	46	0.34
94M02	964027	9	616931	6559888	616837	6560072	0	UNMAPPED	0	5	M	G		BR	L	0707		7.9	3	40	0.18
94M03	964029	9	606689	6567540	606594	6567725	0	PH	0	1	M	O		BR	L	0707		7.0	5	28	0.02
94M06	964031	9	605261	6573230	605166	6573414	0	OSDRR	0	2	L	O		TN/BR	L	0707		8.0	4	84	0.45
94M06	964033	9	601908	6570952	601812	6571136	0	PH	0	2	M	G		BL	L	0707		7.9	220	250	1.90
94M03	964035	9	598052	6568584	597956	6568768	0	PH	2	1	M	O		TN	L	0707		7.7	40	82	0.70
94M03	964037	9	608129	6550341	608034	6550525	0	C	2	9	M	O	C	BL	L	0707	HORNELINE LAKE	8.2	42	110	0.94
94M03	964039	9	606907	6547559	606811	6547743	0	COK	0	1	L	G		BL	L	0707		8.0	40	100	1.40
94M03	964042	9	606858	6546775	606762	6546960	0	OSDRR	0	1	L	G		BL	L	0707		7.7	140	90	1.30
94M03	964044	9	609180	6546487	609084	6546672	10	C	0	5	L	G		BL	L	0707		8.1	10	60	0.52
94M03	964045	9	609180	6546487	609084	6546672	20	C	0	5	L	G		BL	L	0707		8.0	10	58	0.53
94M03	964046	9	609512	6546132	609416	6546316	0	C	0	7	L	G		BR	L	0707		7.9	7	68	0.37
94M03	964048	9	614710	6543775	614615	6543959	0	OSDRR	0	2	L	F		GY/WH	L	0707		8.1	5	66	0.91
94M02	964051	9	615067	6543367	614971	6543552	0	OSDRR	0	2	L	F		BL	L	0707		7.6	5	60	0.39
94M03	964053	9	614209	6545541	614114	6545725	0	OSDRR	0	12	H	G		BL	L	0707		8.2	28	80	1.10
94M03	964055	9	614214	6548685	614119	6548870	0	C	0	1	L	F		GY	H	0707		7.0	8	110	0.02
94M03	964057	9	610220	6552257	610125	6552442	0	COK	2	2	H	FG		GY/BL	L	0707	HORNELINE LAKE	8.0	32	110	0.65
94M03	964059	9	604560	6555783	604465	6555967	0	C	0	7	M	SG		BL	L	0707		8.1	180	180	3.10
94M03	964062	9	603412	6563179	603317	6563363	0	PH	0	3	L	G		BR	L	0707		6.7	4	38	0.02
94M03	964064	9	593374	6560396	593277	6560580	0	OSDRR	1	11	M	OG		GY/BL	L	0807	PUP LAKE	8.2	280	210	2.20
94M03	964066	9	594506	6558102	594409	6558286	0	OSDRR	0	1	L	FO		GY/BL	L	0807		8.2	290	400	2.10
94M03	964068	9	594203	6555401	594106	6555585	10	DME	0	2	L	O		BR	L	0807		7.9	150	160	0.44
94M03	964069	9	594203	6555401	594106	6555585	20	DME	0	2	L	O		BR	L	0807		7.9	160	150	0.46
94M03	964070	9	594460	6551741	594363	6551925	0	DME	0	1	L	O		TN/WH	L	0807		7.6	210	160	6.60
94M03	964073	9	597370	6549641	597272	6549825	0	OSDRR	0	3	M	FO		TN/BR	L	0807		8.1	310	86	6.00
94M03	964075	9	602367	6549551	602271	6549735	0	OSDRR	2	14	M	FG		BR/BL	L	0807	MOOSE LAKE	8.3	220	210	4.60
94M03	964077	9	600698	6548345	600601	6548529	0	OSDRR	2	33	M	G	C	BR/BL	L	0807	MOOSE LAKE	8.3	240	200	4.40
94M03	964079	9	596972	6546793	596875	6546977	0	DME	0	5	L	G		BR	L	0807		8.1	220	230	1.80

Field Observations and RGS-Suite Water Data

Map	Sample ID	UTM Zone	UTM East NAD 27	UTM North Nad 27	UTM East Nad 83	UTM North Nad 83	REP	Form	Size	Depth	Relief	Sediment Comp	Contam	Sediment Colour	Susp	Date	Lake Name	pH 0.1 GCE	SO4 1 ppm TURB	F 20 ppb ION	U 0.05 ppb LIF
94M03	964082	9	595948	6547985	595850	6548169	0	DME	0	2	L	O		TN/BR	L	0807		8.1	290	88	5.60
94M03	964084	9	594070	6547397	593972	6547582	0	OSDRR	0	3	L	O		TN/BR	L	0807		8.1	150	150	9.50
94M03	964087	9	591206	6545606	591109	6545790	0	COK	0	1	L	F		GY	L	0807		8.3	600	250	5.40
94M03	964089	9	590179	6555425	590082	6555609	0	PH	0	8	L	G		BR/BL	L	0807		8.1	12	54	0.35
94M03	964091	9	599480	6544145	599382	6544329	0	DME	0	1	L	FO		TN/WH	L	0807		7.9	280	220	30.00
94M03	964092	9	586832	6557103	586735	6557287	10	PH	0	1	L	O		TN/BR	L	0807		8.0	95	110	3.30
94M03	964093	9	586832	6557103	586735	6557287	20	PH	0	1	L	O		TN/BR	L	0807		8.0	61	110	3.30
94M03	964095	9	593159	6562024	593063	6562208	0	OSDRR	0	15	L	G		BR	L	0807		8.1	730	240	11.50
94M03	964097	9	593378	6563062	593282	6563247	0	COK	0	4	L	O		BR	L	0807		7.8	86	130	3.20
94M03	964099	9	600413	6561780	600317	6561965	0	COK	0	2	L	FO		BR/BL	L	0807		8.3	54	180	0.91
94M04	964102	9	584813	6564890	584717	6565074	0	PH	0	2	M	O		GR/BR	L	0807		8.2	48	110	1.30
94M04	964104	9	585260	6561355	585164	6561539	0	PH	0	3	L			GY	L	0807		8.2	71	110	0.94
94M04	964105	9	584390	6561923	584293	6562107	10	PH	0	3	L	O		GR	L	0807		8.3	32	130	5.60
94M04	964107	9	584390	6561923	584293	6562107	20	PH	0	3	L	O		GR	L	0807		8.3	59	130	5.70
94M04	964109	9	585031	6557327	584934	6557511	0	PH	0	1	L	F		GY	L	0807		8.3	43	180	3.40
94M04	964111	9	580954	6561453	580858	6561637	0	C	0	1	L	O		GY	L	0807		8.3	76	300	6.30
94M04	964113	9	574448	6555537	574351	6555722	0	CA	2	22	H	G		BL	L	0807		8.5	80	360	1.20
94M04	964115	9	572637	6558782	572540	6558966	0	CA	1	20	H	O		TN	L	0807		8.6	78	210	0.75
94M04	964117	9	570884	6561326	570788	6561510	0	CA	2	27	H	FG	C	GY	L	0807	BIRCHES LAKE	8.6	93	330	0.93
94M04	964119	9	567915	6567672	567819	6567856	0	Q	0	1	L	O		BR	L	0807		7.9	2	130	0.02
94M04	964122	9	566881	6567901	566785	6568085	0	CA	2	23	H	G		BL	L	0807	TWIN ISLAND LAKE	8.4	170	610	3.40
94M05	964124	9	566514	6569599	566418	6569784	0	Q	0	12	M	OG		GR	L	0807		8.4	66	300	1.30
94M05	964126	9	567119	6570292	567023	6570476	10	Q	0	9	M	G		TN/GR	L	0807		8.1	73	460	1.40
94M05	964127	9	567119	6570292	567023	6570476	20	Q	0	9	M	G		TN/GR	L	0807		8.2	110	450	1.50
94M04	964128	9	570773	6567825	570677	6568008	0	PPc	0	1	L	O		GR	H	0807		8.2	210	180	6.00
94M04	964130	9	575522	6565448	575426	6565632	0	PPc	0	1	L	O		BL	H	0807		7.9	140	130	3.00
94M05	964132	9	575532	6570773	575436	6570957	0	PPc	0	2	M	O		GR	L	0807		8.1	17	74	0.28
94M05	964134	9	578662	6570381	578565	6570565	0	PPc	0	4	H	G		GY/BL	L	0807		8.3	390	170	15.00
94M06	964136	9	592692	6572416	592595	6572600	0	COKs	0	1	L	G		GY/BR	L	0807		7.5	10	50	0.02
94M06	964138	9	588022	6571879	587925	6572063	0	OSDRR	0	1	L	FO		GY	L	0807		7.9	61	140	0.37
94M06	964142	9	586229	6574151	586133	6574335	0	OSDRR	0	2	L	OG		BR	L	0807		7.7	17	60	0.45
94M06	964144	9	590325	6578302	590228	6578486	0	COKs	0	1	L	OG		BR	L	0807		7.8	4	72	0.16
94M06	964146	9	587130	6581272	587034	6581456	10	COKs	2	7	L	FG		TN/GY	L	0807	GEMINI LAKES	8.2	55	96	0.88
94M06	964147	9	587130	6581272	587034	6581456	20	COKs	2	7	L	FG		TN/GY	L	0807	GEMINI LAKES	8.2	55	98	0.86
94M06	964148	9	588274	6582550	588178	6582735	0	COKs	2	7	L	FO		GY	L	0807	GEMINI LAKES	8.4	40	100	0.86
94M06	964150	9	589842	6583007	589746	6583191	0	COKs	0	6	M	OG		TN	L	0807		8.2	49	110	0.60
94M06	964152	9	586829	6588413	586733	6588597	0	COKs	0	3	M	G		BR	L	0807		8.2	4	98	0.24
94M06	964155	9	586870	6591274	586774	6591458	0	g	0	1	M	FO		TN/GY	L	0807		8.0	5	98	0.22
94M06	964157	9	587689	6593615	587593	6593799	0	COKs	0	7	L	G		BR	L	0807		8.3	28	70	0.22
94M06	964159	9	590189	6589933	590093	6590117	0	COKs	0	10	M	G		BR	L	0807		8.1	19	88	0.42

Field Observations and RGS-Suite Water Data

Map	Sample ID	UTM Zone	UTM East NAD 27	UTM North Nad 27	UTM East Nad 83	UTM North Nad 83	REP	Form	Size	Depth	Relief	Sediment Comp	Contam	Sediment Colour	Susp	Date	Lake Name	pH 0.1 GCE	SO4 1 ppm TURB	F 20 ppb ION	U 0.05 ppb LIF
94M06	964162	9	590822	6586685	590726	6586869	0	COKs	0	10	L	G		BR/BL	L	0807		7.5	1	32	0.02
94M06	964163	9	590150	6586618	590054	6586802	10	COKs	0	7	L	O		TN	L	0807		8.1	10	70	0.50
94M06	964164	9	590150	6586618	590054	6586802	20	COKs	0	7	L	O		TN	L	0807		8.1	10	68	0.48
94M06	964166	9	592921	6584756	592825	6584940	0	COKs	0	6	L	OG		BL	L	0807		8.2	3	78	0.38
94M06	964169	9	593497	6581961	593401	6582145	0	COKs	0	1	L	OG		GY/BL	L	0807		7.9	5	82	0.44
94M06	964171	9	595892	6578730	595795	6578914	0	C	0	1	M	O		GY/BL	L	0807		8.1	110	190	1.50
94M12	964173	9	576626	6600916	576531	6601100	0	OSDRR	0	1	M	O		TN/GY	L	0907		7.9	260	320	3.00
94M12	964175	9	574942	6601378	574847	6601561	0	P	0	18	H	SG		GY	L	0907		8.1	150	130	1.90
94M12	964177	9	572684	6603905	572590	6604089	0	OSDRR	0	7	H	G		BL	L	0907		8.3	10	80	0.32
94M12	964179	9	567226	6608324	567131	6608507	0	P	1	26	M	G		TN/BR	L	0907		8.2	24	140	2.80
94M12	964182	9	559350	6615937	559256	6616121	0	Q	0	7	L	G		TN	L	0907		8.1	1	160	0.30
94M12	964184	9	560059	6620608	559965	6620791	10	Q	0	1	L	O		BR	L	0907		8.1	4	98	0.30
94M12	964185	9	560059	6620608	559965	6620791	20	Q	0	1	L	O		BR	L	0907		8.0	4	110	0.29
94M12	964187	9	557156	6622779	557062	6622962	0	Q	0	9	L	G		TN/BR	L	0907		8.4	3	250	0.61
104P09	964189	9	555249	6623159	555155	6623342	0	Q	1	9	L	G		TN/BR	L	0907		8.4	3	240	0.64
104P16	964191	9	550319	6624696	550225	6624879	0	Q	1	8	L	O		BR	L	0907	NANCY LAKE	8.1	2	74	0.11
104P16	964193	9	551289	6626516	551195	6626699	0	Q	0	8	L	G		BR	L	0907		8.3	3	120	0.12
104P16	964195	9	544052	6631941	543959	6632124	0	Q	0	1	L	O		GY	L	0907		8.3	3	170	0.36
104P16	964197	9	530697	6639200	530604	6639383	0	Q	0	5	L	O		BR	L	0907		8.3	4	92	0.20
104P16	964199	9	536567	6645605	536473	6645788	0	Q	0	8	M	G		TN	L	0907		8.0	4	58	0.98
104P16	964202	9	538868	6646578	538775	6646760	0	Q	0	17	M	OG		TN/BR	L	0907		8.3	10	60	0.59
104P16	964204	9	532951	6651106	532858	6651289	0	Q	1	15	L	G		BL	L	0907	McTAVISH LAKE	8.2	5	66	0.25
104P16	964206	9	532642	6649894	532549	6650076	10	Q	0	3	L	O		BR	L	0907		8.1	7	86	0.31
104P16	964207	9	532642	6649894	532549	6650076	20	Q	0	3	L	O		BR	L	0907		8.1	4	90	0.29
104P16	964208	9	533121	6649294	533028	6649476	0	Q	0	9	L	G		BL	L	0907		8.5	11	78	0.18
104P16	964210	9	527939	6649769	527846	6649952	0	Q	0	2	L	O		BL	L	0907		8.0	8	220	0.29
104P16	964213	9	532692	6646655	532599	6646838	0	Q	0	8	L	O		TN	L	0907		7.9	18	80	2.20
104P16	964215	9	532095	6644718	532002	6644901	0	Q	0	1	L	FO		TN	L	0907		7.9	27	86	0.90
104P16	964217	9	528397	6634980	528304	6635163	0	Q	0	6	L	G		BR	L	0907		8.0	1	96	0.08
104P15	964219	9	525681	6633273	525587	6633456	0	Q	0	10	L	G		TN/BR	L	0907		8.1	1	84	0.05
104P15	964222	9	524942	6628725	524849	6628909	10	Q	1	9	L	G		BR	L	0907		7.9	1	62	0.15
104P15	964223	9	524942	6628725	524849	6628909	20	Q	1	9	L	G		BR	L	0907		7.9	2	76	0.15
104P15	964224	9	523478	6628413	523385	6628597	0	Q	0	13	L	G		BL	L	0907		8.1	2	96	0.42
104P16	964226	9	528835	6625606	528742	6625789	0	Q	0	4	L	G		BR	L	0907		8.0	2	110	0.34
104P15	964228	9	525718	6624439	525625	6624623	0	Q	0	4	L	G		BR	L	0907		7.4	2	42	0.02
104P15	964231	9	523935	6623548	523842	6623732	0	Q	0	3	L	O		GR/BR	L	0907		8.3	3	70	0.06
104P09	964233	9	528383	6622720	528289	6622904	0	Q	0	3	L	OG		BR	L	0907		8.1	1	64	0.20
104P10	964235	9	526107	6621166	526014	6621350	0	Q	0	3	L	G		BR	L	0907		7.3	3	36	0.02
104P10	964237	9	524987	6621527	524894	6621711	0	Q	0	1	L	O		BR	L	0907		7.4	5	38	0.02
104P09	964239	9	532947	6622415	532853	6622599	0	Q	0	3	L	O		BR	L	0907		8.1	3	160	0.88

Field Observations and RGS-Suite Water Data

Map	Sample ID	UTM Zone	UTM East NAD 27	UTM North Nad 27	UTM East Nad 83	UTM North Nad 83	REP	Form	Size	Depth	Relief	Sediment Comp	Contam	Sediment Colour	Susp	Date	Lake Na
104P09	964242	9	537535	6620930	537441	6621113	0	Q	0	1	L	O		TN/BR	L	0907	
104P09	964245	9	535686	6620533	535592	6620717	0	Q	1	7	L	OG		BR	L	0907	
104P09	964247	9	533177	6618205	533083	6618389	0	Q	0	2	L	OG		BR	L	0907	
94M06	964249	9	593716	6570834	593620	6571018	0	COKs	2	30	M	G		TN/GY	L	0907	GRAVEYAR
94M06	964251	9	592362	6569609	592265	6569794	0	COKs	2	23	M	G		TN/WH	L	0907	GRAVEYAR
94M06	964253	9	595531	6572166	595434	6572350	0	COKs	2	21	M	G		BR/BL	L	0907	GRAVEYAR
94M06	964255	9	597388	6572660	597292	6572844	0	PH	0	11	L	O		BR	L	0907	
94M06	964257	9	598608	6572814	598512	6572998	0	PH	0	3	L	O		TN/OR	L	0907	
94M06	964259	9	600492	6574756	600396	6574940	0	C	2	35	M	FG		GY/BL	L	0907	
94M06	964262	9	600949	6573895	600853	6574079	0	OSDRR	0	10	L	FG		GY/BL	L	0907	
94M06	964263	9	601203	6574256	601107	6574440	20	OSDRR	1	13	L	O		GY	L	0907	
94M06	964264	9	601203	6574256	601107	6574440	10	OSDRR	1	14	L	G		TN/GY	L	0907	
94M06	964266	9	602208	6574734	602112	6574918	0	OSDRR	1	2	L	O		TN	L	0907	
94M06	964268	9	602783	6575604	602687	6575788	0	C	0	18	L	O		TN/BR	L	0907	
94M06	964270	9	603345	6577450	603249	6577634	0	C	0	2	L	O		TN	L	0907	
94M06	964272	9	592456	6568817	592360	6569001	0	COK	0	5	M	G		BR	L	0907	
94M03	964274	9	591431	6567501	591334	6567685	0	COK	1	2	L	O		TN/GY	L	0907	
94M03	964277	9	587785	6564790	587688	6564974	0	PH	0	2	L	O		TN/BR	L	0907	
94M03	964279	9	586153	6563450	586057	6563634	0	PH	0	2	L	O		GY/BR	L	0907	
104P09	964282	9	542478	6612505	542384	6612689	0	Q	0	10	L	O		BL	L	1007	
104P09	964284	9	540693	6614457	540599	6614641	10	Q	0	4	L	O		TN/GR	L	1007	
104P09	964285	9	540693	6614457	540599	6614641	20	Q	0	4	L	O		TN/GR	L	1007	
104P09	964286	9	539721	6615342	539627	6615526	0	Q	0	2	L	O		BR	L	1007	
104P09	964288	9	536970	6618452	536876	6618636	0	Q	0	1	L	O		GR/BR	L	1007	
104P09	964290	9	533498	6613833	533404	6614017	0	C	0	1	L	O		TN/GR	L	1007	
104P09	964293	9	532300	6614739	532206	6614923	0	C	0	3	L	G		BL	L	1007	
104P10	964295	9	527962	6616288	527868	6616472	0	CA	0	1	L	O		GY	L	1007	
104P16	964297	9	533390	6628247	533296	6628430	0	Q	0	2	L	O		BR	L	1007	
104P16	964299	9	534323	6626643	534230	6626827	0	Q	0	5	L	O		BR	L	1007	
104P16	964302	9	539736	6628918	539643	6629101	0	Q	0	11	L	G		BL	L	1007	
104P16	964304	9	537915	6630251	537821	6630434	0	Q	1	14	L	G		TN	L	1007	McNAB I
104P16	964306	9	537437	6629084	537343	6629267	0	Q	0	4	L	FG		TN	L	1007	
104P16	964307	9	538764	6625977	538670	6626160	10	Q	0	4	L	O		BR	L	1007	
104P16	964308	9	538764	6625977	538670	6626160	20	Q	0	4	L	O		BR	L	1007	
104P09	964310	9	544091	6620417	543997	6620600	0	Q	0	2	L	O		BR	L	1007	
104P09	964312	9	544166	6619414	544072	6619597	0	Q	0	8	L	G		BL	L	1007	
104P09	964314	9	549728	6615469	549634	6615652	0	Q	0	3	L	G		BL	L	1007	
104P09	964316	9	551645	6614921	551551	6615105	0	Q	0	8	L	O		BR	L	1007	
94M12	964319	9	565692	6603733	565597	6603916	0	OSDRR	2	23	M	FG		BR/BL	L	1007	KITZA L
104P09	964322	9	555108	6616023	555014	6616207	0	Q	0	9	L	G		BR	L	1007	

Map	Sample ID	UTM Zone	UTM East NAD 27	UTM North Nad 27	UTM East Nad 83	UTM North Nad 83	REP	Form	Size	Depth	Relief	Sediment Comp	Contam	Sediment Colour	Susp	Date	Lake Name	pH 0.1 GCE	SO4 1 ppm TURB	F 20 ppb ION	U 0.05 ppb LIF
104P09	964324	9	553843	6618001	553749	6618184	10	Q	1	9	L	G		BR/BL	L	1007		8.3	1	98	0.41
104P09	964325	9	553843	6618001	553749	6618184	20	Q	1	9	L	G		BR/BL	L	1007		8.2	1	94	0.30
104P09	964326	9	554258	6621007	554163	6621191	0	Q	0	9	L	G		BR	L	1007		8.1	1	74	0.32
104P09	964328	9	551446	6620865	551352	6621049	0	Q	1	10	L	G		BR	L	1007		8.1	2	100	0.28
104P09	964330	9	550165	6620783	550071	6620966	0	Q	0	7	L	G		BR	L	1007		8.2	1	82	0.05
104P09	964332	9	548586	6622334	548492	6622518	0	Q	0	2	L	OG		TN/BR	L	1007		8.0	1	72	0.24
104P16	964334	9	547678	6625129	547584	6625313	0	Q	0	9	L	FO		BR	L	1007		8.3	1	110	0.02
104P16	964337	9	546108	6628787	546014	6628971	0	Q	0	5	L	OG		TN/BR	L	1007		7.7	1	36	0.05
104P16	964339	9	545305	6625995	545211	6626179	0	Q	0	6	L	G		GY/BR	L	1007		8.6	1	140	0.39
104P16	964342	9	542598	6625872	542504	6626056	10	Q	0	5	L	G		BR	L	1007		8.2	3	170	0.67
104P16	964343	9	542598	6625872	542504	6626056	20	Q	0	5	L	G		BR	L	1007		8.2	3	170	0.65
104P16	964344	9	541290	6625908	541197	6626091	0	Q	0	2	L	O		BR	L	1007		8.2	2	110	0.14
104P09	964346	9	547391	6621858	547297	6622042	0	Q	0	7	M	G		BR	L	1007		8.1	1	66	0.22
104P09	964348	9	547087	6618543	546993	6618727	0	Q	0	8	L	G		BL	L	1007		8.1	2	92	0.02
104P09	964351	9	554229	6609869	554134	6610052	0	Q	0	12	L	G		BR	L	1007		8.3	8	220	0.98
94M05	964356	9	584658	6578049	584561	6578234	0	OSDRR	0	2	L	O		BR/BL	L	1007		8.2	90	110	0.97
94M05	964357	9	584265	6578354	584168	6578538	0	OSDRR	0	1	M	O		TN/BR	L	1007		8.1	78	90	0.96
94M05	964359	9	581677	6579024	581580	6579209	0	OSDRR	0	1	M	O		BR	L	1007		8.0	19	74	0.05
94M05	964362	9	581406	6585895	581310	6586079	0	COKs	0	3	M	G		GY/BL	L	1007		7.4	2	50	0.18
94M05	964363	9	579600	6588221	579504	6588406	10	OSDRR	0	2	M	G		BR	L	1007		7.3	2	26	0.02
94M05	964364	9	579600	6588221	579504	6588406	20	OSDRR	0	2	M	G		BR	L	1007		7.3	1	26	0.02
94M05	964366	9	583852	6589842	583756	6590027	0	COKs	0	1	M	G		TN/WH	L	1007		7.7	36	88	0.57
94M05	964368	9	584518	6592640	584422	6592824	0	COKs	0	4	M	G		BR/OR	L	1007		7.4	3	84	0.05
94M12	964371	9	584569	6597157	584473	6597341	0	COKs	2	17	M	G		GY/BR	L	1007		8.2	65	160	0.44
94M12	964373	9	572258	6600538	572163	6600722	0	P	0	12	M	G		GY/BL	L	1007		8.0	270	130	4.50
94M12	964375	9	571265	6600220	571169	6600404	0	P	0	9	M	G		BR	L	1007		7.7	180	98	1.30
94M12	964377	9	571033	6602804	570938	6602988	0	P	0	23	H	O		BR/BL	L	1007		8.0	1	46	0.32
94M12	964379	9	569534	6600509	569439	6600693	0	P	1	1	M	O		TN/GY	L	1007		7.4	240	140	3.00
94M12	964383	9	567008	6599159	566913	6599343	0	Q	0	9	L	G		BR	L	1007		8.0	2	130	0.31
94M12	964385	9	568734	6598194	568639	6598378	0	Q	0	7	L	O		TN/GY	L	1007		8.4	10	120	1.20
94M05	964387	9	570337	6593143	570241	6593327	0	P	0	1	L	O		BR	L	1007		7.6	170	170	0.23
94M05	964389	9	577707	6582936	577610	6583120	0	OSDRR	1	1	M	O		GY	L	1007		7.9	360	120	12.50
94M05	964391	9	574633	6580445	574536	6580630	0	COK	0	1	L	SFO		TN/BR	L	1107		8.2	270	220	5.60
94M05	964393	9	570606	6586170	570510	6586354	0	Q	0	1	L	SF		TN	L	1107		8.0	12	390	0.02
94M05	964395	9	568741	6588384	568645	6588568	10	Q	0	2	L	SF		GY	L	1107		8.2	5	110	0.72
94M05	964396	9	568741	6588384	568645	6588568	20	Q	0	2	L	SF		GY	L	1107		8.2	5	120	0.74
94M05	964397	9	568252	6588556	568157	6588740	0	Q	0	2	L	F		TN	L	1107		7.9	4	110	0.92
94M05	964399	9	569191	6591592	569095	6591776	0	Q	0	11	L	G		BR	L	1107		8.2	1	100	0.09
94M12	964402	9	564867	6600584	564772	6600768	0	Q	0	8	L	FG		BR	L	1107		8.4	15	140	1.10
94M12	964403	9	564592	6601089	564497	6601273	10	Q	1	8	L	FG		TN/BR	L	1107		8.4	10	150	1.10

Field Observations and RGS-Suite Water Data

Map	Sample ID	UTM Zone	UTM East NAD 27	UTM North Nad 27	UTM East Nad 83	UTM North Nad 83	REP	Form	Size	Depth	Relief	Sediment Comp	Contam	Sediment Colour	Susp	Date	Lake Name	pH 0.1 GCE	SO4 1 ppm TURB	F 20 ppb ION	U 0.05 ppb LIF
94M12	964404	9	564592	6601089	564497	6601273	20	Q	1	8	L	FG		TN/BR	L	1107		8.5	7	150	1.10
94M12	964406	9	561515	6607600	561420	6607783	0	Q	0	1	L	OG		BR	L	1107		7.7	5	46	0.11
94M12	964408	9	557899	6613739	557804	6613923	0	Q	0	9	L	FG		TN/BR/BL	L	1107		8.1	4	110	0.33
94M12	964410	9	557267	6611679	557172	6611862	0	Q	1	5	L	SF		TN/BR	L	1107		8.4	1	110	0.38
94M12	964412	9	557215	6608948	557120	6609132	0	Q	0	7	L	OG		BR	L	1107		8.3	1	96	0.14
94M12	964414	9	556897	6606822	556802	6607005	0	Q	0	6	L	FO		GY/BL	L	1107		8.3	1	120	0.15
94M12	964416	9	558416	6602648	558322	6602832	0	Q	1	11	L	G		BR/BL	L	1107		8.4	3	140	0.81
94M12	964418	9	560183	6601312	560088	6601496	0	Q	1	23	L	SF		TN	L	1107		8.3	12	140	1.50
94M12	964422	9	562157	6602173	562062	6602357	0	Q	2	7	L	SF		TN	L	1107	CALF LAKE	8.4	5	130	1.00
94M12	964424	9	563470	6601261	563375	6601445	0	Q	1	8	L	FG		BR	L	1107		8.4	5	140	0.98
94M12	964426	9	562634	6599788	562539	6599971	0	Q	0	2	L	O		BR	L	1107		8.2	4	110	1.40
94M12	964428	9	563634	6596951	563539	6597135	0	Q	0	2	L	SF		TN	L	1107		8.5	18	140	1.90
94M12	964430	9	566114	6596616	566019	6596800	0	Q	0	11	L	SF		TN	L	1107		8.6	17	100	1.10
94M12	964431	9	566699	6597388	566604	6597572	10	Q	1	5	L	F		TN	L	1107		8.5	16	110	1.30
94M12	964432	9	566699	6597388	566604	6597572	20	Q	1	5	L	F		TN	L	1107		8.5	16	110	1.20
94M05	964435	9	564509	6594534	564413	6594718	0	Q	0	2	L	F		TN	L	1107		8.5	15	100	1.30
94M05	964437	9	564161	6595530	564066	6595714	0	Q	0	9	M	F		TN	L	1107		8.5	15	130	1.60
104P09	964439	9	556280	6605578	556186	6605761	0	Q	0	2	L	O		BR	L	1107		8.0	2	70	0.09
104P09	964442	9	554251	6605583	554157	6605767	0	Q	0	4	L	G		BR	L	1107		8.1	6	100	0.97
104P09	964445	9	550426	6604695	550332	6604879	0	Q	0	1	L	FO		TN/WH	L	1107		8.1	4	150	0.42
104P09	964447	9	549193	6606622	549098	6606806	0	Q	0	12	L	G		BL	L	1107		8.3	8	180	1.00
104P09	964449	9	545103	6609940	545009	6610124	0	Q	0	1	L	O		GR/BR	L	1107		8.2	3	330	0.36
104P09	964450	9	540732	6609391	540638	6609575	10	Q	1	4	L	G		BR	L	1107		7.8	1	48	0.02
104P09	964451	9	540732	6609391	540638	6609575	20	Q	1	4	L	G		BR	L	1107		7.7	1	52	0.05
104P09	964453	9	540847	6605061	540753	6605244	0	Q	0	1	L	O		BR	L	1107		8.2	2	60	0.06
104P09	964455	9	542361	6603351	542266	6603535	0	Q	0	1	L	G		BR	L	1107		7.4	3	34	0.05
104P09	964457	9	549021	6602541	548927	6602725	0	Q	0	6	L	G		BR	L	1107		7.9	1	64	0.02
104P09	964459	9	547679	6601939	547585	6602123	0	Q	0	6	L	O		BR	L	1107		8.1	7	130	0.56
104P09	964462	9	552647	6598202	552553	6598385	0	Q	1	5	L	G		TN/WH	L	1107		8.3	8	130	1.30
104P09	964464	9	545359	6597998	545265	6598181	0	Q	0	2	L	O		TN/BR	L	1107		8.4	14	140	1.10
104P09	964465	9	546976	6596713	546882	6596897	20	Q	0	4	L	G		BR/BL	L	1107		8.1	2	90	0.30
104P09	964466	9	546976	6596713	546882	6596897	10	Q	0	4	L	G		BR/BL	L	1107		8.1	2	82	0.32
104P09	964469	9	552727	6599981	552632	6600164	0	Q	0	6	L	G		BR	L	1107		8.1	1	66	0.09
104P09	964471	9	555461	6601768	555366	6601952	0	Q	0	2	L	O		TN/BR	L	1107		8.3	4	110	0.41
104P09	964473	9	556500	6599349	556405	6599533	0	Q	1	6	L	G		TN/WH	L	1107		8.2	4	100	0.45
104P08	964475	9	551600	6588600	551505	6588784	0	Q	0	1	M	FO		GY	L	1107		8.3	27	120	1.80
104P08	964477	9	556000	6587800	555905	6587984	0	Q	0	2	L	O		GY/WH	L	1107		8.4	24	180	2.50
94M05	964479	9	557646	6588528	557551	6588712	0	Q	0	1	L	O		BR	L	1107		8.3	9	130	2.40
94M06	964482	9	589676	6570082	589580	6570266	0	COKs	0	1	L	SFO		TN/GY	L	1107		7.9	100	110	1.60
94M06	964484	9	589562	6569309	589465	6569493	0	PH	0	1	L	SFO		GY/BR	L	1107		7.9	5	90	1.10

Field Observations and RGS-Suite Water Data

Map	Sample ID	UTM Zone	UTM East NAD 27	UTM North Nad 27	UTM East Nad 83	UTM North Nad 83	REP	Form	Size	Depth	Relief	Sediment Comp	Contam	Sediment Colour	Susp	Date	Lake Name	pH 0.1 GCE	SO4 1 ppm TURB	F 20 ppb ION	U 0.05 ppb LIF
94M03	964486	9	585933	6568003	585837	6568187	0	PH	0	2	M	OG	C	BR	L	1107		7.9	11	62	0.02
94M05	964487	9	572972	6573687	572876	6573871	10	PPc	0	3	M	G		GY	L	1107		8.1	210	110	1.60
94M05	964488	9	572972	6573687	572876	6573871	20	PPc	0	3	M	G		GY	L	1107		8.0	210	120	1.80
94M05	964490	9	566869	6572055	566773	6572240	0	Q	0	7	L	FG		TN/GY	L	1107		8.4	80	570	1.90
94M05	964492	9	567545	6573358	567449	6573542	0	PPc	0	3	M	G		GY/BL	L	1107		8.2	42	210	2.40
94M05	964495	9	566576	6574234	566480	6574419	0	PPc	0	5	M	OG		GY/BL	L	1107		8.4	25	170	1.10
94M05	964497	9	565523	6577174	565427	6577358	0	PPc	0	22	H	G		BR	L	1107		8.4	56	240	3.10
94M05	964499	9	564899	6582167	564803	6582351	0	PPc	0	5	M	FG		BR	L	1107		8.1	2	96	0.84
94M05	964502	9	560400	6575874	560304	6576058	0	Q	0	1	L	F		GY	L	1207		8.4	12	470	1.40
94M05	964503	9	558704	6578805	558608	6578989	10	Q	0	2	L	O		GR	L	1207		7.9	5	150	1.90
94M05	964504	9	558704	6578805	558608	6578989	20	Q	0	2	L	O		GR	L	1207		7.9	5	150	1.90
94M05	964507	9	563623	6580007	563527	6580192	0	PPc	3	30	M	FO		GR	L	1207	AEROPLANE LAKE	8.5	40	250	2.70
94M05	964508	9	562420	6581631	562324	6581815	0	PPc	3	29	M	FO	C	GR	L	1207	AEROPLANE LAKE	8.5	60	260	2.80
94M05	964510	9	562058	6582912	561963	6583096	0	PPc	0	3	L	O		GR	L	1207		8.1	6	180	0.81
104P08	964512	9	556125	6582650	556029	6582834	0	Q	0	2	L	O		BR	H	1207		8.0	23	160	5.30
104P08	964515	9	555450	6584050	555355	6584234	0	Q	0	2	L	FO		GR/BR	L	1207		7.8	2	92	0.61
94M05	964517	9	560688	6590582	560592	6590766	0	Q	0	1	M	G		BR	L	1207		8.4	23	150	1.70
94M05	964519	9	564271	6592691	564176	6592875	0	Q	0	7	L	F		TN	L	1207		8.3	24	130	1.10
94M05	964522	9	580414	6577743	580317	6577928	10	OSDRR	0	3	M	F		GY/BL	L	1207		8.2	81	100	1.30
94M05	964523	9	580414	6577743	580317	6577928	20	OSDRR	0	3	M	F		GY/BL	L	1207		8.1	85	100	1.30
94M05	964524	9	581057	6576325	580960	6576510	0	OSDRR	0	2	M	F		GY/BL	L	1207		8.0	100	100	1.70

Analytical Data: Major Elements

Map	Sample ID	UTM Zone	UTM East NAD 27	UTM North Nad 27	Rep	Form	Al 0.5 ppb ICP-MS	Ca 5 ppb ICP-AES	Fe 3 ppb ICP-AES	Mg 2 ppb ICP-AES	K 20 ppb ICP-AES	Si 10 ppb ICP-AES	Na 20 ppb ICP-AES
94M03	964002	9	604262	6565049	0	PH	6.7	45000	120	14000	320	1300	1100
94M03	964004	9	613787	6559935	0	PH	1.3	31000	3	15000	430	1900	1600
94M03	964006	9	613273	6558113	0	PH	1.1	32000	3	16000	480	1900	1600
94M03	964008	9	613126	6557247	0	PH	4.6	27000	7	15000	350	1300	1500
94M03	964010	9	613799	6551488	0	PH	2.5	32000	74	5900	170	2300	1400
94M02	964011	9	616878	6550553	10	UNMAPPED	3.3	1400	44	250	150	70	200
94M02	964012	9	616878	6550553	20	UNMAPPED	2.5	1200	43	200	180	50	220
94M02	964014	9	621469	6543746	0	UNMAPPED	5.3	13000	6	4400	310	290	470
94M02	964016	9	623460	6542513	0	UNMAPPED	0.5	49000	3	14000	360	1300	1800
94M02	964019	9	625145	6548777	0	UNMAPPED	4.3	5700	41	760	410	10	270
94M02	964022	9	623867	6549149	0	UNMAPPED	8.0	11000	10	1400	400	10	240
94M02	964025	9	617378	6559787	10	UNMAPPED	2.6	51000	11	14000	390	930	1000
94M02	964026	9	617378	6559787	20	UNMAPPED	1.5	50000	12	14000	340	920	1000
94M02	964027	9	616931	6559888	0	UNMAPPED	3.0	22000	26	12000	610	600	610
94M03	964029	9	606689	6567540	0	PH	130*	3000	100	820	570	160	310
94M06	964031	9	605261	6573230	0	OSDRR	4.3	42000	3	19000	650	1400	2100
94M06	964033	9	601908	6570952	0	PH	1.3	100000	8	25000	900	140	900
94M03	964035	9	598052	6568584	0	PH	2.2	28000	8	22000	390	890	1900
94M03	964037	9	608129	6550341	0	C	0.7	57000	3	21000	730	2300	2000
94M03	964039	9	606907	6547559	0	COK	8.2	35000	29	21000	280	210	1700
94M03	964042	9	606858	6546775	0	OSDRR	8.3	67000	74	27000	240	910	1400
94M03	964044	9	609180	6546487	10	C	3.2	43000	4	13000	670	560	2600
94M03	964045	9	609180	6546487	20	C	3.4	43000	3	13000	720	560	2800
94M03	964046	9	609512	6546132	0	C	9.4	35000	3	14000	630	900	2300
94M03	964048	9	614710	6543775	0	OSDRR	1.3	46000	3	14000	410	1800	1600
94M02	964051	9	615067	6543367	0	OSDRR	4.0	25000	26	10000	60	430	1200
94M03	964053	9	614209	6545541	0	OSDRR	1.0	55000	4	20000	560	2100	3000
94M03	964055	9	614214	6548685	0	C	24.0	8900	310	5900	390	400	260
94M03	964057	9	610220	6552257	0	COK	1.9	55000	37	14000	630	2300	2000
94M03	964059	9	604560	6555783	0	C	2.2	87000	7	29000	770	910	370
94M03	964062	9	603412	6563179	0	PH	37.0	3600	360	1600	240	70	180
94M03	964064	9	593374	6560396	0	OSDRR	1.5	120000	3	64000	1700	3000	2000
94M03	964066	9	594506	6558102	0	OSDRR	1.3	140000	44	58000	1400	1400	1700
94M03	964068	9	594203	6555401	10	DME	2.6	79000	10	40000	3300	1000	1100
94M03	964069	9	594203	6555401	20	DME	3.0	79000	10	39000	3400	1000	1100
94M03	964070	9	594460	6551741	0	DME	11.0	52000	9	46000	1300	570	2000
94M03	964073	9	597370	6549641	0	OSDRR	2.6	120000	19	67000	2400	1000	870
94M03	964075	9	602367	6549551	0	OSDRR	2.3	110000	3	50000	1400	2800	1200
94M03	964077	9	600698	6548345	0	OSDRR	1.2	110000	3	49000	1400	2800	1200
94M03	964079	9	596972	6546793	0	DME	1.9	120000	39	41000	1000	1900	2100

Analytical Data: Major Elements

Map	Sample ID	UTM Zone	UTM East NAD 27	UTM North Nad 27	Rep	Form	Al 0.5 ppb ICP-MS	Ca 5 ppb ICP-AES	Fe 3 ppb ICP-AES	Mg 2 ppb ICP-AES	K 20 ppb ICP-AES	Si 10 ppb ICP-AES	Na 20 ppb ICP-AES	Hardness 0.1 mg/l Calculation
94M03	964082	9	595948	6547985	0	DME	2.5	120000	20	66000	2400	1000	860	571.4
94M03	964084	9	594070	6547397	0	OSDRR	10.0	78000	24	46000	4800	660	4400	384.2
94M03	964087	9	591206	6545606	0	COK	3.0	140000	4	100000	4200	2600	6100	761.4
94M03	964089	9	590179	6555425	0	PH	2.8	35000	4	11000	650	1300	850	132.7
94M03	964091	9	599480	6544145	0	DME	7.1	130000	11	35000	1300	490	750	468.7
94M03	964092	9	586832	6557103	10	PH	8.6	36000	13	58000	2700	450	2600	328.7
94M03	964093	9	586832	6557103	20	PH	8.4	35000	14	57000	2600	430	2500	322.1
94M03	964095	9	593159	6562024	0	OSDRR	1.1	200000	3	96000	3100	480	2800	894.7
94M03	964097	9	593378	6563062	0	COK	1.3	46000	3	28000	1700	280	1100	230.2
94M03	964099	9	600413	6561780	0	COK	3.7	80000	17	20000	660	2600	590	282.1
94M04	964102	9	584813	6564890	0	PH	17.0	32000	8	52000	4200	70	2100	294.0
94M04	964104	9	585260	6561355	0	PH	1.9	40000	15	41000	1900	2900	4400	268.7
94M04	964105	9	584390	6561923	10	PH	4.6	28000	11	55000	2300	1100	5000	296.4
94M04	964107	9	584390	6561923	20	PH	4.0	29000	10	57000	2300	1000	5200	307.1
94M04	964109	9	585031	6557327	0	PH	2.4	42000	30	55000	3000	1100	7300	331.4
94M04	964111	9	580954	6561453	0	C	3.1	43000	23	68000	3800	1400	5700	387.4
94M04	964113	9	574448	6555537	0	CA	0.5	34000	3	55000	2500	4100	6700	311.4
94M04	964115	9	572637	6558782	0	CA	0.9	26000	3	62000	2300	4900	8800	320.2
94M04	964117	9	570884	6561326	0	CA	1.5	34000	3	59000	1900	4500	8400	327.9
94M04	964119	9	567915	6567672	0	Q	0.9	26000	49	13000	4000	370	1800	118.5
94M04	964122	9	566881	6567901	0	CA	0.9	50000	3	56000	1500	5500	2300	355.5
94M05	964124	9	566514	6569599	0	Q	0.8	38000	3	49000	2000	4600	2800	296.7
94M05	964126	9	567119	6570292	10	Q	1.2	38000	3	45000	1300	3000	2100	280.2
94M05	964127	9	567119	6570292	20	Q	1.0	38000	4	46000	1300	3000	2200	284.3
94M04	964128	9	570773	6567825	0	PPc	6.7	50000	78	120000	3600	1700	23000	619.0
94M04	964130	9	575522	6565448	0	PPc	7.8	29000	17	50000	3900	4000	2600	278.3
94M05	964132	9	575532	6570773	0	PPc	8.1	35000	15	28000	1500	650	1500	202.7
94M05	964134	9	578662	6570381	0	PPc	0.9	93000	4	100000	2300	1900	3600	644.0
94M06	964136	9	592692	6572416	0	COKs	28.0	17000	470	8300	3800	1400	320	76.6
94M06	964138	9	588022	6571879	0	OSDRR	1.6	29000	3	33000	930	3500	3400	208.3
94M06	964142	9	586229	6574151	0	OSDRR	57.0	29000	12	9200	1600	130	470	110.3
94M06	964144	9	590325	6578302	0	COKs	6.4	24000	38	15000	410	340	1200	121.7
94M06	964146	9	587130	6581272	10	COKs	1.0	33000	3	42000	1200	5300	4400	255.4
94M06	964147	9	587130	6581272	20	COKs	1.6	33000	3	42000	1200	5300	4400	255.4
94M06	964148	9	588274	6582550	0	COKs	10.0	34000	3	44000	1100	4600	4800	266.1
94M06	964150	9	589842	6583007	0	COKs	3.0	26000	5	44000	890	530	2700	246.1
94M06	964152	9	586829	6588413	0	COKs	7.2	40000	3	27000	590	3300	1900	211.1
94M06	964155	9	586870	6591274	0	g	5.2	42000	14	18000	690	2400	1600	179.0
94M06	964157	9	587689	6593615	0	COKs	1.2	25000	5	28000	520	2800	2400	177.7
94M06	964159	9	590189	6589933	0	COKs	1.2	38000	6	23000	900	2300	3100	189.6

Analytical Data: Major Elements

Map	Sample ID	UTM Zone	UTM East NAD 27	UTM North Nad 27	Rep	Form	Al 0.5 ppb ICP-MS	Ca 5 ppb ICP-AES	Fe 3 ppb ICP-AES	Mg 2 ppb ICP-AES	K 20 ppb ICP-AES	Si 10 ppb ICP-AES	Na 20 ppb ICP-AES	Hardness 0.1 mg/l Calculation
94M06	964162	9	590822	6586685	0	COKs	9.4	33000	3	31000	1200	2100	2500	210.1
94M06	964163	9	590150	6586618	10	COKs	1.7	32000	3	31000	1200	2000	2500	207.6
94M06	964164	9	590150	6586618	20	COKs	14.0	32000	3	31000	1200	2000	2500	207.6
94M06	964166	9	592921	6584756	0	COKs	6.6	52000	12	25000	490	2600	1900	232.8
94M06	964169	9	593497	6581961	0	COKs	7.9	35000	75	22000	440	1100	1500	178.0
94M06	964171	9	595892	6578730	0	C	7.1	64000	35	34000	230	820	2000	299.8
94M12	964173	9	576626	6600916	0	OSDRR	2.2	110000	21	41000	2400	4100	1900	443.5
94M12	964175	9	574942	6601378	0	P	1.4	99000	3	21000	1400	3400	990	333.7
94M12	964177	9	572684	6603905	0	OSDRR	1.5	39000	3	27000	1300	870	530	208.6
94M12	964179	9	567226	6608324	0	P	3.2	62000	3	16000	1100	5500	1200	220.7
94M12	964182	9	559350	6615937	0	Q	1.4	35000	3	22000	1400	3400	4600	178.0
94M12	964184	9	560059	6620608	10	Q	5.1	38000	200	8200	130	3900	1500	128.7
94M12	964185	9	560059	6620608	20	Q	4.4	39000	180	8100	140	3900	1500	130.7
94M12	964187	9	557156	6622779	0	Q	4.5	61000	93	18000	870	5900	2500	226.4
104P09	964189	9	555249	6623159	0	Q	1.2	62000	3	19000	830	6000	2500	233.1
104P16	964191	9	550319	6624696	0	Q	6.1	35000	3	10000	920	2200	1700	128.6
104P16	964193	9	551289	6626516	0	Q	2.3	47000	6	13000	310	7100	2300	170.9
104P16	964195	9	544052	6631941	0	Q	1.2	69000	39	16000	960	6700	2600	238.2
104P16	964197	9	530697	6639200	0	Q	3.8	46000	42	16000	280	8300	2100	180.8
104P16	964199	9	536567	6645605	0	Q	0.9	46000	3	20000	1100	4600	1900	197.2
104P16	964202	9	538868	6646578	0	Q	1.4	32000	3	22000	1200	5600	1800	170.5
104P16	964204	9	532951	6651106	0	Q	0.8	50000	3	16000	830	5400	2000	190.7
104P16	964206	9	532642	6649894	10	Q	2.3	56000	43	23000	420	3000	1900	234.5
104P16	964207	9	532642	6649894	20	Q	2.6	56000	45	23000	400	3000	1900	234.5
104P16	964208	9	533121	6649294	0	Q	1.2	52000	10	20000	500	4400	1800	212.2
104P16	964210	9	527939	6649769	0	Q	3.3	54000	73	21000	590	1300	1600	221.3
104P16	964213	9	532692	6646655	0	Q	2.0	37000	3	23000	1500	4300	2100	187.1
104P16	964215	9	532095	6644718	0	Q	3.2	24000	3	26000	1100	5200	2000	167.0
104P16	964217	9	528397	6634980	0	Q	2.1	42000	3	11000	1100	7600	1400	150.2
104P15	964219	9	525681	6633273	0	Q	1.0	53000	3	15000	590	6400	1400	194.1
104P15	964222	9	524942	6628725	10	Q	1.2	38000	3	13000	560	3000	1300	148.4
104P15	964223	9	524942	6628725	20	Q	1.5	39000	5	13000	580	3100	1300	150.9
104P15	964224	9	523478	6628413	0	Q	1.5	31000	4	23000	630	2100	2600	172.1
104P16	964226	9	528835	6625606	0	Q	4.0	35760	-1	14330	686	2039	1881	148.3
104P15	964228	9	525718	6624439	0	Q	46.0	14000	12	3400	1500	360	460	49.0
104P15	964231	9	523935	6623548	0	Q	4.2	50000	33	13000	330	4400	1200	178.4
104P09	964233	9	528383	6622720	0	Q	2.5	34000	5	9600	500	2500	1100	124.4
104P10	964235	9	526107	6621166	0	Q	97.0	9300	30	2600	940	1000	640	33.9
104P10	964237	9	524987	6621527	0	Q	83.0	20000	43	4700	420	2400	490	69.3
104P09	964239	9	532947	6622415	0	Q	5.0	34912	-1	18808	1153	1711	2149	164.6

Analytical Data: Major Elements

Map	Sample ID	UTM Zone	UTM East NAD 27	UTM North Nad 27	Rep	Form	Al 0.5 ppb ICP-MS	Ca 5 ppb ICP-AES	Fe 3 ppb ICP-AES	Mg 2 ppb ICP-AES	K 20 ppb ICP-AES	Si 10 ppb ICP-AES	Na 20 ppb ICP-AES	Hardness 0.1 mg/l Calculation
104P09	964242	9	537535	6620930	0	Q	3.4	42000	12	15000	380	4400	2200	166.6
104P09	964245	9	535686	6620533	0	Q	27.0	21000	8	7100	670	440	860	81.7
104P09	964247	9	533177	6618205	0	Q	13.0	27000	9	9900	770	380	810	108.2
94M06	964249	9	593716	6570834	0	COKs	1.4	52000	3	38000	1200	5300	3300	286.3
94M06	964251	9	592362	6569609	0	COKs	1.1	51000	3	38000	1200	5500	3300	283.8
94M06	964253	9	595531	6572166	0	COKs	1.2	61000	3	31000	830	3600	2400	280.0
94M06	964255	9	597388	6572660	0	PH	6.5	41000	3	27000	790	2500	2100	213.6
94M06	964257	9	598608	6572814	0	PH	2.2	55000	5	29000	930	910	1900	256.8
94M06	964259	9	600492	6574756	0	C	3.0	55000	3	30000	790	3700	2300	260.9
94M06	964262	9	600949	6573895	0	OSDRR	1.5	75000	3	37000	790	3200	2100	339.6
94M06	964263	9	601203	6574256	20	OSDRR	2.0	57212	-1	23542	687	2327	2073	239.8
94M06	964264	9	601203	6574256	10	OSDRR	1.6	67000	3	26000	750	4400	2500	274.4
94M06	964266	9	602208	6574734	0	OSDRR	2.5	55000	4	20000	640	1800	1800	219.7
94M06	964268	9	602783	6575604	0	C	1.2	43000	3	49000	970	2600	4500	309.2
94M06	964270	9	603345	6577450	0	C	4.9	32000	4	20000	1500	420	1900	162.3
94M06	964272	9	592456	6568817	0	COK	2.1	37000	3	43000	3400	1200	2200	269.5
94M03	964274	9	591431	6567501	0	COK	1.2	39000	3	38000	1100	3700	3100	253.9
94M03	964277	9	587785	6564790	0	PH	4.0	28000	5	35000	1000	420	4500	214.0
94M03	964279	9	586153	6563450	0	PH	2.0	34000	14	50000	1700	1500	3600	290.8
104P09	964282	9	542478	6612505	0	Q	1.0	60000	5	15000	650	4800	1700	211.6
104P09	964284	9	540693	6614457	10	Q	2.1	25000	9	13000	1100	890	2000	116.0
104P09	964285	9	540693	6614457	20	Q	4.3	25000	11	13000	1100	890	2000	116.0
104P09	964286	9	539721	6615342	0	Q	17.0	29000	15	8100	1100	250	1100	105.8
104P09	964288	9	536970	6618452	0	Q	22.0	13000	8	3900	760	140	500	48.5
104P09	964290	9	533498	6613833	0	C	2.9	56000	12	20000	170	4800	1600	222.2
104P09	964293	9	532300	6614739	0	C	2.5	44000	26	19000	710	3300	1400	188.1
104P10	964295	9	527962	6616288	0	CA	1.7	32000	27	31000	570	2300	3500	207.6
104P16	964297	9	533390	6628247	0	Q	2.2	43000	7	17000	630	2400	3000	177.4
104P16	964299	9	534323	6626643	0	Q	4.9	26000	3	13000	1400	850	1800	118.5
104P16	964302	9	539736	6628918	0	Q	2.2	53000	3	17000	940	5600	2400	202.3
104P16	964304	9	537915	6630251	0	Q	1.4	50000	3	20000	1200	6200	2500	207.2
104P16	964306	9	537437	6629084	0	Q	1.3	65000	3	23000	1200	5800	2700	257.0
104P16	964307	9	538764	6625977	10	Q	7.5	38000	17	9200	480	1200	1300	132.8
104P16	964308	9	538764	6625977	20	Q	8.1	38000	18	9200	510	1200	1300	132.8
104P09	964310	9	544091	6620417	0	Q	3.6	58000	31	20000	340	5700	2800	227.2
104P09	964312	9	544166	6619414	0	Q	1.6	61000	22	19000	400	4300	3200	230.6
104P09	964314	9	549728	6615469	0	Q	1.5	44000	11	21000	160	780	2500	196.3
104P09	964316	9	551645	6614921	0	Q	1.6	46000	3	15000	980	5600	2200	176.6
94M12	964319	9	565692	6603733	0	OSDRR	1.4	64000	3	18000	2300	730	1100	233.9
104P09	964322	9	555108	6616023	0	Q	3.4	44000	8	10000	340	5100	1400	151.0

Analytical Data: Major Elements

Map	Sample ID	UTM Zone	UTM East NAD 27	UTM North Nad 27	Rep	Form	Al 0.5 ppb ICP-MS	Ca 5 ppb ICP-AES	Fe 3 ppb ICP-AES	Mg 2 ppb ICP-AES	K 20 ppb ICP-AES	Si 10 ppb ICP-AES	Na 20 ppb ICP-AES
104P09	964324	9	553843	6618001	10	Q	1.3	52000	3	16000	930	5000	2600
104P09	964325	9	553843	6618001	20	Q	0.9	51000	3	16000	900	5000	2500
104P09	964326	9	554258	6621007	0	Q	1.6	46000	10	11000	1300	2200	1800
104P09	964328	9	551446	6620865	0	Q	1.2	31000	3	14000	1200	770	2400
104P09	964330	9	550165	6620783	0	Q	1.3	41000	3	13000	780	6400	2400
104P09	964332	9	548586	6622334	0	Q	23.0	36000	3	14000	910	240	1700
104P16	964334	9	547678	6625129	0	Q	2.5	57000	7	16000	1100	5800	2800
104P16	964337	9	546108	6628787	0	Q	32.0	12000	11	3100	740	290	630
104P16	964339	9	545305	6625995	0	Q	1.8	55000	24	16000	700	5500	2400
104P16	964342	9	542598	6625872	10	Q	1.3	56000	25	18000	650	5400	2700
104P16	964343	9	542598	6625872	20	Q	3.3	56000	26	18000	630	5500	2700
104P16	964344	9	541290	6625908	0	Q	2.4	41000	7	16000	690	4200	2300
104P09	964346	9	547391	6621858	0	Q	4.2	39000	3	11000	600	1400	1400
104P09	964348	9	547087	6618543	0	Q	1.9	51000	310	16000	330	4600	2200
104P09	964351	9	554229	6609869	0	Q	1.2	64000	4	22000	1100	6100	2500
94M05	964356	9	584658	6578049	0	OSDRR	3.0	50000	36	50000	1100	3400	5000
94M05	964357	9	584265	6578354	0	OSDRR	9.9	36000	15	45000	1300	1100	4400
94M05	964359	9	581677	6579024	0	OSDRR	5.3	38000	45	11000	470	1300	630
94M05	964362	9	581406	6585895	0	COKs	47.0	22000	35	4700	380	60	260
94M05	964363	9	579600	6588221	10	OSDRR	190*	7600	3	1800	850	70	140
94M05	964364	9	579600	6588221	20	OSDRR	200*	7600	3	1800	820	70	130
94M05	964366	9	583852	6589842	0	COKs.	7.4	28000	3	24000	900	2900	1800
94M05	964368	9	584518	6592640	0	COKs	8.8	29000	3	7900	1100	270	770
94M12	964371	9	584569	6597157	0	COKs	1.9	36000	3	31000	1100	4000	3500
94M12	964373	9	572258	6600538	0	P	1.8	120000	9	38000	2100	3400	1500
94M12	964375	9	571265	6600220	0	P	1.5	64000	3	30000	1500	2500	1300
94M12	964377	9	571033	6602804	0	P	3.8	38000	3	5200	1200	90	220
94M12	964379	9	569534	6600509	0	P	3.2	83000	10	32000	2300	1300	1200
94M12	964383	9	567008	6599159	0	Q	1.6	31000	12	16000	1500	450	1500
94M12	964385	9	568734	6598194	0	Q	1.4	18000	3	52000	1200	1400	2100
94M05	964387	9	570337	6593143	0	P	2.5	84000	19	39000	9300	2900	1200
94M05	964389	9	577707	6582936	0	OSDRR	2.3	76000	4	87000	2500	1400	8600
94M05	964391	9	574633	6580445	0	COK	1.6	78000	11	67000	1300	2100	2500
94M05	964393	9	570606	6586170	0	Q	3.1	22000	3	14000	30	2000	410
94M05	964395	9	568741	6588384	10	Q	2.4	36000	3	33000	1200	2000	2300
94M05	964396	9	568741	6588384	20	Q	1.8	36000	3	33000	1200	2000	2300
94M05	964397	9	568252	6588556	0	Q	2.2	29000	3	37000	1400	2100	1900
94M05	964399	9	569191	6591592	0	Q	2.1	33000	3	11000	1700	1900	830
94M12	964402	9	564867	6600584	0	Q	4.1	49000	3	31000	1100	3500	2300
94M12	964403	9	564592	6601089	10	Q	1.5	49000	3	31000	1100	3500	2300

Analytical Data: Major Elements

							Al	Ca	Fe	Mg	K	Si	Na	Hardness
			UTM	UTM			0.5	5	3	2	20	10	20	0.1
	Sample	UTM	East	North			ppb	ppb	ppb	ppb	ppb	ppb	ppb	mg/l
Map	ID	Zone	NAD 27	Nad 27	Rep	Form	ICP-MS	ICP-AES	ICP-AES	ICP-AES	ICP-AES	ICP-AES	ICP-AES	Calculation
94M12	964404	9	564592	6601089	20	Q	4.2	49000	3	31000	1100	3500	2300	250.0
94M12	964406	9	561515	6607600	0	Q	95.0	9100	73	3500	3000	80	380	37.1
94M12	964408	9	557899	6613739	0	Q	4.1	39000	12	18000	910	3300	2100	171.5
94M12	964410	9	557267	6611679	0	Q	3.8	54000	3	20000	940	4600	1900	217.2
94M12	964412	9	557215	6608948	0	Q	4.3	35000	3	17000	1100	3200	1700	157.4
94M12	964414	9	556897	6606822	0	Q	1.4	51000	3	21000	980	4000	2000	213.8
94M12	964416	9	558416	6602648	0	Q	1.3	63000	3	23000	940	3800	2000	252.0
94M12	964418	9	560183	6601312	0	Q	1.6	39000	3	44000	1100	3400	2700	278.6
94M12	964422	9	562157	6602173	0	Q	1.1	52000	3	30000	1100	3500	2200	253.4
94M12	964424	9	563470	6601261	0	Q	1.1	51000	3	31000	1100	3500	2300	255.0
94M12	964426	9	562634	6599788	0	Q	5.4	26000	3	44000	1400	600	1800	246.1
94M12	964428	9	563634	6596951	0	Q	30.0	39000	3	62000	1300	2700	2700	352.7
94M12	964430	9	566114	6596616	0	Q	1.8	17000	3	63000	1400	2400	2400	301.9
94M12	964431	9	566699	6597388	10	Q	2.6	18000	3	54000	1300	2400	2500	267.3
94M12	964432	9	566699	6597388	20	Q	1.6	19000	3	55000	1300	2400	2500	273.9
94M05	964435	9	564509	6594534	0	Q	1.3	18000	3	53000	1200	2200	2300	263.2
94M05	964437	9	564161	6595530	0	Q	1.3	34000	3	59000	1300	2500	2400	327.9
104P09	964439	9	556280	6605578	0	Q	12.0	24000	27	7200	950	450	810	89.6
104P09	964442	9	554251	6605583	0	Q	4.9	22000	3	20000	990	470	1700	137.3
104P09	964445	9	550426	6604695	0	Q	1.7	50000	3	22000	920	4200	2800	215.4
104P09	964447	9	549193	6606622	0	Q	2.4	64000	13	24000	1000	3800	2200	258.6
104P09	964449	9	545103	6609940	0	Q	3.0	59959	-1	14943	795	1128	2162	211.3
104P09	964450	9	540732	6609391	10	Q	5.5	19000	3	6000	1000	200	670	72.2
104P09	964451	9	540732	6609391	20	Q	6.3	20000	11	6100	970	190	670	75.1
104P09	964453	9	540847	6605061	0	Q	9.7	44000	5	14000	410	760	990	167.5
104P09	964455	9	542361	6603351	0	Q	63.0	8200	49	1800	5400	60	40	27.9
104P09	964457	9	549021	6602541	0	Q	13.0	29000	5	6900	220	250	830	100.8
104P09	964459	9	547679	6601939	0	Q	1.7	34000	3	19000	1100	2000	2200	163.1
104P09	964462	9	552647	6598202	0	Q	12.0	45000	3	30000	920	2600	1800	235.9
104P09	964464	9	545359	6597998	0	Q	52.0	53000	8	32000	890	1700	1500	264.1
104P09	964465	9	546976	6596713	20	Q	3.0	20315	-1	16823	587	678	881	120.0
104P09	964466	9	546976	6596713	10	Q	3.2	22000	29	19000	680	460	1100	133.2
104P09	964469	9	552727	6599981	0	Q	2.2	29000	4	8900	500	420	1100	109.1
104P09	964471	9	555461	6601768	0	Q	2.7	32000	3	21000	630	1600	1500	166.4
104P09	964473	9	556500	6599349	0	Q	2.7	29000	3	24000	770	1100	1300	171.2
104P08	964475	9	551600	6588600	0	Q	3.0	51000	30	24000	840	1800	990	226.2
104P08	964477	9	556000	6587800	0	Q	22.0	19000	7	56000	1400	2500	3300	278.1
94M05	964479	9	557646	6588528	0	Q	19.0	23000	8	52000	1400	280	1900	271.6
94M06	964482	9	589676	6570082	0	COKs	6.1	41000	8	30000	1200	2200	2100	225.9
94M06	964484	9	589562	6569309	0	PH	38.0	32000	51	8900	1300	140	690	116.6

Analytical Data: Major Elements

Map	Sample ID	UTM Zone	UTM East NAD 27	UTM North Nad 27	Rep	Form	Al 0.5 ppb ICP-MS	Ca 5 ppb ICP-AES	Fe 3 ppb ICP-AES	Mg 2 ppb ICP-AES	K 20 ppb ICP-AES	Si 10 ppb ICP-AES	Na 20 ppb ICP-AES	Hardness 0.1 mg/l Calculation
94M03	964486	9	585933	6568003	0	PH	7.8	29000	10	8200	1200	150	600	106.2
94M05	964487	9	572972	6573687	10	PPc	7.8	66000	10	63000	1000	2900	2300	424.2
94M05	964488	9	572972	6573687	20	PPc	1.8	66000	9	63000	1000	2900	2300	424.2
94M05	964490	9	566869	6572055	0	Q	1.5	27000	3	74000	2000	2900	5200	372.2
94M05	964492	9	567545	6573358	0	PPc	1.3	58000	3	40000	1300	2500	3200	309.5
94M05	964495	9	566576	6574234	0	PPc	5.0	23000	3	39000	1300	2100	3200	218.0
94M05	964497	9	565523	6577174	0	PPc	-1.0	52000	3	38000	1900	3300	3200	286.3
94M05	964499	9	564899	6582167	0	PPc	3.0	25000	3	36000	730	1300	2100	210.7
94M05	964502	9	560400	6575874	0	Q	4.3	38000	3	45000	1100	1700	2400	280.2
94M05	964503	9	558704	6578805	10	Q	30.0	22000	26	21000	1300	290	2300	141.4
94M05	964504	9	558704	6578805	20	Q	11.0	22000	39	21000	1300	300	2300	141.4
94M05	964507	9	563623	6580007	0	PPc	1.4	38000	3	46000	1600	4000	3700	284.3
94M05	964508	9	562420	6581631	0	PPc	11.0	38000	3	46000	1600	4000	3700	284.3
94M05	964510	9	562058	6582912	0	PPc	4.7	27000	12	31000	1400	240	2200	195.1
104P08	964512	9	556125	6582650	0	Q	36.0	68000	68	17000	6400	740	210	239.8
104P08	964515	9	555450	6584050	0	Q	34.0	21000	36	12000	1500	260	600	101.9
94M05	964517	9	560688	6590582	0	Q	1.6	42000	3	68000	1200	2700	2400	384.9
94M05	964519	9	564271	6592691	0	Q	4.1	43000	3	65000	1400	3400	2500	375.0
94M05	964522	9	580414	6577743	10	OSDRR	1.2	38000	10	47000	1200	1200	4800	288.4
94M05	964523	9	580414	6577743	20	OSDRR	8.0	38000	10	47000	1200	1200	4800	288.4
94M05	964524	9	581057	6576325	0	OSDRR	2.0	21000	10	51000	1200	530	4900	262.5

Analytical Data: Trace Elements

Map	Sample ID	UTM Zone	UTM East NAD 27	UTM North Nad 27	REP	Form	Li 0.005 ppb ICP	Be 0.005 ppb ICP	Al 2 ppb ICP	Ti 0.5 ppb ICP	V 0.1 ppb ICP	Cr 0.3 ppb ICP	Fe 10 ppb ICP	Mn 0.1 ppb ICP	Co 0.05 ppb ICP	Ni 0.2 ppb ICP	Cu 0.1 ppb ICP	Zn 0.5 ppb ICP	As 0.1 ppb ICP	Rb 0.05 ppb ICP	Sr 0.5 ppb ICP	Y 0.01 ppb ICP	Mo 0.05 ppb ICP	Cd 0.05 ppb ICP	In 0.01 ppb ICP	Sb 0.01 ppb ICP	Cs 0.01 ppb ICP	Ba 0.2 ppb ICP
94M03	964002	9	604262	6565049	0	PH	10.674	0.005	9	0.5	0.2	0.3	108	12.2	0.12	1.9	1.3	1.8	0.5	0.26	145.4	0.02	0.90	0.32	0.01	0.14	0.01	81.5
94M03	964004	9	613787	6559935	0	PH	3.489	0.005	2	0.5	0.2	0.3	20	0.8	0.05	0.5	0.5	0.5	0.4	0.16	173.5	0.01	1.14	0.10	0.01	0.06	0.01	132.6
94M03	964006	9	613273	6558113	0	PH	3.963	0.005	2	0.6	0.4	1.3	13	0.6	0.05	0.5	0.4	0.5	0.5	0.22	184.6	0.01	1.37	0.05	0.01	1.25	0.01	155.8
94M03	964008	9	613126	6557247	0	PH	3.572	0.005	6	0.5	0.3	0.3	23	0.6	0.05	0.4	0.4	0.5	0.4	0.14	160.5	0.01	1.22	0.05	0.01	0.08	0.01	124.6
94M03	964010	9	613799	6551488	0	PH	6.377	0.005	3	0.7	0.1	0.3	64	7.9	0.07	0.7	0.6	0.9	0.1	0.10	128.6	0.02	0.32	0.06	0.01	0.05	0.01	62.8
94M02	964011	9	616878	6550553	10	UNMAPPED	0.514	0.006	4	0.5	0.1	0.3	48	4.1	0.05	0.2	0.5	1.3	0.1	0.19	6.4	0.01	0.05	0.05	0.01	0.02	0.01	6.2
94M02	964012	9	616878	6550553	20	UNMAPPED	0.458	0.005	4	0.5	0.1	0.3	48	4	0.05	0.2	0.5	1.1	0.1	0.29	5.1	0.01	0.05	0.07	0.01	0.01	0.01	4.9
94M02	964014	9	621469	6543746	0	UNMAPPED	1.458	0.005	7	0.5	0.1	0.3	20	1.1	0.05	0.5	1.1	0.8	0.2	0.19	39.9	0.01	0.09	0.05	0.01	0.04	0.01	19.9
94M02	964016	9	623460	6542513	0	UNMAPPED	5.823	0.005	2	0.5	0.4	1.4	10	0.6	0.05	0.4	0.2	0.5	0.1	0.19	274.8	0.01	1.05	0.05	0.01	0.28	0.01	138.1
94M02	964019	9	625145	6548777	0	UNMAPPED	0.328	0.005	8	0.5	0.1	0.3	50	5.5	0.05	0.2	0.5	1.5	0.3	0.32	25.0	0.01	0.07	0.05	0.01	0.02	0.01	49.0
94M02	964022	9	623867	6549149	0	UNMAPPED	0.261	0.005	13	0.5	0.1	0.3	24	0.7	0.05	0.6	0.8	1.3	0.3	0.17	41.6	0.01	0.56	0.05	0.01	0.12	0.01	136.8
94M02	964025	9	617378	6559787	10	UNMAPPED	2.632	0.005	3	0.5	0.3	0.4	16	2.2	0.06	0.7	0.3	1.5	0.2	0.15	187.2	0.01	0.71	0.05	0.01	0.08	0.01	234.0
94M02	964026	9	617378	6559787	20	UNMAPPED	2.645	0.005	3	0.5	0.3	0.4	12	1.6	0.05	0.7	0.2	1.1	0.2	0.12	185.1	0.01	0.7	0.05	0.01	0.07	0.01	228.3
94M02	964027	9	616931	6559888	0	UNMAPPED	2.505	0.005	4	0.5	0.3	0.3	29	1.0	0.05	0.5	0.3	0.8	0.3	0.25	112.2	0.01	0.24	0.05	0.01	0.10	0.01	133.4
94M03	964029	9	606689	6567540	0	PH	0.677	0.018	124	0.9	0.3	0.4	99	4.8	0.18	1.0	2.1	3.7	0.3	0.29	11.7	0.27	0.12	0.06	0.01	0.04	0.01	20.5
94M06	964031	9	605261	6573230	0	OSDRR	7.628	0.005	5	0.6	0.2	0.4	10	0.5	0.05	0.5	0.3	0.8	0.2	0.40	252.0	0.01	0.42	0.05	0.01	0.03	0.01	143.1
94M06	964033	9	601908	6570952	0	PH	37.928	0.005	2	0.5	0.2	0.3	10	4.8	0.09	1.9	0.1	1.1	0.3	0.61	309.4	0.01	0.20	0.05	0.01	0.06	0.01	37.0
94M03	964035	9	598052	6568584	0	PH	8.955	0.005	3	0.5	0.2	0.3	14	0.6	0.05	0.5	0.2	0.8	0.3	0.18	270.3	0.01	0.22	0.05	0.01	0.05	0.01	32.7
94M03	964037	9	608129	6550341	0	C	5.851	0.005	2	1.0	0.4	0.4	10	0.3	0.05	1.0	0.3	0.8	0.9	0.30	301.3	0.01	2.11	0.05	0.01	0.10	0.01	108.9
94M03	964039	9	606907	6547559	0	COK	3.188	0.005	11	0.5	0.4	1.5	38	6.7	0.06	1.9	0.6	2.0	0.9	0.15	179.5	0.01	4.06	0.06	0.01	0.61	0.01	110.5
94M03	964042	9	606858	6546775	0	OSDRR	2.359	0.005	14	0.6	1.0	0.4	66	14.1	0.18	4.7	0.8	2.8	2.7	0.10	193.9	0.02	4.07	0.05	0.01	0.50	0.01	108.6
94M03	964044	9	609180	6546487	10	C	7.443	0.005	5	0.5	0.3	0.4	10	20.2	0.05	0.8	0.3	1.5	0.3	0.43	277.9	0.01	0.26	0.05	0.01	0.04	0.01	101.5
94M03	964045	9	609180	6546487	20	C	7.508	0.005	5	0.5	0.2	0.3	10	21.6	0.05	0.8	0.3	2.4	0.3	0.45	280.6	0.01	0.2	0.05	0.01	0.02	0.01	104.5
94M03	964046	9	609512	6546132	0	C	5.982	0.005	4	0.5	0.3	0.4	10	4.8	0.24	0.6	0.2	1.3	0.3	0.33	263.2	0.01	0.15	0.05	0.01	0.03	0.01	104.9
94M03	964048	9	614710	6543775	0	OSDRR	3.728	0.005	2	0.7	0.3	0.4	10	0.7	0.05	0.7	0.2	1.5	0.4	0.14	194.2	0.01	1.32	0.05	0.01	0.07	0.01	159.8
94M02	964051	9	615067	6543367	0	OSDRR	3.273	0.005	7	0.5	0.2	0.3	32	1.8	0.05	0.6	0.6	0.9	0.3	0.05	123.2	0.01	0.75	0.16	0.01	0.13	0.01	103.8
94M03	964053	9	614209	6545541	0	OSDRR	6.014	0.005	2	0.8	0.2	0.3	10	2.2	0.05	0.6	0.1	1.0	0.4	0.23	294.4	0.01	1.94	0.05	0.01	0.03	0.01	120.7
94M03	964055	9	614214	6548685	0	C	4.098	0.005	33	0.5	0.3	0.3	304	1.7	0.08	0.8	1.1	1.5	0.6	0.16	22.3	0.06	0.16	0.05	0.01	0.13	0.01	13.9
94M03	964057	9	610220	6552257	0	COK	6.998	0.008	3	0.9	0.3	0.3	28	15.0	0.07	1.3	0.5	0.9	0.9	0.29	255.1	0.01	2.41	0.05	0.01	0.14	0.01	128.0
94M03	964059	9	604560	6555783	0	C	3.403	0.005	4	0.5	0.2	0.3	10	6.0	0.05	3.6	0.3	6.1	0.2	0.42	343.5	0.01	3.39	0.05	0.01	0.11	0.01	78.2
94M03	964062	9	603412	6563179	0	PH	1.101	0.005	53	0.5	0.2	0.3	367	3.9	0.05	0.5	0.8	2.6	0.7	0.21	15.7	0.05	0.09	0.05	0.01	0.05	0.01	7.2
94M03	964064	9	593374	6560396	0	OSDRR	5.808	0.005	3	1.1	0.2	0.4	10	1.6	0.05	1.4	0.1	1.5	0.8	0.58	575.1	0.01	2.06	0.05	0.01	0.09	0.01	40.4
94M03	964066	9	594506	6558102	0	OSDRR	6.002	0.005	3	0.8	0.5	0.5	39	14.5	0.12	3.2	0.1	2.2	0.8	0.61	612.0	0.01	3.54	0.05	0.01	0.18	0.01	41.1
94M03	964068	9	594203	6555401	10	DME	3.022	0.005	4	0.5	1.6	0.4	10	58.0	0.06	1.3	0.2	2.5	0.9	2.05	381.8	0.01	1.35	0.06	0.01	0.13	0.01	58.6
94M03	964069	9	594203	6555401	20	DME	3.000	0.005	4	0.6	1.6	0.4	15	58.7	0.06	1.2	0.2	1.8	0.9	2.06	383.2	0.01	1.29	0.17	0.01	0.14	0.01	60.7
94M03	964070	9	594460	6551741	0	DME	8.098	0.005	14	0.5	0.5	0.3	15	5.9	0.08	2.4	0.2	1.6	0.3	0.58	495.5	0.01	6.88	0.05	0.01	0.23	0.01	18.5
94M03	964073	9	597370	6549641	0	OSDRR	4.168	0.005	4	0.6	0.2	0.4	21	14.2	0.08	1.3	0.1	1.8	0.2	1.20	418.3	0.01	0.41	0.05	0.01	0.06	0.01	29.4
94M03	964075	9	602367	6549551	0	OSDRR	3.921	0.005	2	1.0	0.3	0.3	10	1.0	0.05	2.2	0.3	1.4	0.6	0.43	319.6	0.01	3.03	0.05	0.01	0.08	0.01	34.3
94M03	964077	9	600698	6548345	0	OSDRR	3.844	0.005	2	1.1	0.2	0.3	10	1.1	0.05	2.2	0.3	1.5	0.7	0.43	315.7	0.01	3.06	0.13	0.01	0.09	0.01	35.1
94M03	964079	9	596972	6546793	0	DME	7.078	0.005	2	0.8	0.2	0.3	41	22.4	0.09	5.0	0.1	2.6	0.2	0.52	410.5	0.01	0.81	0.07	0.01	0.06	0.01	44.3

Analytical Data: Trace Elements

Map	Sample ID	UTM Zone	UTM East NAD 27	UTM North Nad 27	REP	Form	Li 0.005 ppb ICP	Be 0.005 ppb ICP	Al 2 ppb ICP	Ti 0.5 ppb ICP	V 0.1 ppb ICP	Cr 0.3 ppb ICP	Fe 10 ppb ICP	Mn 0.1 ppb ICP	Co 0.05 ppb ICP	Ni 0.2 ppb ICP	Cu 0.1 ppb ICP	Zn 0.5 ppb ICP	As 0.1 ppb ICP	Rb 0.05 ppb ICP	Sr 0.5 ppb ICP
94M03	964082	9	595948	6547985	0	DME	4.152	0.005	4	0.7	0.2	0.3	26	14.0	0.10	1.5	0.2	1.6	0.2	1.21	421.6
94M03	964084	9	594070	6547397	0	OSDRR	12.835	0.005	5	0.5	0.3	0.3	22	4.9	0.08	1.3	0.2	1.4	0.4	1.92	447.8
94M03	964087	9	591206	6545606	0	COK	10.472	0.005	5	1.2	0.7	0.3	10	3.9	0.20	3.0	1.2	1.3	0.7	0.82	752.9
94M03	964089	9	590179	6555425	0	PH	2.962	0.006	3	0.5	0.1	0.3	10	1.2	0.05	0.8	0.5	1.3	0.3	0.32	161.6
94M03	964091	9	599480	6544145	0	DME	2.934	0.005	8	0.5	0.3	0.3	10	3.2	0.10	7.7	0.2	2.3	0.1	0.70	456.4
94M03	964092	9	586832	6557103	10	PH	7.812	0.005	10	0.5	0.4	0.5	19	3.9	0.12	0.8	0.4	2.1	0.8	1.26	442.8
94M03	964093	9	586832	6557103	20	PH	7.559	0.009	9	0.5	0.4	0.5	30	3.7	0.08	0.8	0.4	1.4	0.6	1.2	429.3
94M03	964095	9	593159	6562024	0	OSDRR	6.005	0.005	4	0.6	0.2	0.3	10	1.7	0.14	12.1	0.1	3.8	0.8	1.45	1017.8
94M03	964097	9	593378	6563062	0	COK	2.622	0.005	2	0.5	0.3	0.3	12	0.8	0.11	1.1	0.4	2.2	0.8	1.04	270.6
94M03	964099	9	600413	6561780	0	COK	3.394	0.009	3	1.0	0.3	0.3	17	9.2	0.12	1.6	0.5	1.9	0.2	0.27	255.6
94M04	964102	9	584813	6564890	0	PH	6.254	0.007	18	0.5	0.4	0.5	32	0.9	0.07	0.9	0.6	1.9	1.4	1.07	260.4
94M04	964104	9	585260	6561355	0	PH	11.226	0.005	2	0.8	0.2	0.3	23	0.7	0.06	0.9	0.2	1.0	1.0	0.69	403.1
94M04	964105	9	584390	6561923	10	PH	14.181	0.007	6	0.5	0.7	0.5	30	0.8	0.06	0.9	0.5	1.4	1.0	0.77	253.2
94M04	964107	9	584390	6561923	20	PH	14.767	0.012	5	0.5	0.7	0.4	24	0.8	0.09	1	0.5	1.4	1	0.79	265
94M04	964109	9	585031	6557327	0	PH	18.573	0.009	3	0.6	0.4	0.6	31	7.7	0.11	1.2	0.4	1.0	1.5	0.72	549.0
94M04	964111	9	580954	6561453	0	C	11.312	0.008	5	0.7	0.7	0.6	33	0.8	0.16	1.2	0.4	1.3	0.5	1.05	635.3
94M04	964113	9	574448	6555537	0	CA	11.496	0.005	2	1.1	0.2	0.4	10	0.1	0.05	0.6	0.2	0.9	0.8	0.90	368.7
94M04	964115	9	572637	6558782	0	CA	14.091	0.007	2	1.1	0.2	0.3	13	0.3	0.05	0.2	0.2	1.0	0.4	1.11	194.5
94M04	964117	9	570884	6561326	0	CA	10.965	0.005	3	1.1	0.2	0.3	10	0.3	0.05	0.5	0.2	0.8	1.3	0.92	409.3
94M04	964119	9	567915	6567672	0	Q	1.797	0.005	2	0.5	0.1	0.3	51	1.5	0.05	0.4	0.2	1.0	0.4	1.37	139.3
94M04	964122	9	566881	6567901	0	CA	5.432	0.005	2	1.4	0.3	0.3	10	0.2	0.08	0.9	0.2	1.0	1.0	0.48	453.4
94M05	964124	9	566514	6569599	0	Q	5.693	0.005	2	1.2	0.1	0.3	10	0.6	0.05	0.5	0.1	1.3	0.5	0.87	354.1
94M05	964126	9	567119	6570292	10	Q	4.980	0.005	2	1.0	0.3	0.3	10	0.6	0.05	0.7	0.2	1.7	1.0	0.44	373.7
94M05	964127	9	567119	6570292	20	Q	4.837	0.005	2	0.8	0.3	0.3	10	0.6	0.05	0.8	0.2	2.8	1.1	0.47	363.7
94M04	964128	9	570773	6567825	0	PPc	19.088	0.005	9	1.2	0.9	0.9	67	7.0	0.21	2.0	0.8	1.6	0.9	3.02	571.9
94M04	964130	9	575522	6565448	0	PPc	4.915	0.005	8	1.0	0.5	0.3	12	3.3	0.06	0.4	0.3	1.1	0.2	1.80	353.6
94M05	964132	9	575532	6570773	0	PPc	2.356	0.006	8	0.5	0.4	0.3	24	3.7	0.05	0.7	0.3	0.7	0.3	1.33	242.7
94M05	964134	9	578662	6570381	0	PPc	9.110	0.005	3	0.8	0.2	0.3	10	0.8	0.15	2.0	0.3	1.2	4.0	2.04	599.2
94M06	964136	9	592692	6572416	0	COKs	3.107	0.009	27	1.7	1.4	0.3	411	2.0	0.14	1.1	1.2	2.3	1.3	1.32	94.1
94M06	964138	9	588022	6571879	0	OSDRR	6.724	0.005	2	1.0	0.1	0.3	10	0.6	0.05	0.4	0.1	0.7	0.6	0.66	318.1
94M06	964142	9	586229	6574151	0	OSDRR	1.048	0.005	64	0.5	0.6	0.3	21	0.9	0.07	0.6	0.6	1.4	2.5	1.08	136.6
94M06	964144	9	590325	6578302	0	COKs	2.770	0.005	8	0.5	0.2	0.3	49	0.8	0.05	0.5	0.5	0.9	0.4	0.31	172.0
94M06	964146	9	587130	6581272	10	COKs	6.621	0.005	2	1.4	0.2	0.3	10	0.3	0.05	0.6	0.2	0.9	0.8	0.48	287.4
94M06	964147	9	587130	6581272	20	COKs	6.689	0.005	2	1.5	0.2	0.3	10	0.3	0.05	0.7	0.2	0.9	0.8	0.5	298.4
94M06	964148	9	588274	6582550	0	COKs	7.372	0.005	2	1.3	0.2	0.3	10	0.5	0.05	0.7	0.3	0.9	1.0	0.40	349.3
94M06	964150	9	589842	6583007	0	COKs	6.453	0.005	4	0.5	0.2	0.4	25	1.1	0.06	0.6	0.2	1.1	0.7	0.61	243.1
94M06	964152	9	586829	6588413	0	COKs	3.262	0.005	2	1.0	0.2	0.3	10	0.3	0.06	0.8	0.3	1.3	0.2	0.51	351.3
94M06	964155	9	586870	6591274	0	g	2.105	0.005	3	0.7	0.1	0.3	21	1.3	0.05	0.7	0.2	1.4	0.1	0.59	268.8
94M06	964157	9	587689	6593615	0	COKs	5.057	0.006	2	0.9	0.2	0.3	11	1.9	0.05	0.4	0.2	1.1	0.4	0.38	167.6
94M06	964159	9	590189	6589933	0	COKs	4.797	0.005	2	0.7	0.1	0.3	14	0.4	0.05	0.5	0.3	1.4	0.2	0.38	347.2

Analytical Data: Trace Elements

Map	Sample ID	UTM Zone	UTM East NAD 27	UTM North Nad 27	REP	Form	Li 0.005 ppb ICP	Be 0.005 ppb ICP	Al 2 ppb ICP	Ti 0.5 ppb ICP	V 0.1 ppb ICP	Cr 0.3 ppb ICP	Fe 10 ppb ICP	Mn 0.1 ppb ICP	Co 0.05 ppb ICP	Ni 0.2 ppb ICP	Cu 0.1 ppb ICP	Zn 0.5 ppb ICP	As 0.1 ppb ICP	Rb 0.05 ppb ICP	Sr 0.5 ppb ICP	Y 0.01 ppb ICP	Mo 0.05 ppb ICP	Cd 0.05 ppb ICP	In 0.01 ppb ICP	Sb 0.01 ppb ICP	Cs 0.01 ppb ICP	Ba 0.2 ppb ICP
94M06	964162	9	590822	6586685	0	COKs	4.009	0.005	10	0.6	0.2	0.3	10	0.2	0.05	0.2	0.3	2.1	0.9	0.54	314.8	0.01	0.64	0.05	0.01	0.03	0.01	125.7
94M06	964163	9	590150	6586618	10	COKs	3.931	0.005	2	0.6	0.1	0.3	10	0.2	0.05	0.5	0.2	1.5	1.0	0.54	319.2	0.01	0.68	0.05	0.01	0.03	0.01	126.6
94M06	964164	9	590150	6586618	20	COKs	3.967	0.005	2	0.6	0.1	0.3	10	0.1	0.05	0.5	0.2	1.7	0.9	0.5	314.6	0.01	0.63	0.05	0.01	0.04	0.01	121.3
94M06	964166	9	592921	6584756	0	COKs	3.606	0.005	2	0.8	0.2	0.3	10	0.6	0.06	1.0	0.2	1.3	0.4	0.22	316.4	0.01	0.29	0.05	0.01	0.05	0.01	98.3
94M06	964169	9	593497	6581961	0	COKs	2.868	0.005	8	0.5	0.1	0.3	78	0.5	0.05	1.0	0.5	2.1	0.5	0.19	265.3	0.02	0.68	0.05	0.01	0.13	0.01	85.0
94M06	964171	9	595892	6578730	0	C	8.182	0.005	5	0.5	0.1	0.3	36	5.5	0.08	1.2	0.3	1.4	0.5	0.14	422.3	0.01	0.56	0.05	0.01	0.09	0.01	69.3
94M12	964173	9	576626	6600916	0	OSDRR	4.642	0.005	2	1.2	0.2	0.3	10	3.8	0.10	2.1	0.2	2.0	0.1	1.49	820.3	0.01	3.01	0.05	0.01	0.08	0.01	21.8
94M12	964175	9	574942	6601378	0	P	1.981	0.005	2	1.1	0.2	0.3	10	1.1	0.08	8.6	0.1	3.2	0.2	0.68	760.7	0.01	2.27	0.05	0.01	0.07	0.01	48.1
94M12	964177	9	572684	6603905	0	OSDRR	0.766	0.005	2	0.5	0.3	0.3	11	2.1	0.05	0.9	0.2	1.4	0.6	1.76	389.2	0.01	0.64	0.05	0.01	0.07	0.01	115.0
94M12	964179	9	567226	6608324	0	P	1.525	0.005	2	1.4	0.1	0.3	10	0.2	0.05	5.4	0.1	1.2	0.3	1.53	511.4	0.01	2.98	0.05	0.01	0.07	0.01	99.0
94M12	964182	9	559350	6615937	0	Q	3.616	0.012	4	0.8	0.2	0.5	18	0.9	0.05	0.2	0.2	1.2	0.3	0.83	246.3	0.01	2.10	2.11	0.01	0.01	0.01	205.6
94M12	964184	9	560059	6620608	10	Q	2.040	0.014	8	1.0	0.3	0.5	213	21.8	0.05	0.7	0.3	1.8	1.0	0.12	151.7	0.04	0.66	0.26	0.01	0.15	0.01	65.1
94M12	964185	9	560059	6620608	20	Q	2.016	0.006	6	1.0	0.2	0.5	186	22.2	0.05	0.6	0.3	1.3	0.9	0.11	151.4	0.03	0.59	0.09	0.01	0.13	0.01	66.1
94M12	964187	9	557156	6622779	0	Q	2.908	0.005	4	1.2	0.4	0.7	11	5.7	0.05	0.4	0.3	0.9	0.5	0.49	267.6	0.01	1.00	0.05	0.01	0.03	0.01	232.4
104P09	964189	9	555249	6623159	0	Q	3.226	0.005	3	1.2	0.3	0.6	10	2.5	0.05	0.4	0.2	0.7	0.6	0.48	276.4	0.01	1.07	0.05	0.01	0.04	0.01	245.3
104P16	964191	9	550319	6624696	0	Q	0.999	0.005	8	0.6	0.2	0.4	13	0.5	0.05	0.2	0.1	0.5	0.7	1.18	147.5	0.01	0.36	0.05	0.01	0.01	0.01	165.2
104P16	964193	9	551289	6626516	0	Q	1.100	0.005	2	1.3	0.2	0.4	12	3.6	0.05	0.2	0.1	0.5	0.5	0.37	175.7	0.01	0.40	0.05	0.01	0.03	0.01	178.5
104P16	964195	9	544052	6631941	0	Q	3.377	0.007	2	1.5	0.4	0.6	41	24.3	0.05	0.6	0.3	0.7	0.8	0.53	284.8	0.02	1.05	0.05	0.01	0.06	0.01	387.7
104P16	964197	9	530697	6639200	0	Q	1.091	0.007	2	1.8	0.4	0.5	41	0.9	0.05	0.6	0.3	1.0	0.4	0.46	221.6	0.02	0.21	0.05	0.01	0.05	0.01	162.2
104P16	964199	9	536567	6645605	0	Q	1.970	0.005	2	0.9	0.4	0.5	10	0.2	0.05	0.2	0.3	0.5	0.2	0.73	244.7	0.01	0.98	0.05	0.01	0.08	0.01	202.1
104P16	964202	9	538868	6646578	0	Q	2.103	0.005	2	1.0	0.4	0.3	10	0.2	0.05	0.2	0.2	0.6	0.3	0.75	257.7	0.01	1.75	0.05	0.01	0.08	0.01	167.3
104P16	964204	9	532951	6651106	0	Q	1.940	0.005	3	0.9	0.2	0.4	10	0.7	0.05	0.2	0.3	1.3	0.2	0.60	239.9	0.01	0.38	0.07	0.01	0.03	0.01	178.2
104P16	964206	9	532642	6649894	10	Q	1.755	0.015	3	0.8	0.3	0.6	49	2.5	0.05	0.2	0.2	1.5	0.3	0.33	328.9	0.01	0.14	0.05	0.01	0.05	0.01	160.5
104P16	964207	9	532642	6649894	20	Q	1.750	0.007	3	0.8	0.3	0.6	63	2.5	0.05	0.2	0.2	1.1	0.3	0.35	315.2	0.01	0.14	0.06	0.01	0.05	0.01	150.6
104P16	964208	9	533121	6649294	0	Q	1.419	0.005	2	0.9	0.2	0.5	29	0.9	0.05	0.2	0.2	0.8	0.2	0.42	254.0	0.01	0.14	0.05	0.01	0.03	0.01	141.3
104P16	964210	9	527939	6649769	0	Q	2.898	0.021	4	0.6	0.3	0.6	97	2.0	0.05	0.4	0.2	1.3	0.5	0.57	279.2	0.02	1.03	0.05	0.01	0.09	0.01	292.8
104P16	964213	9	532692	6646655	0	Q	2.487	0.015	3	0.9	0.5	0.4	21	0.4	0.05	0.2	0.2	0.6	0.2	0.67	223.3	0.01	3.14	0.05	0.01	0.11	0.01	63.5
104P16	964215	9	532095	6644718	0	Q	3.438	0.005	3	0.9	0.3	0.3	21	0.5	0.05	0.2	0.1	0.6	0.1	0.64	221.2	0.01	2.76	0.05	0.01	0.05	0.01	26.1
104P16	964217	9	528397	6634980	0	Q	1.065	0.013	2	1.4	0.1	0.3	16	7.0	0.05	0.2	0.1	0.7	0.5	1.53	147.7	0.01	0.37	0.05	0.01	0.01	0.02	177.4
104P15	964219	9	525681	6633273	0	Q	1.459	0.010	2	1.1	0.1	0.3	10	0.3	0.05	0.2	0.1	0.8	0.1	0.31	190.6	0.01	0.15	0.05	0.01	0.01	0.01	335.8
104P15	964222	9	524942	6628725	10	Q	1.053	0.009	2	0.7	0.1	0.3	16	0.4	0.05	0.2	0.1	0.5	0.2	0.74	169.3	0.01	0.25	0.05	0.01	0.02	0.01	157.4
104P15	964223	9	524942	6628725	20	Q	1.045	0.005	2	0.7	0.2	0.3	20	0.4	0.05	0.2	0.1	0.6	0.2	0.75	169.5	0.01	0.26	0.05	0.01	0.03	0.01	156
104P15	964224	9	523478	6628413	0	Q	2.635	0.005	2	0.5	0.2	0.4	26	0.5	0.05	0.3	0.2	0.5	0.4	0.42	197.3	0.01	0.57	0.05	0.01	0.03	0.01	144.1
104P16	964226	9	528835	6625606	0	Q	0.700	-1.000	4	1.9	0.1	0.5	-1	0.5	0.10	0.2	0.8	1.4	0.1	0.35	155.8	-1.00	0.38	0.05	0.01	0.05	0.01	149.6
104P15	964228	9	525718	6624439	0	Q	0.094	0.014	39	0.5	0.2	0.3	50	0.3	0.05	0.2	0.4	0.7	0.2	1.46	34.4	0.01	0.05	0.05	0.01	0.03	0.01	23.2
104P15	964231	9	523935	6623548	0	Q	1.003	0.005	3	1.1	0.2	0.4	43	4.2	0.05	0.2	0.2	0.6	0.3	0.52	172.7	0.02	0.28	0.05	0.01	0.03	0.01	193.3
104P09	964233	9	528383	6622720	0	Q	0.901	0.005	2	0.6	0.2	0.3	20	0.5	0.05	0.2	0.2	0.6	0.2	0.56	114.1	0.01	0.13	0.05	0.01	0.02	0.01	215.0
104P10	964235	9	526107	6621166	0	Q	0.119	0.010	85	0.7	0.2	0.5	46	0.6	0.05	0.3	0.6	1.4	0.2	1.57	29.6	0.08	0.08	0.05	0.01	0.02	0.01	45.5
104P10	964237	9	524987	6621527	0	Q	0.220	0.005	67	1.1	0.3	0.6	71	3.1	0.05	0.3	0.7	1.7	0.2	0.74	52.6	0.07	0.10	0.05	0.01	0.03	0.01	115.5
104P09	964239	9	532947	6622415	0	Q	1.400	-1.000	5	1.5	0.2	0.5	-1	0.1	0.10	0.3	0.2	2.0	0.1	0.38	225.6	-1.00	2.13	0.05	0.01	0.05	0.01	192.2

Analytical Data: Trace Elements

Map	Sample ID	UTM Zone	UTM East NAD 27	UTM North Nad 27	REP	Form	Li 0.005 ppb ICP	Be 0.005 ppb ICP	Al 2 ppb ICP	Ti 0.5 ppb ICP	V 0.1 ppb ICP	Cr 0.3 ppb ICP	Fe 10 ppb ICP	Mn 0.1 ppb ICP	Co 0.05 ppb ICP	Ni 0.2 ppb ICP	Cu 0.1 ppb ICP	Zn 0.5 ppb ICP	As 0.1 ppb ICP	Rb 0.05 ppb ICP	Sr 0.5 ppb ICP	Y 0.01 ppb ICP	Mo 0.05 ppb ICP	Cd 0.05 ppb ICP	In 0.01 ppb ICP	Sb 0.01 ppb ICP	Cs 0.01 ppb ICP	Ba 0.2 ppb ICP
104P09	964242	9	537535	6620930	0	Q	1.362	0.005	2	0.7	0.2	0.5	27	0.7	0.05	0.2	0.3	1.1	0.4	0.35	168.0	0.01	0.22	0.05	0.01	0.02	0.01	192.2
104P09	964245	9	535686	6620533	0	Q	0.263	0.005	28	0.5	0.2	0.3	10	0.4	0.05	0.2	0.2	0.5	0.1	0.97	81.0	0.01	0.05	0.05	0.01	0.02	0.01	43.8
104P09	964247	9	533177	6618205	0	Q	0.525	0.005	13	0.5	0.3	0.4	10	0.4	0.05	0.2	0.2	0.7	0.1	1.31	112.1	0.01	0.32	0.05	0.01	0.03	0.01	52.0
94M06	964249	9	593716	6570834	0	COKs	9.642	0.005	2	1.0	0.2	0.5	10	0.2	0.05	0.2	0.1	0.6	0.8	0.86	443.7	0.01	1.28	0.05	0.01	0.03	0.01	42.0
94M06	964251	9	592362	6569609	0	COKs	9.937	0.005	2	1.0	0.2	0.6	10	0.2	0.05	0.2	0.1	0.9	0.7	0.84	440.6	0.01	1.33	0.05	0.01	0.04	0.01	40.8
94M06	964253	9	595531	6572166	0	COKs	9.279	0.005	2	0.7	0.2	0.5	13	0.3	0.05	0.2	0.1	0.6	0.3	0.42	381.0	0.01	0.98	0.05	0.01	0.04	0.01	63.0
94M06	964255	9	597388	6572660	0	PH	8.895	0.005	2	0.5	0.3	0.4	26	0.3	0.05	0.2	0.4	0.8	0.1	0.25	308.0	0.01	1.62	0.05	0.01	0.08	0.01	53.5
94M06	964257	9	598608	6572814	0	PH	9.420	0.006	2	0.5	0.3	0.4	18	0.7	0.05	0.2	0.2	1.1	0.2	0.37	329.9	0.01	1.04	0.05	0.01	0.06	0.01	39.0
94M06	964259	9	600492	6574756	0	C	10.040	0.006	2	0.8	0.2	0.5	13	0.2	0.05	0.2	0.2	1.0	0.6	0.26	345.6	0.01	0.76	0.05	0.01	0.06	0.01	60.3
94M06	964262	9	600949	6573895	0	OSDRR	14.191	0.005	2	0.5	0.3	0.5	10	0.3	0.05	0.2	0.2	0.9	0.6	0.25	447.2	0.01	0.57	0.05	0.01	0.05	0.01	103.2
94M06	964263	9	601203	6574256	20	OSDRR	7.800	-1.000	2	1.7	0.1	0.3	-1	0.1	0.17	0.9	0.1	2.0	0.1	0.21	350.3	-1.00	0.88	0.05	0.01	0.04	0.01	75.3
94M06	964264	9	601203	6574256	10	OSDRR	10.736	0.005	2	1.0	0.3	0.7	18	0.2	0.05	0.2	0.2	1.0	0.3	0.23	393.4	0.01	0.86	0.05	0.01	0.04	0.01	90.5
94M06	964266	9	602208	6574734	0	OSDRR	9.453	0.005	3	0.5	0.3	0.5	21	0.6	0.05	0.2	0.3	0.9	0.3	0.14	306.3	0.01	0.45	0.05	0.01	0.07	0.01	100.6
94M06	964268	9	602783	6575604	0	C	10.303	0.005	2	0.7	0.4	0.8	21	0.4	0.05	0.2	0.1	0.9	0.2	0.27	462.6	0.01	1.05	0.05	0.01	0.05	0.01	52.0
94M06	964270	9	603345	6577450	0	C	9.749	0.005	5	0.5	0.3	0.5	38	0.5	0.05	0.2	0.3	1.2	0.6	1.10	268.4	0.01	0.62	0.05	0.01	0.07	0.01	112.4
94M06	964272	9	592456	6568817	0	COK	7.803	0.010	2	0.5	0.5	0.8	29	3.7	0.05	0.2	0.4	1.3	0.3	2.21	465.9	0.02	0.11	0.05	0.01	0.09	0.01	72.8
94M03	964274	9	591431	6567501	0	COK	10.608	0.005	2	0.8	0.3	0.5	18	0.4	0.05	0.2	0.2	1.0	0.7	0.71	416.4	0.01	1.20	0.05	0.01	0.05	0.01	37.1
94M03	964277	9	587785	6564790	0	PH	9.307	0.007	4	0.5	0.6	0.5	34	0.6	0.05	0.2	0.4	1.7	0.3	0.42	336.2	0.01	2.54	0.05	0.01	0.17	0.01	48.0
94M03	964279	9	586153	6563450	0	PH	15.290	0.008	2	0.5	0.9	0.8	40	1.0	0.05	0.9	0.6	1.6	1.2	0.75	434.9	0.01	2.35	0.05	0.01	0.29	0.01	85.0
104P09	964282	9	542478	6612505	0	Q	3.130	0.005	2	1.3	0.2	0.4	10	1.4	0.05	0.2	0.1	0.6	0.1	0.66	267.8	0.01	0.36	0.05	0.01	0.03	0.01	370.7
104P09	964284	9	540693	6614457	10	Q	4.668	0.005	2	0.5	0.2	0.4	18	0.3	0.05	0.2	0.2	0.6	0.7	0.76	163.6	0.01	0.65	0.05	0.01	0.05	0.01	150.6
104P09	964285	9	540693	6614457	20	Q	4.603	0.005	4	0.5	0.3	0.4	22	0.4	0.05	0.2	0.3	0.6	0.8	0.8	162.4	0.01	0.61	0.05	0.01	0.05	0.01	143.6
104P09	964286	9	539721	6615342	0	Q	2.263	0.005	17	0.5	0.3	0.4	35	0.5	0.05	0.2	0.3	0.7	0.8	1.23	124.4	0.01	0.96	0.05	0.01	0.06	0.01	102.5
104P09	964288	9	536970	6618452	0	Q	0.283	0.016	21	0.5	0.3	0.3	72	0.7	0.05	0.2	0.3	1.3	0.1	0.82	29.1	0.01	0.44	0.05	0.01	0.01	0.01	7.9
104P09	964290	9	533498	6613833	0	C	1.943	0.005	2	0.9	0.2	0.4	46	1.9	0.05	0.2	0.2	0.7	0.1	0.16	220.8	0.01	0.47	0.05	0.01	0.04	0.01	109.6
104P09	964293	9	532300	6614739	0	C	1.735	0.005	2	0.5	0.2	0.3	59	1.3	0.05	0.2	0.2	0.6	0.2	0.63	202.6	0.01	0.38	0.05	0.01	0.04	0.01	135.7
104P10	964295	9	527962	6616288	0	CA	2.781	0.005	2	0.5	0.3	0.6	74	1.0	0.05	0.2	0.2	0.5	0.2	0.28	238.0	0.01	0.57	0.05	0.01	0.04	0.01	62.0
104P16	964297	9	533390	6628247	0	Q	0.736	0.007	2	0.5	0.2	0.3	53	1.1	0.05	0.2	0.2	0.5	0.2	0.43	175.9	0.01	0.35	0.05	0.01	0.02	0.01	152.6
104P16	964299	9	534323	6626643	0	Q	1.816	0.005	4	0.5	0.2	0.4	30	0.6	0.05	0.2	0.3	1.3	0.1	1.12	161.3	0.01	0.62	0.05	0.01	0.04	0.01	98.9
104P16	964302	9	539736	6628918	0	Q	2.251	0.005	2	1.1	0.3	0.6	27	0.5	0.05	0.2	0.2	0.8	0.8	0.49	222.9	0.01	0.94	0.05	0.01	0.02	0.01	273.1
104P16	964304	9	537915	6630251	0	Q	3.126	0.005	2	1.3	0.3	0.5	10	0.2	0.05	0.2	0.2	0.7	0.1	0.51	282.2	0.01	1.30	0.05	0.01	0.07	0.01	252.0
104P16	964306	9	537437	6629084	0	Q	3.856	0.005	2	1.6	0.4	0.7	10	0.6	0.05	0.2	0.3	1.2	0.1	0.51	334.5	0.01	1.70	0.05	0.01	0.07	0.01	269.4
104P16	964307	9	538764	6625977	10	Q	0.818	0.005	8	0.5	0.3	0.5	56	0.7	0.05	0.2	0.3	1.3	0.3	0.62	145.9	0.01	0.28	0.05	0.01	0.02	0.01	180.4
104P16	964308	9	538764	6625977	20	Q	0.768	0.014	8	0.5	0.3	0.5	41	0.6	0.05	0.2	0.3	0.8	0.3	0.6	133.1	0.01	0.24	0.05	0.01	0.03	0.01	171.6
104P09	964310	9	544091	6620417	0	Q	2.846	0.007	3	1.0	0.2	0.6	64	3.3	0.05	0.2	0.2	0.9	0.3	0.36	262.6	0.01	0.10	0.05	0.01	0.02	0.01	201.6
104P09	964312	9	544166	6619414	0	Q	3.284	0.005	2	1.0	0.2	0.7	51	21.6	0.05	0.2	0.2	1.1	0.3	0.32	267.2	0.01	0.24	0.05	0.01	0.03	0.01	176.1
104P09	964314	9	549728	6615469	0	Q	3.295	0.005	2	0.5	0.3	0.6	52	1.7	0.05	0.3	0.3	0.7	0.8	0.20	232.1	0.02	0.60	0.05	0.01	0.11	0.01	136.1
104P09	964316	9	551645	6614921	0	Q	1.785	0.005	2	1.1	0.2	0.4	22	0.6	0.05	0.2	0.2	0.9	0.5	0.71	216.4	0.01	0.10	0.05	0.01	0.02	0.01	207.4
94M12	964319	9	565692	6603733	0	OSDRR	2.946	0.005	2	0.5	0.1	0.3	37	0.5	0.05	0.2	0.2	1.1	0.5	1.61	582.1	0.01	0.22	0.05	0.01	0.04	0.01	40.5
104P09	964322	9	555108	6616023	0	Q	1.133	0.005	2	1.0	0.2	0.3	10	1.0	0.05	0.2	0.1	0.9	0.3	0.42	176.8	0.01	0.05	0.05	0.01	0.01	0.01	136.6

Analytical Data: Trace Elements

Map	Sample ID	UTM Zone	UTM East NAD 27	UTM North Nad 27	REP	Form	Li 0.005 ppb ICP	Be 0.005 ppb ICP	Al 2 ppb ICP	Ti 0.5 ppb ICP	V 0.1 ppb ICP	Cr 0.3 ppb ICP	Fe 10 ppb ICP	Mn 0.1 ppb ICP	Co 0.05 ppb ICP	Ni 0.2 ppb ICP	Cu 0.1 ppb ICP	Zn 0.5 ppb ICP	As 0.1 ppb ICP	Rb 0.05 ppb ICP	Sr 0.5 ppb ICP	Y 0.01 ppb ICP	Mo 0.05 ppb ICP	Cd 0.05 ppb ICP	In 0.01 ppb ICP	Sb 0.01 ppb ICP	Cs 0.01 ppb ICP	Ba 0.2 ppb ICP
104P09	964324	9	553843	6618001	10	Q	2.397	0.005	2	1.0	0.2	0.3	21	0.4	0.05	0.2	0.2	0.8	0.7	0.57	218.5	0.01	0.64	0.05	0.01	0.03	0.01	352.9
104P09	964325	9	553843	6618001	20	Q	2.323	0.005	2	0.9	0.1	0.3	15	0.4	0.05	0.2	0.2	0.7	0.8	0.54	215.8	0.01	0.66	0.05	0.01	0.02	0.01	353
104P09	964326	9	554258	6621007	0	Q	0.713	0.005	2	0.5	0.2	0.3	38	0.7	0.05	0.2	0.3	0.8	0.4	0.81	193.0	0.01	0.35	0.05	0.01	0.04	0.01	142.5
104P09	964328	9	551446	6620865	0	Q	1.406	0.005	2	0.5	0.2	0.4	34	0.4	0.05	0.2	0.2	0.5	0.3	1.15	136.7	0.01	0.11	0.05	0.01	0.03	0.01	101.3
104P09	964330	9	550165	6620783	0	Q	1.204	0.005	2	1.0	0.1	0.3	27	0.3	0.05	0.2	0.1	0.7	0.3	0.75	157.2	0.01	0.05	0.05	0.01	0.01	0.01	152.9
104P09	964332	9	548586	6622334	0	Q	0.890	0.005	20	0.5	0.2	0.3	40	0.5	0.05	0.2	0.3	0.7	0.3	0.95	147.2	0.01	0.19	0.05	0.01	0.04	0.01	80.0
104P16	964334	9	547678	6625129	0	Q	1.541	0.005	2	1.0	0.1	0.3	30	1.1	0.05	0.2	0.1	1.0	0.9	0.64	210.9	0.01	0.83	0.05	0.01	0.01	0.01	459.4
104P16	964337	9	546108	6628787	0	Q	0.087	0.005	30	0.5	0.2	0.3	52	0.8	0.05	0.2	0.6	0.7	0.1	0.63	35.7	0.01	0.05	0.05	0.01	0.01	0.01	37.8
104P16	964339	9	545305	6625995	0	Q	2.123	0.005	2	1.1	0.2	0.3	33	1.7	0.05	0.2	0.2	1.0	0.6	0.47	216.5	0.01	0.82	0.05	0.01	0.04	0.01	242.9
104P16	964342	9	542598	6625872	10	Q	2.274	0.005	2	0.9	0.3	0.4	48	1.2	0.05	0.2	0.1	0.6	0.4	0.26	210.4	0.01	1.20	0.05	0.01	0.04	0.01	201.3
104P16	964343	9	542598	6625872	20	Q	2.303	0.005	2	0.9	0.3	0.3	35	1.3	0.05	0.2	0.2	0.8	0.4	0.31	210.6	0.01	1.18	0.05	0.01	0.03	0.01	203.9
104P16	964344	9	541290	6625908	0	Q	1.967	0.005	2	0.8	0.2	0.3	21	1.4	0.31	0.2	0.2	0.6	0.3	0.36	190.8	0.01	0.39	0.05	0.01	0.03	0.01	198.6
104P09	964346	9	547391	6621858	0	Q	0.606	0.005	4	0.5	0.2	0.3	18	0.9	0.05	0.2	0.3	1.4	0.3	0.59	138.6	0.01	0.22	0.05	0.01	0.03	0.01	145.5
104P09	964348	9	547087	6618543	0	Q	1.777	0.005	2	1.1	0.1	0.3	293	63.6	0.05	0.2	0.2	0.7	0.3	0.28	192.2	0.01	0.06	0.05	0.01	0.03	0.01	158.9
104P09	964351	9	554229	6609869	0	Q	2.886	0.005	2	1.3	0.2	0.3	10	1.2	0.05	0.2	0.1	0.6	0.1	0.40	285.6	0.01	0.93	0.05	0.01	0.03	0.01	240.5
94M05	964356	9	584658	6578049	0	OSDRR	8.781	0.018	3	1.1	0.3	0.4	43	1.0	0.05	0.5	0.5	2.0	0.9	0.56	508.2	0.01	0.71	0.07	0.01	0.10	0.01	58.9
94M05	964357	9	584265	6578354	0	OSDRR	8.786	0.005	9	0.6	0.4	0.5	28	3.7	0.05	0.2	0.4	1.7	0.4	1.12	521.0	0.01	0.68	0.05	0.01	0.11	0.01	32.5
94M05	964359	9	581677	6579024	0	OSDRR	1.330	0.017	6	0.5	0.1	0.3	48	3.0	0.05	0.2	0.1	1.0	0.4	0.68	168.7	0.01	0.12	0.05	0.01	0.01	0.01	61.0
94M05	964362	9	581406	6585895	0	COKs	0.603	0.005	53	0.5	0.8	0.3	56	0.8	0.05	0.6	0.5	0.9	1.0	0.27	126.9	0.01	1.97	0.05	0.01	0.21	0.01	155.5
94M05	964363	9	579600	6588221	10	OSDRR	0.109	0.010	164	0.5	0.7	0.3	38	0.3	0.05	0.2	0.4	4.8	0.4	1.24	20.7	0.01	0.80	0.05	0.01	0.06	0.01	6.2
94M05	964364	9	579600	6588221	20	OSDRR	0.053	0.005	179	0.5	0.8	0.3	13	0.2	0.05	0.2	0.5	1.2	0.5	1.25	20.5	0.01	0.89	0.05	0.01	0.07	0.01	5.2
94M05	964366	9	583852	6589842	0	COKs	3.451	0.006	7	0.6	0.2	0.3	10	0.3	0.05	0.2	0.3	1.2	0.1	0.53	312.2	0.01	0.44	0.05	0.01	0.06	0.01	49.8
94M05	964368	9	584518	6592640	0	COKs	1.462	0.015	10	0.5	0.1	0.3	22	0.3	0.05	0.2	0.6	1.7	0.1	0.97	178.3	0.01	0.78	0.05	0.01	0.02	0.01	50.3
94M12	964371	9	584569	6597157	0	COKs	6.253	0.005	2	0.7	0.1	0.3	25	0.5	0.05	0.2	0.2	0.9	0.4	0.88	306.9	0.01	0.33	0.05	0.01	0.03	0.01	39.9
94M12	964373	9	572258	6600538	0	P	3.376	0.005	2	0.8	0.3	0.3	21	4.5	0.05	0.7	0.1	1.9	0.2	1.03	1073.1	0.01	1.34	0.09	0.01	0.05	0.01	18.8
94M12	964375	9	571265	6600220	0	P	2.943	0.006	3	0.7	0.1	0.3	10	0.2	0.05	0.5	0.2	1.1	0.1	0.98	682.3	0.01	0.34	0.05	0.01	0.03	0.01	17.6
94M12	964377	9	571033	6602804	0	P	0.497	0.005	4	0.5	0.2	0.3	28	0.3	0.05	0.6	0.2	0.9	0.4	0.84	174.4	0.01	0.60	0.05	0.01	0.07	0.01	72.2
94M12	964379	9	569534	6600509	0	P	5.180	0.005	4	0.5	0.1	0.3	10	2.5	0.05	0.6	0.2	1.2	0.6	2.08	662.5	0.01	0.48	0.05	0.01	0.08	0.01	27.0
94M12	964383	9	567008	6599159	0	Q	2.324	0.005	2	0.5	0.1	0.3	24	1.5	0.05	0.2	0.2	0.7	0.3	1.49	275.0	0.01	0.13	0.05	0.01	0.02	0.01	53.6
94M12	964385	9	568734	6598194	0	Q	5.160	0.005	2	0.5	0.2	0.3	35	0.3	0.05	0.2	0.2	0.8	0.1	0.57	163.4	0.01	0.84	0.05	0.01	0.03	0.01	43.9
94M05	964387	9	570337	6593143	0	P	2.596	0.005	4	0.8	0.1	0.3	27	4.3	0.05	0.2	0.2	1.1	0.1	5.19	312.5	0.01	0.17	0.05	0.01	0.02	0.01	53.4
94M05	964389	9	577707	6582936	0	OSDRR	14.317	0.005	2	0.5	0.2	0.3	21	0.5	0.05	1.9	0.4	2.0	0.5	0.72	449.6	0.01	3.29	0.05	0.01	0.15	0.01	12.9
94M05	964391	9	574633	6580445	0	COK	6.580	0.005	2	0.6	0.1	0.3	35	1.2	0.05	1.3	0.2	1.1	0.3	0.70	426.2	0.01	0.48	0.05	0.01	0.08	0.01	22.8
94M05	964393	9	570606	6586170	0	Q	0.696	0.005	4	0.6	0.1	0.3	41	2.7	0.05	0.2	0.2	0.5	0.1	0.05	109.5	0.01	1.24	0.05	0.01	0.06	0.01	16.2
94M05	964395	9	568741	6588384	10	Q	4.675	0.005	2	0.7	0.2	0.3	43	0.5	0.05	0.3	0.7	0.9	0.3	0.52	343.6	0.01	0.86	0.05	0.01	0.05	0.01	140.4
94M05	964396	9	568741	6588384	20	Q	4.695	0.006	2	0.7	0.1	0.3	20	0.4	0.05	0.3	0.4	1.2	0.2	0.56	365.8	0.01	0.86	0.05	0.01	0.05	0.01	148.1
94M05	964397	9	568252	6588556	0	Q	5.023	0.009	2	0.8	0.2	0.3	24	0.4	0.05	0.3	0.7	1.4	0.4	0.66	302.1	0.01	0.82	0.05	0.01	0.06	0.01	213.6
94M05	964399	9	569191	6591592	0	Q	1.037	0.005	3	0.7	0.1	0.3	19	0.4	0.05	0.2	0.2	1.0	0.1	1.50	170.1	0.01	0.19	0.05	0.01	0.01	0.01	143.4
94M12	964402	9	564867	6600584	0	Q	4.184	0.005	2	1.6	0.2	0.3	10	0.4	0.05	0.6	0.2	1.1	0.2	0.43	402.2	0.01	1.42	0.05	0.01	0.05	0.01	166.1
94M12	964403	9	564592	6601089	10	Q	4.123	0.008	2	1.7	0.2	0.3	10	0.5	0.05	0.5	0.4	1.5	0.2	0.44	396.9	0.01	1.45	0.05	0.01	0.05	0.01	166.5

Analytical Data: Trace Elements

Map	Sample ID	UTM Zone	UTM East NAD 27	UTM North Nad 27	REP	Form	Li 0.005 ppb ICP	Be 0.005 ppb ICP	Al 2 ppb ICP	Ti 0.5 ppb ICP	V 0.1 ppb ICP	Cr 0.3 ppb ICP	Fe 10 ppb ICP	Mn 0.1 ppb ICP	Co 0.05 ppb ICP	Ni 0.2 ppb ICP	Cu 0.1 ppb ICP	Zn 0.5 ppb ICP	As 0.1 ppb ICP	Rb 0.05 ppb ICP	Sr 0.5 ppb ICP
94M12	964404	9	564592	6601089	20	Q	4.027	0.006	3	1.4	0.2	0.3	10	0.4	0.05	0.5	0.3	1.1	0.2	0.41	384.6
94M12	964406	9	561515	6607600	0	Q	0.216	0.012	106	1.0	1.9	0.3	97	1.0	0.08	0.5	1.5	2.7	0.9	1.46	44.9
94M12	964408	9	557899	6613739	0	Q	2.438	0.005	5	1.3	0.1	0.3	28	1.1	0.05	0.4	0.2	0.7	0.4	0.59	240.4
94M12	964410	9	557267	6611679	0	Q	2.623	0.005	2	1.8	0.2	0.3	12	0.9	0.05	0.4	0.3	0.7	0.2	0.35	282.5
94M12	964412	9	557215	6608948	0	Q	2.969	0.005	3	1.2	0.1	0.3	17	0.7	0.05	0.2	0.7	1.0	0.4	0.65	241.0
94M12	964414	9	556897	6606822	0	Q	3.553	0.005	2	1.4	0.1	0.3	14	0.4	0.05	0.3	0.3	1.1	0.9	0.70	308.1
94M12	964416	9	558416	6602648	0	Q	2.569	0.006	2	1.4	0.2	0.8	18	0.7	0.05	0.6	0.4	1.0	0.2	0.34	320.0
94M12	964418	9	560183	6601312	0	Q	4.776	0.005	2	1.2	0.1	0.3	19	0.2	0.05	0.4	0.3	1.0	0.1	0.26	403.3
94M12	964422	9	562157	6602173	0	Q	3.196	0.005	2	1.2	0.2	0.3	10	0.4	0.05	0.4	0.3	1.1	0.2	0.35	328.2
94M12	964424	9	563470	6601261	0	Q	3.249	0.005	2	1.3	0.2	0.3	13	0.6	0.05	0.4	0.3	0.8	0.2	0.33	336.2
94M12	964426	9	562634	6599788	0	Q	3.430	0.005	8	0.5	0.4	0.3	30	1.9	0.05	0.4	0.5	1.2	0.1	0.82	366.6
94M12	964428	9	563634	6596951	0	Q	5.167	0.005	2	1.1	0.1	0.3	18	0.5	0.05	0.5	0.2	0.7	0.1	0.58	470.1
94M12	964430	9	566114	6596616	0	Q	4.337	0.006	2	0.9	0.1	0.3	17	0.3	0.05	0.2	0.4	1.0	0.1	0.75	190.2
94M12	964431	9	566699	6597388	10	Q	4.475	0.005	2	0.9	0.1	0.3	10	0.2	0.05	0.3	0.2	0.9	0.1	0.48	172.1
94M12	964432	9	566699	6597388	20	Q	4.443	0.005	2	0.8	0.1	0.3	19	0.3	0.05	0.3	0.3	0.8	0.1	0.48	172.7
94M05	964435	9	564509	6594534	0	Q	3.804	0.005	2	0.9	0.1	0.3	26	0.4	0.05	0.3	0.1	0.8	0.1	0.67	177.2
94M05	964437	9	564161	6595530	0	Q	4.839	0.005	2	0.9	0.1	0.3	25	0.3	0.05	0.4	0.1	0.9	0.1	0.38	316.2
104P09	964439	9	556280	6605578	0	Q	0.608	0.005	14	0.5	0.2	0.3	54	0.6	0.05	0.3	0.3	1.0	0.5	1.10	101.7
104P09	964442	9	554251	6605583	0	Q	2.718	0.005	6	0.5	0.3	0.3	32	0.4	0.05	0.3	0.2	0.5	0.1	0.68	145.6
104P09	964445	9	550426	6604695	0	Q	4.726	0.005	2	1.5	0.1	0.3	10	0.4	0.05	0.3	0.1	0.5	0.1	0.33	290.4
104P09	964447	9	549193	6606622	0	Q	2.279	0.005	4	1.4	0.2	0.6	31	3.8	0.05	0.5	0.2	0.6	0.2	0.33	308.0
104P09	964449	9	545103	6609940	0	Q	6.000	-1.000	3	1.5	0.1	0.5	-1	0.1	0.17	1.1	0.1	4.9	0.4	1.44	204.8
104P09	964450	9	540732	6609391	10	Q	0.516	0.005	6	0.5	0.1	0.3	39	0.3	0.05	0.2	0.1	0.5	0.7	1.32	98.2
104P09	964451	9	540732	6609391	20	Q	0.525	0.005	5	0.5	0.1	3.8	41	26.7	0.05	1.4	0.3	0.6	0.6	1.32	99
104P09	964453	9	540847	6605061	0	Q	1.370	0.005	11	0.5	0.2	0.3	22	0.9	0.05	0.5	0.3	0.6	0.1	0.49	166.2
104P09	964455	9	542361	6603351	0	Q	0.211	0.005	61	0.5	0.8	0.7	67	8.9	0.05	0.5	0.9	1.9	0.4	8.00	21.7
104P09	964457	9	549021	6602541	0	Q	0.507	0.005	14	0.5	0.1	0.3	31	0.4	0.05	0.2	0.1	0.5	0.2	0.29	114.9
104P09	964459	9	547679	6601939	0	Q	1.713	0.005	3	0.9	0.1	0.3	15	0.3	0.05	0.3	0.1	0.5	0.1	0.39	244.3
104P09	964462	9	552647	6598202	0	Q	2.753	0.005	2	0.9	0.1	0.3	11	0.4	0.05	0.4	0.2	0.5	0.1	0.29	296.9
104P09	964464	9	545359	6597998	0	Q	2.506	0.005	2	0.8	0.2	0.3	22	0.6	0.05	0.6	0.2	0.5	0.1	0.43	293.7
104P09	964465	9	546976	6596713	20	Q	0.300	-1.000	3	0.6	0.1	0.5	-1	0.1	0.05	0.2	0.1	1.2	0.1	0.53	146.5
104P09	964466	9	546976	6596713	10	Q	1.722	0.005	2	0.5	0.2	0.3	58	1.1	0.05	0.5	0.3	0.6	0.3	0.56	149.3
104P09	964469	9	552727	6599981	0	Q	0.900	0.005	5	0.5	0.1	0.3	29	0.9	0.05	0.2	0.1	0.5	0.3	0.52	143.7
104P09	964471	9	555461	6601768	0	Q	1.487	0.005	2	0.7	0.1	0.3	19	0.8	0.05	0.3	0.2	0.5	0.1	0.21	208.8
104P09	964473	9	556500	6599349	0	Q	1.747	0.005	2	0.5	0.1	0.3	10	0.2	0.05	0.2	0.1	0.5	0.1	0.31	216.0
104P08	964475	9	551600	6588600	0	Q	2.123	0.005	4	0.9	1.1	0.3	31	0.6	0.13	2.1	0.8	0.6	0.4	0.38	226.4
104P08	964477	9	556000	6587800	0	Q	5.149	0.005	2	0.9	0.7	2.0	22	12.0	0.08	1.3	0.4	0.8	0.1	0.37	170.9
94M05	964479	9	557646	6588528	0	Q	3.081	0.008	19	0.5	0.9	0.3	49	1.1	0.07	0.5	0.4	0.8	0.5	0.74	350.5
94M06	964482	9	589676	6570082	0	COKs	5.910	0.005	3	0.9	0.2	0.3	10	0.4	0.05	0.3	0.2	1.0	0.1	0.48	489.5
94M06	964484	9	589562	6569309	0	PH	1.014	0.005	40	0.5	1.1	0.3	74	1.3	0.09	0.5	0.8	0.7	1.6	0.57	221.0

Analytical Data: Trace Elements

Map	Sample ID	UTM Zone	UTM East NAD 27	UTM North Nad 27	REP	Form	Li 0.005 ppb ICP	Be 0.005 ppb ICP	Al 2 ppb ICP	Ti 0.5 ppb ICP	V 0.1 ppb ICP	Cr 0.3 ppb ICP	Fe 10 ppb ICP	Mn 0.1 ppb ICP	Co 0.05 ppb ICP	Ni 0.2 ppb ICP	Cu 0.1 ppb ICP	Zn 0.5 ppb ICP	As 0.1 ppb ICP	Rb 0.05 ppb ICP	Sr 0.5 ppb ICP	Y 0.01 ppb ICP	Mo 0.05 ppb ICP	Cd 0.05 ppb ICP	In 0.01 ppb ICP	Sb 0.01 ppb ICP	Cs 0.01 ppb ICP	Ba 0.2 ppb ICP
94M03	964486	9	585933	6568003	0	PH	1.437	0.005	9	0.5	0.1	0.3	35	2.9	0.05	0.2	0.3	1.5	0.3	1.08	102.8	0.01	0.12	0.05	0.01	0.02	0.01	28.0
94M05	964487	9	572972	6573687	10	PPc	4.890	0.005	3	1.2	0.1	0.3	10	3.8	0.05	0.5	0.1	1.1	0.3	0.80	563.6	0.01	0.06	0.05	0.01	0.03	0.01	27.9
94M05	964488	9	572972	6573687	20	PPc	5.078	0.005	2	1.1	0.1	0.3	17	4.2	0.05	0.6	0.2	1.2	0.2	0.79	562.4	0.01	0.06	0.05	0.01	0.04	0.01	28
94M05	964490	9	566869	6572055	0	Q	9.305	0.005	2	0.9	0.2	0.3	26	0.3	0.05	0.3	0.1	0.8	0.1	0.36	205.8	0.01	0.90	0.05	0.01	0.03	0.01	13.3
94M05	964492	9	567545	6573358	0	PPc	5.367	0.005	2	1.0	0.1	0.3	10	0.5	0.05	0.8	0.2	0.7	0.3	0.67	394.0	0.01	1.58	0.05	0.01	0.06	0.01	93.8
94M05	964495	9	566576	6574234	0	PPc	4.944	0.005	2	0.7	0.2	0.3	23	0.3	0.05	0.4	0.2	0.7	0.3	0.56	150.4	0.01	0.98	0.05	0.01	0.06	0.01	36.0
94M05	964497	9	565523	6577174	0	PPc	5.622	0.005	2	1.1	0.2	0.3	11	2.1	0.05	0.6	0.1	0.5	0.4	0.75	373.5	0.01	1.75	0.05	0.01	0.03	0.01	81.4
94M05	964499	9	564899	6582167	0	PPc	4.339	0.005	4	0.6	0.2	0.3	32	1.1	0.05	0.4	0.2	0.7	0.5	0.78	194.7	0.01	0.21	0.05	0.01	0.02	0.01	68.7
94M05	964502	9	560400	6575874	0	Q	4.220	0.005	2	0.7	0.3	0.3	35	0.3	0.05	0.4	0.1	0.7	0.2	0.38	370.4	0.01	2.13	0.05	0.01	0.03	0.01	142.7
94M05	964503	9	558704	6578805	10	Q	5.015	0.011	9	0.5	0.2	0.3	57	0.7	0.06	0.3	0.2	0.5	0.3	1.21	209.8	0.01	0.67	0.05	0.01	0.04	0.01	82.8
94M05	964504	9	558704	6578805	20	Q	5.076	0.006	9	0.5	0.2	0.3	54	0.7	0.06	0.3	0.2	0.5	0.3	1.25	210.1	0.01	0.68	0.05	0.01	0.04	0.01	83
94M05	964507	9	563623	6580007	0	PPc	5.991	0.005	2	1.3	0.1	0.3	10	0.3	0.05	0.3	0.1	0.5	0.5	0.74	371.9	0.01	1.55	0.05	0.01	0.03	0.01	53.2
94M05	964508	9	562420	6581631	0	PPc	5.960	0.005	2	1.2	0.1	0.3	10	0.3	0.05	0.3	0.1	0.5	0.6	0.71	370.6	0.01	1.56	0.05	0.01	0.03	0.01	52.3
94M05	964510	9	562058	6582912	0	PPc	3.808	0.009	2	0.5	0.2	0.3	33	0.6	0.05	0.4	0.2	0.6	0.5	1.27	243.4	0.01	0.48	0.05	0.01	0.05	0.01	48.0
104P08	964512	9	556125	6582650	0	Q	2.202	0.012	14	1.3	2.5	0.3	54	1.7	0.16	1.2	0.5	1.2	1.0	1.97	343.7	0.05	3.08	0.05	0.01	0.13	0.01	114.4
104P08	964515	9	555450	6584050	0	Q	0.878	0.012	35	0.5	0.8	0.3	38	1.7	0.10	0.3	0.4	2.0	0.6	1.32	125.3	0.02	1.49	0.05	0.01	0.07	0.01	44.2
94M05	964517	9	560688	6590582	0	Q	4.687	0.008	2	0.8	0.1	0.3	15	5.8	0.05	0.4	0.1	0.5	0.1	0.62	530.2	0.01	0.89	0.05	0.01	0.02	0.01	90.0
94M05	964519	9	564271	6592691	0	Q	4.887	0.006	2	1.3	0.1	0.3	17	0.2	0.05	0.4	0.1	0.5	0.1	0.68	500.0	0.01	1.26	0.05	0.01	0.03	0.01	83.1
94M05	964522	9	580414	6577743	10	OSDRR	8.055	0.005	2	0.6	0.2	0.3	28	1.7	0.07	1.4	0.3	0.7	0.8	0.63	385.8	0.01	0.88	0.05	0.01	0.09	0.01	41.6
94M05	964523	9	580414	6577743	20	OSDRR	8.084	0.006	2	0.5	0.1	0.3	23	1.6	0.07	1.5	0.3	0.8	0.8	0.6	376.0	0.01	0.83	0.05	0.01	0.09	0.01	40.9
94M05	964524	9	581057	6576325	0	OSDRR	12.007	0.005	2	0.5	0.3	0.3	37	1.3	0.10	1.2	0.2	0.8	0.9	0.64	142.2	0.01	1.37	0.05	0.01	0.11	0.01	17.7

Analytical Data: Trace Elements

Map	Sample ID	UTM Zone	UTM East NAD 27	UTM North Nad 27	REP	Form	La 0.01 ppb ICP	Ce 0.01 ppb ICP	Pr 0.005 ppb ICP	Nd 0.005 ppb ICP	Sm 0.005 ppb ICP	Eu 0.005 ppb ICP	Tb 0.005 ppb ICP	Gd 0.005 ppb ICP	Dy 0.005 ppb ICP	Ho 0.005 ppb ICP	Er 0.005 ppb ICP	Tm 0.005 ppb ICP	Yb 0.005 ppb ICP	Lu 0.005 ppb ICP	Tl 0.005 ppb ICP	Pb 0.01 ppb ICP	U 0.005 ppb ICP	T-Alk 4 ppm TITRAT	Cond. uS ELECT	TDS mg/l ELECT
94M03	964002	9	604262	6565049	0	PH	0.01	0.01	0.005	0.019	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.14	1.428	112	303.0	154.0
94M03	964004	9	613787	6559935	0	PH	0.01	0.01	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.07	0.791	124	251.0	125.0
94M03	964006	9	613273	6558113	0	PH	0.01	0.01	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.02	0.865	116	254.0	129.0
94M03	964008	9	613126	6557247	0	PH	0.01	0.01	0.005	0.007	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.03	0.768	92	233.0	117.0
94M03	964010	9	613799	6551488	0	PH	0.01	0.01	0.005	0.008	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.08	0.164	68	197.1	99.2
94M02	964011	9	616878	6550553	10	UNMAPPED	0.01	0.01	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.03	0.005	16	8.6	4.3
94M02	964012	9	616878	6550553	20	UNMAPPED	0.01	0.01	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.04	0.005	16	9.0	4.5
94M02	964014	9	621469	6543746	0	UNMAPPED	0.01	0.01	0.005	0.010	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.006	0.005	0.005	0.04	0.054	40	96.4	48.5
94M02	964016	9	623460	6542513	0	UNMAPPED	0.01	0.01	0.005	0.005	0.005	0.007	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.03	1.212	140	307.0	154.0
94M02	964019	9	625145	6548777	0	UNMAPPED	0.01	0.01	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.06	0.015	16	34.2	17.2
94M02	964022	9	623867	6549149	0	UNMAPPED	0.01	0.01	0.005	0.007	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.03	0.040	32	67.0	33.5
94M02	964025	9	617378	6559787	10	UNMAPPED	0.01	0.01	0.005	0.005	0.005	0.008	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.06	0.681	148	327.0	163.0
94M02	964026	9	617378	6559787	20	UNMAPPED	0.01	0.01	0.005	0.005	0.005	0.008	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.05	0.638	152	322.0	161.0
94M02	964027	9	616931	6559888	0	UNMAPPED	0.01	0.01	0.005	0.005	0.005	0.007	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.05	0.258	88	187.5	93.7
94M03	964029	9	606689	6567540	0	PH	0.08	0.18	0.026	0.134	0.029	0.009	0.005	0.038	0.041	0.008	0.026	0.005	0.022	0.005	0.005	0.26	0.033	12	20.3	10.1
94M06	964031	9	605261	6573230	0	OSDRR	0.01	0.01	0.005	0.012	0.006	0.007	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.08	0.690	136	327.0	164.0
94M06	964033	9	601908	6570952	0	PH	0.01	0.01	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.05	2.249	112	647.0	324.0
94M03	964035	9	598052	6568584	0	PH	0.01	0.01	0.005	0.009	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.06	1.054	112	303.0	151.0
94M03	964037	9	608129	6550341	0	C	0.01	0.01	0.005	0.005	0.009	0.007	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.06	1.421	152	410.0	205.0
94M03	964039	9	606907	6547559	0	COK	0.01	0.01	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.08	1.781	104	322.0	161.0
94M03	964042	9	606858	6546775	0	OSDRR	0.01	0.01	0.005	0.006	0.006	0.006	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.12	1.980	128	504.0	252.0
94M03	964044	9	609180	6546487	10	C	0.01	0.01	0.005	0.009	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.06	0.766	128	291.0	146.0
94M03	964045	9	609180	6546487	20	C	0.01	0.01	0.005	0.005	0.005	0.008	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.08	0.731	132	295.0	148.0
94M03	964046	9	609512	6546132	0	C	0.01	0.01	0.005	0.005	0.009	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.04	0.440	120	268.0	134.0
94M03	964048	9	614710	6543775	0	OSDRR	0.01	0.01	0.005	0.005	0.009	0.008	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.07	1.217	148	318.0	159.0
94M02	964051	9	615067	6543367	0	OSDRR	0.01	0.01	0.005	0.005	0.008	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.07	0.486	86	193.7	97.0
94M03	964053	9	614209	6545541	0	OSDRR	0.01	0.01	0.005	0.005	0.010	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.05	1.396	160	395.0	197.0
94M03	964055	9	614214	6548685	0	C	0.04	0.09	0.014	0.060	0.018	0.005	0.005	0.019	0.011	0.005	0.005	0.005	0.005	0.005	0.005	0.49	0.108	32	93.6	46.8
94M03	964057	9	610220	6552257	0	COK	0.01	0.01	0.005	0.005	0.008	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.06	0.963	140	350.0	175.0
94M03	964059	9	604560	6555783	0	C	0.01	0.01	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.06	3.425	138	618.0	309.0
94M03	964062	9	603412	6563179	0	PH	0.04	0.09	0.015	0.055	0.021	0.005	0.005	0.011	0.007	0.005	0.005	0.005	0.005	0.005	0.005	0.23	0.062	10	23.1	11.5
94M03	964064	9	593374	6560396	0	OSDRR	0.01	0.01	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.05	3.090	248	941.0	471.0
94M03	964066	9	594506	6558102	0	OSDRR	0.01	0.01	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.06	2.740	252	989.0	496.0
94M03	964068	9	594203	6555401	10	DME	0.01	0.01	0.005	0.006	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.04	0.693	160	638.0	319.0
94M03	964069	9	594203	6555401	20	DME	0.01	0.01	0.005	0.007	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.05	0.666	156	634.0	316.0
94M03	964070	9	594460	6551741	0	DME	0.01	0.01	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.03	8.245	88	584.0	293.0
94M03	964073	9	597370	6549641	0	OSDRR	0.01	0.01	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.03	6.755	204	949.0	474.0
94M03	964075	9	602367	6549551	0	OSDRR	0.01	0.01	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.02	5.211	196	817.0	410.0
94M03	964077	9	600698	6548345	0	OSDRR	0.01	0.01	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.01	5.056	196	820.0	410.0
94M03	964079	9	596972	6546793	0	DME	0.01	0.01	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.03	2.263	172	782.0	392.0

Analytical Data: Trace Elements

Map	Sample ID	UTM Zone	UTM East NAD 27	UTM North Nad 27	REP	Form	La 0.01 ppb ICP	Ce 0.01 ppb ICP	Pr 0.005 ppb ICP	Nd 0.005 ppb ICP	Sm 0.005 ppb ICP	Eu 0.005 ppb ICP	Tb 0.005 ppb ICP	Gd 0.005 ppb ICP	Dy 0.005 ppb ICP	Ho 0.005 ppb ICP	Er 0.005 ppb ICP	Tm 0.005 ppb ICP	Yb 0.005 ppb ICP	Lu 0.005 ppb ICP	Tl 0.005 ppb ICP	Pb 0.01 ppb ICP	U 0.005 ppb ICP	T-Alk 4 ppm TITRAT	Cond. uS ELECT	TDS mg/l ELECT
94M03	964082	9	595948	6547985	0	DME	0.01	0.01	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.03	6.654	208	943.0	471.0
94M03	964084	9	594070	6547397	0	OSDRR	0.01	0.01	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.04	12.089	188	696.0	348.0
94M03	964087	9	591206	6545606	0	COK	0.01	0.01	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.01	6.344	88	1270.0	635.0
94M03	964089	9	590179	6555425	0	PH	0.01	0.01	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.01	0.384	100	247.0	123.0
94M03	964091	9	599480	6544145	0	DME	0.01	0.01	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.04	42.499	160	815.0	408.0
94M03	964092	9	586832	6557103	10	PH	0.01	0.01	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.04	7.110	204	575.0	288.0
94M03	964093	9	586832	6557103	20	PH	0.01	0.01	0.005	0.005	0.005	0.006	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.05	7.06	200	572.0	286.0
94M03	964095	9	593159	6562024	0	OSDRR	0.01	0.01	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.01	16.633	132	1407.0	704.0
94M03	964097	9	593378	6563062	0	COK	0.01	0.01	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.01	7.474	112	420.0	211.0
94M03	964099	9	600413	6561780	0	COK	0.01	0.01	0.005	0.006	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.03	0.964	184	511.0	256.0
94M04	964102	9	584813	6564890	0	PH	0.01	0.01	0.005	0.009	0.005	0.005	0.005	0.005	0.005	0.005	0.006	0.005	0.005	0.005	0.005	0.06	2.525	200	529.0	265.0
94M04	964104	9	585260	6561355	0	PH	0.01	0.01	0.005	0.008	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.01	1.822	176	488.0	243.0
94M04	964105	9	584390	6561923	10	PH	0.01	0.01	0.005	0.012	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.04	11.926	214	541.0	271.0
94M04	964107	9	584390	6561923	20	PH	0.01	0.01	0.005	0.007	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.02	12.01	210	544.0	272.0
94M04	964109	9	585031	6557327	0	PH	0.01	0.01	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.01	6.065	280	590.0	294.0
94M04	964111	9	580954	6561453	0	C	0.01	0.01	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.04	8.294	284	681.0	341.0
94M04	964113	9	574448	6555537	0	CA	0.01	0.01	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.01	1.913	226	584.0	292.0
94M04	964115	9	572637	6558782	0	CA	0.01	0.01	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.01	1.303	232	586.0	293.0
94M04	964117	9	570884	6561326	0	CA	0.01	0.01	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.02	1.612	246	608.0	303.0
94M04	964119	9	567915	6567672	0	Q	0.01	0.01	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.01	0.070	104	214.0	106.0
94M04	964122	9	566881	6567901	0	CA	0.01	0.01	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.01	4.078	180	629.0	315.0
94M05	964124	9	566514	6569599	0	Q	0.01	0.01	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.02	1.987	202	529.0	265.0
94M05	964126	9	567119	6570292	10	Q	0.01	0.01	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.02	2.386	152	487.0	244.0
94M05	964127	9	567119	6570292	20	Q	0.01	0.01	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.01	2.364	148	494.0	247.0
94M04	964128	9	570773	6567825	0	PPc	0.01	0.01	0.005	0.008	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.08	15.968	392	997.0	499.0
94M04	964130	9	575522	6565448	0	PPc	0.01	0.01	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.02	6.103	136	176.0	238.0
94M05	964132	9	575532	6570773	0	PPc	0.01	0.01	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.03	0.437	158	344.0	173.0
94M05	964134	9	578662	6570381	0	PPc	0.01	0.01	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.03	16.976	264	1064.0	532.0
94M06	964136	9	592692	6572416	0	COKs	0.08	0.18	0.019	0.098	0.037	0.011	0.005	0.030	0.026	0.005	0.010	0.005	0.006	0.005	0.005	0.41	0.108	70	144.8	72.4
94M06	964138	9	588022	6571879	0	OSDRR	0.01	0.01	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.03	0.676	140	365.0	183.0
94M06	964142	9	586229	6574151	0	OSDRR	0.01	0.01	0.005	0.007	0.007	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.03	0.761	92	201.0	100.0
94M06	964144	9	590325	6578302	0	COKs	0.01	0.01	0.005	0.005	0.005	0.005	0.005	0.005	0.006	0.005	0.005	0.005	0.005	0.005	0.005	0.05	0.265	108	212.0	106.0
94M06	964146	9	587130	6581272	10	COKs	0.01	0.01	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.04	1.173	192	457.0	228.0
94M06	964147	9	587130	6581272	20	COKs	0.01	0.01	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.02	1.196	196	455.0	227.0
94M06	964148	9	588274	6582550	0	COKs	0.01	0.01	0.005	0.005	0.005	0.005	0.005	0.005	0.007	0.005	0.005	0.005	0.005	0.005	0.005	0.03	1.203	198	462.0	231.0
94M06	964150	9	589842	6583007	0	COKs	0.01	0.01	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.06	1.149	162	420.0	210.0
94M06	964152	9	586829	6588413	0	COKs	0.01	0.01	0.005	0.005	0.005	0.005	0.005	0.005	0.006	0.005	0.005	0.005	0.005	0.005	0.005	0.06	0.377	164	357.0	179.0
94M06	964155	9	586870	6591274	0	g	0.01	0.01	0.005	0.005	0.005	0.008	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.02	0.414	140	298.0	149.0
94M06	964157	9	587689	6593615	0	COKs	0.01	0.01	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.01	0.354	140	305.0	153.0
94M06	964159	9	590189	6589933	0	COKs	0.01	0.01	0.005	0.005	0.005	0.005	0.005	0.005	0.006	0.005	0.005	0.005	0.005	0.005	0.005	0.01	0.575	146	335.0	168.0

Analytical Data: Trace Elements

Map	Sample ID	UTM Zone	UTM East NAD 27	UTM North Nad 27	REP	Form	La 0.01 ppb ICP	Ce 0.01 ppb ICP	Pr 0.005 ppb ICP	Nd 0.005 ppb ICP	Sm 0.005 ppb ICP	Eu 0.005 ppb ICP	Tb 0.005 ppb ICP	Gd 0.005 ppb ICP	Dy 0.005 ppb ICP	Ho 0.005 ppb ICP	Er 0.005 ppb ICP	Tm 0.005 ppb ICP	Yb 0.005 ppb ICP	Lu 0.005 ppb ICP
94M06	964162	9	590822	6586685	0	COKs	0.01	0.01	0.005	0.005	0.005	0.011	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005
94M06	964163	9	590150	6586618	10	COKs	0.01	0.01	0.005	0.005	0.006	0.007	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005
94M06	964164	9	590150	6586618	20	COKs	0.01	0.01	0.005	0.005	0.005	0.012	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005
94M06	964166	9	592921	6584756	0	COKs	0.01	0.01	0.005	0.005	0.005	0.009	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005
94M06	964169	9	593497	6581961	0	COKs	0.01	0.01	0.005	0.006	0.005	0.011	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005
94M06	964171	9	595892	6578730	0	C	0.01	0.01	0.005	0.005	0.005	0.010	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005
94M12	964173	9	576626	6600916	0	OSDRR	0.01	0.01	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005
94M12	964175	9	574942	6601378	0	P	0.01	0.01	0.005	0.008	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005
94M12	964177	9	572684	6603905	0	OSDRR	0.01	0.01	0.005	0.007	0.005	0.008	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005
94M12	964179	9	567226	6608324	0	P	0.01	0.01	0.005	0.005	0.005	0.009	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005
94M12	964182	9	559350	6615937	0	Q	0.01	0.01	0.005	0.010	0.025	0.005	0.005	0.010	0.005	0.005	0.005	0.005	0.005	0.005
94M12	964184	9	560059	6620608	10	Q	0.01	0.02	0.005	0.015	0.005	0.005	0.005	0.005	0.009	0.005	0.005	0.005	0.005	0.005
94M12	964185	9	560059	6620608	20	Q	0.01	0.01	0.005	0.019	0.005	0.005	0.005	0.009	0.007	0.005	0.005	0.005	0.005	0.005
94M12	964187	9	557156	6622779	0	Q	0.01	0.01	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005
104P09	964189	9	555249	6623159	0	Q	0.01	0.01	0.005	0.005	0.005	0.007	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005
104P16	964191	9	550319	6624696	0	Q	0.01	0.01	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005
104P16	964193	9	551289	6626516	0	Q	0.01	0.01	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005
104P16	964195	9	544052	6631941	0	Q	0.01	0.01	0.005	0.006	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005
104P16	964197	9	530697	6639200	0	Q	0.01	0.01	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005
104P16	964199	9	536567	6645605	0	Q	0.01	0.01	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005
104P16	964202	9	538868	6646578	0	Q	0.01	0.01	0.005	0.005	0.005	0.006	0.005	0.006	0.005	0.005	0.005	0.005	0.005	0.005
104P16	964204	9	532951	6651106	0	Q	0.01	0.01	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.006	0.005	0.005	0.005
104P16	964206	9	532642	6649894	10	Q	0.01	0.01	0.005	0.005	0.005	0.005	0.005	0.006	0.005	0.005	0.005	0.005	0.005	0.005
104P16	964207	9	532642	6649894	20	Q	0.01	0.01	0.005	0.006	0.005	0.005	0.005	0.006	0.005	0.005	0.005	0.005	0.005	0.005
104P16	964208	9	533121	6649294	0	Q	0.01	0.01	0.005	0.005	0.005	0.005	0.005	0.009	0.005	0.005	0.009	0.005	0.005	0.005
104P16	964210	9	527939	6649769	0	Q	0.01	0.01	0.005	0.009	0.008	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005
104P16	964213	9	532692	6646655	0	Q	0.01	0.01	0.005	0.005	0.009	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005
104P16	964215	9	532095	6644718	0	Q	0.01	0.01	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005
104P16	964217	9	528397	6634980	0	Q	0.01	0.01	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005
104P15	964219	9	525681	6633273	0	Q	0.01	0.01	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005
104P15	964222	9	524942	6628725	10	Q	0.01	0.01	0.005	0.006	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005
104P15	964223	9	524942	6628725	20	Q	0.01	0.01	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005
104P15	964224	9	523478	6628413	0	Q	0.01	0.01	0.005	0.010	0.005	0.005	0.005	0.008	0.005	0.005	0.005	0.005	0.005	0.005
104P16	964226	9	528835	6625606	0	Q	-1.00	-1.00	-1.000	-1.000	-1.000	-1.000	-1.000	-1.000	-1.000	-1.000	-1.000	-1.000	-1.000	-1.000
104P15	964228	9	525718	6624439	0	Q	0.01	0.01	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005
104P15	964231	9	523935	6623548	0	Q	0.01	0.01	0.005	0.006	0.005	0.007	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005
104P09	964233	9	528383	6622720	0	Q	0.01	0.01	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005
104P10	964235	9	526107	6621166	0	Q	0.04	0.05	0.011	0.052	0.005	0.006	0.005	0.024	0.008	0.005	0.005	0.005	0.006	0.005
104P10	964237	9	524987	6621527	0	Q	0.02	0.04	0.009	0.039	0.010	0.005	0.005	0.009	0.012	0.005	0.005	0.005	0.014	0.005
104P09	964239	9	532947	6622415	0	Q	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00

Analytical Data: Trace Elements

Map	Sample ID	UTM Zone	UTM East NAD 27	UTM North Nad 27	REP	Form	La 0.01 ppb ICP	Ce 0.01 ppb ICP	Pr 0.005 ppb ICP	Nd 0.005 ppb ICP	Sm 0.005 ppb ICP	Eu 0.005 ppb ICP	Tb 0.005 ppb ICP	Gd 0.005 ppb ICP	Dy 0.005 ppb ICP	Ho 0.005 ppb ICP	Er 0.005 ppb ICP	Tm 0.005 ppb ICP	Yb 0.005 ppb ICP	Lu 0.005 ppb ICP	Tl 0.005 ppb ICP	Pb 0.01 ppb ICP	U 0.005 ppb ICP	T-Alk 4 ppm TITRAT	Cond. uS ELECT	TDS mg/l ELECT
104P09	964242	9	537535	6620930	0	Q	0.01	0.01	0.005	0.005	0.005	0.006	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.03	0.064	130	286.0	143.0
104P09	964245	9	535686	6620533	0	Q	0.01	0.01	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.01	0.016	62	144.6	72.2
104P09	964247	9	533177	6618205	0	Q	0.01	0.01	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.01	0.534	84	197.7	98.9
94M06	964249	9	593716	6570834	0	COKs	0.01	0.01	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.01	2.722	134	479.0	239.0
94M06	964251	9	592362	6569609	0	COKs	0.01	0.01	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.01	2.788	138	477.0	238.0
94M06	964253	9	595531	6572166	0	COKs	0.01	0.01	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.01	1.907	148	463.0	231.0
94M06	964255	9	597388	6572660	0	PH	0.01	0.01	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.02	1.809	126	385.0	193.0
94M06	964257	9	598608	6572814	0	PH	0.01	0.01	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.01	3.672	140	460.0	230.0
94M06	964259	9	600492	6574756	0	C	0.01	0.01	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.01	1.687	130	447.0	223.0
94M06	964262	9	600949	6573895	0	OSDRR	0.01	0.01	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.01	2.134	130	557.0	278.0
94M06	964263	9	601203	6574256	20	OSDRR	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	0.625	180	-1.0	-1.0
94M06	964264	9	601203	6574256	10	OSDRR	0.01	0.01	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.02	1.340	160	441.0	220.0
94M06	964266	9	602208	6574734	0	OSDRR	0.01	0.01	0.005	0.005	0.006	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.02	0.871	150	381.0	190.0
94M06	964268	9	602783	6575604	0	C	0.01	0.01	0.005	0.005	0.010	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.02	2.302	210	544.0	272.0
94M06	964270	9	603345	6577450	0	C	0.01	0.01	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.01	0.956	128	279.0	139.0
94M06	964272	9	592456	6568817	0	COK	0.01	0.01	0.005	0.005	0.005	0.005	0.005	0.007	0.007	0.005	0.005	0.005	0.005	0.005	0.005	0.03	1.423	160	468.0	233.0
94M03	964274	9	591431	6567501	0	COK	0.01	0.01	0.005	0.005	0.007	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.01	2.596	146	460.0	229.0
94M03	964277	9	587785	6564790	0	PH	0.01	0.01	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.01	3.368	136	395.0	197.0
94M03	964279	9	586153	6563450	0	PH	0.01	0.01	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.03	4.404	204	502.0	251.0
104P09	964282	9	542478	6612505	0	Q	0.01	0.01	0.005	0.005	0.005	0.005	0.005	0.007	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.02	0.185	178	369.0	184.0
104P09	964284	9	540693	6614457	10	Q	0.01	0.01	0.005	0.005	0.005	0.005	0.005	0.005	0.007	0.005	0.005	0.005	0.005	0.005	0.005	0.02	0.834	94	211.0	106.0
104P09	964285	9	540693	6614457	20	Q	0.01	0.01	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.03	0.797	96	215.0	107.0
104P09	964286	9	539721	6615342	0	Q	0.01	0.01	0.005	0.005	0.005	0.005	0.005	0.010	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.02	0.463	88	194.1	96.6
104P09	964288	9	536970	6618452	0	Q	0.01	0.01	0.005	0.008	0.005	0.005	0.005	0.010	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.02	0.021	42	89.3	44.6
104P09	964290	9	533498	6613833	0	C	0.01	0.01	0.005	0.005	0.005	0.005	0.005	0.010	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.02	0.846	166	377.0	188.0
104P09	964293	9	532300	6614739	0	C	0.01	0.01	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.03	0.802	140	331.0	166.0
104P10	964295	9	527962	6616288	0	CA	0.01	0.01	0.005	0.011	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.02	1.119	156	364.0	182.0
104P16	964297	9	533390	6628247	0	Q	0.01	0.01	0.005	0.010	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.01	0.324	142	309.0	154.0
104P16	964299	9	534323	6626643	0	Q	0.01	0.01	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.02	0.364	100	213.0	106.0
104P16	964302	9	539736	6628918	0	Q	0.01	0.01	0.005	0.009	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.01	0.213	166	357.0	178.0
104P16	964304	9	537915	6630251	0	Q	0.01	0.01	0.005	0.005	0.005	0.007	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.01	0.869	150	340.0	169.0
104P16	964306	9	537437	6629084	0	Q	0.01	0.01	0.005	0.009	0.005	0.010	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.02	1.463	194	456.0	227.0
104P16	964307	9	538764	6625977	10	Q	0.01	0.01	0.005	0.005	0.011	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.03	0.125	106	227.0	114.0
104P16	964308	9	538764	6625977	20	Q	0.01	0.01	0.005	0.007	0.005	0.005	0.005	0.016	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.02	0.107	106	232.0	116.0
104P09	964310	9	544091	6620417	0	Q	0.01	0.01	0.005	0.006	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.010	0.005	0.005	0.03	0.308	182	392.0	196.0
104P09	964312	9	544166	6619414	0	Q	0.01	0.01	0.005	0.014	0.012	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.03	0.420	186	404.0	202.0
104P09	964314	9	549728	6615469	0	Q	0.01	0.01	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.006	0.005	0.005	0.02	1.902	162	326.0	163.0
104P09	964316	9	551645	6614921	0	Q	0.01	0.01	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.007	0.005	0.005	0.005	0.005	0.01	0.383	142	315.0	157.0
94M12	964319	9	565692	6603733	0	OSDRR	0.01	0.01	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.01	1.157	60	442.0	221.0
104P09	964322	9	555108	6616023	0	Q	0.01	0.01	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.006	0.005	0.005	0.01	0.028	118	255.0	127.0

Analytical Data: Trace Elements

Map	Sample ID	UTM Zone	UTM East NAD 27	UTM North Nad 27	REP	Form	La 0.01 ppb ICP	Ce 0.01 ppb ICP	Pr 0.005 ppb ICP	Nd 0.005 ppb ICP	Sm 0.005 ppb ICP	Eu 0.005 ppb ICP	Tb 0.005 ppb ICP	Gd 0.005 ppb ICP	Dy 0.005 ppb ICP	Ho 0.005 ppb ICP	Er 0.005 ppb ICP	Tm 0.005 ppb ICP	Yb 0.005 ppb ICP	Lu 0.005 ppb ICP	Tl 0.005 ppb ICP	Pb 0.01 ppb ICP	U 0.005 ppb ICP	T-Alk 4 ppm TITRAT	Cond. uS ELECT	TDS mg/l ELECT
104P09	964324	9	553843	6618001	10	Q	0.01	0.01	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.01	0.558	160	333.0	166.0
104P09	964325	9	553843	6618001	20	Q	0.01	0.01	0.005	0.005	0.005	0.01	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.01	0.58	148	340.0	170.0
104P09	964326	9	554258	6621007	0	Q	0.01	0.01	0.005	0.013	0.005	0.008	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.006	0.01	0.467	136	284.0	141.0
104P09	964328	9	551446	6620865	0	Q	0.01	0.01	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.009	0.005	0.005	0.01	0.304	112	239.0	119.0
104P09	964330	9	550165	6620783	0	Q	0.01	0.01	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.01	0.010	164	277.0	138.0
104P09	964332	9	548586	6622334	0	Q	0.01	0.01	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.01	0.331	152	254.0	127.0
104P16	964334	9	547678	6625129	0	Q	0.01	0.01	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.01	0.102	156	365.0	182.0
104P16	964337	9	546108	6628787	0	Q	0.01	0.01	0.005	0.006	0.005	0.005	0.005	0.008	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.01	0.005	60	81.8	40.8
104P16	964339	9	545305	6625995	0	Q	0.01	0.01	0.005	0.005	0.005	0.008	0.005	0.005	0.005	0.005	0.005	0.005	0.006	0.005	0.005	0.03	0.436	184	345.0	172.0
104P16	964342	9	542598	6625872	10	Q	0.01	0.01	0.005	0.005	0.005	0.005	0.005	0.010	0.008	0.005	0.005	0.005	0.005	0.005	0.005	0.02	0.763	200	360.0	180.0
104P16	964343	9	542598	6625872	20	Q	0.01	0.01	0.005	0.005	0.005	0.005	0.005	0.008	0.01	0.005	0.005	0.005	0.005	0.005	0.005	0.03	0.813	200	359.0	179.0
104P16	964344	9	541290	6625908	0	Q	0.01	0.01	0.005	0.005	0.011	0.005	0.005	0.005	0.010	0.005	0.005	0.005	0.005	0.005	0.005	0.01	0.203	184	290.0	145.0
104P09	964346	9	547391	6621858	0	Q	0.01	0.01	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.02	0.270	168	235.0	118.0
104P09	964348	9	547087	6618543	0	Q	0.01	0.01	0.005	0.005	0.008	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.03	0.097	180	319.0	159.0
104P09	964351	9	554229	6609869	0	Q	0.01	0.01	0.005	0.005	0.008	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.01	1.230	160	427.0	213.0
94M05	964356	9	584658	6578049	0	OSDRR	0.01	0.01	0.005	0.005	0.006	0.005	0.005	0.005	0.010	0.005	0.005	0.005	0.005	0.005	0.005	0.11	1.594	240	576.0	288.0
94M05	964357	9	584265	6578354	0	OSDRR	0.01	0.01	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.04	2.744	192	460.0	230.0
94M05	964359	9	581677	6579024	0	OSDRR	0.01	0.01	0.005	0.005	0.007	0.005	0.005	0.013	0.009	0.005	0.005	0.005	0.005	0.005	0.005	0.02	0.158	120	232.0	116.0
94M05	964362	9	581406	6585895	0	COKs	0.01	0.01	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.02	0.259	72	132.9	66.4
94M05	964363	9	579600	6588221	10	OSDRR	0.01	0.01	0.005	0.016	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.02	0.038	36	50.4	25.2
94M05	964364	9	579600	6588221	20	OSDRR	0.01	0.01	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.01	0.036	28	50.1	24.9
94M05	964366	9	583852	6589842	0	COKs	0.01	0.01	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.01	0.763	144	304.0	152.0
94M05	964368	9	584518	6592640	0	COKs	0.01	0.01	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.01	0.084	120	189.7	94.9
94M12	964371	9	584569	6597157	0	COKs	0.01	0.01	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.01	0.596	172	395.0	197.0
94M12	964373	9	572258	6600538	0	P	0.01	0.01	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.02	5.593	124	803.0	402.0
94M12	964375	9	571265	6600220	0	P	0.01	0.01	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.01	1.570	108	519.0	260.0
94M12	964377	9	571033	6602804	0	P	0.01	0.01	0.005	0.007	0.005	0.006	0.005	0.008	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.01	0.394	108	208.0	104.0
94M12	964379	9	569534	6600509	0	P	0.01	0.01	0.005	0.005	0.005	0.005	0.005	0.008	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.02	3.718	84	601.0	300.0
94M12	964383	9	567008	6599159	0	Q	0.01	0.01	0.005	0.005	0.006	0.009	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.02	0.405	156	253.0	126.0
94M12	964385	9	568734	6598194	0	Q	0.01	0.01	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.02	1.404	256	444.0	222.0
94M05	964387	9	570337	6593143	0	P	0.01	0.01	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.03	0.769	160	735.0	367.0
94M05	964389	9	577707	6582936	0	OSDRR	0.01	0.01	0.005	0.005	0.005	0.005	0.005	0.005	0.008	0.005	0.005	0.005	0.005	0.005	0.005	0.01	12.660	148	954.0	478.0
94M05	964391	9	574633	6580445	0	COK	0.01	0.01	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.02	5.833	196	815.0	407.0
94M05	964393	9	570606	6586170	0	Q	0.01	0.01	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.02	0.059	92	195.9	98.0
94M05	964395	9	568741	6588384	10	Q	0.01	0.01	0.005	0.005	0.005	0.005	0.005	0.005	0.006	0.005	0.005	0.005	0.005	0.005	0.005	0.03	1.093	196	393.0	197.0
94M05	964396	9	568741	6588384	20	Q	0.01	0.01	0.005	0.005	0.005	0.006	0.005	0.006	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.02	1.164	224	394.0	197.0
94M05	964397	9	568252	6588556	0	Q	0.01	0.01	0.005	0.005	0.005	0.009	0.005	0.005	0.007	0.005	0.005	0.005	0.005	0.005	0.005	0.03	1.428	200	396.0	198.0
94M05	964399	9	569191	6591592	0	Q	0.01	0.01	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.02	0.029	152	227.0	113.0
94M12	964402	9	564867	6600584	0	Q	0.01	0.01	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.02	1.391	180	403.0	201.0
94M12	964403	9	564592	6601089	10	Q	0.01	0.01	0.005	0.005	0.005	0.009	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.02	1.354	184	392.0	195.0

Analytical Data: Trace Elements

Map	Sample ID	UTM Zone	UTM East NAD 27	UTM North Nad 27	REP	Form	La 0.01 ppb ICP	Ce 0.01 ppb ICP	Pr 0.005 ppb ICP	Nd 0.005 ppb ICP	Sm 0.005 ppb ICP	Eu 0.005 ppb ICP	Tb 0.005 ppb ICP	Gd 0.005 ppb ICP	Dy 0.005 ppb ICP	Ho 0.005 ppb ICP	Er 0.005 ppb ICP	Tm 0.005 ppb ICP	Yb 0.005 ppb ICP	Lu 0.005 ppb ICP	Tl 0.005 ppb ICP	Pb 0.01 ppb ICP	U 0.005 ppb ICP	T-Alk 4 ppm TITRAT	Cond. uS ELECT	TDS mg/l ELECT
94M12	964404	9	564592	6601089	20	Q	0.01	0.01	0.005	0.005	0.005	0.007	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.03	1.291	188	430.0	215.0
94M12	964406	9	561515	6607600	0	Q	0.03	0.05	0.009	0.023	0.006	0.008	0.005	0.007	0.011	0.005	0.005	0.005	0.005	0.005	0.005	0.12	0.184	36	76.5	38.2
94M12	964408	9	557899	6613739	0	Q	0.01	0.01	0.005	0.005	0.006	0.008	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.02	0.490	196	305.0	152.0
94M12	964410	9	557267	6611679	0	Q	0.01	0.01	0.005	0.005	0.005	0.007	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.02	0.510	140	364.0	181.0
94M12	964412	9	557215	6608948	0	Q	0.01	0.01	0.005	0.012	0.005	0.009	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.02	0.076	168	282.0	141.0
94M12	964414	9	556897	6606822	0	Q	0.01	0.01	0.005	0.005	0.009	0.026	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.02	0.134	168	373.0	186.0
94M12	964416	9	558416	6602648	0	Q	0.01	0.01	0.005	0.005	0.010	0.008	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.02	0.935	188	428.0	214.0
94M12	964418	9	560183	6601312	0	Q	0.01	0.01	0.005	0.005	0.005	0.007	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.03	1.899	220	465.0	232.0
94M12	964422	9	562157	6602173	0	Q	0.01	0.01	0.005	0.005	0.005	0.009	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.03	1.222	168	415.0	207.0
94M12	964424	9	563470	6601261	0	Q	0.01	0.01	0.005	0.005	0.005	0.007	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.02	1.249	180	400.0	199.0
94M12	964426	9	562634	6599788	0	Q	0.01	0.01	0.005	0.005	0.012	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.02	1.676	244	425.0	212.0
94M12	964428	9	563634	6596951	0	Q	0.01	0.01	0.005	0.005	0.005	0.006	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.02	2.416	280	596.0	237.0
94M12	964430	9	566114	6596616	0	Q	0.01	0.01	0.005	0.005	0.005	0.005	0.005	0.006	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.05	1.428	300	518.0	259.0
94M12	964431	9	566699	6597388	10	Q	0.01	0.01	0.005	0.005	0.005	0.006	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.02	1.666	284	473.0	236.0
94M12	964432	9	566699	6597388	20	Q	0.01	0.01	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.03	1.648	284	474.0	237.0
94M05	964435	9	564509	6594534	0	Q	0.01	0.01	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.01	1.676	288	466.0	232.0
94M05	964437	9	564161	6595530	0	Q	0.01	0.01	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.04	1.808	268	568.0	284.0
104P09	964439	9	556280	6605578	0	Q	0.01	0.01	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.01	0.096	96	167.2	83.7
104P09	964442	9	554251	6605583	0	Q	0.01	0.01	0.005	0.005	0.005	0.006	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.01	1.218	156	249.0	124.0
104P09	964445	9	550426	6604695	0	Q	0.01	0.01	0.005	0.005	0.005	0.008	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.02	0.573	192	387.0	193.0
104P09	964447	9	549193	6606622	0	Q	0.01	0.01	0.005	0.005	0.005	0.016	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.01	1.066	172	460.0	230.0
104P09	964449	9	545103	6609940	0	Q	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	0.270	212	-1.0	-1.0
104P09	964450	9	540732	6609391	10	Q	0.01	0.01	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.01	0.016	92	141.1	70.5
104P09	964451	9	540732	6609391	20	Q	0.01	0.01	0.005	0.005	0.005	0.008	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.02	0.017	88	140.3	70.1
104P09	964453	9	540847	6605061	0	Q	0.01	0.01	0.005	0.005	0.008	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.01	0.054	188	289.0	144.0
104P09	964455	9	542361	6603351	0	Q	0.02	0.04	0.005	0.031	0.010	0.005	0.005	0.007	0.007	0.005	0.008	0.005	0.005	0.005	0.005	0.04	0.072	42	69.5	34.6
104P09	964457	9	549021	6602541	0	Q	0.01	0.01	0.005	0.005	0.008	0.008	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.01	0.011	104	179.8	89.8
104P09	964459	9	547679	6601939	0	Q	0.01	0.01	0.005	0.008	0.006	0.009	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.01	0.652	176	296.0	148.0
104P09	964462	9	552647	6598202	0	Q	0.01	0.01	0.005	0.005	0.005	0.011	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.01	1.414	196	388.0	194.0
104P09	964464	9	545359	6597998	0	Q	0.01	0.01	0.005	0.005	0.005	0.006	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.01	1.766	200	458.0	229.0
104P09	964465	9	546976	6596713	20	Q	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	0.168	160	-1.0	-1.0
104P09	964466	9	546976	6596713	10	Q	0.01	0.01	0.005	0.005	0.005	0.007	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.01	0.374	140	237.0	118.0
104P09	964469	9	552727	6599981	0	Q	0.01	0.01	0.005	0.007	0.005	0.013	0.005	0.005	0.006	0.005	0.005	0.005	0.005	0.005	0.005	0.01	0.052	120	197.0	98.0
104P09	964471	9	555461	6601768	0	Q	0.01	0.01	0.005	0.005	0.005	0.014	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.01	0.449	180	299.0	149.0
104P09	964473	9	556500	6599349	0	Q	0.01	0.01	0.005	0.005	0.005	0.006	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.01	0.505	152	304.0	152.0
104P08	964475	9	551600	6588600	0	Q	0.01	0.01	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.02	2.208	204	390.0	195.0
104P08	964477	9	556000	6587800	0	Q	0.01	0.01	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.02	3.373	296	482.0	241.0
94M05	964479	9	557646	6588528	0	Q	0.01	0.01	0.005	0.025	0.009	0.010	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.02	3.667	300	462.0	231.0
94M06	964482	9	589676	6570082	0	COKs	0.01	0.01	0.005	0.008	0.005	0.005	0.005	0.005	0.006	0.005	0.005	0.005	0.005	0.005	0.005	0.01	2.301	156	426.0	212.0
94M06	964484	9	589562	6569309	0	PH	0.01	0.02	0.005	0.023	0.015	0.009	0.005	0.005	0.009	0.005	0.005	0.005	0.005	0.005	0.005	0.05	1.492	120	216.0	108.0

Analytical Data: Trace Elements

Map	Sample ID	UTM Zone	UTM East NAD 27	UTM North Nad 27	REP	Form	La 0.01 ppb ICP	Ce 0.01 ppb ICP	Pr 0.005 ppb ICP	Nd 0.005 ppb ICP	Sm 0.005 ppb ICP	Eu 0.005 ppb ICP	Tb 0.005 ppb ICP	Gd 0.005 ppb ICP	Dy 0.005 ppb ICP	Ho 0.005 ppb ICP	Er 0.005 ppb ICP	Tm 0.005 ppb ICP	Yb 0.005 ppb ICP	Lu 0.005 ppb ICP
94M03	964486	9	585933	6568003	0	PH	0.01	0.01	0.005	0.012	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005
94M05	964487	9	572972	6573687	10	PPc	0.01	0.01	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005
94M05	964488	9	572972	6573687	20	PPc	0.01	0.01	0.005	0.006	0.008	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005
94M05	964490	9	566869	6572055	0	Q	0.01	0.01	0.005	0.007	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005
94M05	964492	9	567545	6573358	0	PPc	0.01	0.01	0.005	0.005	0.006	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005
94M05	964495	9	566576	6574234	0	PPc	0.01	0.01	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005
94M05	964497	9	565523	6577174	0	PPc	0.01	0.01	0.005	0.006	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005
94M05	964499	9	564899	6582167	0	PPc	0.01	0.01	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005
94M05	964502	9	560400	6575874	0	Q	0.01	0.01	0.005	0.013	0.009	0.008	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005
94M05	964503	9	558704	6578805	10	Q	0.01	0.01	0.005	0.010	0.010	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005
94M05	964504	9	558704	6578805	20	Q	0.01	0.01	0.005	0.014	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005
94M05	964507	9	563623	6580007	0	PPc	0.01	0.01	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005
94M05	964508	9	562420	6581631	0	PPc	0.01	0.01	0.005	0.006	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005
94M05	964510	9	562058	6582912	0	PPc	0.01	0.01	0.005	0.011	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005
104P08	964512	9	556125	6582650	0	Q	0.03	0.05	0.006	0.039	0.007	0.010	0.005	0.005	0.011	0.005	0.007	0.005	0.005	0.005
104P08	964515	9	555450	6584050	0	Q	0.01	0.01	0.005	0.008	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005
94M05	964517	9	560688	6590582	0	Q	0.01	0.01	0.005	0.005	0.008	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005
94M05	964519	9	564271	6592691	0	Q	0.01	0.01	0.005	0.005	0.007	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005
94M05	964522	9	580414	6577743	10	OSDRR	0.01	0.01	0.005	0.006	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005
94M05	964523	9	580414	6577743	20	OSDRR	0.01	0.01	0.005	0.007	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005
94M05	964524	9	581057	6576325	0	OSDRR	0.01	0.01	0.005	0.005	0.006	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005

Regional Lake Water Geochemistry
of the Northern Kechika Trough
(94M/2, 3, 4, 5, 6, 12; 104P/8, 9, 10, 15, 16)

Open File 1999-6

Appendix B

Analytical Duplicate Data

Notes :

- Analytical repeats (21 samples) and control water analyses were conducted by ICP-MS at the Analytical Method Development Laboratory, Geological Survey of Canada, Ottawa.
- Analytical precision of conductivity/TDS measurements with the Corning Checkmate 90 conductivity/TDS meter was determined at the Analytical Sciences Laboratory, Victoria, using 10 replicate analyses of each of 4 randomly-selected lake water samples and an aliquot of distilled water.

Table 1

Analytical Repeat Data: ICP-MS

	Li	Be	Al	Ti	V	Cr	Fe	Mn	Co	Ni	Cu	Zn	As	Rb	Sr	Y	Mo	Cd	In	Sb	Cs	Ba	La	Ce
	0.005	0.005	2	0.5	0.1	0.3	10	0.1	0.05	0.2	0.1	0.5	0.1	0.05	0.5	0.01	0.05	0.05	0.01	0.01	0.01	0.2	0.01	0.01
	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
	ICPMS	ICPMS	ICPMS	ICPMS	ICPMS	ICPMS	ICPMS	ICPMS	ICPMS	ICPMS	ICPMS	ICPMS	ICPMS	ICPMS	ICPMS	ICPMS	ICPMS	ICPMS	ICPMS	ICPMS	ICPMS	ICPMS	ICPMS	ICPMS
94M 964010	6.377	0.005	3	0.7	0.1	0.3	64	7.9	0.07	0.7	0.6	0.9	0.1	0.10	128.6	0.02	0.32	0.06	0.01	0.05	0.01	62.8	0.01	0.01
94M 964010	6.658	0.005	3	0.8	0.1	0.3	80	8.7	0.06	0.7	0.6	1.2	0.1	0.11	127.5	0.02	0.30	0.05	0.01	0.06	0.01	67.5	0.01	0.01
94M 964026	2.645	0.005	3	0.5	0.3	0.4	12	1.6	0.05	0.7	0.2	1.1	0.2	0.12	185.1	0.01	0.70	0.05	0.01	0.07	0.01	228.3	0.01	0.01
94M 964026	2.687	0.005	2	0.5	0.2	0.3	29	1.8	0.05	0.6	0.2	1.2	0.3	0.14	181.8	0.01	0.74	0.05	0.01	0.08	0.01	235.5	0.01	0.01
94M 964059	3.403	0.005	4	0.5	0.2	0.3	10	6.0	0.05	3.6	0.3	6.1	0.2	0.42	343.5	0.01	3.39	0.05	0.01	0.11	0.01	78.2	0.01	0.01
94M 964059	3.503	0.005	2	0.6	0.1	0.3	10	6.4	0.05	3.4	0.4	7.0	0.2	0.43	352.4	0.01	3.65	0.05	0.01	0.12	0.01	80.6	0.01	0.01
94M 964064	5.808	0.005	3	1.1	0.2	0.4	10	1.6	0.05	1.4	0.1	1.5	0.8	0.58	575.1	0.01	2.06	0.05	0.01	0.09	0.01	40.4	0.01	0.01
94M 964064	5.805	0.005	2	1.2	0.1	0.3	10	1.7	0.05	1.0	0.1	1.5	0.8	0.59	592.2	0.01	2.13	0.06	0.01	0.11	0.01	42.5	0.01	0.01
94M 964075	3.921	0.005	2	1.0	0.3	0.3	10	1.0	0.05	2.2	0.3	1.4	0.6	0.43	319.6	0.01	3.03	0.05	0.01	0.08	0.01	34.3	0.01	0.01
94M 964075	3.834	0.005	2	1.3	0.1	0.3	10	1.0	0.05	1.7	0.4	1.6	0.7	0.45	318.0	0.01	3.09	0.05	0.01	0.10	0.01	35.0	0.01	0.01
94M 964087	10.472	0.005	5	1.2	0.7	0.3	10	3.9	0.20	3.0	1.2	1.3	0.7	0.82	752.9	0.02	2.88	0.05	0.01	0.38	0.01	42.3	0.01	0.01
94M 964087	10.695	0.005	4	1.3	0.6	0.3	10	4.2	0.23	2.1	1.4	1.6	0.9	0.89	781.8	0.02	2.89	0.05	0.01	0.39	0.01	44.1	0.01	0.01
94M 964130	4.915	0.005	8	1.0	0.5	0.3	12	3.3	0.06	0.4	0.3	1.1	0.2	1.80	353.6	0.01	0.36	0.05	0.01	0.03	0.01	6.8	0.01	0.01
94M 964130	5.307	0.005	8	1.1	0.5	0.3	26	3.6	0.08	0.2	0.4	1.4	0.3	2.00	352.0	0.01	0.43	0.05	0.01	0.03	0.01	7.5	0.01	0.01
94M 964162	4.009	0.005	10	0.6	0.2	0.3	10	0.2	0.05	0.2	0.3	2.1	0.9	0.54	314.8	0.01	0.64	0.05	0.01	0.03	0.01	125.7	0.01	0.01
94M 964162	4.075	0.005	9	0.7	0.1	0.3	10	0.2	0.05	0.3	0.3	2.2	1.1	0.56	317.7	0.01	0.67	0.05	0.01	0.04	0.01	124.2	0.01	0.01
94M 964169	2.868	0.005	8	0.5	0.1	0.3	78	0.5	0.05	1.0	0.5	2.1	0.5	0.19	265.3	0.02	0.68	0.05	0.01	0.13	0.01	85.0	0.01	0.01
94M 964169	2.789	0.005	8	0.5	0.1	0.3	103	0.6	0.05	0.9	0.6	1.2	0.6	0.20	265.3	0.01	0.70	0.05	0.01	0.14	0.01	86.9	0.01	0.01
94M 964195	3.377	0.007	2	1.5	0.4	0.6	41	24.3	0.05	0.6	0.3	0.7	0.8	0.53	284.8	0.02	1.05	0.05	0.01	0.06	0.01	387.7	0.01	0.01
94M 964195	3.156	0.005	2	1.9	0.2	0.3	48	21.2	0.09	0.7	0.3	0.7	0.7	0.47	246.0	0.01	1.03	0.05	0.01	0.05	0.01	353.0	0.01	0.01
94M 964241	0.005	0.005	2	0.5	0.1	0.3	46	0.1	0.05	0.2	0.1	0.5	0.1	0.05	0.5	0.01	0.05	0.05	0.01	0.01	0.01	0.4	0.01	0.01
94M 964241	0.005	0.005	2	0.5	0.1	0.3	18	0.1	0.05	0.2	0.1	0.5	0.1	0.05	0.5	0.01	0.05	0.05	0.01	0.01	0.01	0.5	0.01	0.01
94M 964255	8.895	0.005	2	0.5	0.3	0.4	26	0.3	0.05	0.2	0.4	0.8	0.1	0.25	308.0	0.01	1.62	0.05	0.01	0.08	0.01	53.5	0.01	0.01
94M 964255	8.527	0.005	2	0.8	0.1	0.3	10	0.2	0.05	0.5	0.4	0.8	0.1	0.25	280.0	0.01	1.68	0.05	0.01	0.08	0.01	50.9	0.01	0.01
94M 964268	10.303	0.005	2	0.7	0.4	0.8	21	0.4	0.05	0.2	0.1	0.9	0.2	0.27	462.6	0.01	1.05	0.05	0.01	0.05	0.01	52.0	0.01	0.01
94M 964268	8.989	0.005	2	0.7	0.2	0.3	10	0.3	0.05	0.5	0.2	0.7	0.1	0.24	408.6	0.01	1.04	0.05	0.01	0.06	0.01	48.5	0.01	0.01
94M 964285	4.603	0.005	4	0.5	0.3	0.4	22	0.4	0.05	0.2	0.3	0.6	0.8	0.80	162.4	0.01	0.61	0.05	0.01	0.05	0.01	143.6	0.01	0.01
94M 964285	3.900	0.005	4	0.5	0.2	0.3	32	0.4	0.05	0.2	0.3	0.6	0.7	0.68	136.7	0.01	0.51	0.05	0.01	0.04	0.01	119.0	0.01	0.01
94M 964302	2.251	0.005	2	1.1	0.3	0.6	27	0.5	0.05	0.2	0.2	0.8	0.8	0.49	222.9	0.01	0.94	0.05	0.01	0.02	0.01	273.1	0.01	0.01
94M 964302	2.364	0.005	2	1.5	0.1	0.3	11	0.4	0.05	0.2	0.2	0.7	0.7	0.46	208.9	0.01	0.90	0.05	0.01	0.02	0.01	252.4	0.01	0.01
94M 964308	0.768	0.014	8	0.5	0.3	0.5	41	0.6	0.05	0.2	0.3	0.8	0.3	0.60	133.1	0.01	0.24	0.05	0.01	0.03	0.01	171.6	0.01	0.01
94M 964308	0.777	0.005	9	0.6	0.2	0.3	36	0.5	0.05	0.2	0.3	0.8	0.3	0.59	125.4	0.01	0.25	0.05	0.01	0.01	0.01	153.9	0.01	0.01
94M 964356	8.781	0.018	3	1.1	0.3	0.4	43	1.0	0.05	0.5	0.5	2.0	0.9	0.56	508.2	0.01	0.71	0.07	0.01	0.10	0.01	58.9	0.01	0.01
94M 964356	7.659	0.005	3	1.2	0.3	0.3	38	0.8	0.08	0.5	0.4	1.7	0.9	0.49	455.4	0.01	0.56	0.05	0.01	0.09	0.01	58.8	0.01	0.01
94M 964393	0.696	0.005	4	0.6	0.1	0.3	41	2.7	0.05	0.2	0.2	0.5	0.1	0.05	109.5	0.01	1.24	0.05	0.01	0.06	0.01	16.2	0.01	0.01
94M 964393	0.725	0.005	4	0.9	0.1	0.3	18	2.6	0.05	0.2	0.2	0.6	0.1	0.05	111.4	0.01	1.27	0.05	0.01	0.06	0.01	16.1	0.01	0.01
94M 964450	0.516	0.005	6	0.5	0.1	0.3	39	0.3	0.05	0.2	0.1	0.5	0.7	1.32	98.2	0.01	0.10	0.05	0.01	0.03	0.01	96.9	0.01	0.01
94M 964450	0.516	0.005	5	0.5	0.1	0.3	32	0.2	0.05	0.2	0.1	0.5	0.6	1.28	97.0	0.01	0.10	0.05	0.01	0.03	0.01	92.3	0.01	0.01
94M 964490	9.305	0.005	2	0.9	0.2	0.3	26	0.3	0.05	0.3	0.1	0.8	0.1	0.36	205.8	0.01	0.90	0.05	0.01	0.03	0.01	13.3	0.01	0.01
94M 964490	9.112	0.005	2	1.0	0.2	0.3	26	0.3	0.05	0.3	0.1	0.7	0.1	0.37	200.7	0.01	0.84	0.05	0.01	0.03	0.01	12.8	0.01	0.01
94M 964510	3.808	0.009	2	0.5	0.2	0.3	33	0.6	0.05	0.4	0.2	0.6	0.5	1.27	243.4	0.01	0.48	0.05	0.01	0.05	0.01	48.0	0.01	0.01
94M 964510	3.770	0.005	2	0.5	0.2	0.3	47	0.7	0.05	0.5	0.2	0.5	0.4	1.20	242.6	0.01	0.43	0.05	0.01	0.06	0.01	46.1	0.01	0.01

Table 1

Analytical Repeat Data: ICP-MS

	Pr	Nd	Sm	Eu	Tb	Gd	Dy	Ho	Er	Tm	Yb	Lu	Tl	Pb	U
	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.01	0.005
	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
	ICPMS	ICPMS	ICPMS	ICPMS	ICPMS	ICPMS	ICPMS	ICPMS	ICPMS	ICPMS	ICPMS	ICPMS	ICPMS	ICPMS	ICPMS
94M 964010	0.005	0.008	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.08	0.164
94M 964010	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.08	0.177
94M 964026	0.005	0.005	0.005	0.008	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.05	0.638
94M 964026	0.005	0.008	0.005	0.012	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.05	0.692
94M 964059	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.06	3.425
94M 964059	0.005	0.005	0.005	0.007	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.04	3.533
94M 964064	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.05	3.090
94M 964064	0.005	0.012	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.05	3.208
94M 964075	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.02	5.211
94M 964075	0.005	0.007	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.03	5.477
94M 964087	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.01	6.344
94M 964087	0.005	0.008	0.009	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.02	6.743
94M 964130	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.02	6.103
94M 964130	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.02	6.706
94M 964162	0.005	0.005	0.005	0.011	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.01	0.629
94M 964162	0.005	0.005	0.005	0.007	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.02	0.659
94M 964169	0.005	0.006	0.005	0.011	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.01	0.623
94M 964169	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.01	0.652
94M 964195	0.005	0.006	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.01	0.537
94M 964195	0.005	0.005	0.009	0.018	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.01	0.478
94M 964241	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.01	0.005
94M 964241	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.01	0.005
94M 964255	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.02	1.809
94M 964255	0.005	0.005	0.005	0.006	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.01	1.758
94M 964268	0.005	0.005	0.010	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.02	2.302
94M 964268	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.02	2.119
94M 964285	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.03	0.797
94M 964285	0.005	0.005	0.005	0.007	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.04	0.730
94M 964302	0.005	0.009	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.01	0.213
94M 964302	0.005	0.005	0.005	0.019	0.005	0.005	0.007	0.005	0.005	0.005	0.005	0.005	0.005	0.02	0.220
94M 964308	0.005	0.007	0.005	0.005	0.005	0.016	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.02	0.107
94M 964308	0.005	0.005	0.007	0.012	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.03	0.114
94M 964356	0.005	0.005	0.006	0.005	0.005	0.005	0.010	0.005	0.005	0.005	0.005	0.005	0.005	0.11	1.594
94M 964356	0.005	0.007	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.07	1.426
94M 964393	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.02	0.059
94M 964393	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.02	0.063
94M 964450	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.01	0.016
94M 964450	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.01	0.014
94M 964490	0.005	0.007	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.01	3.047
94M 964490	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.01	3.028
94M 964510	0.005	0.011	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.02	1.115
94M 964510	0.005	0.006	0.005	0.005	0.005	0.006	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.01	1.137

Table 2. Mean and standard deviation (SD) for 37 elements in control water samples Ottawa Rive Ottawa Tap (n=116) and SLRS-2 (n=8) by ICP-MS .

Element	Ottawa River, Mean ±SD ICP-MS	Ottawa Tap, Mean ±SD ICP-MS	SLRS-2, Mean ±SD ICP-MS	Accepted
Li, ppt	544±31	591±43	-	-
Be, ppt	7±5	2±5	8±3	-
Al, ppb	54.4±6.4	97.4±6.5	83.0±4.4	84.4±3.4
Ti, ppb	1.28±0.21	2.43±0.37	1.88±0.24	-
V, ppt	349±33	157±33	166±10	250±60
Cr, ppt	229±40	239±56	424±57	450±70
Fe, ppb	94.0±5.5	42.0±4.5	126±4.9	129±7
Mn, ppb	3.38±0.16	10.8±0.6	10.1±0.33	10.1±0.3
Co, ppt	30±10	30±15	80±7	63±12
Ni, ppt	718±114	830±250	1030±80	1030±100
Cu, ppb	1.22±0.12	3.37±0.33	3.02±0.14	2.76±0.17
Zn, ppb	1.14±0.15	4.27±0.38	3.62±0.21	3.33±0.15
As, ppt	612±136	614±111	838±141	770±90
Rb, ppb	1.68±0.08	1.52±0.08	1.56±0.05	-
Sr, ppb	45.8±4.0	66.0±4.7	29.9±1.1	27.3±0.4
Y, ppt	131±8	110±12	180±7	-

Control Water Samples: ICP-MS

Mo, ppt	221±26	220±28	176±20	160±20
Cd, ppt	20±6	27±7	37±6	28±4
Sb, ppt	54±7	67±9	304±17	260±50
Cs, ppt	6±2	-	8±1	-
Ba, ppb	16.8±0.9	16.9±1.77	14.1±0.22	13.8±0.3
La, ppt	246±14	169±13	409±13	-
Ce, ppt	289±16	164±11	538±16	-
Pr, ppt	59±4	33±3	98±4	-
Nd, ppt	230±19	124±12	359±19	-
Sm, ppt	41±6	19±5	83±9	-
Eu, ppt	6±2	4±2	10±3	-
Tb, ppt	4±1	3±1	6±1	-
Gd, ppt	32±6	18±3	48±10	-
Dy, ppt	23±4	12±4	30±5	-
Ho, ppt	4±1	3±1	6±1	-
Er, ppt	13±3	8±3	15±2	-
Yb, ppt	12±2	9±3	16±2	-
Tl, ppt	6±2	4±2	5±1	-
Pb, ppt	181±17	320±33	136±16	129±11
U, ppt	70±6	24±4	51±4	49±2

Analytical Precision: Conductivity and TDS Determinations

Table 3

Sample		Conductivity (uS)	TDS (mg/l)
distilled water	Median	0.95	0.47
(n=10)	Mean ± 1s	0.93 ± 0.03	0.46 ± 0.01
	RSD (%)	3.32	3.03
	Precision	6.63	6.05
964288	Median	89.30	44.65
(n=10)	Mean ± 1s	89.34 ± 0.05	44.65 ± 0.05
	RSD (%)	0.06	0.12
	Precision	0.12	0.24
964504	Median	256	127.5
(n=10)	Mean ± 1s	256.0 ± 0.8	127.5 ± 0.5
	RSD (%)	0.32	0.41
	Precision	0.64	0.83
964343	Median	359	179
(n=10)	Mean ± 1s	359.4 ± 0.5	179.4 ± 0.5
	RSD (%)	0.14	0.29
	Precision	0.29	0.58
964279	Median	502	251
(n=10)	Mean ± 1s	501.8 ± 0.9	250.9 ± 0.3
	RSD (%)	0.18	0.13
	Precision	0.37	0.25

Listed from top to bottom in order of increasing concentration
All measurements made with a Corning Checkmate 90 TDS/Conductivity meter