APPENDIX I-2

2011 AQUATICS BASELINE



RAINY RIVER RESOURCES LIMITED
RAINY RIVER GOLD PROJECT

AQUATIC RESOURCES
2011 BASELINE INVESTIGATION

Submitted by:

AMEC Environment & Infrastructure
a Division of AMEC Americas Limited
160 Traders Blvd. E., Suite 110
Mississauga, Ontario
L4Z 3K7

June 2012
TC111504

amec

June 27, 2012
TC111504

Mr. Kyle Stanfield, P.Eng
Vice President, Environment & Sustainability
Rainy River Resources Ltd.
111 Victoria Avenue East
Thunder Bay, ON
P7C 1B7

Dear Mr. Stanfield,

AMEC Environment & Infrastructure is pleased to submit the attached 2011 Aquatic Resources Baseline Investigation for the Rainy River Gold Project.

The 2011 Aquatic Resources Baseline Investigation adds to the baseline studies conducted previously by Klohn Crippen Berger over the period of 2008 to 2010.

We greatly appreciate the opportunity to provide support for your Rainy River Gold Project. Should you have any questions regarding the study, please do not hesitate to contact us.

Yours Sincerely,

AMEC Environment & Infrastructure,
a division of AMEC Americas Limited



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Aquatic Ecologist



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TABLE OF CONTENTS

PAGE

1.0 INTRODUCTION 1

1.1 General Setting 1
1.2 General Methodology 2
1.3 Spatial Boundaries 2

2.0 METHODOLOGY 5

2.1 Surface Water Quality 5
2.2 Sediment Quality 5
2.3 Habitat Assessment 6
2.4 Benthic Invertebrate Community 7
2.5 Fisheries Resources 8

3.0 RESULTS 15

3.1 Pinewood River System 15
3.1.1 Water Quality 15
3.1.2 Sediment Quality 16
3.1.3 Habitat Assessment 17
3.1.4 Benthic Invertebrate Community 17
3.1.5 Fisheries Resources 18
3.2 Tait Creek System 18
3.2.1 Water Quality 18
3.2.2 Sediment Quality 19
3.2.3 Habitat Assessment 19
3.2.4 Benthic Invertebrate Community 20
3.2.5 Fisheries Resources 20
3.3 Loslo Creek 20
3.3.1 Water Quality 20
3.3.2 Sediment Quality 21
3.3.3 Habitat Assessment 22
3.3.4 Benthic Invertebrate Community 22
3.3.5 Fisheries Resources 23
3.4 Upper Tributary 5 23
3.4.1 Water Quality 23
3.4.2 Sediment Quality 24
3.4.3 Habitat Assessment 24
3.4.4 Benthic Invertebrate Community 24
3.4.5 Fisheries Resources 25

3.5 Marr Creek System 25
3.5.1 Water Quality 25
3.5.2 Sediment Quality 26
3.5.3 Habitat Assessment 27
3.5.4 Benthic Invertebrate Community 28
3.5.5 Fisheries Resources 28
3.6 West Creek System 28
3.6.1 Water Quality 28
3.6.2 Sediment Quality 29
3.6.3 Habitat Assessment 30
3.6.4 Benthic Invertebrate Community 31
3.6.5 Fisheries Resources 31
3.7 Clark Creek System 32
3.7.1 Water Quality 32
3.7.2 Sediment Quality 32
3.7.3 Habitat Assessment 33
3.7.4 Benthic Invertebrate Community 33
3.7.5 Fisheries Resources 34
3.8 Blackhawk Creek System 34
3.8.1 Water Quality 34
3.8.2 Sediment Quality 35
3.8.3 Habitat Assessment 35
3.8.4 Benthic Invertebrate Community 35
3.8.5 Fisheries Resources 36

4.0 DISCUSSION 51

5.0 ADDITIONAL WATER QUALITY DATA 53

6.0 REFERENCES 57

LIST OF FIGURES

PAGE

1-1 Project Site Location 3
1-2 Watershed and Subwatershed Boundaries 4
2-1 Water Quality Sampling Locations 10
2-2 Sediment Quality Sampling Locations 11
2-3 Habitat Assessment Locations 12
2-4 Benthic Invertebrate Community Sampling Locations 13
2-5 Fisheries Sampling Locations 14

LIST OF TABLES

3-1 Water Chemistry and Metals Analysis Results 37
3-2 In Situ Water Quality Measurements 38
3-3 Sediment Quality Analysis Results 39
3-4 Sediment Grain Size Analysis Results 40
3-5 Key Habitat Characteristics of Ponds 41
3-6 Key Habitat Characteristics of Creeks and Rivers 42
3-7 Benthic Invertebrate Community Indices Summary 43
3-8 Benthic Invertebrate Family Proportions by Location 44
3-9 Species Specific Catch Per Unit Effort for Gillnets 45
3-10 Species Specific Catch Per Unit Effort for Minnow Traps 46
3-11 Species Specific Catch Per Unit Effort for Seining 47
3-12 Species Specific Catch Per Unit Effort for Electrofishing 48
3-13 Species Specific Catch Per Unit Effort for Dip Netting 49
3-14 Species Distribution Across Study Area Between 2008 And 2011 50
5-1 Summary of 2011 - 2012 Water Quality Data 55

LIST OF APPENDICES

A Photographic Record
B Water Quality Data and Certificates of Analysis
C Sediment Quality Data and Certificates of Analysis
D Sediment Grain Size Data
E Aquatic Habitat Data
F Benthic Invertebrate Community Data
G Fisheries Resources Capture and Sampling Effort Data Summary
H RRR Water Quality Data

1.0 INTRODUCTION

Rainy River Resources Ltd. (RRR) has been exploring the Rainy River Gold Project (RRGP, the Project) situated in the Township of Chapple on private lands, approximately 65 km northwest of Fort Frances in northwestern Ontario (Figure 1-1). This Aquatic Resources Baseline Investigation report was prepared by AMEC Environment & Infrastructure, a division of AMEC Americas Limited (AMEC), to describe the current environmental conditions and update existing information.

Environmental information was available for a localized area pertaining to the site as part of previous baseline investigations (Klohn Crippen Berger 2011). AMEC conducted a comprehensive gap analysis to determine the extent and quality of existing environmental data in the winter of 2011. The results presented herein were dictated by the findings of the gap analysis with respect to current project site considerations. This report focuses on the new information collected by AMEC, but where appropriate historic data have been included to provide a broader context.

1.1 General Setting

The RRGP is located in the Rainy River District, in northwestern Ontario, about 40 km east of Lake of the Woods. It is located in Chapple Township, approximately 65 km northwest of Fort Frances and 420 km west of Thunder Bay (Figure 1-1). The UTM coordinates for the centroid of the proposed open pit are 425660E, 5409700N (NAD 83 Zone 15).

The RRGP is located within the Late Achaean Rainy River Greenstone Belt which forms part of the western Wabigoon sub province, located in the Superior Province of the Canadian Shield. The terrain in the general vicinity of the Project site transitions from upland, bedrock controlled pond areas to the northeast, to lower-lying, to gently undulating terrain to the southwest. The Pinewood River system, which drains most of the Project site area, is associated with a broad floodplain. Lands more proximal to the Project site area are typically gently rolling to flat, with wetlands occurring in low lying contributing watersheds, and rounded bedrock outcrops and subcrops occurring in upland areas.

The site area occurs within the western portion of the Great Lakes St. Lawrence Forest Region in the area between Lake Superior and Lake of the Woods; but is near to the Boreal Forest and Prairie regions, and therefore exhibits some transitional characteristics. Wetlands are present due to the pervasive clay till substrates and subdued topography that characterize much of the area, combined with extensive beaver activity.

Land uses within the Project area mainly reflect low-density rural and some local agricultural and forestry practices. The area is intersected by a well-developed network of both Provincial and Municipal access roads as well as private roads crossing privately-held lands.

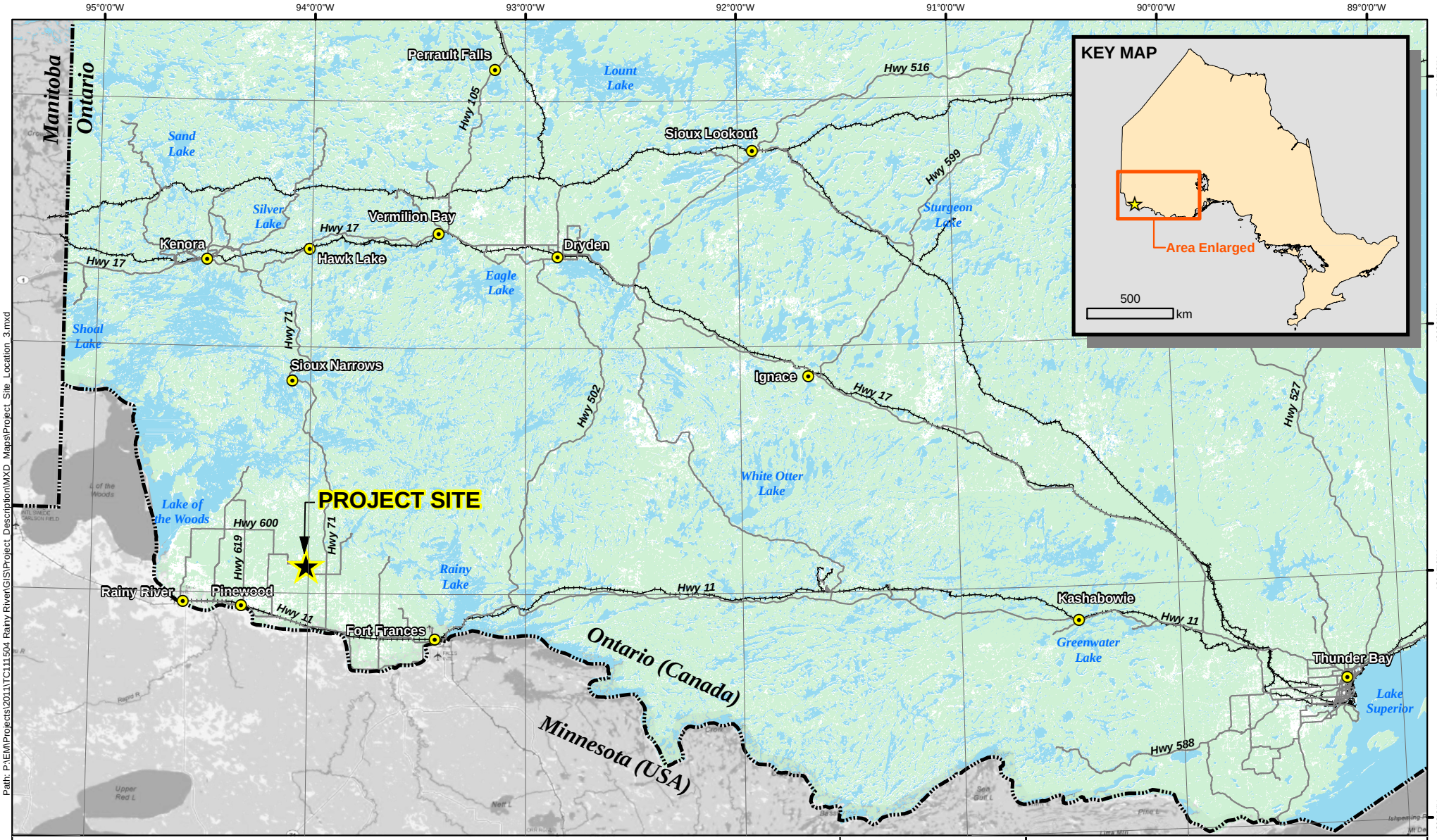
1.2 General Methodology

Baseline data were gathered using the standard approaches of literature review, observation and sample collection, data analysis and discussions with people having specific knowledge of the area. Despite the generation of separate baseline reports, where appropriate, an ecosystem perspective has been used to integrate the data into functional relationships. It is recognized that the entire physical, chemical and biological system (i.e., the ecosystem) is interconnected. For example, surface water systems are connected to groundwater systems, which are in turn affected by climate, geology, soils and general aspects of the terrain. The expression of surface water systems in terms of water flow, water quality and riverbed / creek bed materials, affects the presence and abundance of aquatic life and wildlife. In addition, the entire study team functioned as an integrated unit to ensure that all team members carried out their studies in a coordinated manner, so as to avoid inconsistencies and misinterpretations of the data.

1.3 Spatial Boundaries

The Project site area is positioned within the upper portion of the Pinewood River watershed. The RRGP is somewhat unique from an environmental perspective, in that there are no lakes located within, or adjacent to, the RRGP footprint. The creeks and streams that are present in the local area do not support a commercial or recreational fishery, and a number including Marr Creek and Clark Creek, appear to have been altered to act dominantly as agricultural drains.

The Project Site area for the purposes of this report focused on watersheds which included the following drainage systems: Pinewood River, Tait Creek, Loslo Creek, Marr Creek, West Creek, Clark Creek and Blackhawk Creek (Figure 1-2).



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LEGEND

- Project Site
- Regional Communities
- Provincial / National Border
- Regional Road / Highway
- Railway

0 25 50 100 150 200 250 Kilometres

NOTES:
- Ontario base data extracted from Land Information Ontario (MNR) data warehouse.
- Base data outside of Ontario extracted from ESRI DeLorme World Basemap

Datum: NAD83
Projection: UTM Zone 15N

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Project Location

PROJECT N°: TC111504	**FIGURE: 1-1**
SCALE: 1:1,800,000	DATE: June 2012

395000 400000 405000 410000 415000 420000 425000 430000 435000 440000

5420000 5415000 5410000 5405000 5400000 5395000

Hwy 621
Hwy 619
Hwy 600
Hwy 11
Hwy 71

Jones Creek Watershed
Loslo Creek Watershed
Upper Trib 5 - Marr Creek Watershed
West Creek Watershed
Kishkakoesis River Watershed
Spruce Is. Watershed
Mid-Pinewood Watershed
Dearlock - Tait Creek Watershed
Upper Pinewood - Clark Creek Watershed
Lower Pinewood Watershed

Little Pine Lake
Boundary Lake
Off Lake
Muskrat Lake
Pinewood Lake
Pinewood River
Rainy River

Ontario (Canada)
Minnesota (USA)

Path: P:\EM\Projects\2011\TC111504 Rainy River\GIS\Aquatics\Report 1\MXD_Maps\Fig1-2 Watersheds and Subwatersheds.mxd

LEGEND

- Project Site
- Regional Road / Highway
- Railway
- Waterbody
- Low-Lying Wetland Area
- Permanent Watercourse
- Intermittent (Intermittent Watercourse
- General Surface Flow Direction

Elevation Colour Ramp: High ground – Low ground

- Pinewood River Watershed (approx. 57,450 ha)
- Main Project Area Watershed (approx. 20,700 ha)
- Subwatershed Areas (Labelled on map)
  - -Upper Trib 5 - Marr Cr. approx. 1,230 ha
  - -Loslo Cr. approx. 1,620 ha
  - -West Cr. approx. 1,635 ha
  - -Jones Cr. approx. 2,490 ha
  - -Upper Pinewood - Clark Cr. approx. 6,130 ha
  - -Mid-Pinewood approx. 6,530 ha
  - -Dearlock - Tait Cr. approx. 7,600 ha
  - -Kishkakoesis R. approx. 9,200 ha
  - -Spruce Is. approx. 9,580 ha
  - -Lower Pinewood approx. 11,435 ha

NOTES:
- Road data extracted from Land Information Ontario, Ontario Road Network, MNR
- Ontario base data extracted from Land Information Ontario (MNR) data warehouse.
- Base data outside of Ontario extracted from ESRI USGS Topographic maps
- Watershed delineations are approximate and are derived from MNR Ontario Digital Elevation Model and Quaternary Watershed boundaries

Datum: NAD83
Projection: UTM Zone 15N

0 3.5 7 14 21 28 35 Kilometres

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Regional Topography, Watershed and Subwatershed Boundaries

PROJECT N°: TC111504 | **FIGURE: 1-2**

SCALE: 1:127,000 | DATE: June 2012

2.0 METHODOLOGY

Sampling locations were selected based on their proximity to the RRGP site and surface water patterns to adjacent water bodies. Sites were also selected based on landowner permissions, accessibility and logistic feasibility. Field sampling was conducted from July 18 to 25, 2011 and from September 26 to October 3, 2011.

2.1 Surface Water Quality

Periodic baseline surface water quality monitoring began at the RRGP in 2007 and was established as a monthly program in 2009. This initial program was augmented in the spring of 2010 to include a total of 14 monthly sampling locations that continues presently. Results from this monitoring program are presented in Section 5 of this report and in KCB (2011).

As part of AMEC's aquatic baseline study, surface water samples were collected for chemical analysis from seven locations on the Pinewood River, one location on Tait Creek, three locations on Loslo Creek, six locations on Marr Creek, five locations on West Creek, three locations on Clark Creek and one location on Blackhawk Creek. An overview of these sampling locations is provided in Figure 2-1.

Water quality grab samples were collected 10 cm below the water surface and filled to remove all headspace. Samples were kept cool until they could be shipped to Maxxam Analytics laboratory in Mississauga, Ontario (possessing accreditation from the Canadian Association for Laboratory Accreditation). In-situ surface water field measurements of dissolved oxygen, conductivity, pH and temperature were also taken using portable analytical equipment. The surface water sampling program provided additional physico-chemical data to compliment site-specific biophysical microhabitat condition information, as reported in the context of habitat assessment information provided within this document. Analytical results were compared to the Ontario Provincial Water Quality Objectives (PWQO) for the protection of aquatic life, and Canadian Environmental Quality Guidelines (CEQG) for the protection of aquatic life.

2.2 Sediment Quality

Surficial sediment samples were collected using a Petite Ponar grab sampler at seven locations on the Pinewood River, one location on Tait Creek, three locations on Loslo Creek, six locations on Marr Creek, five locations on West Creek, three locations on Clark Creek and at one location on Blackhawk Creek. Sampling locations are presented in Figure 2-2.

At each sampling location, three replicate sediment grabs were collected and homogenized to provide one sample per location. Replicates were collected for the purpose of a more complete representation of substrates within the sampling location. Chemical analyses and grain size analysis were conducted at Maxxam Analytics laboratory in Mississauga, Ontario.

Results were compared to the Ontario Provincial Sediment Quality Guidelines (PSQG). The PSQG are guidelines which promote the protection of aquatic life and are based on sound scientific information. According to the PSQG document, three levels of effects are prescribed that reflect potential chronic and long term effects of contaminants on benthic invertebrates. The three levels are:

- No effect: no toxic effects are observed on aquatic organisms (concentrations are less than the method detection limits);

- Lowest effect level (LEL): level of sediment contamination that can be tolerated by the majority of the sediment-dwelling benthic invertebrates, for which the sediment is considered to be clean to marginally contaminated; and

- Severe effect level (SEL): level of sediment contamination at which pronounced disturbance of the sediment-dwelling community can be expected, for which the sediment is considered heavily contaminated.

Chemistry results were also compared to the CEQG. CEQG criteria are established based on formal federal protocol to evaluate potential adverse biological effects in aquatic environments. They prescribe a level of contamination at which there are probable effects (PEL).

2.3 Habitat Assessment

Habitat inventories were completed at nine locations on the Pinewood River, two locations on Tait Creek, one location on Loslo Creek, ten locations on Marr Creek, nine locations on West Creek, three locations on Clark Creek, and one location on Blackhawk Creek. Habitat sampling locations are presented in Figure 2-3.

Habitat inventories included both creek and pond habitats within the Project study area. The creek channels within the area were characterized from a channel morphological perspective. The objectives of channel morphological inventories were to:

- Characterize habitat in terms of channel / floodplain dimensions and gradient, substrate composition and vegetation communities; and

- Provide information to assist with the selection of appropriate sampling locations to characterize water, sediment and benthic macroinvertebrates.

During field investigations topographic maps, orthophotographs, a handheld global positioning system (GPS), rangefinder and compass were used to reference location, orientation and to measure distances.

Similar habitat delineation was applied to shoreline areas along pond margins. Shoreline habitat was differentiated on the basis of substrate composition, shoreline gradients, depth, riparian and aquatic vegetation and cover opportunities.

2.4 Benthic Invertebrate Community

Benthic invertebrate communities were sampled at seven locations on the Pinewood River, one location on Tait Creek, three locations on Loslo Creek, six locations on Marr Creek, five locations on West Creek, three locations on Clark Creek and one location on Blackhawk Creek. Benthic sampling locations are presented in Figure 2-4. Benthic invertebrates were collected between September 27 and October 2, 2011. All samples were collected using a Petite Ponar grab sampler, which sampled an approximate area of 0.02 m^2 per grab. Three replicate sub-samples were taken and pooled (homogenized) at each replicate station to increase the representation of the benthic invertebrate community by reducing intra-sample variation inherent to benthic communities. All samples were preserved in 10% formalin.

Benthic invertebrate communities at each sample location were characterized using a series of descriptor indices including: total invertebrate density, Simpson's index of diversity, evenness and taxon richness. These indices were calculated and summarized using the guidelines for Environmental Effects Monitoring as stipulated by Environment Canada (2002). Percent Ephemeroptera, Plecoptera, Trichoptera (EPT; i.e., mayflies, stoneflies, caddisflies) and percent Chironomids were also used as descriptors of the benthic invertebrate communities sampled as they are recognized as useful indices for characterization and comparison of benthic invertebrate communities.

Total invertebrate density (TID) was calculated for each replicate station as the total number of individuals per square metre.

Simpson's Index of Diversity (I-D) is a descriptor of both the abundance patterns and taxonomic richness of the community. Simpson's Index of Diversity can range from 0 to 1 and reaches its greatest indication of diversity at a value of 1.

Simpson's Evenness (E) is similar to Simpson's Index of Diversity, but is a measure of how the abundance of individuals is distributed within the taxonomic groups inhabiting the sample location. Evenness ranges from 0 to 1 and reaches complete evenness at 1.

Taxon richness (Family Richness) is a count of the number of taxa found within an area. For this study richness was reported at the family level.

Percent EPT is the percentage of individual benthic invertebrates within a sample that belong to the orders Ephemeroptera, Plecoptera and Trichoptera. Increases in this metric may indicate improved water quality.

Percent Chironomids is the percentage of individual benthic invertebrates within a sample that belong to the family Chironomidae. These organisms are generally more tolerant of pollution and their numbers tend to increase in degraded conditions.

2.5 Fisheries Resources

Fish communities were sampled between July and September 2011, under License to Collect Fish for Scientific Purposes No. 1063620. The following techniques were used to sample fish: gillnets, minnow traps, seine nets, backpack electroshocker and dip nets to provide a diverse range of passive and active methods to capturing both small-bodied and large bodied fish species, pond and fluvial habitats. Sampling locations for each gear type are presented in Figure 2-5.

Gillnets 15.2 m in length with stretch mesh size ranging from 38.1mm to 50.8 mm were set between 1 and 23 hours to capture large bodied fish species in pond habitats. Nets were typically set on the substrate between 1 and 6 m of depth. The gill nets were placed perpendicular to the channel flow for general community sampling in conjunction with the ongoing study. Gill net Catch per Unit Effort (CPUE) is described in this report as the catch per 15 m standard gill net set, calculated as:

CPUE = total catch / set period (hours)

Targeted passive effort for small-bodied fish was provided at the majority of locations using a maximum of 7 baited minnow traps for 1 to 24 hours sets. Minnow traps were generally set along creek banks or within 3 m of pond and river banks in depths between 0.5 to 1 m. The technique was used to target the forage fish community and coincided with dip net efforts. Minnow trap species specific CPUE is presented in Table 3-10 as the number of fish per trap hour:

CPUE = total catch / number of traps set x sampling duration (hours)

Seine netting effort was conducted primarily on the Pinewood River, but was also used at Loslo Creek, Marr Creek, Clark Creek and Blackhawk Creek in areas of greater relative width and depth. Each seine pull covered an average area of 70 m^2 providing presence / absence data as well as giving a quantitative estimate of abundance. CPUE is presented in Table 3-11 as the number of fish per seine pull. A photographic representation of the habitat typically sampled by this technique is provided in Appendix A.

Backpack electroshocking was conducted by a provincially accredited crew leader using a Smith-Root Inc. Model LR-24 backpack electroshocker with a second crew member using a dip net. In general, the backpack electroshocker was set to 600 V, 60 Hz with a 2% duty cycle. Habitats considered suitable for electroshocking ranged from: wadeable sections of creeks and rivers, to bank margins of deeper sections with variable substrates. All electroshocked sites were sampled using a sweeping motion concentrating on equal effort in different habitats.

Electroshocking CPUE is presented as the total catch of individuals per electrosecond. As instances of this ratio may be considerably less than one, CPUE is presented in Table 3-12 as the total number of individuals captured per electrosecond multiplied by a factor of 1000.

Dip netting was conducted at several locations characterized by low conductivity as an alternative means to electroshocking of investigating presence / absence and relative abundance of small-bodied species. This technique was most successful in back eddies of tributaries where velocity was reduced. Dip netting was typically conducted by slowly walking upstream along the margins so as to not disturb substrates in the path of observation. CPUE is presented in Table 3-13 as the number of fish per dip.

Specific levels of effort for each water body are reported in Section 3.0. All fish captured were identified to species by qualified fisheries biologists, were measured for length, weight and were scrutinized for any obvious parasites or lesions. All fish were returned unharmed to the location of capture except for a small number of individuals sacrificed to verify identifications.

420000 423000 426000 429000

5412000

5409000

Jones Cr. Trib. 3
Loslo Cr. Trib. 2
Loslo Cr. Trib. 3
Marr Cr. Trib. 1
West Cr. Trib. 4
West Cr. Trib. 3
West Cr. Trib. 2
West Cr. Trib. 1
Loslo Cr. Trib. 1
Marr Cr.
Loslo Cr.
West Cr.
Clark Cr.
Pinewood River
Blackhawk Cr.
Tait Cr. Trib. 2

Los-T-2
Los-1
Los-2
Marr-Up-Pond
Marr-1
Marr-2
Marr-3
Marr-4
Marr-5
Cor-1
Wes-4
Wes-1
Wes-2-Pond
Wes-2
Wes-3
Wes-3-Pond
Wes-4
Pin-1
Pin-2
Pin-3
Pin-4
Pin-5
Pin-6
Pin-7
Cla-1
Cla-2
Cla-3
Upp-T5-1
Tai-T2-1
Bla-1

Hwy 600
Elulk Rd.
Loslo Rd.
Marr Rd.
Roen Rd.
Georgeson Rd.
Clark Rd.
Gallinger Rd.
Heatwole Rd.
Teeple Rd.
Tait Rd.

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LEGEND

- In-Situ Water Quality Sampling Location
- Grab Sample Location
- Road
- Watercourse
- Waterbody

0 1 2 4 6 8 Kilometres

NOTES:
- Road data extracted from Land Information Ontario, Ontario Road Network, MNR
- Background LIDAR surveyed in Fall 2010

Datum: NAD83
Projection: UTM Zone 15N

N W E S

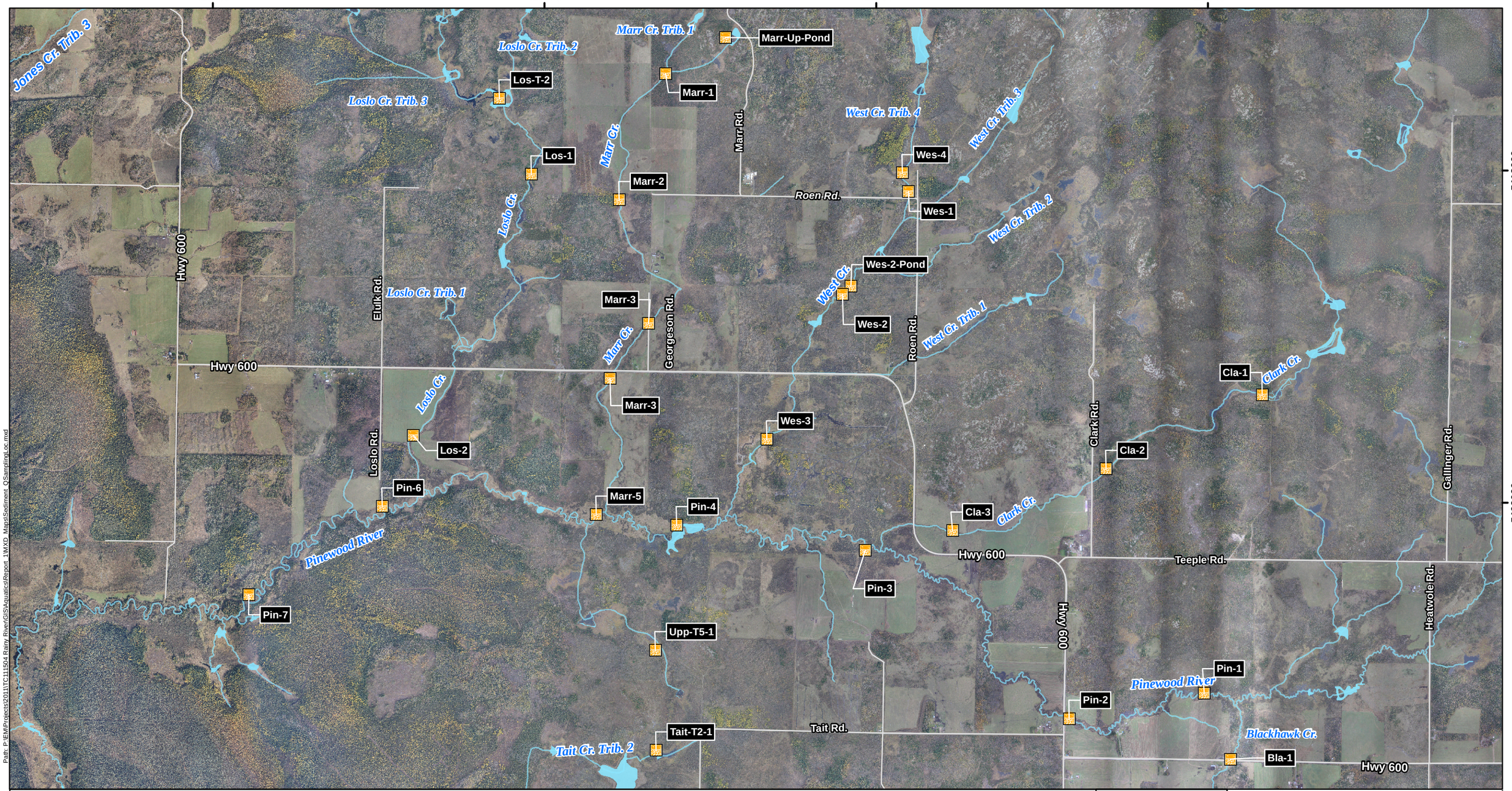
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Water Quality Sampling Locations

PROJECT N°: TC111504 | **FIGURE: 2-1**

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LEGEND

- Sediment Sampling Location
- Watercourse
- Road
- Waterbody

0 1 2 4 6 8 Kilometres

NOTES:
- Road data extracted from Land Information Ontario, Ontario Road Network, MNR
- Background LIDAR surveyed in Fall 2010

Datum: NAD83
Projection: UTM Zone 15N

RAINY RIVER

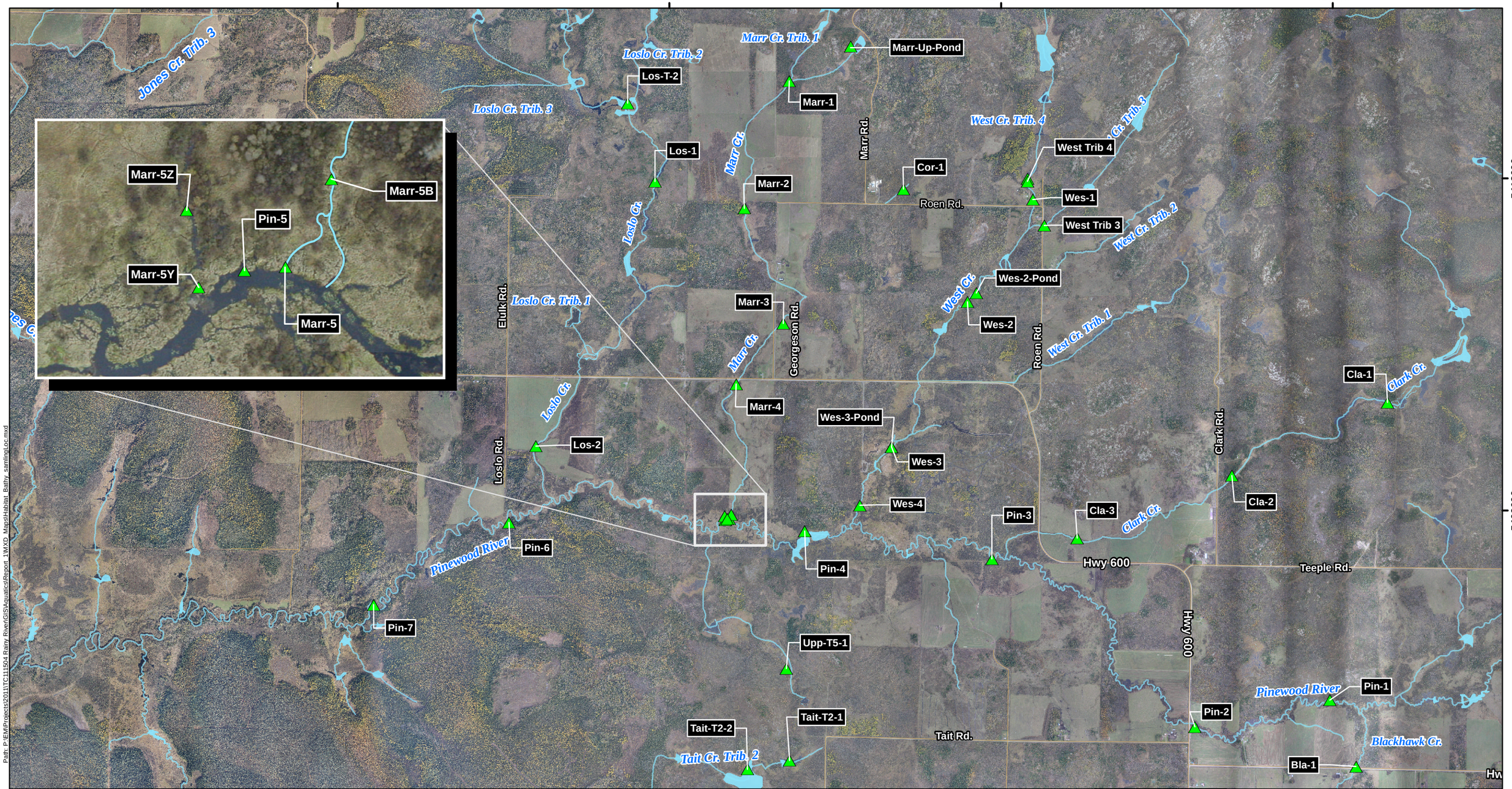
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Sediment Quality Sampling Locations

PROJECT N^{o}: TC111504 | **FIGURE: 2-2**

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LEGEND

- Habitat and Bathymetry Sampling Locations
- Watercourse
- Road
- Waterbody

0 1 2 4 6 8 Kilometres

NOTES:
- Road data extracted from Land Information Ontario, Ontario Road Network, MNR
- Background LIDAR surveyed in Fall 2010

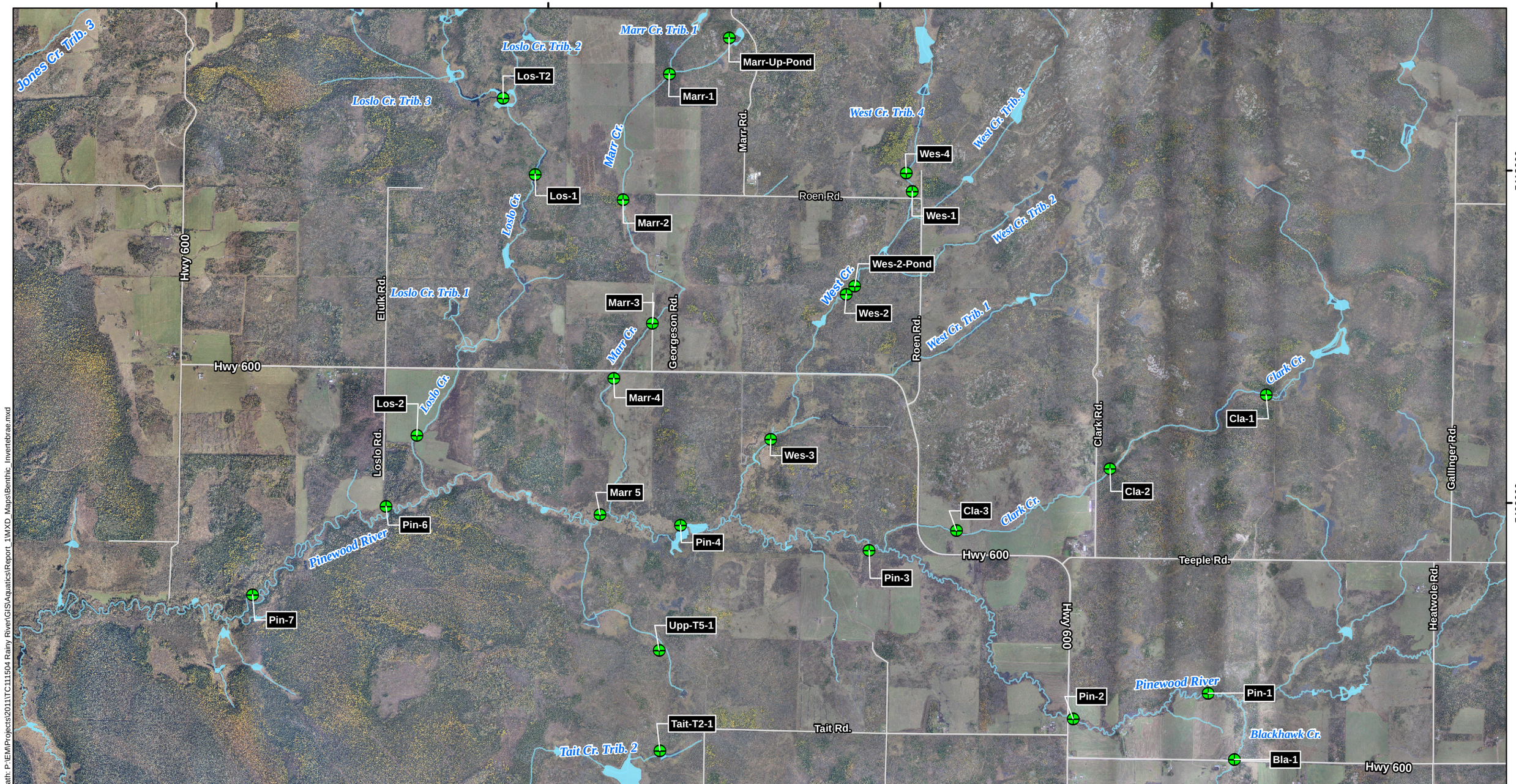
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Projection: UTM Zone 15N

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Habitat Sampling Locations

PROJECT N°: TC111504	**FIGURE: 2-3**
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LEGEND

- Benthic Invertebrate Sampling Location
- Road
- Watercourse
- Waterbody

0 1 2 4 6 8 Kilometres

NOTES:
- Road data extracted from Land Information Ontario, Ontario Road Network, MNR
- Background LIDAR surveyed in Fall 2010

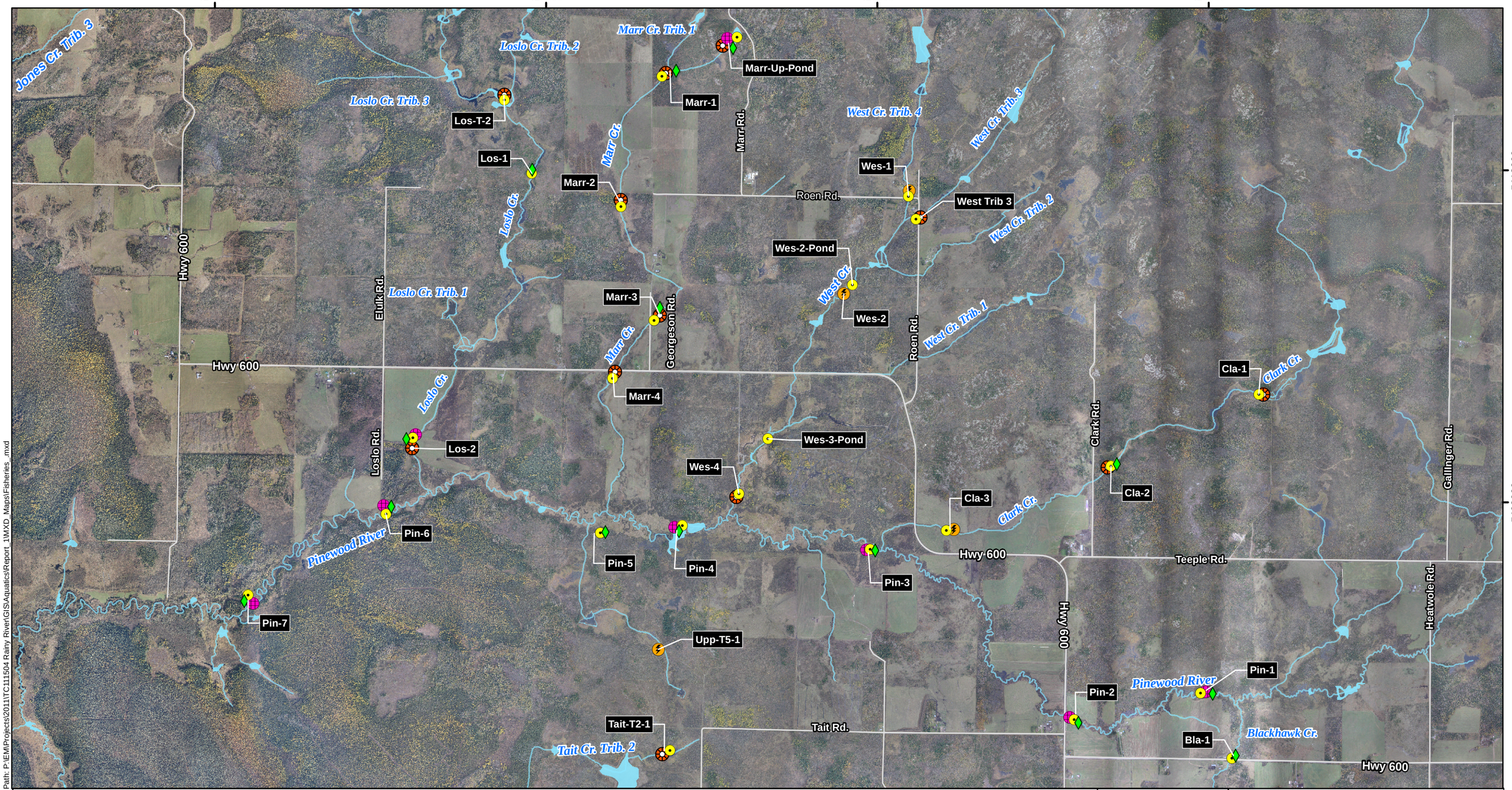
Datum: NAD83
Projection: UTM Zone 15N

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Benthic Invertebrate Community Sampling Locations

PROJECT N^{o}: TC111504	**FIGURE: 2-4**
SCALE: 1:33,000	DATE: June 2012



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LEGEND

Gear Type

- Dip Net
- Electrofisher
- Gill Net
- Minnow Trap
- Seine Net

- Road
- Watercourse
- Waterbody

0 1 2 4 6 8 Kilometres

NOTES:
- Road data extracted from Land Information Ontario, Ontario Road Network, MNR
- Background LIDAR surveyed in Fall 2010

Datum: NAD83
Projection: UTM Zone 15N

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Fisheries Sampling Locations

PROJECT N^{o}: TC111504 | **FIGURE: 2-5**

SCALE: 1:33,000 | DATE: June 2012

3.0 RESULTS

3.1 Pinewood River System

3.1.1 Water Quality

Water quality samples were collected from locations along the Pinewood River (Pin-1, Pin-2, Pin-3, Pin-4, Pin-6 and Pin-7) (Figure 2-1). Analytical results for general chemistry and metals are presented in Table 3-1 and field collected water quality parameters are provided in Table 3-2. Certificates of Analysis are provided in Appendix B.

Over the duration of the sampling period, water temperatures ranged from 8.7 to 28.40°C between all sites. The highest temperature (28.40 °C) was recorded at sample station Wes-Pond-3 on July 11, 2011, and the lowest temperature (8.7 °C) was recorded at station Marr-2 on September 11, 2011.

General chemistry and total metal parameters were found to meet the provincial objective (PWQO) and federal guideline (CEQG) values with the following exceptions:

- Aluminum concentration did not meet the CEQG (100 µg/L) at all Pinewood River sample locations. Concentrations ranged from 150 µg/L (Pin-2) to 400 µg/L (Pin-1) and were greatest at the Pin-7 sample location (2,700 µg/L). The results are not directly comparable the interim PWQO (75 µg/L, as measured in a clay-free sample) as the samples were not field-filtered, and therefore, not necessarily clay-free.

- Iron concentrations exceeded the PWQO and CEQG (both 300 µg/L) at all sampling locations along the Pinewood River. Concentrations ranged from 370 µg/L (Pin-6) to 1,000 µg/L (Pin-3) and was highest at Pin-7 (2,100 µg/L).

- All Pinewood River samples had total phosphorus concentrations were above the interim PWQO value of 30 µg/L. Concentrations ranged from 49 (Pin-2) to 14 µg/L (Pin-7).The interim PWQO states that excessive plant growth in rivers and streams should be eliminated at a total phosphors concentration below 30 µg/L.

- Cobalt exceeded the PWQO (0.9 µg/L) at the Pin-7 sample location (1.6 µg/L).

- Copper was present above the CEQG (calculated value = 3.7 µg/L) at the Pin-7 sample location (4.0 µg/L), but was below the PWQO of 5.0 µg/L.

- Mercury was present in concentrations above the CEQG (0.026 µg/L) at sample location Pin-3 (0.1 µg/L), but was below the PWQO (0.2 µg/L).

- Vanadium was present above the interim PWQO of 6.0 µg/L at the Pin-7 sample location (7.1 µg/L).

- Zirconium was present above the interim PWQO of 4.0 µg/L at the Pin-7 sample location (5.0 µg/L).

Dissolved oxygen concentrations, measured in-situ at the Pinewood River in September 2011, decreased in a downstream direction from sample location Pin-1 (6,620 µg/L) to the Pin-7 sample location (1,580 µg/L). Physico-chemical parameters measured including pH, dissolved oxygen, conductivity, total dissolved solids and temperature indicated no limitation to aquatic habitat.

3.1.2 Sediment Quality

Sediment samples were collected from locations along Pinewood River at stations Pin-1, Pin-2, Pin-3 Pin-4, Pin-6 and Pin-7 (Figure 2-2). Results of chemical and physical analyses are presented in Table 3-3 and Table 3-4, respectively. Sediment chemistry Certificates of Analysis are provided in Appendix C. Sediment grain size Certificates of Analysis are provided in Appendix D.

Inorganic and metal parameters were met both provincial (PSQG) and federal (CEQG) guideline values for Pinewood River samples, with the following exceptions:

- Total Organic Carbon (TOC) did not meet the PSQG LEL (1%) but was below the PSQG SEL (10%) at all Pinewood River samples, and ranged from 1.5 (Pin-1) to 3.1% (Pin-4).

- Total Kjeldahl Nitrogen (TKN) did not meet the PSQG LEL (550 µg/g) but was below the PSQG SEL (4,800 µg/g) at all Pinewood River sample locations, ranging from 730 to 3,470 µg/g. There is no CEQG for TKN.

- Manganese exceeded the PSQG SEL (1,100 µg/g) at sampling location Pin-7 (1,300 µg/g), but was below the PSQG LEL (460 µg/g) at all other Pinewood River sampling locations.

- Nickel did not meet the PSGQ LEL (16 µg/g) at sampling station Pin-7 (19 µg/g), but was well below the PSQG SEL (65 µg/g). All other samples collected from Pinewood River had nickel concentrations below the LEL, ranging from 7.5 to 12 µg/g.

Sediment particle size was variable amongst the Pinewood River sample locations, but generally the percentage of sand showed a reduction from the more upstream sample locations (Pin-1) to the downstream locations (Pin-6 and Pin-7). More downstream sampling locations

were characterized by a silt / clay composition. Pin-2 showed the largest particle size distribution with gravel and sand constituting the majority of the sample.

3.1.3 Habitat Assessment

Pinewood River habitat assessment locations are shown on Figure 2-3. A summary of key habitat characteristics for each location is presented in Table 3-6. Photographs of representative habitats associated with sample locations are provided in Appendix A.

The Pinewood River watershed covers an approximate area of 461 km^2 , originating at the outlet of Pinewood Lake, flowing westward for approximately 50 km before draining into the Rainy River. The Pinewood River receives drainage from all creeks within the study area including, Tait Creek, Loslo Creek, Upper Tributary 5, Marr Creek, West Creek, Clark Creek and Blackhawk Creek. The Pinewood River watershed lies in an area of gently rolling glaciofluvial and lacustrine sedimentary deposits, with intermittent areas of bedrock outcrop. Substrate compositions during the 2011 sampling programs were relatively uniform throughout, dominated by silt/muck, detritus, and clay, with isolated areas of sand and gravel. The river is characterized by a relatively large floodplain and low gradient with numerous beaver dams, resulting in a low flow system filled with oxbow and beaver pond wetlands. Morphology of the Pinewood River consists primarily of pools and flats. Surrounding land use within the Pinewood River watershed is primarily agricultural with some reaches of the river characterized by forested riparian areas.

Wetted widths on the Pinewood River ranged from 1.8 to 15 m, while floodplain widths ranged from 35 to 90 m in certain locations (Pin-2 and Pin-7). Floodplain widths were greater directly below the confluence of Clark Creek (Pin-3), West Creek (Pin-4) and Marr Creek (Pin-5), reaching widths from 200 to 250 m. In channelized reaches, depths ranged from 0.3 to 1 m, and having a predominantly U-shaped channel. Cover for fish was provided by overhanging and aquatic vegetation, while some localized areas of woody debris and undercut banks were present within forested reaches. The Pinewood River had well-developed macrophyte communities within 5 m of its banks, particularly in the slower moving flow areas of wetlands and beaver ponds. The most abundant macrophytes noted throughout the Pinewood River included: yellow pond-lily (*Nuphar luteum*), broad-leaved arrowhead (*Sagittaria latifolia*), slender pondweed (*Stuckenia filaformis*), duckweed (*Lemna minor*), marsh spikerush (*Scirpus palustris*) and Richardson pondweed (*Potamogeton richardsonii*).

3.1.4 Benthic Invertebrate Community

Benthic invertebrate community sampling locations on the Pinewood River are shown in Figure 2-4. The results of benthic invertebrate sampling are presented in Tables 3-7 and 3-8, with taxonomic enumeration data presented in Appendix F.

Simpson's diversity values were variable from upstream to downstream and ranged from 0.45 (Pin-1) to 0.82 (Pin-6), while evenness was comparable between all sites ranging from

0.20 to 0.43. Family richness, ranged between 7 (Pin-3) and 20 (Pin-4) families. Percent EPT ranged from 0.0% (Pin-3) to 26.79% (Pin-2) with a mean value of 8.84%. Percent Chironomids was generally higher than percent EPT at Pinewood River locations, ranging from 9.57% (Pin-7) to 73.03% (Pin-1) and a mean of 41.77%. However, percent EPT and Chironomids were relatively low but similar at Pin-7 (8.70% and 9.57%, respectively), and instead was dominated by coleopteran beetles and gastropods. Total density, as expressed as number of individuals per square meter, was variable between sample locations, generating a mean density of 7,415.46 individuals/m^2. The greatest densities were observed at Pin-2 and Pin-4 with 18,608 and 17,391 individuals/m^2, respectively. Chironomidae was the family in greatest proportion across all sample locations ranging from 9.57 to 73.03%, with the exception of station Pin-7 (Elmidae). Other taxa present in the Pinewood River, in order of relative abundance included Caenidae, Tubificidae, Naididae, Hydrobiidae and Planorbidae.

3.1.5 Fisheries Resources

Fish sampling results from Pinewood River are presented in Tables 3-9 to 3-13. Results are presented as species specific CPUE based on gear type. Sampling locations are shown in Figure 2-5. Fish biometrics and further sampling details are provided in Appendix G. A summary of presence / absence of fish species captured during the 2011 field survey as well as previous studies (Klohn Crippen Berger 2011) is provided in Table 3-14.

In total 17 fish species were captured in the Pinewood River in 2011 including: Brook Stickleback (*Culaea inconstans*), Northern Redbelly Dace (*Chrosomus eos*), Finescale Dace *(Phoxinus neogaeus*), Pearl Dace (*Margariscus margarita*), Creek Chub (*Semotilus atromaculatus*), White Sucker (*Catostomus commersonii*), Spottail Shiner (*Notropis hudsonius*), Golden Shiner (*Notomigonus crysoleucas),* Northern pike (*Esox lucius*), Blackchin Shiner (*Notropis heterodon*), Central Mudminnow (*Umbra limi*), Common Shiner (*Luxilus cornutus*), Johnny Darter (*Etheostoma nigrum*), Blackside Darter (*Percina maculate*), Brassy Minnow (*Hybognathus hankinsoni*), Blacknose Dace (*Rhinichthys atratulus)* and Brown Bullhead (*Ameiurus nebulosus*).

Pin-2 and Pin-3 were the sample locations of greatest catch abundance. The most species captured in the greatest abundance throughout the Pinewood River was Brook Stickleback. Northern Pike were captured by gillnet and seine net at Pin-4 (2 individuals), Pin-6 (5 individuals) and Pin-7 (2 individuals).

3.2 Tait Creek System

3.2.1 Water Quality

A water quality sample was collected from one location on Tributary 2 of Tait Creek (Tait-T2-1) (Figure 2-1). Analytical results for general chemistry and metals are presented in Table 3-1, and

field collected water quality parameters are provided in Table 3-2. Certificates of Analysis are provided in Appendix B.

General chemistry and metals parameters met PWQO and CEQG concentrations, with the exception of aluminum and phosphorus. Aluminum was detected at 120 µg/L and did not meet the CEQG (100 µg/L), but was not directly comparable to the PWQO (75 µg/L, as measured in a clay-free sample) as the sample was not field-filtered, and therefore was not necessarily clay free. Phosphorus was detected at 53 µg/L, which was slightly higher than the interim PWQO (30 µg/L).

Physico-chemical parameters measured include pH, dissolved oxygen, conductivity, total dissolved solids and temperature, and indicated no limitation to aquatic habitat.

3.2.2 Sediment Quality

Sediment was collected from one location on Tributary 2 of Tait Creek (Tait-T2-1; Figure 2-2). Results of chemical and physical analyses are presented in Table 3-3 and Table 3-4, respectively. Sediment chemistry and grain size Certificates of Analysis are provided in Appendices C and D.

All metal parameters met PSQG and CEQG values in the Tait Creek Tributary 2 sample. However, TOC was 4.7% at this sample location and therefore above the PSQG LEL (1%) but was below the PSQG SEL (10%). TKN was 3,260 µg/g and was above the PSQG LEL (550 µg/g), but below the PSQG SEL (4,800 µg/g). Grain size was characterized by a sand/silt composition.

3.2.3 Habitat Assessment

Table 3-5 summarizes key habitat characteristics from the assessment location at Tait-T2-1 on the unnamed pond on Tait Creek. The habitat assessment location is presented in Figure 2-3. Photographs of representative habitats associated with sample locations are provided in Appendix A.

Tait Creek is a tributary of Pinewood River located in the southwest region of the Study Area. The unnamed pond assessed at station Tait-T2-1 had a relatively uniform shoreline and a depth averaging 2 m. The unnamed pond was determined to have three semi-distinct habitat sections that differed slightly in substrate and littoral vegetation compositions. Although localized areas varied to some extent, substrate compositions throughout were predominantly silt / muck with clay and detritus mixed. Emergent littoral vegetation was dominated by common cattail (*Typha latifolia*) in the shallow shoreline areas, while floating vegetation such as yellow pond-lily provided cover in open water areas. Other aquatic macrophytes included: coontail (*Ceratophyllum demersum*), floating pondweed (*Potamogeton natans*) and broad-leaved arrowhead. Alder and willow thickets extended to the water's edge in the riparian zone. The

forest surrounding the pond was dominated by black spruce (*Picea mariana*), with interspersed tamarack (*Larix laricina*) and balsam poplar (*Populus balsamifera*).

3.2.4 Benthic Invertebrate Community

Benthic invertebrate community sampling conducted at Tait Creek is shown on Figure 2-4, with results presented in Tables 3-7 and 3-8, and taxonomic enumeration data presented in Appendix F.

Results from the single location sampled on Tait Creek indicated the presence of a healthy benthic community. Simpson's diversity at Tait-T2-1 was 0.46, and family richness was 15. Total invertebrate density was high at a value of 15,884.06 individuals/m^2, however, evenness was relatively low at 0.12. Percent EPT was low in comparison to percent Chironomids, with values of 2.92% and 72.63%, respectively. Chironomids were also the family of greatest proportion at 72.63% of the entire sample.

3.2.5 Fisheries Resources

Fish sampling results for Tait Creek are presented in Tables 3-9 to 3-13. Results are presented as species specific CPUE based on gear type. Sampling locations are shown in Figure 2-5. Fish biometrics, method of capture and other details related to fishing methods are provided in Appendix G. A summary of presence / absence of fish species captured during the 2011 field survey as well as previous studies (Klohn Crippen Berger 2011) is provided in Table 3-14.

Three fish species were captured at this location and included Brook Stickleback, Pearl Dace and Brassy Minnow. Brassy Minnow was captured in the greatest abundance with 23 of the 40 fish sampled being of this species. Dip netting was the most successful method of sampling with 38 of the 40 fish captured using this technique.

3.3 Loslo Creek

3.3.1 Water Quality

Water quality samples were collected from two locations at Loslo Creek (Los-1 and Los-2) as well as at one location of Loslo Creek Tributary 2 (Los-T-2; Figure 2-1). Analytical results for general chemistry and metals are presented in Table 3-1 and field collected water quality parameters are provided in Table 3-2. Certificates of Analysis are provided in Appendix B.

General chemistry and metals parameters were found to meet PWQO and CEQG values, with the following exceptions:

- Aluminum was above the CEQG (100 µg/L) at sample location Los-1 (310 µg/L). The results are not directly comparable to the PWQO (75 µg/L, as measured in a clay-free sample) as the samples were not field-filtered, and therefore, not necessarily clay-free.

- Iron did not meet the PWQO and CEQG (both 300 µg/L) at sampling locations Los-1 and Los-2 (630 µg/L and 370 µg/L, respectively).

- All Loslo Creek samples had total phosphorus concentrations (ranging from 38 µg/L to 61 µg/L) which did not meet the interim PWQO of 30 µg/L.

Physico-chemical parameters measured including pH, dissolved oxygen, conductivity, total dissolved solids and temperature indicated no limitation to aquatic habitat.

3.3.2 Sediment Quality

Sediment samples were collected from two locations at Loslo Creek (Los-1 and Los-2) as well as one location within Loslo Creek Tributary 2 (Los-T-2; Figure 2-2). Results of chemical and physical analyses are presented in Table 3-3 and Table 3-4, respectively. Sediment chemistry and grain size Certificates of Analysis are provided in Appendices C and D, respectively.

Inorganic and metal parameters were found to be below objective values listed in the PSQG and CEQG in Loslo Creek samples, with the following exceptions:

- TOC was above the PSQG LEL (1%) but below the PSQG SEL (10%) in Los-1 and Los-T-2, with concentrations of 3.4% and 7.5%, respectively. TOC was less than the LEL in Los-2 (0.75%).

- TKN did not meet the PSQG SEL (4,800 µg/g) in Los-1 and Los-T-2, with concentrations of 5,080 µg/g and 7,690 µg/g, respectively. TKN was below the LEL in Los-2 (242 µg/g).

- Copper was slightly above the PSQG LEL (16 µg/g) at Los-T-2 (17 µg/g), but well below the PSQG SEL (110 µg/g) and CEQG (197 µg/g).

- Manganese was marginally greater than the PSQG LEL (460 µg/g) at Los-T-2 (480 µg/g), but was below the PSQG SEL (1,100 µg/g).

- Nickel was above the PSGQ LEL (16 µg/g) in sample Los-T-2 (18 µg/g), but well below the PSQG SEL (65 µg/g). All other samples from Pinewood River had nickel concentrations ranging from 7.5 µg/g to 12 µg/g.

Sediment particle size was variable between Loslo Creek sampling locations, but generally displayed a sand dominated composition throughout. Sampling locations directly on the Loslo

Creek (Los-1, Los-2) had higher percentages of sand, while the location on the upstream pond had a higher percentage of silt and clay mixed.

3.3.3 Habitat Assessment

Tables 3-5 and 3-6 summarize key habitat characteristics from both creek and pond assessment locations on the Loslo Creek system. The habitat assessment locations are presented on Figure 2-3. Photographs of representative habitats associated with sample locations are provided in Appendix A.

Originating in a large wetland complex, Loslo Creek lies west of Marr Creek and flows south towards Pinewood River through forested areas and agricultural fields. The creek is characterized by a low gradient with a multitude of beaver ponds throughout its length creating a low flow system. Habitat was assessed at a flooded pond near the convergence of two tributaries in the upper reaches of Loslo Creek (Los-T-2). The wetland at the upper end of Loslo Creek was well established and highly productive for emergent and submergent vegetation including: common cattail, broad-leaved arrowhead, floating pondweed, coontail, sedge species and marsh spikerush. Riparian vegetation was dominated by alder thickets with areas of graminoid and sedge interspersed throughout.

Flowing south from the convergence of the Loslo Creek tributaries, the creek becomes channelized and well defined. Wetted width in the channelized creek at Los-1 was 2.80 m with a floodplain width of 18 m. Riparian areas were dominated by graminoid species, broadfruit burreed (*Sparganium eurycarpum*) and marsh spikerush, providing some cover for fish. Near the confluence of Loslo Creek with the Pinewood River, gradient was further reduced and wetted width increases to 5.0 m with a floodplain width considerably wider at 50 m. Cover for fish in the downstream reaches of Loslo Creek was provided by woody debris through forested areas, as well as undercut banks and abundant overhanging vegetation. Consistent with nearby watercourses, substrate was primarily silt / muck with detritus and clay.

3.3.4 Benthic Invertebrate Community

Benthic invertebrate community sampling locations for Loslo Creek are shown in Figure 2-4 with results presented in Tables 3-7 and 3-8 and taxonomic enumeration data presented in Appendix F.

Sampling results from a total of three locations at Loslo Creek were included Simpson's diversity values ranging between 0.23 and 0.75, with evenness remained relatively consistent and ranging from 0.22 to 0.30. Both diversity and evenness were highest at station Los-T2 (0.75 and 0.30, respectively). Family richness ranged from 6 to 13 and was greatest at Los-T2. EPT taxa were only identified in one sample location (Los-T2) at a low proportion (1.02%). Percent Chironomids was variable at Loslo Creek sample locations ranging from 28.57% to 87.65%. Los-1 and Los-2 both had communities represented by greater than 80% Chironomids,

while a community dominated by the families Chironomidae, Hyalellidae (amphipods) and Sphaeriidae (bivalve molluscs) was observed at Los-T2.Total invertebrate density was greatest among stations Los-1 and Los-2 with densities reaching 9,507 and 7,362 individuals/m^2, respectively. The density value was observed at station Los-T2 with 1,420 individuals/m^2.

3.3.5 Fisheries Resources

Fish sampling results from Loslo Creek are presented in Tables 3-9 to 3-13. Results are presented as species specific CPUE based on gear type. Sampling locations are shown in Figure 2-5. Fish biometrics, method of capture, and other details related to fishing methods are provided in Appendix G. A summary of presence / absence of fish species captured during the 2011 field survey as well as previous studies (Klohn Crippen Berger 2011) is provided in Table 3-14.

In total, six different fish species were caught: Brook Stickleback, Northern Redbelly Dace, Finescale Dace, White Sucker, Central Mudminnow and Brassy Minnow. Loslo Creek Tributary 2 had the greatest number of fish captured with 115, most of which were Brassy Minnows (109). Dip netting proved to be the most successful method of capture with 118 fish captured compared to 32 fish caught while seine netting. Three fish were caught using minnow traps. No fish were captured in gillnet set at station Los-2.

3.4 Upper Tributary 5

3.4.1 Water Quality

Water quality samples were collected from one location within Upper Tributary 5 (Upp-T5-1; Figure 2-1). Analytical results for general chemistry and metals are presented in Table 3-1 and in situ field collected water quality parameters are provided in Table 3-2. Certificates of Analysis are provided in Appendix B.

General chemistry and metals parameters were found to meet PWQO and CEQG values with the exception of aluminum and phosphorus. Aluminum did not meet the CEQG (100 µg/L) at sample location Upp-T5-1 (150 µg/L). The results are not directly comparable the PWQO (75 µg/L, as measured in a clay-free sample) as the samples were not field-filtered, and therefore, not necessarily clay-free. Phosphorus was slightly elevated above the interim PWQO of 30 µg/L at a value of 70 µg/L at Upp-T5-1.

Lab measured pH was 8.16 for the same sample. Physico-chemical parameters that were measured included pH, dissolved oxygen, conductivity, total dissolved solids and temperature and indicated no limitation to aquatic habitat.

3.4.2 Sediment Quality

A sediment sample was collected at Upper Tributary 5 (Upp-T5-1), a tributary of Pinewood River (Figure 2-2). The results of chemical and physical analyses are presented in Table 3-3 and Table 3-4, respectively. Sediment chemistry and grain size Certificates of Analysis are provided in Appendices C and D.

Inorganic and metal parameters were found to meet PSQG and CEQG in the Upper Tributary 5 sample, with the following exceptions:

- TOC was above the PSQG LEL (1%), but below the PSQG SEL (10%) at 3.3%; and
- TKN was above the PSQG LEL (550 µg/g), but below the PSQG SEL (4,800 µg/g) at Upp-T5-1 (3,470 µg/g).

The substrate at Upper Tributary 5 displayed an even distribution of sand, silt and clay, with sand having a slightly higher percentage of the composition.

3.4.3 Habitat Assessment

Upper Tributary 5 is a small intermittent creek that originates to the south of Pinewood River within pastureland, and drains into the river approximately 200 m downstream of Marr Creek. The creek had a high level of entrenchment and a sand / silt substrate. The creek was dry during the field investigation in 2011, suggesting this tributary does not provide permanent fish habitat. Table 3-6 summarizes key habitat characteristics from the location assessed on Upper Tributary 5. The habitat assessment location is presented in Figure 2-3. Photographs of representative habitats associated with sample locations are provided in Appendix A.

3.4.4 Benthic Invertebrate Community

The benthic sampling location on Upper Tributary 5 is shown in Figure 2-4. The results of the benthic sampling program are presented in Tables 3-7 and 3-8, with detailed species descriptions presented in Appendix F.

The sampling results from the single location on Upper Tributary 5 indicated a relatively moderate density of individuals amounting to 2,724 organisms/m^2. Family richness value was 10, with a Simpson's diversity value of 0.42 and an evenness of 0.17. Percent EPT was quite low in comparison to percent Chironomids. EPT amounted to 2.66% while Chironomids occupied 74.47% of the sample. In addition, Chironomids accounted for the largest proportion of the sample at 74.47%, while other families were noted to be less than 10% of the relative abundance.

3.4.5 Fisheries Resources

Fish sampling results from Upper Tributary 5 are presented in Tables 3-9 to 3-13. Upper Tributary 5 was sampled using a backpack electrofishing unit. Nine individuals of two species were captured; five Brook Stickleback and four Central Mudminnow. No additional fishing effort was conducted on the watercourse and no other species were observed. A summary of presence / absence of fish species captured during the 2011 field survey as well as previous studies (Klohn Crippen Berger 2011) is provided in Table 3-14.

3.5 Marr Creek System

3.5.1 Water Quality

Water quality samples were collected from five locations at Marr Creek (Marr-1, Marr-2, Marr-3, Marr-4 and Marr-5), as well as from a Marr Creek tributary pond (Marr-Up-Pond; Figure 2-1). Analytical results for general chemistry and metals are presented in Table 3-1 and field collected water quality parameters are provided in Table 3-2. Certificates of Analysis are provided in Appendix B.

General chemistry and metals parameters were found to meet PWQO and CEQG values, with the following exceptions:

- Aluminum did not meet the CEQG (100 µg/L) at five of the six Marr Creek sample locations (Marr-1, Marr-Up-Pond, Marr-2, Marr-4 and Marr-5), with concentrations ranging from 52 µg/L to a maximum of 2,000 µg/L. The results were not directly comparable the PWQO (75 µg/L, as measured in a clay-free sample) as the samples were not field-filtered, and therefore, not necessarily clay-free.

- Iron was present above the PWQO and CEQG (both 300 µg/L) at five of six Marr Creek sampling locations (Marr-1, Marr-Up-Pond, Marr-2, Marr-3, Marr-4) with concentrations ranging from 280 to 3,900 µg/L. Marr-1, Marr-2 and Marr-4 had concentrations at least four times greater than the PWQO and CEQG at 2,900 µg/L, 3,900 µg/L and 1,300 µg/L, respectively.

- All Marr Creek samples, except Marr-Up-Pond, had total phosphorus concentrations exceeding the interim PWQO of 30 µg/L, and ranged from 65 to 17 µg/L.

- Cobalt exceeded the PWQO (0.9 µg/L) at Marr Creek sample locations Marr-1, Marr-2 and Marr-4 with measured concentrations of 2.7 µg/L, 2.6 µg/L and 1 µg/L, respectively.

- Copper did not meet the CEQG (calculated at 2.2 µg/L) at Mar-2 (5 µg/L), but was equal to the PWQO.

- Mercury was above the CEQG (0.026 µg/L) in sample Pin-3 (0.1 µg/L), but was below the PWQO (0.2 µg/L).

- Vanadium was above the interim PWQO (6 µg/L) at Marr-1 (7 µg/L).

- Zinc was above the PWQO and CEQG (both 30 µg/L) at Marr-2, and was above the interim PWQO (20 µg/L) at Marr-3.

Physico-chemical parameters measured including pH, dissolved oxygen, conductivity, total dissolved solids and temperature indicated no limitation to aquatic habitat.

3.5.2 Sediment Quality

Sediment samples were collected at five locations along Marr Creek (Marr-1, Marr-2, Marr-3, Marr-4 and Marr-5) as well as from Marr-Up-Pond (Figure 2-2). Results of chemical and physical analyses are presented in Table 3-3 and Table 3-4, respectively. Sediment chemistry and grain size Certificates of Analysis are provided in Appendices C and D.

Inorganic and metal parameters were found to meet PSQG and CEQG objective values at Marr Creek except for the following:

- TOC was above the PSQG LEL (1%) for all samples collected from Marr Creek and ranged from 2.1% (Marr-1) to 13% (Marr-2). TOC was also greater than the PSQG SEL (10%) at Marr-2.

- TKN ranged from 1,900 (Marr-1) to 8,630 µg/g (Marr-Up-Pond) for Marr Creek sample locations and did not meet the PSQG LEL (550 µg/g). TKN did not meet the PSQG SEL (4,800 µg/g) in Marr-2 (8,630 µg/g).

- Copper did not meet the PSQG LEL (16 µg/g) at Marr-1, Marr-Up-Pond, and Marr-2 (20, 25 and 17 µg/g, respectively), but was below the PSQG SEL (110 µg/g) and CEQG (197 µg/g).

- Manganese did not meet the PSQG SEL (1,100 µg/g) at Marr-4 (1,900 µg/g), but was below the PSQG LEL (460 µg/g) at all other Marr Creek sample locations.

Sediment particle size was variable between Marr Creek sampling locations. The highest percentage of clay was observed at the most upstream location (Marr-1) and generally showed a reduction of clay percentage moving downstream. The location on the upstream pond (Marr-Up-Pond) had the highest percentage of sand observed. All other sample locations (Marr-2, Marr-3, Marr-4 and Marr-5) generally showed an even mixture of sand, silt and clay.

3.5.3 Habitat Assessment

Tables 3-5 and 3-6 summarizes key habitat characteristics from both creek and pond assessment locations on the Marr Creek system. Habitat assessment locations are presented in Figure 2-3. Photographs of representative habitats associated with sample locations are provided in Appendix A.

Marr Creek originates at a large wetland complex to the east of the Loslo Creek system and flows south to the Pinewood River. The headwater wetland located at Marr-Up-Pond is well-established and highly productive and diverse in aquatic vegetation. Littoral vegetation is dense, dominated by sedge species, arrowhead, marsh spikerush, and graminoid species. Floating pond lily is present in localized areas of open water in the wetland open water areas. A fish barrier exists at the eastern edge of the wetland/beaver pond complex in the form of a 1.5 m high waterfall, likely preventing fish migration.

Exiting the wetland complex, the creek becomes channelized with minimal flow, reaching a wetted width of 0.54 m near Marr-2. The creek flows through pasture land with limited riparian vegetation, before entering forested lands in the Pinewood River valley. Cover for fish is relatively limited through the pasture lands, but is provided by overhanging riparian grasses and woody debris in localized areas. As typified by other creeks in the study area, Marr Creek also has a low gradient and morphology is affected by beaver activity, restricting flow along its length, creating a step/pool morphology potentially isolating fish within pond habitats, with reduced connectivity.

Before draining into Pinewood River, the creek becomes braided into multiple distinct channels near Marr-5. Stream banks in this area are vertical with an abundance of undercut banks providing adequate cover for fish. Substrate through the lower downstream reaches was comprised of a silt/muck and clay type bottom. Emergent aquatic vegetation, primarily sedge species, broad-leaved arrowhead and graminoid species occupy the riparian zone within pasture lands, while submergent aquatic macrophytes such as pondweed dominate the open water pooled areas.

A tributary of Marr Creek, Core Shack Creek is a small intermittent and ephemeral drainage feature originating roughly 350 m north of Roen Rd. The creek was dry during the 2011 habitat investigation. The creek channel showed signs of seasonal flow through forested areas with braiding observed in several locations (Klohn Crippen Berger 2011). Upstream reaches had an undefined channel. Substrate was primarily clay with localized gravel and cobble deposits. Surrounding forested areas near Roen Road consisted of white birch, trembling aspen and black ash. Table 3-6 summarizes key habitat characteristics from Core Shack Creek. The habitat assessment location is presented in Figure 2-3.

3.5.4 Benthic Invertebrate Community

Benthic sampling locations on Marr Creek are shown in Figure 2-4. The results of the benthic sampling program are presented in Tables 3-7 and 3-8, with detailed taxonomic enumeration data presented in Appendix F.

Results for the six Marr Creek sample locations showed considerable variation for benthic invertebrate community descriptors. Family richness ranged from 2 (Marr-Up-Pond) to 15 (Marr-5). Family richness was greatest at the two most downstream locations, Marr-4 (10) and Marr-5 (15). Total invertebrate density was highly variable ranging from 115.94 to 3,391 organisms/m^2, the highest observed at station Marr-4. Simpson's diversity values ranged from 0.16 (Marr-3) to 0.67 (Marr-2). Evenness ranged from 0.19 to 1.00, with complete evenness observed at station Marr-Up-Pond, however, the total number of families for this site was only 2. EPT taxa were absent from Marr Creek sampling locations except Marr-4 and Marr-5, where they amounted for 0.85 and 1.32% of the relative abundance, respectively. Chironomids were present at each sample location except Marr-2. Their relative abundance ranged from 12 (Marr-4) to 91% (Marr-3) for the remaining Marr Creek locations Chironomids accounted for a large portion of the relative abundance of taxa across the majority of Marr Creek sample locations. The following families also had a relatively large representation in Marr Creek samples Chaoboridae, Hydrobiidae and Valvatidae.

3.5.5 Fisheries Resources

Fish catch and abundance results for Marr Creek are presented in Tables 3-9 to 3-13. Meristic data is provided in Appendix G. A summary of presence / absence of fish species captured during the 2011 field survey as well as previous studies (Klohn Crippen Berger 2011) is provided in Table 3-14.

A total of nine fish species were captured in the Marr Creek system including: Brook Stickleback, Northern Redbelly Dace, Finescale Dace, Pearl Dace, Creek Chub, Spottail Shiner, Central Mudminnow, Common Shiner and Fathead Minnows. Seine netting proved the most efficient method of capture, especially at Marr-3 where a total of 128 fish were captured by seine net. Gill netting was only feasible in limited areas of suitable habitat and depth and did not yield any fish captures. Brook Stickleback was the most abundant species caught with a total of 98 of 121 fish of this species captured by seine net.

3.6 West Creek System

3.6.1 Water Quality

Water quality samples were collected from five fluvial sample locations of West Creek (Wes-1, Wes-2, Wes-3 and Wes-4), as well as from a pond (Wes-2-Pond) (Figure 2-1). Analytical results

for general chemistry and metals are presented in Table 3-1 and field collected water quality parameters are provided in Table 3-2. Certificates of Analysis can be found in Appendix B.

General chemistry and metals parameters met PWQO and CEQG objective values, with the following exceptions:

- Aluminum did not meet the CEQG (100 µg/L) at two of five West Creek sample locations, Wes-2 and Wes-2-Pond, with concentrations of 1,100 and 240 µg/L, respectively. The results are not directly comparable the PWQO (75 µg/L, as measured in a clay-free sample) as the samples were not field-filtered, and therefore, not necessarily clay-free.

- Iron was present above the PWQO and CEQG (both 300 µg/L) at Wes-2 and Wes-2-Pond, with concentrations of 1,500 and 320 µg/L, respectively.

- Wes-2 and Wes-3 had total phosphorus concentrations which did not meet the interim PWQO for total phosphorus (30 µg/L), with concentrations of 68 and 36 µg/L, respectively.

- Cobalt was present above the PWQO (0.9 µg/L) at West Creek sample location Wes-2 at a concentration of 1.0 µg/L.

Physico-chemical parameters measured including pH, dissolved oxygen, conductivity, total dissolved solids and temperature indicated no limitation to aquatic habitat.

3.6.2 Sediment Quality

Sediment samples were collected Wes-1, Wes-2, Wes-3 and Wes-4), as well as from Wes-2-Pond (Figure 2-2). Sediment quality and quantity results are provided in Tables 3-3 and 3-4 with laboratory Certificates of Analysis provided in Appendices C and D.

Inorganic and metal parameters were found meet PSQG and CEQG in West Creek samples, with the following exceptions:

- TOC was above the PSQG LEL (1%) but below the PSQG SEL (10%) at Wes-2-Pond, Wes-3 and Wes-4, with concentrations of 1.5%, 3.0% and 8.7%, respectively.

- TKN was above the PSQG LEL (550 µg/g), but below the PSQG SEL (4,800 µg/g) at Wes-2-Pond and Wes-3, with concentrations of 980 µg/g and 3,350 µg/g, respectively. TKN and was above the PSQG SEL at Wes-4 (8,580 µg/g).

Sediment particle size was variable between West Creek sample locations, but generally the percentage of sand showed a reduction from the more upstream sample locations (Wes-1) to the downstream locations (Wes-3 and Wes-4). More downstream sample locations were characterized by a sand / silt composition. Wes-1 showed the largest particle size distribution with gravel and sand constituting the majority of the sample.

3.6.3 Habitat Assessment

Tables 3-5 and 3-6 summarize key habitat characteristics from West Creek and its associated tributaries. Habitat assessment locations are presented in Figure 2-3. Photographs of representative habitats associated with sample locations are provided in Appendix A.

West Creek drains the largest area relative to other watercourses within the study area (approximately 1,635 ha). As with other nearby creeks, a number of beaver dams impede flow and cause flooding of riparian areas and create a morphology made of primarily of pools and flats. It has four main tributaries north of Roen Road which converge into a single main channel that eventually drains into the Pinewood River.

West Creek Tributary 1 is a small ephemeral stream north of Roen Road. Fish have been observed in this tributary during past investigations. Low flow conditions have however, created an intermittent connection to the main channel of West Creek thereby restricting movement and possibly prevented overwintering survival (Klohn Crippen Berger 2011).

West Creek Tributary 2 crosses Roen Road approximately 500m north of Tributary 1. Beaver activity has restricted flows creating a small pond at Wes-2-Pond. The pond is densely vegetated around the perimeter riparian zone, consisting of alder and willow thicket, which extended to the water's edge. Emergent aquatic vegetation such as sedge and graminoid species occupied shallow littoral areas, while floating pondweed and slender pondweed dominated the open water areas. As seen in other pond habitats within the study area, substrates consisted of mainly silt/muck with clay and detritus.

West Creek Tributary 3 crosses Roen Road approximately 500 m north of the West Creek Tributary 2 crossing of the same road. The tributary is intermittent, running through semi-forested valley lands with a relatively higher gradient than previous discussed for other locations. A large beaver pond/wetland complex exists at the headwater of Tributary 3. Substrate in the channelized reaches is comprised of silt/muck and clay, but also contains isolated patches of gravel. Cover for fish is available in undercut banks, which are part of the relatively steep banks through forested areas, as well as woody debris. Alder thickets occupy near bank riparian zones in the channelized reaches.

West Creek Tributary 4 drains a large wetland at its headwaters and continues to flow south to join the main channel of West Creek. The channel becomes braided and diffuse at the mouth where it meets the main channel near sample location Wes-Trib-4B. A number of beaver dams

along the length of the tributary impede flow and present numerous fish passage barriers. Willow and alder thickets occupy littoral reaches in areas along shorelines of beaver ponds. Substrate within the channelized reach contained mainly clay, but had boulders and cobble in interspersed throughout.

The channel becomes braided and diffuse near the mouth of West Creek before draining into the Pinewood River at Wes-4). Wetted widths in this area are relatively small (1.40 m) in comparison to overall width of the floodplain at 120 m. Substrate in this area changes from a silt/muck in upper reaches to a more clay dominated sediment type.

3.6.4 Benthic Invertebrate Community

The results of benthic invertebrate community sampling are provided in Tables 3-7 and 3-8, taxonomic enumeration data presented in Appendix F.

Average TID was 3,831.89 individuals/m^2 and was generally indicated a high density of organisms for the majority of West Creek. The mean Simpson's diversity value was 0.59 and ranged from 0.17 (Wes-2-Pond) to 0.78 (Wes-2). Family richness was variable but relatively high at all sites (greater than or equal to 7) and specifically at Wes-1 which had a richness of 21. Evenness ranged between 0.19 (Wes-3) and 0.44 (Wes-4), with a mean of 0.27 for the West Creek system.

Percent EPT was inconsistent across sample locations with Wes-3 and Wes-4 having no EPT taxa present. Generally representation by these taxa was low (less than 10%) except at Wes-1 which had a percent EPT of 37%. Percent Chironomids showed large variability with Wes-2-Pond consisting of 91% Chironomids in comparison to only 1% at Wes-2. Other sample locations had percent Chironomid values ranging from 12 to 35%.

Other taxa which were represented in significant proportions at West Creek included Tubificidae, Ceratopogonidae and Sphaeriidae.

3.6.5 Fisheries Resources

Species specific CPUE per gear type for West Creek are presented in Tables 3-9 to 3-13. Sampling locations are shown in Figure 2-5. Fish meristic data are provided in Appendix G. A summary of presence / absence of fish species captured during the 2011 field survey as well as previous studies (Klohn Crippen Berger 2011) is provided in Table 3-14.

Twelve species were captured from the West Creek system in 2011, including; Brook Stickleback, Northern Redbelly Dace, Finescale Dace, Pearl Dace, Creek Chub, White Sucker, Blackchin Shiner (*Notropis heterodon*), Central Mudminnow, Common Shiner, Blackside Darter (*Percina maculate*) and Brassy Minnow. The sample location with the greatest fish capture total was Wes-3-Pond (n=155). The most productive method of capture was minnow traps and the

largest fish count by species was 36 Common Shiners from Wes-3-Pond. Electrofishing the West Creek system also resulted in fish capture at sites Wes-1 and Wes-2.

3.7 Clark Creek System

3.7.1 Water Quality

Water quality samples were collected from three locations of Clark Creek (Cla-1, Cla-2 and Cla-3; Figure 2-1). Analytical results for general chemistry and metals are presented in Table 3-1 and in situ field collected water quality parameters are provided in Table 3-2. Certificates of Analysis are included Appendix B.

General chemistry and metals parameters were found meet PWQO and CEQG values, with the following exceptions:

- Aluminum exceeded the CEQG (100 µg/L) at two of three Clark Creek sample locations, Cla-2 and Cla-3, having concentrations of 210 and 750 µg/L, respectively. The results are not directly comparable the PWQO (75 µg/L, as measured in a clay-free sample) as the samples were not field-filtered, and therefore, not necessarily clay-free.

- Iron was present at a concentration that did not meet the PWQO and CEQG (both 300 µg/L) at all three Clark Creek sample locations, with concentrations ranging from 330 (Cla-1) to 790 µg/L (Cla-2).

- Uranium was present at a concentration slightly above the interim PWQO (5 µg/L) at Cla-2 (5.5 µg/L).

- Zinc did not meet the PWQO and CEQG (both 30 µg/L) as well as the interim PWQO (20 µg/L), at sample location Cla-3 (40 µg/L).

Physico-chemical parameters measured including pH, dissolved oxygen, conductivity, total dissolved solids and temperature indicated no limitation to aquatic habitat.

3.7.2 Sediment Quality

Sediment samples were collected at Cla-1, Cla-2 and Cla-3 (Figure 2-2). Results of chemical and physical analyses are presented in Table 3-3 and Table 3-4, with Certificates of Analysis provided in Appendices C and D.

Inorganic and metal parameters were meet objective values listed in the PSQG and CEQG at Clark Creek, with the following exceptions:

- TOC was above the PSQG LEL (1%) but below the PSQG SEL (10%) at Cla-2 and Cla-3, with concentrations of 2.9% and 2.5%, respectively. TOC was less than the LEL at Cla-1 (0.72%).

- TKN was above the PSQG LEL (550 µg/g) and the PSQG SEL (4,800 µg/g) for all Clark Creek samples, with concentrations ranging from 780 to 2,260 µg/g. TKN was less than the LEL in Cla-2 (242 µg/g).

- Nickel was above the PSGQ LEL (16 µg/g) at Cla-3 (20 µg/g), but was well below the PSQG SEL (65 µg/g).

Sampling locations in Clark Creek showed a relatively uniform substrate composition throughout, consisting of a predominantly sand composition with moderate percentages of silt and mucked mixed.

3.7.3 Habitat Assessment

Clark Creek originates east of Clark Road, flowing southwest through pasture lands, passing by a municipal landfill before draining into Pinewood River approximately 500 m west of Highway 600. As with other tributaries of Pinewood River, Clark Creek contained a predominantly silk/muck substrate with interspersed areas of gravel and cobble throughout its length. The creek has a low gradient and an abundance of beaver activity creating low flow and pooled morphology throughout.

Clark Creek is relatively consistent in habitat character throughout its length. Wetted widths in the channelized reaches ranged between 0.66 and 2.1 m, while floodplain widths varied from 20 to 30 m. Vegetated cover was limited to emergent vegetation such as broad-leaved arrowhead and marshy spikerush. Table 3-6 summarizes key habitat characteristics from Clark Creek. Habitat assessment locations are presented in Figure 2-3. Photographs of representative habitats associated with sample locations are provided in Appendix A.

3.7.4 Benthic Invertebrate Community

Benthic invertebrate community sampling locations at West Creek are shown in Figure 2-4 with results presented in Tables 3-7 and 3-8. Detailed taxonomic enumeration data are presented in Appendix F.

Simpson's diversity ranged from 0.42 (Cla-3) to 0.75 (Cla-2), and evenness between 0.25 (Cla-1) and 0.50 (Cla-2). Density was highest at station Cla-1 (2,956 organisms/m^2) and lowest at Cla-3 (521 organisms/m^2). Family richness ranged from 6 (Cla-3) to 14 (Cla-1). EPT taxa were present at every sample location in Clark Creek, however in relatively low proportions (less than 15% for all locations), and ranged from 2.78% (Cla-3) to 12.77% (Cla-2) with Cla-3 having a value of 4.90%. Percent Chironomids varied greatly between sample locations and

ranged from 13.73% (Cla-1) to 75.0% (Cla-3). Cla-2 had a value between these at 41.49. Other taxa with large contributions by proportion to the benthic invertebrate community of Clark Creek included: Hyalellidae (amphipods), Elmidae (riffle beetles), and Tubificidae (oligochaete worms). Hyalellidae was the family in the greatest proportion at site Cla-1.

3.7.5 Fisheries Resources

Species-specific catch per unit effort by gear type for Clark Creek are presented in Tables 3-9 to 3-13. Fish meristic data and other details related to fishing methods are provided in Appendix G. A summary of presence / absence of fish species captured during the 2011 field survey as well as previous studies (Klohn Crippen Berger 2011) is provided in Table 3-14.

In total, 11 species were captured at Clark Creek in 2011 and included: Brook Stickleback, Northern Redbelly Dace, Finescale Dace, Pearl Dace, Creek Chub, White Sucker, Spottail Shiner, Central Mudminnow, Common Shiner, Brassy Minnow and Blacknose Dace. Minnow traps proved to be the most productive method of capture and Cla-2 was the site with the highest fish capture total by this gear type (n=77). Brassy Minnows were the more abundant species present with 31 fish captured at Cla-2. The second most abundant species captured was Finescale Dace with a total of 29 individuals caught at site Cla-1. All fish captured in the seine were not measured or recorded, but analyzed to see if any different species could be identified.

3.8 Blackhawk Creek System

3.8.1 Water Quality

One location was sampled at Blackhawk Creek (Bla-1) in 2011 (Figure 2-1). Analytical results for general chemistry and metals are presented in Table 3-1, and in-situ field water quality parameters are provided in Table 3-2. Certificates of Analysis are provided in Appendix B.

General chemistry and metals parameters met PWQO and CEQG values, with the following exceptions:

- Aluminum did not meet the CEQG (100 µg/L) at sample location Bla-1 (180 µg/L). The results are not directly comparable the PWQO (75 µg/L, as measured in a clay-free sample) as the sample was not field-filtered, and therefore, not necessarily clay-free.

- Iron was present above the PWQO and CEQG (both 300 µg/L) at sampling location Bla-1 (460 µg/L).

- The Blackhawk Creek sample had a total phosphorus concentration of 61 µg/L, which did not meet the interim PWQO of 30 µg/L.

Physico-chemical parameters measured including pH, dissolved oxygen, conductivity, total dissolved solids and temperature indicated no limitation to aquatic habitat.

3.8.2 Sediment Quality

One sediment sample was collected at Blackhawk Creek (Bla-1; Figure 2-2). Results of chemical and physical analyses are presented in Table 3-3 and Table 3-4, respectively. Sediment chemistry and grain size Certificates of Analysis are provided in Appendices C and D.

Inorganic and metal parameters met PSQG and CEQG, with the following exceptions:

- TOC was above the PSQG LEL (1%), but below the PSQG SEL (10%) at Bla-1 (2.3%).
- TKN was above the PSQG LEL (550 µg/g), but below the PSQG SEL (4,800 µg/g) at Bla-1 (1,930 µg/g).

The substrate at Blackhawk Creek sample site was dominated by sand, but clay and gravel were also observed.

3.8.3 Habitat Assessment

Blackhawk Creek is a tributary of the upper Pinewood River which flows in a northerly direction, draining pasturelands and wooded areas prior to and after crossing Highway 600. The creek is characterized as having relatively entrenched vegetated banks, with substrates consisting of silt/ muck with a mixture of boulder, cobble and gravel. Cover for fish was limited to some undercutting of creek banks and emergent vegetation, which included grass and sedge species, as well as broad-leaved arrowhead. Other aquatic macrophytes observed at the Blackhawk Creek sample location include floating arrowhead, marsh marigold, marshy spikerush, slender pondweed and sedge species. Wetted width of the main channel was 2.1 m and had a mean average depth of 1.5 m; floodplain width was 60 m. Table 3-6 summarizes key habitat characteristics for Bla-1. Photographs of representative habitats associated with sample locations are provided in Appendix A.

3.8.4 Benthic Invertebrate Community

The single benthic invertebrate community sampling location on Blackhawk Creek is shown in Figure 2-4 with results of sampling presented in Tables 3-7 and 3-8 and taxonomic enumeration data provided in Appendix F.

Station Bla-1 yielded low density of benthic invertebrates (72.46 organisms/m^2). Three families were represented in the sample and included: Chironimidae (60%), Tubificadae (20%) and Sphaeriidae (20%). The Simpson's diversity value was 0.56 and evenness was 0.76. No individuals belonging to the EPT families were collected from this site.

3.8.5 Fisheries Resources

Fish sampling results from Blackhawk Creek are presented in Tables 3-9 to 3-13. Fish meristic data and other details related to fishing methods are provided in Appendix G. A summary of presence / absence of fish species captured during the 2011 field survey as well as previous studies (Klohn Crippen Berger 2011) is provided in Table 3-14.

Ten species of fish were captured at Blackhawk Creek including; Brook Stickleback, Northern Redbelly Dace, Finescale Dace, Pearl Dace, Creek Chub, White Sucker, Central Mudminnow, Common Shiner, Fathead Minnow, and Brassy Minnow. Seine netting was the most successful method of capture for small-bodied fish with a total of 149 fish enumerated, compared to 57 fish captured in minnow traps. The species present in the greatest abundance at Bla-1 was the Common Shiner (n=35) followed by the White Sucker (n=27).

TABLE 3-1
SUMMARY OF SURFACE WATER ANALYTICAL RESULTS

Parameter	Sample Area				Pinewood River						Tait Creek	Loslo Creek			Upper Trib. 5	Marr Creek						West Creek					Clark Creek			Blackhawk Creek
	Sample Date				30-Sep-11	30-Sep-11	29-Sep-11	2-Oct-11	1-Oct-11	30-Sep-11	2-Oct-11	1-Oct-11	1-Oct-11	1-Oct-11	2-Oct-11	28-Sep-11	28-Sep-11	28-Sep-11	27-Sep-11	27-Sep-11	27-Sep-11	29-Sep-11	29-Sep-11	29-Sep-11	2-Oct-11	29-Sep-11	28-Sep-11	28-Sep-11	2-Oct-11	30-Sep-11
	Replicate Station				Pin-1	Pin-2	Pin-3	Pin-4	Pin-6	Pin-7	Tait-T2-1	Los-1	Los-2	Los-T-2	Upp-T5 -1	Marr-1	Marr-Up-Pond	Marr-2	Marr-3	Marr-4	Marr-5	Wes-1	Wes-2	Wes-2-Pond	Wes-3	Wes-4	Cla-1	Cla-2	Cla-3	Bla-1
General Chemistry	**Units**	**RDL**	**PWQO**	**CEQG**																										
Total Ammonia-N	mg/L	0.01	-	-	<	<	<	<	0.02	0.02	0.12	0.02	<	<	<	0.01	0.04	0.06	0.04	0.02	<	<	<	0.02	0.02	<	<	<	<	<
T-Alkalinity as $CaCO_3$	mg/L	1	X[A]	-	168	258	238	203	213	187	149	190	254	134	176	222	42	66	182	239	170	88	205	178	218	80	140	332	338	163
Dissolved Organic Carbon	mg/L	0.2	-	-	23.6	16.8	18	18.1	20.5	20.2	29.8	21.6	18.8	23.3	15.6	25.8	16	17.1	22.3	15.4	21.9	20.1	14.8	18.1	18.2	21.7	21.1	8.8	7.8	26.9
Conductivity	umho/cm	1	-	-	366	512	477	405	406	368	280	355	482	264	327	419	83	194	377	554	336	171	383	329	491	150	267	616	630	350
Hardness as $CaCO_3$	mg/L	1	-	-	170	250	250	200	200	170	150	180	240	140	170	220	41	92	200	280	170	85	190	180	230	79	150	310	310	160
Nitrate - Nitrogen	mg/L	0.1	-	2.935	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	0.4	<	<
Nitrite - Nitrogen	mg/L	0.01	-	0.06	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<
Nitrate + Nitrite	mg/L	0.1	-	-	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	0.4	<	<
pH (Lab measured)	pH units	-	6.5-8.5	6.5-9.0	8.06	8.06	7.97	8.13	7.87	7.84	8.06	7.87	7.92	7.87	8.16	7.91	7.13	7.54	8.02	7.96	8.06	7.78	8.12	8.08	8.15	7.82	7.98	8.10	8.19	7.62
pH (Field measured)	pH units	-	6.5-8.5	6.5-9.0	8.21	7.70	7.72	7.90	7.52	7.50	7.98	7.37	7.53	7.81	8.53	7.46	7.00	7.22	7.68	7.36	7.97	7.36	8.11	8.06	8.17	7.80	7.72	7.76	8.02	7.16
Dissolved Sulphate (SO4)	mg/L	1	-	-	14	8	<	4	<	<	<	<	<	<	<	<	<	29	17	10	<	<	<	<	28	<	<	9	12	<
Total Suspended Solids	mg/L	1	-	-	13	2	15	14	4	41	6	12	6	5	8	78	6	8	3	17	6	2	86	8	2	<	11	5	15	5
Metals																														
Total Aluminum (Al)	µg/L	5	75[i,B]	100[i]	**400**	**150**	**250**	**300**	**180**	**2700**	**120**	**310**	58	77	**150**	**2000**	**360**	**530**	52	**390**	**170**	56	**1100**	**240**	49	21	81	**210**	**750**	**180**
Total Antimony (Sb)	µg/L	0.5	20[i]	-	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<
Total Arsenic (As)	µg/L	1	100 (5)[C]	5	1	1	2	2	2	3	<	1	1	1	2	4	<	2	1	1	2	<	2	1	1	<	<	<	2	1
Total Barium (Ba)	µg/L	2	-	-	21	32	33	23	17	51	21	22	18	14	22	55	12	43	11	30	19	12	27	16	46	8	12	39	52	23
Total Beryllium (Be)	µg/L	0.5	11/1,100[D]	-	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<
Total Bismuth (Bi)	µg/L	1	-	-	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<
Total Boron (B)	µg/L	10	200[i]	1,500	22	26	24	28	20	25	13	10	26	13	17	17	<	31	<	23	17	<	17	12	24	<	<	27	31	23
Total Cadmium (Cd)	µg/L	0.1	0.2	0.015-0.088[J]	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<
Dissolved Calcium (Ca)	mg/L	0.05	-	-	39.7	60	61.2	46.4	49	42.2	37.5	44	56.2	33.2	37.3	56.5	10.9	22.7	48.5	67.8	40.3	20.9	49.6	45	55.3	19.3	34.9	75.9	76.7	40.3
Total Calcium (Ca)	µg/L	200	-	-	43,000	66,000	62,000	47,000	53,000	48,000	39,000	46,000	62,000	34,000	39,000	62,000	12,000	46,000	50,000	70,000	41,000	23,000	54,000	47,000	62,000	20,000	36,000	85,000	88,000	45,000
Total Chromium (Cr)	µg/L	5	1 / 8.9[E]	1 / 8.9[E]	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<
Total Cobalt (Co)	µg/L	0.5	0.9	-	<	<	<	<	<	**1.6**	<	0.7	<	<	<	**2.7**	<	**2.6**	<	**1**	<	<	**1**	<	<	<	<	<	<	<
Total Copper (Cu)	µg/L	1	5 (5)[F]	2-6.22[K]	2	<	1	<	2	**4**	<	<	<	<	1	3	1	**5**	<	2	1	<	2	1	2	<	1	<	2	<
Total Iron (Fe)	µg/L	100	300	300	**530**	**440**	**1,000**	**520**	**370**	**2,100**	190	**630**	**370**	260	230	**2,900**	**580**	**3,900**	**560**	**1,300**	290	270	**1,500**	**320**	180	<	**330**	**790**	**690**	**460**
Total Lead (Pb)	µg/L	0.5	20/25 (3/5)[G]	1.02-13.43[L]	<	<	<	<	<	1.2	<	<	<	<	<	1.6	<	0.9	<	<	<	<	0.5	<	<	<	<	<	<	<
Total Lithium (Li)	µg/L	5	-	-	11	12	<	12	6	9	<	<	8	5	5	<	<	<	<	9	<	<	5	<	9	<	<	13	17	9
Total Magnesium (Mg)	µg/L	50	-	-	19,000	27,000	27,000	23,000	21,000	20,000	15,000	18,000	26,000	14,000	21,000	26,000	3,900	11,000	22,000	28,000	21,000	8,900	19,000	17,000	24,000	8,100	17,000	37,000	35,000	17,000
Dissolved Magnesium (Mg)	mg/L	0.05	-	-	17.3	24	22.7	21.5	19.4	16.8	13.9	16.9	23.1	13.3	19	20	3.48	8.52	18.2	25.9	17.2	8	17	15.7	21.5	7.52	14.1	29.6	29.1	15.6
Total Manganese (Mn)	µg/L	2	-	-	84	120	590	120	320	660	51	500	74	110	78	960	47	480	100	470	70	49	320	77	18	16	72	190	57	240
Mercury (Hg)	µg/L	0.1	0.2	0.026	<	<	**0.1**	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<
Total Molybdenum (Mo)	µg/L	0.5	40[i]	73	<	0.8	0.6	1.2	<	1.2	<	<	<	<	0.6	0.7	<	0.6	0.9	0.8	<	<	1.2	<	2.3	<	<	1.2	1.6	0.7
Total Nickel (Ni)	µg/L	1	25	48-225[M]	2	1	2	1	2	6	1	1	2	1	1	6	<	3	2	2	2	<	4	2	2	<	1	1	1	1
Total Phosphorous	mg/L	0.002	0.030[i]	-	**0.058**	**0.049**	**0.086**	**0.064**	**0.053**	**0.14**	**0.053**	**0.061**	**0.038**	**0.058**	**0.07**	**0.17**	0.02	**0.16**	**0.066**	**0.078**	**0.065**	0.022	**0.068**	0.041	**0.036**	0.025	0.024	**0.035**	**0.074**	**0.061**
Total Potassium (K)	µg/L	200	-	-	2500	2800	2000	2400	790	3000	2000	1,500	1,000	1900	2200	4000	580	3300	3800	2000	1700	1,000	2300	1400	3700	490	790	1600	3900	3400
Total Selenium (Se)	µg/L	2	100	1	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<
Total Silicon (Si)	µg/L	50	-	-	3,400	3,700	7,900	1,100	4,200	11,000	1,200	8,200	1,600	1,600	820	14,000	3,000	3,300	2,100	8,100	1,100	6,700	8,700	4,500	3,600	7,100	8,000	8,400	9,400	7,400
Total Silver (Ag)	µg/L	0.1	0.1	0.1	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<
Total Sodium (Na)	µg/L	100	-	-	6,400	6,800	6,500	6,400	3,600	4,400	1,900	1,800	3,600	2,200	2,600	2,400	510	2,300	3,100	6,000	2,700	1,100	1,600	1,700	6,800	980	1,700	6,300	6,100	4,600
Total Strontium (Sr)	µg/L	1	-	-	120	190	130	140	110	100	95	95	130	58	76	110	22	65	95	140	96	38	86	72	120	35	66	230	210	150
Total Tellurium (Te)	µg/L	1	-	-	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<
Total Tin (Sn)	µg/L	1	-	-	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<
Total Titanium (Ti)	µg/L	5	-	-	16	10	23	11	7	120	<	10	<	<	6	71	13	16	<	20	6	<	43	8	<	<	6	8	28	9
Total Thallium (Tl)	µg/L	0.05	0.3[i]	0.8	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<
Total Tungsten (W)	µg/L	1	30[i]	-	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<
Total Uranium (U)	µg/L	0.1	5[i]	15	1.6	1.2	1.7	1.3	0.6	1.5	0.4	0.8	0.7	1.2	1.1	3.6	<	0.5	1.2	0.8	1.3	<	0.4	0.9	1.5	<	0.2	**5.5**	4.5	0.6
Total Vanadium (V)	µg/L	0.5	6[i]	-	2	0.8	1.6	1.1	0.7	**7.1**	0.7	0.9	<	0.5	1.1	**7**	1.1	2.5	<	1.4	0.8	<	4	1.1	1	<	<	0.9	2.5	0.7
Total Zinc (Zn)	µg/L	5	30 (20)[H]	30	<	<	<	<	<	11	<	9	<	<	<	11	<	**39**	**21**	12	<	<	7	<	6	<	<	8	**40**	<
Total Zirconium (Zr)	µg/L	1	4[i]	-	<	<	<	<	<	**5**	<	<	<	<	<	2	<	<	<	<	<	<	2	<	<	<	<	<	<	<

Notes:	
	Sample Site Pin-7 is presented as "Route 600" in Appendix B
PWQO	Provincial Water Quality Objectives, taken from "Policies, Guidelines, Provincial Water Quality Objectives ("PWQO") of the Ministry of Environment and Energy," July, 1994; Table 2; Table of PWQOs and Interim PWQOs ("IPWQO"). IPWQOs denoted by superscript "i".
CEQG	Canadian Environmental Quality Guidelines ("CEQG") from the Canadian Council of Ministers of the Environment, Summary Table: "Canadian Water Quality Guidelines for the Protection of Aquatic Life" Summary Table Accessed Online @ http://st-ts.ccme.ca/, November 15, 2011
100	indicates exceedence of an interim PWQO
100	indicates exceedence of the PWQO.
100	indicates exceedence of the CEQG.
100	indicates exceedence of both the PWQO and CEQG.
RDL	indicates Reportable Detection Limit.
<	means not detected above the RDL.
i	indicates value is an Interim PWQO.
A	PWQO states: Alkalinity should not be decreased by more than 25% of the natural concentration.
B	PWQO is for total aluminum measured in a clay-free sample; analyzed samples not clay-free.
C	PWQO for arsenic is 100 µg/L; IPWQO is 5 µg/L
D	PWQO for beryllium is 11 µg/L where hardness is <75 mg/L, 1,100 µg/L where hardness is >75 mg/L.
E	PWQO/CCME for hexavalent chromium is 1 µg/L, PWQO/CCME for trivalent chromium is 8.9 µg/L; total chromium reported.
F	PWQO for copper is 5 µg/L; IPWQO is 5 µg/L where hardness is >20 mg/L.
G	PWQO for lead is 20 µg/L where alkalinity is 40-80 mg/L and 25 µg/L where alkalinity is >80 mg/L; IPWQO is 3 µg/L where hardness is 30-80 mg/L and 5 µg/L where hardness is >80 mg/L.
H	PWQO for zinc is 30 µg/L; IPWQO is 20 µg/L.
I	CCME for aluminum where pH is ≥6.5.
J	CCME for cadmium = $10^{0.86[\log10(\text{hardness})]-3.2}$ µg/L.
K	CCME for copper = $e^{0.8545[\ln(\text{hardness})]-1.465} * 0.2$µg/L; Minimum of 2 µg/L.
L	CCME for lead = $e^{1.273[\ln(\text{hardness})]-4.705}$; Minimum of 1 µg/L.
M	CCME for nickel = $e^{0.76[\ln(\text{hardness})]+1.06}$ µg/L.

TABLE 3-2
IN SITU WATER QUALITY MEASUREMENTS

Watercourse Name	Sample Location ID	Date	Depth (m)	Temperature (°C)	Specific Conductance (µS/cm)	Conductivity (µS/cm)	Total Dissolved Solids (g/L)	Dissolved Oxygen (%)	Dissolved Oxygen (mg/L)	pH	ORP
Pinewood River	Pin-1	22-Jul-11	0.4	23.11	0.276	265	0.179	108.1	9.06	7.54	-18.10
	Pin-1-F	30-Sep-11	0.38	12.86	0.261	NR	0.170	NR	6.62	8.21	68
	Pin-2	21-Jul-11	0.26	27.00	NR	312	0.156	NR	NR	7.75	NR
	Pin-2-F	30-Sep-11	0.21	10.48	0.362	NR	0.235	NR	6.06	7.70	146
	Pin-3	22-Jul-11	>1.5	28.20	NR	25	0.212	NR	NR	8.80	NR
	Pin-3-F	29-Sep-11	0.72	15.60	0.377	NR	0.245	NR	6.06	7.72	135
	Pin-4	23-Jul-11	0.3	19.20	0.346	308	0.225	60.2	5.49	7.26	8.6
	Pin-4-F	2-Oct-11	0.86	13.41	0.304	NR	0.197	NR	6.72	7.90	120
	Pin-5	19-Jul-11	0.64	27.60	0.331	343	NR	NR	9.50	6.31	96.3
	Pin-6	25-Jul-11	2	20.40	0.396	360	0.257	37.4	3.43	7.16	1.6
	Pin-6-F	1-Oct-11	0.73	13.56	0.306	NR	0.198	NR	3.71	7.52	113
	Pin-7	30-Sep-11	0.48	12.94	0.276	NR	0.179	NR	1.58	7.50	23
Tait Creek Trib. 2	Tait-T2-1	26-Jul-11	NR	21.87	0.278	260	0.181	116.8	10.13	6.73	NR
	Tait-T2-1-F	2-Oct-11	0.35	17.10	0.232	NR	0.151	NR	7.63	7.98	101
Loslo Creek	Los-1	24-Jul-11	1.06	18.84	0.274	242	0.178	40.4	3.96	6.67	14.2
	Los-1-F	1-Oct-11	1.12	10.30	0.248	NR	0.161	NR	6.16	7.37	135
	Los-2	25-Jul-11	>1.5	20.82	0.383	353	0.250	34	2.75	6.05	NR
	Los-2-F	1-Oct-11	0.97	12.32	0.325	NR	0.211	NR	6.26	7.53	121
	Los-T-2	24-Jul-11	NR	19.08	0.218	193	0.142	59.1	5.53	7.48	6.7
	Los-T-2-F	1-Oct-11	1.3	10.55	0.189	NR	0.123	NR	5.54	7.81	76
Upper Trib. 5	Upp-T5-1	26-Jul-11	NR	NR	NR	NR	NR	NR	NR	NR	NR
	Upp-T5-F	2-Oct-11	0.54	13.80	0.252	NR	0.164	NR	8.46	8.53	109
Marr Creek	Marr-1	20-Jul-11	NR	NR	NR	348	0.174	NR	NR	7.77	NR
	Marr-1-F	28-Sep-11	0.59	14.16	0.321	NR	0.209	NR	10.67	7.46	125
	Marr-2	21-Jul-11	0.37	25.20	NR	277	0.140	NR	NR	6.90	NR
	Marr-2-F	28-Sep-11	0.25	8.70	0.129	NR	0.084	NR	7.78	7.22	157
	Marr-3	20-Jul-11	0.32	24.10	NR	327	0.164	NR	NR	6.76	NR
	Marr-3-F	27-Sep-11	0.44	11.80	0.278	NR	0.177	NR	10.82	7.68	165
	Marr-4	19-Jul-11	NR	19.70	0.220	280	NR	NR	8.63	6.83	88.7
	Marr-4-F	27-Sep-11	0.125	8.91	0.374	NR	0.242	NR	5.68	7.36	184
	Marr-5	19-Jul-11	NR	NR	NR	NR	NR	NR	NR	NR	NR
	Marr-5-F	27-Sep-11	0.71	13.43	0.255	NR	0.166	NR	13.55	7.97	75
	Marr-Up-Pond	21-Jul-11	NR	24.90	NR	97	0.048	NR	NR	7.07	NR
	Marr-Up-Pond-F	28-Sep-11	0.49	12.46	0.063	NR	0.041	NR	11.54	7.00	91
Core Shack Creek	Cor-1	21-Jul-11	NR	NR	NR	NR	NR	NR	NR	NR	NR
West Creek	Wes-1	21-Jul-11	0.11	21.03	0.162	149	NR	68.1	5.88	6.63	13.5
	Wes-1-F	29-Sep-11	0.2	13.04	0.134	NR	0.087	NR	6.32	7.36	143
	Wes-2-Pond	20-Jul-11	NR	24.92	0.246	246	NR	3.5	43.10	6.75	10.6
	Wes-2-Pond-F	29-Sep-11	0.36	15.92	0.268	NR	0.174	NR	8.62	8.06	150
	Wes-2	20-Jul-11	0.1	22.84	0.282	270	NR	67	5.79	6.90	26.5
	Wes-2-F	29-Sep-11	0.15	15.74	0.304	NR	0.197	NR	8.53	8.11	154
	Wes-3-F	2-Oct-11	0.33	9.93	0.254	NR	0.165	NR	6.82	8.17	47
	Wes-3-Pond	22-Jul-11	0.4	28.40	0.321	343	NR	152.6	11.66	8.10	NR
	Wes-4	23-Jul-11	0.4	17.38	0.379	326	0.248	39	3.82	6.74	5.6
	Wes-4-F	29-Sep-11	0.91	14.81	0.123	NR	0.080	NR	6.85	7.80	58
Clark Creek	Cla-1	24-Jul-11	0.12	25.16	0.222	223	0.144	83.2	6.96	6.88	-8.6
	Cla-1-F	28-Sep-11	0.16	18.37	0.230	NR	0.149	NR	9.92	7.72	131
	Cla-2	23-Jul-11	0.68	15.60	NR	528	0.263	NR	NR	8.03	NR
	Cla-2-F	28-Sep-11	0.41	12.48	0.451	NR	0.294	NR	8.32	7.76	126
	Cla-3	25-Jul-11	0.38	19.97	0.599	541	0.389	113.6	10.32	7.74	NR
	Cla-3-F	2-Oct-11	1.25	12.12	0.436	NR	0.283	NR	6.08	8.02	125
Blackhawk Creek	Bla-1	22-Jul-11	1.5	22.55	0.252	240	0.163	57.8	4.99	6.88	37.5
	Bla-1-F	30-Sep-11	0.25	10.84	0.250	NR	0.163	NR	11.41	7.16	145

Notes:

NR = Not Recorded
NA= Not Applicable

TABLE 3-3
SUMMARY OF SEDIMENT ANALYTICAL RESULTS

Parameter	Sample Area					Pinewood River						Tait Creek	Loslo Creek			Upper Trib. 5	Marr Creek						West Creek					Clark Creek			Blackhawk Creek
	Sample Date					30-Sep-11	30-Sep-11	29-Sep-11	2-Oct-11	1-Oct-11	30-Sep-11	2-Oct-11	1-Oct-11	1-Oct-11	1-Oct-11	2-Oct-11	28-Sep-11	28-Sep-11	28-Sep-11	27-Sep-11	27-Sep-11	27-Sep-11	29-Sep-11	29-Sep-11	29-Sep-11	2-Oct-11	29-Sep-11	28-Sep-11	28-Sep-11	2-Oct-11	30-Sep-11
	Replicate Station					Pin-1	Pin-2	Pin-3	Pin-4	Pin-6	Pin-7	Tait-T2-1	Los-1	Los-2	Lot-T-2	Upp-T5-1	Marr-1	Marr-Up-Pond	Marr-2	Marr-3	Marr-4	Marr-5	Wes-1	Wes-2	Wes-2-Pond	Wes-3	Wes-4	Cla-1	Cla-2	Cla-3	Bla-1
	Units	RDL	PSQG LEL	PSQG SEL	CEQG PEL																										
Inorganics																															
Available (CaCl2) pH	pH	-	-	-	-	6.12	7.07	7.12	6.14	6.93	7.47	6.52	6.31	7.16	6.28	6.59	6.33	5.30	5.82	6.40	6.87	6.16	6.50	7.22	6.57	6.67	6.11	7.07	6.87	7.10	6.44
Moisture	%	1	-	-	-	48	23	41	56	33	44	71	72	15	77	54	42	68	70	56	61	42	18	25	26	56	78	29	48	41	36
Total Organic Carbon	mg/kg	500	1	10	-	**1.5**	**1.6**	**2**	**3.1**	**1.5**	**2**	**4.7**	**3.4**	0.75	**7.5**	**3.3**	**2.1**	**7.1**	**13**	**4**	**3.6**	**2.1**	0.86	0.69	**1.5**	**3**	**8.7**	0.72	**2.9**	**2.5**	**2.3**
Total Kjeldahl Nitrogen	µg/g	50	550	4,800	-	**1,670**	**730**	**1,360**	**3,470**	**935**	**1,200**	**3,260**	**5,080**	242	**7,690**	**3,470**	**1,900**	**3,990**	**8,630**	**4,140**	**4,200**	**2,250**	429	380	**980**	**3,350**	**8,580**	**780**	**2,260**	**1,130**	**1,930**
Loss on Ignition	%	0.2	-	-	-	7.4	1.1	6.2	12	4.9	5.7	13	9.8	2.1	20	10	7.0	18	30	12	8.9	8.1	1.2	1.6	3.9	8.0	22	3.7	8.6	5.3	5.9
Metals																															
Acid Extractable Aluminum (Al)	µg/g	50	-	-	-	4,300	4,800	7,000	6,400	6,800	8,200	6,400	5,900	4,200	8,100	7,900	11,000	11,000	10,000	7,000	6,200	7,200	2,200	5,200	9,100	6,400	6,400	7,500	6,800	9,500	8,300
Acid Extractable Antimony (Sb)	µg/g	0.2	-	-	-	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<
Acid Extractable Arsenic (As)	µg/g	1	6	33	17	1	1	3	2	2	4	1	2	2	3	2	3	1	2	1	4	2	1	2	2	2	2	1	3	4	3
Acid Extractable Barium (Ba)	µg/g	0.5	-	-	-	30	37	55	53	50	81	42	49	30	77	68	81	86	80	62	69	56	18	41	54	53	60	55	60	77	60
Acid Extractable Beryllium (Be)	µg/g	0.2	-	-	-	0.2	0.3	0.4	0.4	0.3	0.5	0.3	0.4	0.3	0.4	0.4	0.7	0.6	0.4	0.2	0.3	0.5	<	0.3	0.3	0.4	<	0.3	0.5	0.6	0.4
Acid Extractable Bismuth (Bi)	µg/g	1	-	-	-	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<
Acid Extractable Boron (B)	µg/g	5	-	-	-	<	<	<	<	<	7	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	6	6	<
Acid Extractable Cadmium (Cd)	µg/g	0.1	0.6	10	3.5	0.1	<	0.2	0.3	0.1	0.2	0.1	0.1	<	0.4	0.2	0.2	0.1	0.4	0.2	0.2	0.2	<	<	0.1	0.1	0.3	<	0.2	0.2	0.2
Acid Extractable Calcium (Ca)	µg/g	50	-	-	-	4,000	16,000	12,000	5,400	8,400	37,000	15,000	7,300	9,600	11,000	8,400	5,400	7,700	9,300	5,400	5,700	6,200	1,800	9,300	3,800	18,000	9,000	4,000	8,300	27,000	5,800
Acid Extractable Chromium (Cr)	µg/g	1	26	110	90	10	13	16	15	16	21	14	13	10	17	16	23	19	20	16	15	17	5	12	19	14	13	17	15	23	20
Acid Extractable Cobalt (Co)	µg/g	0.1	-	-	-	4.1	5.2	6.9	6.1	5.8	9.1	4.1	5.3	4.1	7.0	6.1	9.8	5.2	5.1	4.8	10	7.5	1.9	4.7	6.0	4.8	3.9	5.4	5.9	8.8	7.4
Acid Extractable Copper (Cu)	µg/g	0.5	16	110	197	5.2	5.0	9.4	9.0	9.6	16	8.9	7.1	4.9	**17**	10	**20**	**25**	**17**	13	10	9.5	2.7	6.2	7.4	10	11	8.5	9.4	15	11
Acid Extractable Iron (Fe)	µg/g	50	20,000	40,000	-	5,600	7,400	10,000	9,100	10,000	14,000	8,100	8,500	7,000	10,000	11,000	16,000	10,000	9,100	8,000	13,000	11,000	3,600	8,200	13,000	9,500	6,700	10,000	9,600	15,000	11,000
Acid Extractable Lead (Pb)	µg/g	1	31	250	91.3	3	5	6	5	5	7	6	5	3	7	7	9	8	6	5	5	6	2	5	6	5	6	6	6	8	7
Acid Extractable Magnesium (Mg)	µg/g	50	-	-	-	2,500	9,000	6,900	3,400	6,100	22,000	8,600	4,100	5,800	5,500	5,000	4,800	3,500	3,700	3,200	3,500	4,300	1,100	5,100	3,400	9,500	4,200	3,400	5,300	14,000	3,900
Acid Extractable Manganese (Mn)	µg/g	1	460	1,100	-	130	340	240	250	180	**1,300**	130	430	150	**480**	230	250	150	170	140	**1,900**	360	240	150	270	250	220	170	220	430	310
Acid Extractable Mercury (Hg)	µg/g	0.05	0.2	2	0.486	<	<	<	<	<	<	<	<	<	0.06	<	0.05	<	0.07	<	<	<	<	<	<	<	<	0.05	<	<	<	<
Acid Extractable Molybdenum (Mo)	µg/g	0.5	-	-	-	<	<	<	<	<	<	<	<	<	<	<	<	<	0.6	<	<	<	<	<	<	<	<	<	<	<	<	<
Acid Extractable Nickel (Ni)	µg/g	0.5	16	75	-	7.5	8.8	12	12	12	**19**	11	9.9	8.6	**18**	13	**23**	13	15	13	12	13	4.4	10	14	12	11	12	12	**20**	15
Acid Extractable Phosphorus (P)	µg/g	50	-	-	-	440	400	450	470	470	600	430	410	310	470	390	290	310	640	400	700	500	290	320	380	490	480	350	400	550	390
Acid Extractable Potassium (K)	µg/g	200	-	-	-	440	580	790	650	650	1,100	790	610	420	730	960	1,200	590	740	570	560	760	<	630	1,200	560	430	700	730	1,400	880
Acid Extractable Selenium (Se)	µg/g	0.5	-	-	-	<	<	0.7	<	<	<	<	0.6	<	0.5	0.5	<	0.6	1.0	0.6	<	<	0.5	<	<	<	<	<	<	0.7	<
Acid Extractable Silver (Ag)	µg/g	0.2	-	-	-	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<
Acid Extractable Sodium (Na)	µg/g	100	-	-	-	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<
Acid Extractable Strontium (Sr)	µg/g	1	-	-	-	11	16	18	16	15	27	15	15	11	22	15	17	20	25	15	15	16	5	12	14	18	14	12	17	29	21
Acid Extractable Thallium (Tl)	µg/g	0.05	-	-	-	0.05	0.07	0.09	0.10	0.10	0.15	0.10	0.09	0.05	0.10	0.11	0.14	0.10	0.15	0.08	0.07	0.09	<	0.08	0.11	0.07	0.07	0.15	0.13	0.14	0.12
Acid Extractable Tin (Sn)	µg/g	5	-	-	-	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<
Acid Extractable Uranium (U)	µg/g	0.05	-	-	-	0.74	0.54	1.1	1.2	0.63	0.83	0.61	1.5	0.39	4.0	0.81	1.2	1.7	2.0	2.9	0.69	0.94	0.32	0.47	2.2	0.95	1.5	0.56	1.6	1.1	1.6
Acid Extractable Vanadium (V)	µg/g	5	-	-	-	12	13	19	19	20	27	16	16	13	23	21	34	22	23	18	18	21	7	17	24	19	15	20	19	29	22
Acid Extractable Zinc (Zn)	µg/g	5	120	820	315	31	30	51	54	42	46	35	36	26	46	42	52	42	55	49	72	52	16	27	37	32	46	34	46	85	54

Notes:	
	Sample Site Pin-7 is presented as "Route 600" in Appendix C
PSQG	Provincial Sediment Quality Guidelines, taken from "Guidelines for Identifying, Assessing and Managing Contaminated Sediments in Ontario - An Integrated Approach" dated May 2008; Table 1; Provincial Sediment Quality Guidelines for Metals and Nutrients. LEL indicates Lowest Effect Level, SEL indicates Severe Effect Level.
CEQG	Canadian Environmental Quality Guidelines ("CEQG") from the Canadian Council of Ministers of the Environment, Summary Table: "Canadian Sediment Quality Guidelines for the Protection of Aquatic Life" Update 2002. PEL means Probable Effect Level.
100	Indicates exceedence of the PSQG LEL.
100	Indicates exceedence of the PSQG SEL.
100	Indicates exceedence of the PEL.
RDL	Indicates Reportable Detection Limit.
<	Indicates not detected above the RDL.

TABLE 3-4
SEDIMENT PARTICLE SIZE DISTRIBUTION

Sample Area		Pinewood River						Tait Creek	Loslo Creek			Upper Trib. 5	Marr Creek						West Creek					Clark Creek			Blackhawk Creek
Sample Date		29-Sep-11	29-Sep-11	29-Sep-11	29-Sep-11	29-Sep-11	29-Sep-11	29-Sep-11	29-Sep-11	29-Sep-11	29-Sep-11	29-Sep-11	29-Sep-11	29-Sep-11	29-Sep-11	29-Sep-11	29-Sep-11	29-Sep-11	29-Sep-11	29-Sep-11	29-Sep-11	29-Sep-11	29-Sep-11	29-Sep-11	29-Sep-11	29-Sep-11	29-Sep-11
Replicate Station		Pin-1	Pin-2	Pin-3	Pin-4	Pin-6	Pin-7	Tait-T2-1	Los-1	Los-2	Los-T-2	Upp-T5-1	Marr-1	Marr-Up-Pond	Marr-2	Marr-3	Marr-4	Marr-5	Wes-1	Wes-2	Wes-2-Pond	Wes-3	Wes-4	Cla-1	Cla-2	Cla-3	Bla-1
Parameter	Units																										
Gravel	%	0.0	35.0	0.0	0.5	0.0	0.0	3.0	11.0	0.0	2.0	0.0	0.0	20.0	0.6	0.0	0.0	0.0	13.0	0.0	3.6	0.0	1.4	0.0	4.0	0.0	22.0
Sand	%	58.0	63.5	51.0	35.5	41.0	26.0	47.0	60.0	85.0	42.0	45.0	31.0	53.0	30.0	43.0	59.8	37.0	80.0	72.0	45.8	43.0	51.6	47.0	58.7	45.0	48.0
Silt	%	21.0	10.0	20.0	35.0	30.0	35.0	29.0	10.0	4.0	25.0	25.0	20.0	6.0	36.0	29.0	25.0	27.0	3.0	9.0	21.8	33.0	31.0	20.0	20.7	19.0	9.0
Clay	%	20.0	8.0	29.0	29.0	29.0	39.0	20.0	19.0	11.0	31.0	31.0	50.0	24.0	34.0	28.0	16.0	36.0	4.0	20.0	28.8	24.0	16.0	33.0	14.6	36.0	21.0

Notes	Sample Site Pin-7 is presented as "Route 600" in Appendix D

TABLE 3-5
KEY HABITAT CHARACTERISTICS OF PONDS

Watercourse	Sample Location ID	Littoral Zone	Substrates (%)		Litorral Vegetation (%)			Supralittoral (%)	Eulitorral (%)	Water Quality				Dissolved Oxygen Profile (mg/L)		Temperature Profile (°C)	
			0-1m	1-2m	Emergent	Floating	Submergent			pH	Cond. (µS/cm)	TDS (g/L)	ORP	0m	1m	0m	1m
Tait	Tait-T2-1	A	60 Si/Mu 10 Cl 30 D	65 Si/Mu 5 Cl 30 D	10 (20 Cattails 5 Broad-Leaved Arrowhead 10 Sedges)	5 (50 Yellow Pond Lilly 50 Floating Pondweed)	5 Coontail	50 BS 30 TA 20 BP	30 Alder 5 Willow 5 Dogwood 50 Graminoid 5 Ericaceous 5 Poplar	6.73	260	0.181	28.2	10.13	NR	21.9	NR
		B	50 Si/Mu 10 Cl 40 D	65 Si/Mu 5 Cl 30 D	10 (20 Cattails 5 Sedges)	5 (30 Yellow Pond Lilly 5 Floating Pondweed)	5 Coontail	50 BS 5 La 15 TA 10 BP 10 WB	40 Alder 5 Willow 5 Dogwood 40 Graminoid 10 Poplar								
		C	40 Si/Mu 50 Cl 10 D	45 Si/Mu 50 Cl 5 D	1 Broad-Leaved Arrowhead	1 Yellow Pond Lilly	1 Coontail	60 BS 5 La 20 TA 15 BP	50 Alder 5 Willow 5 Dogwood 30 Graminoid 5 Ericaceous 5 Poplar								
Loslo	Los-T-2	A	10 Sa 50 Si/Mu 20 Cl 20 D	NR	5 (80 Cattails 5 Broad-Leaved Arrowhead 5 Floating Arrowhead 10 Burreed)	10 (80 Floating Pondweed 20 Duckweed)	60 (50 Coontail 30 Narrow Pondweed 20 Myriofylum)	60 BS 5 La 25 TA 10 BP	5 Alder 10 Willow 65 Graminoid 20 Ericaceous	7.48	193	0.142	6.7	5.53	NR	19.1	NR
		B	NR	NR	65 (5 Arrowhead 45 Carex 10 Grasses 5 Marshy Spikerush)	50 (5 Pond Lilly 15 Broad-Leaved Pondweed 30 Floating Arrowhead)	0	10 JP 65 BS 20 BP 5 WP	15 Alder 35 Graminoid 40 Grasses 10 Cattails								
		C	NR	NR	65 (5 Arrowhead 45 Carex 10 Grasses 5 Marshy Spikerush)	0	0	80 BS 5 BP 10 WB 5 WS	10 Alder 70 Graminoid 5 Grasses 15 Cattails								
		D	NR	NR	65 (5 Arrowhead 45 Carex 10 Grasses 5 Marshy Spikerush)	0	0	20 BS 55 BP 25 WB	25 Alder 25 Graminoid 50 Cattails								

TABLE 3-5 CONTINUED

Watercourse	Sample Location ID	Littoral Zone	Substrates (%)		Litorral Vegetation (%)			Supralittoral (%)	Eulitorral (%)	Water Quality				Dissolved Oxygen Profile (mg/L)		Temperature Profile (°C)	
			0-1m	1-2m	Emergent	Floating	Submergent			pH	Cond. (µS/cm)	TDS (g/L)	ORP	0m	1m	0m	1m
Marr	Marr-1	A	5 Sa 35 Si/Mu 50 Cl 10 D	10 Gr 5 Sa 30 Si/Mu 50 Cl 5 D	100 (5 Carex 10 Arrowhead 85 Grasses)	25 Lemna	50 Common Bladderwort	20 BS 20 TA 20 BP 10 WB 30 Wi	5 Alder 20 Willow 65 Graminoid 10 Ericaceous	7.77	348	0.174	NR	NR	NR	NR	NR
		B	NR	NR	85 (70 Grasses 15 Carex)	25 Lemna	5 Common Bladderwort	30 JP 50 BS 10 BP 10 WB	30 Willow 10 Graminoid 30 BS 30 WB								
		C	NR	NR	100 (5 Carex 10 Arrowhead 85 Grasses)	45 (90 Lemna 10 Broad - Leaved Pondweed)	10 Common Bladderwort	10 JP 60 BS 25 BP 5 WB	5 Alder 25 Willow 20 Graminoid 50 Poplar								
Marr	Marr-Up-Pond	A	5 Si/Mu 20 D 75 Br	15 Si/Mu 35 D 50 Br	65 (5 Arrowhead 45 Carex 10 Grasses 5 Marshy Spikerush)	0	0	50 BS 10 BP 30 WB 10 WP	15 Alder 75 Graminoid 10 Cattails	7.07	97	0.048	NR	NR	NR	24.9	NR
		B	NR	NR	65 (5 Arrowhead 45 Carex 10 Grasses 5 Marshy Spikerush)	50 (5 Pond Lilly 15 Broad-Leaved Pondweed 30 Floating Arrowhead)	0	10 JP 65 BS 20 BP 5 WP	15 Alder 35 Graminoid 40 Grasses 10 Cattails								
		C	NR	NR	65 (5 Arrowhead 45 Carex 10 Grasses 5 Marshy Spikerush)	0	0	80 BS 5 BP 10 WB 5 WS	10 Alder 70 Graminoid 5 Grasses 15 Cattails								
		D	NR	NR	65 (5 Arrowhead 45 Carex 10 Grasses 5 Marshy Spikerush)	0	0	20 BS 55 BP 25 WB	25 Alder 25 Graminoid 50 Cattails								

TABLE 3-5 CONTINUED

Watercourse	Sample Location ID	Littoral Zone	Substrates (%)		Litorral Vegetation (%)			Supralittoral (%)	Eulitorral (%)	Water Quality				Dissolved Oxygen Profile (mg/L)		Temperature Profile (°C)	
			0-1m	1-2m	Emergent	Floating	Submergent			pH	Cond. (µS/cm)	TDS (g/L)	ORP	0m	1m	0m	1m
West	Wes-2-Pond	A	40 Si/Mu 20 Cl 40 D	40 Si/Mu 20 Cl 40 D	80 (35 Carex 20 Graminoid 20 Pipereed 5 Daucus)	60 Floating Pondweed	45 (20 Slender Pondweed 30 Floating Pondweed)	30 BS 20 TA 40 WB	30 Alder 30 Willow 25 Graminoid 5 Ericaceous	6.75	246	NR	10.6	3.5	NR	24.9	NR
		B	40 Si/Mu 20 Cl 40 D	40 Si/Mu 20 Cl 40 D	80 (35 Carex 20 Graminoid 20 Pipereed 5 Daucus)	60 Floating Pondweed	45 (20 Slender Pondweed 30 Floating Pondweed)	30 BS 20 TA 40 WB	30 Alder 30 Willow 25 Graminoid 5 Ericaceous								
		C	40 Si/Mu 20 Cl 40 D	40 Si/Mu 20 Cl 40 D	80 (35 Carex 20 Graminoid 20 Pipereed 5 Daucus)	60 Floating Pondweed	45 (20 Slender Pondweed 30 Floating Pondweed)	30 BS 20 TA 40 WB	30 Alder 30 Willow 25 Graminoid 5 Ericaceous								
		D	40 Si/Mu 20 Cl 40 D	40 Si/Mu 20 Cl 40 D	80 (35 Carex 20 Graminoid 20 Pipereed 5 Daucus)	60 Floating Pondweed	45 (20 Slender Pondweed 30 Floating Pondweed)	30 BS 20 TA 40 WB	30 Alder 30 Willow 25 Graminoid 5 Ericaceous								

Notes
Co = Cobble
Gr = Gravel
Sa = Sand
Sm = Silt/Muck
Cl = Clay
D = Detritus
Bo = Boulder
JP = Jack Pine
TA = Trembling Aspen
BS = Black Spruce
WS = White Spruce
LA = Larch
WB = White Birch
WI - Willow
BP = Balsam Poplar
NR= Not Recorded
NA= Not Applicable

TABLE 3-6
KEY HABITAT CHARACTERISTICS OF CREEKS AND RIVERS

Watercourse Name	Sample Location ID	Watercourse Type	Location Cordinates (Zone 15)		Habitat Sheet (Y/N)	Wet/Dry	Section Length (m)	Current Velocity (m/s)	Channel Morphology (% composition)	Channel Features (m)	Other Channel Features (%)	Mean Wetted Width (m)	Mean Wetted Depth (m)	Mean Bankfull Width (m)	Mean Bankfull Depth (m)	Floodplain Width (m)	Left Upstream Bank Stability	Right Upstream Bank Stability	Substrate Composition (%)[1]	In stream Cover (% of surface area)	Aquatic Vegetation Type (based on overall 100% distribution)			Overhead Coverage (% stream shaded)	Migratory Obstructions / Potential Critical Habitat	Summer Water Chemistry Parameters	Surrounding Land Use	Sources of Pollution	Upwellings
			Easting	Northern																	Emergent	Floating	Submergent						
Pinewood River	Pin-1	Permanent: Stream	0428973	5407289	Y	Wet	40	0.1	Pools: 80 Braided/Diffuse:10 Beaver Ponds:10	Gradient: 0.03 Meander Length:30 Meander Amplitude:17 Entrenchment: L 1.3/1 R 1.5/2.5	Undercut Banks:5 Beaver Dams/# Observed: 1 Eroding Banks: 30 Woody Structure: 2 Organic Debris: 10	5.40	0.40	6.80	1.80	45	Low-Moderate	Moderate	Bo: 2 Gr: 5 Sa: 3 Si/Mu: 10 Cl: 80	Undercut Banks:10 Logs:0.3	30 (20 Sedges 5 Water Parsnip)	NR	10 Floating Pondweed	Canopy(Vertical Shading): 25 Ground Vegetation: Shrubs:5 Graminoid:20	NR	WT: 23.11°C DO: 9.06mg/L pH: 7.54 Con: 265µS/cm TDS: 179ppm ORP: NR	Agriculture	Agriculture	None Observed
	Pin-2	Permanent: Channelized Stream	0427752	5407048	Y	Wet	18	NR	Pools:60 Flats:10 Runs:30	Gradient: Low/Moderate Meander Length:18 Meander Amplitude:3.4 Entrenchment:1/1	Undercut Banks:5 Eroding Banks:60 Woody Structure:10 Organic Debris:5	1.80	0.26	1.80	0.47	35	Low-Moderate	Low	Co: 60 Gr: 30 Sa: 5 Si/Mu: 5	Overhanging Branches:5 Bottom Branch Debris:5 Undercut Banks:5 Logs:0.5	15 (20 Arrowhead 80 Burreed)	NR	25 (90 Myriophyllum 10 Broad-Leaved Pondweed)	Canopy(Vertical Shading):10	NR	WT:27°C DO:NR mg/L pH:NR Con:312µS/cm TDS:156ppm ORP:NR	Agriculture Forested	Agriculture	None Observed
	Pin-3	Permanent: Channelized Stream	0425917	5408565	Y	Wet	43.6	<0.01	Flats	Gradient:Very Low Meander Length:30.4 Meander Amplitude:6.5 Entrenchment:1/1	Undercut Banks:5 Beaver Dams/# Observed:1 Eroding Banks:5	7	>1.5	7	>1.75	>200	High	High	Sa:5 Si/Mu:30 Cl:50 D:5	Undercut Banks:5	5 (25 Broad-Leaved Arrowhead 25 Marshy Spikerush 40 Branching Spikerush 10 Floating Arrowhead)	NR	15 (50 Yellow Pond Lilly 30 Broad-Leaved Arrowhead 5 Slender Pondweed 15 Myriophyllum **Richardson's Pondweed also observed)	Canopy(Vertical Shading):5 Ground Vegetation: Shrubs:5 Graminoid:5	NR	WT:28.2°C DO:NR mg/L pH:8.8 Con:25µS/cm TDS:212ppm ORP:NR	Agriculture Forested Road	Agriculture Forested Road	None Observed
	Pin-4	Permanent: Channelized River	0424224	5408815	Y	Wet	140	0.01	Pools:50 Flats:45 Braided/Diffuse:5	Gradient: Low/Moderate Meander Length:260 Meander Amplitude:17 Entrenchment:1/2.5	Eroding Banks:5 Woody Structure:1 Organic Debris:5	15	0.30	17	0.30	200	High	High	Si/Mu:60 Cl:25 D:15	Undercut Banks:1 Logs:0.5	8 (Sedges Cattails Water Parsnip)	NR	70 (Floating Pondweed Yellow Pond Lilly Coontail Slender Pondweed Duckweed)	Canopy(Vertical Shading):10 Ground Vegetation/ Shrubs:1 Graminoid:9	NR	WT:19.2°C DO:5.49mg/L pH:7.26 Con: 308µS/cm TDS:225ppm ORP:8.6	Forrest Drilling (Temporary)	Drilling	None Observed
	Pin-5	Permanent: Channelized Stream	0423523	5408925	Y	Wet	70	0.02	Pools:25 Flats:75	Meander Length:65 Meander Amplitude:22 Entrenchment:1/1	Undercut Banks:5 Beaver Dams/# Observed:1(5%) Woody Structure:5 Organic Debris:5	5	0.40	6	0.64	250	Moderate-High	Moderate-High	Si/Mu:30 Cl:50 D:20	Undercut Banks:5 Logs:0.5	15 (10 Broad-Leaved Arrowhead 5 Spikerush 5 Burreed)	NR	85 (40 Yellow Pond Lilly 5 Ceratophyllum 20 Slender Pondweed 5 Broad Leaved-Pondweed 5 Richardson's)	Graminoid:95	NR	WT:27.6°C DO:9.5mg/L pH:6.31 Con:343µS/cm TDS:NRppm ORP:96.3	Agriculture Forested	Agriculture	None Observed
	Pin-6	Permanent: Channelized River	0421549	5408894	Y	Wet	120	0.01	Pools:30 Flats:70	Gradient:Low Meander Length:70 Meander Amplitude:25	Eroding Banks:5 Woody Structure:10 Organic Debris:10	5	2	5.40	>2.2	30	Low-Moderate	Low-Moderate	Si/Mu:75 Cl:15 D:10	Overhanging Branches:5 Bottom Branch Debris:5	15 (Spike Rush Yellow Pond Lilly)	NR	5 Pondweed	Canopy(Vertical Shading):10 Ground Vegetation: Shrubs:5 Graminoid:5	NR	WT:20.4°C DO:3.43mg/L pH:7.16 Con:360µS/cm TDS:257ppm ORP:1.6	Agriculture Forested	Agriculture Forested Road	None Observed
	Pin-7	Permanent: Channelized Stream	0420348	5408151	Y	Wet	80	NR	Flats:100	Gradient:Low Meander Length:75 Meander Amplitude:60 Entrenchment:2/1	Undercut Banks:5 Woody Structure:5 Organic Debris:15	8	1	10	3.50	90	High	High	Sa:5 Si/Mu:60 Cl:35	Overhanging Branches:3 Bottom Branch Debris:10 Undercut Banks:5 Logs:(2%)	5 (15 Marshy Spikerush 85 Bullrush)	NR	15 (60 Richardson's Pondweed 5 Bladderwort 5 Coontail 20 Broad-Leaved Pondweed 10 Slender Pondweed)	Canopy(Vertical Shading):25 Ground Vegetation: Shrubs:5 Graminoid:5	NR	WT:NR °C DO:NR mg/L pH:NR Con:NR µS/cm TDS:NR ppm ORP:NR	Agriculture Forested	Agriculture Forested	None Observed
Tait Cr. Trib.2	Tai-T2-2	Ephemeral: Channelized	0423706	5406665	N	Dry	NR	NA	NA	NR	NR	NA	NA	0.40	NR	NR	NR	NR	NR	NA	NA	NA	NA	Canopy(Vertical Shading): Ground Vegetation: Willow Alder Shrubs:Ericaceous Graminoid	NR	NA	NR	NR	None Observed
Loslo Creek	Los-1	Permanent: Channelized Stream	0422870	5411973	Y	Wet	35	0.01	Beaver Ponds	Gradient:Low Meander Length:70 Meander Amplitude:7.9 Entrenchment:1/1	Undercut Banks:5-10 Beaver Dams/# Observed:2 Woody Structure:5 Organic Debris:15	2.80	1.06	2.80	1.06	18	High	High	Gr:10 Sa:15 Si/Mu:40 Cl:20 D:5	Undercut Banks: 5 Logs:(<5%)	10 (40 Burreed 40 Marshy Spikerush 15 Broad-Leaved Arrowhead 3 Marsh Marigold 2 Cattails)	NR	15 (Broad-Leaved Pondweed Lemna)	Graminoid:10	NR	WT:18.84°C DO:3.96mg/L pH:6.67 Con:0.274µS/cm[3] TDS:178ppm ORP:14.2	Forested	Forested	None Observed
	Los-2	Permanent: Channelized Stream	0421792	5409583	Y	Wet	60	0	Pools:20 Flats:80	Gradient:Low Meander Length:40 Meander Amplitude:11.5 Entrenchment:>1/1 (Very Steep)	Undercut Banks:5 Eroding Banks:5 Woody Structure:5 Organic Debris:10	5	>1.5	6.50	>2	50	Low-Moderate	Low-Moderate	Gr:5 Sa:5 Si/Mu:50 Cl:35 D:5	Logs:1	20 (Sedges Water Carrot Broad-Leaved Arrowhead Spikerush)	NR	5 Floating Pondweed	Canopy(Vertical Shading):10 Ground Vegetation: Shrubs:4 Graminoid:6	NR	WT:20.82°C DO:2.75mg/L pH:6.05 Con:0.383µS/cm[3] TDS:250ppm ORP:NR	Agriculture	Agriculture	None Observed
Upper Trib. 5	UPP-T5-1	Ephemeral: Channelized	0424057	5407574	N	Dry	NR	NA	NA	Entrenchment:High	NR	NA	NA	0.50	0.40	NR	NR	NR	Sa/Si	NA	NA	NA	NA	Canopy(Vertical Shading): Ground Vegetation: Poplar Shrubs:Ericaceous Graminoid	NR	NA	NR	NR	None Observed

TABLE 3-6 CONTINUED

Watercourse Name	Sample Location ID	Watercourse Type	Location Coordinates (Zone 15)		Habitat Sheet (Y/N)	Wet/Dry	Section Length (m)	Current Velocity (m/s)	Channel Morphology (% composition)	Channel Features (m)	Other Channel Features (%)	Mean Wetted Width (m)	Mean Wetted Depth (m)	Mean Bankfull Width (m)	Mean Bankfull Depth (m)	Floodplain Width (m)	Left Upstream Bank Stability	Right Upstream Bank Stability	Substrate Composition (%)[1]	In stream Cover (% of surface area)	Aquatic Vegetation Type (based on overall 100% distribution)			Overhead Coverage (% stream shaded)	Migratory Obstructions / Potential Critical Habitat	Summer Water Chemistry Parameters	Surrounding Land Use	Sources of Pollution	Upwellings
			Easting	Northern																	Emergent	Floating	Submergent						
Marr Creek	Marr-2	Permanent: Channelized Stream	0423677	5411731	Y	Wet	6.5	<0.001	Flats	Sinuosity: Gradient:Low Meander Length:6.5 Meander Amplitude:1.6 Entrenchment:1/1	Undercut Banks:85 Eroding Banks:5 Organic Debris:10	0.54	0.37	0.62	0.55	85	Moderate-High	Moderate-High	Gr:5 Sa:5 Si/Mu:10 Cl:60 D:20	Undercut Banks:20	5 (Pipeweed Carex)	NR	5 (Pink Flowers with long slender leaves **Unidentified**)	Canopy(Vertical Shading): Ground Vegetation: Shrubs:5 Graminoid:60	NR	WT:25.2°C DO:NR mg/L pH:6.9 Con:277µS/cm TDS:140ppm ORP:NR	Agriculture Pasture Forrest	Agriculture	None Observed
	Marr-3	Permanent: Channelized Stream	0424030	5410691	Y	Wet	35	<0.01	Flats:90 Braided/Diffuse:10	Gradient:Low Meander Length:12 Meander Amplitude:1.5 Entrenchment:1.5/ 0.25	Woody Structure:5 Organic Debris:15	2.10	0.32	2.90	0.62	50	Moderate-High	Moderate-High	Sa:10 Si/Mu:40 Cl:40 D:10	Overhanging Branches:5 Bottom Branch Debris:5	75 (15 Sedge 60 Carex)	NR	5 Lemna	Canopy(Vertical Shading):5 Ground Vegetation: Shrubs:5 Graminoid:80	NR	WT:24.1°C DO:NR mg/L pH:6.76 Con:327µS/cm TDS:164ppm ORP:NR	Agriculture Forested	Agriculture Forested	None Observed
	Marr-4	Permanent: Channelized Stream	0423603	5410144	Y	Wet	75	<0.01	Pools:25 Flats:75	Gradient:Low Meander Length:17.9 Meander Amplitude:8 Entrenchment:1/1	Undercut Banks:35 Beaver Dams/# Observed:1 Organic Debris:30	0.63	0.25	1.10	0.79	180-200	Moderate-High	Moderate-High	Gr:10 Si/Mu:30 Cl:45 D:15	Bottom Branch Debris:2 Undercut Banks:30 Logs:Breaver Dam	35 (20 Carex 5 Broad-Leaved Arrowhead 5 Burreed 5 Marsh Marigold)	NR	45 (25 Pondweed 25 Lemna 5 Ceratophyllum 5 Slender Pondweed 5 Round Pondweed)	Graminoid:68	Beaver Dam	WT:19.7°C DO:8.63 mg/L pH:6.83 Con:280µS/cm TDS:NR ppm ORP:88.7	Agriculture Road	Agriculture Road	None Observed
	Marr-4A	Intermittent: Channelized Stream	0423642	5409640	N	Wet	NR	NR	NR	NR	NR	NR	NR	NR	NR	180-200	NR	NR	NR	NR	35 (20 Carex 5 Broad-Leaved Arrowhead 5 Burreed 5 Marsh Marigold)	NR	45 (25 Pondweed 25 Lemna 5 Ceratophyllum 5 Slender Pondweed 5 Round Pondweed)	Graminoid:68	NR	WT:19.7°C DO:8.63 mg/L pH:6.83 Con:280µS/cm TDS:NR ppm ORP:88.7	Agriculture	Agriculture Road	None Observed
	Marr-5	Intermittent: Channelized Stream	0423538	5408928	N	Wet	NR	NR	Braided/Diffuse	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	Cattle Crossing	NR	NR	NR	None Observed
	Marr-5Y	Intermittent: Channelized Stream	0423504	5408918	N	Wet	NR	NR	Braided/Diffuse	NR	NR	1.22	0.74	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	None Observed
	Marr-5Z	Intermittent: Channelized Stream	0423499	5408950	N	Wet	NR	NR	Braided/Diffuse	NR	NR	NR	NR	NR	NR	NR	NR	NR	Si/Cl	NR	NR	NR	NR	Graminoid	NR	NR	NR	NR	None Observed
	Marr-5B	Permanent: Channelized Stream	0423559	5408963	N	Wet	NR	0	NR	Entrenchment:High (Steep bank/box shape channel)	NR	1	0.50	NR	NR	20	NR	NR	Si/Cl/D	NR	NR	NR	Duckweed	Canopy(Vertical Shading): Ground Vegetation: Willow Alders Shrubs: Dogwood Graminoid:	NR	NR	NR	NR	None Observed
Core Shack Creek	Cor-1	Intermittent	0425117	5411904	N	Dry	25	NA	NA	NR	Woody Structure: Organic Debris:	NA	NA	1.10	0.42	NR	NR	NR	Co:10 Gr:10 Cl:80	NA	NA	NA	NA	Canopy(Vertical Shading):100 Ground Vegetation: 30 White Birch 20 Trembling Aspen 50 Black Ash Graminoid:Bedstraw Violet Alder Rue Pyeweed Goldenrod	NR	NA	NR	NR	None Observed
West Creek	West Trib.4	Permanent: Not Channelized	0426238	5420000	N	Wet	NR	0	NR	NR	NR	NR	0.40	NR	NR	NR	NR	NR	NR	NR	Carex	NR	NR	Canopy(Vertical Shading): Ground Vegetation: Willow Spruce Graminoid	NR	NR	NR	NR	None Observed
	West Trib.4B	Permanent: Not Channelized	0426238	5411974	N	Wet	180	0.03	Braided/Diffuse	NR	Beaver Dams/# Observed:1	40	0.3-0.4	NR	NR	200	NR	NR	Bo:10 Co:10 Cl:80	NR	10 (Bullrush Cattail)	NR	Lilly Pads Pondweed Coontail Lemna Frogsbit	Canopy(Vertical Shading): Ground Vegetation: Willow Alder Graminoid:80	Beaver Dam	NR	Agriculture	Agriculture Road	None Observed
	Wes-1	Permanent: Stream	0426287	5411811	Y	Wet	30	0.03	Pools:70 Runs:30	Meander Length:12 Meander Amplitude:8 Entrenchment:0.35 /0.4	Undercut Banks:30 Eroding Banks:5 Woody Structure:30 Organic Debris:5	1.10	0.11	2	0.80	12	High	High	Bo:10 Gr:45 Si/Mu:20 Cl:20 D:5	Overhanging Branches:30 Bottom Branch Debris:10 Undercut Banks:50 Logs:5	35 (30 Burreed 5 Water Parsnip)	NR	0	Canopy(Vertical Shading):80 Ground Vegetation: Shrubs:20 Graminoid:60	NR	WT:21.03°C DO:5.88mg/L pH:6.63 Con:149µS/cm TDS:NR ppm ORP:13.5	Agriculture Drilling Forested	Agriculture Road	None Observed
	Wes-2	Permanent: Channelized Stream	0425696	5410885	Y	Wet	25	0.12	Pools:10 Flats:80 Runs:5 Riffles:5 Beaver Ponds:1	Gradient: 0.025 Meander Length:25 Meander Amplitude:12 Entrenchment:0.8/ 1.5	Undercut Banks:10 Beaver Dams/# Observed:1 Woody Structure:30 Organic Debris:5	1	0.10	4	0.95	48	High	Moderate-High	Bo:5 Co:5 Gr:30 Si/Mu:5 Cl:55	Overhanging Branches:1 Undercut Banks:5 Logs:1	90 (80 Burreed 10 Arrowhead)	NR	10 Duckweed	Canopy(Vertical Shading):40 Ground Vegetation: Graminoid:100	Beaver Dam	WT:22.84°C DO:5.79mg/L pH:6.9 Con:270µS/cm TDS:NR ppm ORP:26.5	Agriculture Drilling Road	Agriculture Drilling Road	None Observed/ However gravel substrate may allow for some upwelling
	Wes-3	Permanent: Channelized Stream	0425009	5409575	N	Wet	NR	0	Flats	NR	NR	7.50	0.50	13	1.20	75	High	High	Si/Mu:10 Cl:90	NR	20 (80 Cattails 5 Arrowhead 10 Pyeweed/Nightsh ade/Carex)	NR	80 (30 Coontail 10 Floating Pondweed 5 Water Hemlock 30 Yellow Pond Lilly 5 Duckweed)	Canopy(Vertical Shading):20 Ground Vegetation: 20 Trembling Aspen 10 Black Spruce 20 Tamarack 20 White Birch 30 Willow	Beaver Pond/Lodge	WT:28.4°C DO:11.66mg/L pH:8.1 Con:343µS/cm TDS:NR ppm ORP:NR	Agriculture Drilling Forested	Agriculture Drilling Forested	None Observed
	Wes-3-Pond	Permanent	0425009	5409575	Y	Wet	75	0	Beaver Ponds	Gradient:0.01	Beaver Dams/# Observed:1 Eroding Banks: Woody Structure:30 Organic Debris:40	30	0.40	NR	1	200	High	High	Si/Mu: 20 Cl: 70 D: 10	Logs:1	Water Parsnip Cattails Sedges Broad-Leaved Arrowhead	NR	Floating Pondweed Slender Pondweed Coontail	Graminoid	Beaver Pond/Lodge	WT:28.4°C DO:11.66mg/L pH:8.1 Con:343µS/cm TDS:NR ppm ORP:NR	Agriculture Drilling Forested	Agriculture Drilling Forested	None Observed

TABLE 3-6 CONTINUED

Watercourse Name	Sample Location ID	Watercourse Type	Location Coordinates (Zone 15)		Habitat Sheet (Y/N)	Wet/Dry	Section Length (m)	Current Velocity (m/s)	Channel Morphology (% composition)	Channel Features (m)	Other Channel Features (%)	Mean Wetted Width (m)	Mean Wetted Depth (m)	Mean Bankfull Width (m)	Mean Bankfull Depth (m)	Floodplain Width (m)	Left Upstream Bank Stability	Right Upstream Bank Stability	Substrate Composition (%)[1]	In stream Cover (% of surface area)	Aquatic Vegetation Type (based on overall 100% distribution)			Overhead Coverage (% stream shaded)	Migratory Obstructions / Potential Critical Habitat	Summer Water Chemistry Parameters	Surrounding Land Use	Sources of Pollution	Upwellings
			Easting	Northern																	Emergent	Floating	Submergent						
West Creek (Cont'd)	Wes-4	Permanent: Channelized Stream	0424723	5409049	Y	Wet	24.9	0.01	Pools:40 Flats:60	Gradient:Low Meander Length:24.9 Meander Amplitude:7.1 Entrenchment:1/1	Undercut Banks:10 Beaver Dams/# Observed:1 Eroding Banks:20 Woody Structure:10 Organic Debris:5	1.40	0.40	1.20	0.84	120	Moderate-High	Moderate-High	Sa: 5 Si/Mu: 15 Cl: 80	Overhanging Branches:5 Bottom Branch Debris:5 Undercut Banks:10 Logs:1.5	10 (Broad-Leaved Arrowhead Narrow-Leaved Spikerush)	NR	5	Canopy(Vertical Shading):5 Ground Vegetation: Shrubs:5 Graminoid:10	NR	WT:17.38°C DO:3.82mg/L pH:6.74 Con:326µS/cm TDS:248ppm ORP:5.6	Agriculture Drilling Forested	Agriculture Drilling Forested	None Observed
	West Trib. 3	Intermittent	0426391	5411575	N	Wet	NR	<0.01	Pools: Flats: Braided/Diffuse:	NR	Undercut Banks:25 Woody Structure:25	1.10	0.45	3	0.90	NR	NR	NR	Gr:25 Si/Mu:25 Cl:30 D:20	Bottom Branch Debris:25 Undercut Banks:25	NR	NR	NR	Canopy(Vertical Shading):80 Ground Vegetation:30 Willow Alder White Birch Trembling Aspen Shrubs: Graminoid:50 Water Parsnip Meadow Rue Nightshade Ferns	NR	NR	NR	NR	None Observed
Clark Creek	Cla-1	Permanent: Channelized Stream	0429495	5409977	Y	Wet	18.5	0.02	Flats	Gradient:Low Meander Length:9.8 Meander Amplitude:0.89 Entrenchment:2/1	Undercut Banks:2 Eroding Banks:10 Woody Structure:5 Organic Debris:5	0.66	0.12	1.08	0.36	20.0	Low-Moderate	Low-Moderate	Si/Mu:10 Cl:75 D:15	Undercut Banks:2 Logs:(5%)	5 (45 Burreed 5 Marsh Marigold 40 Marshy Spikerush 10 Broad-Leaved Arrowhead)	NR	10 (30 Slender Pondweed 30 Lemna 40 Myriophyllum)	Graminoid:5	NR	WT:25.16°C DO:6.96mg/L pH:6.88 Con:0.222µS/cm[3] TDS:144ppm ORP:-8.6	Forested Dump	Forested Dump Road	None Observed
	Cla-2	Permanent: Channelized Stream	0428087	5409317	Y	Wet	28	0.01	Pools:70 Flats:20 Riffles:10	Gradient:Low/Moderate Meander Length:28 Meander Amplitude:5.7 Entrenchment:1/1-2/1	Undercut Banks:5 Eroding Banks:15 Woody Structure:5 Organic Debris:5	2.10	0.68	3.10	1.06	30	High	Moderate-High	Gr:10 Sa:15 Si/Mu:35 Cl:40	Undercut Banks:15 Logs:(5%)	5 (30 Broad-Leaved Arrowhead 30 Floating Arrowhead 40 Marsh Marigold)	NR	5 Pondweed	Canopy(Vertical Shading): Ground Vegetation: Shrubs:2 Graminoid:40	NR	WT:15.6°C DO:NR mg/L pH:8.03 Con:528µS/cm TDS:263ppm ORP:NR	Agriculture Forested	Agriculture	None Observed
	Cla-3	Permanent: Channelized Stream	0426688	5408752	Y	Wet	8.7	0.01	Pools:15 Flats:85	Gradient:Low Meander Length:8.7 Meander Amplitude:1.7 Entrenchment:2/1	Undercut Banks:10 Eroding Banks:5 Woody Structure:10 Organic Debris:5	1.60	0.38	2.20	0.88	30	High	High	Gr:10 Sa:30 Si/Mu:40 Cl:15 D:5	Overhanging Branches:80 Bottom Branch Debris:50 Undercut Banks:10 Logs:(5%)	10 (2 Marshy Spikerush 8 Carex)	NR	0	Canopy(Vertical Shading):85 Ground Vegetation: Graminoid:10	NR	WT:19.97°C DO:10.32mg/L pH:7.74 Con:541µS/cm TDS:389ppm ORP:NR	Agriculture Pasture	Agriculture	None Observed
Blackhawk Creek	Bla-1	Permanent: Channelized Stream	0429210	5406689	Y	Wet	40	<0.01	Runs	Sinuosity:Low Gradient:0.01	Undercut Banks:10 Woody Structure:20 Organic Debris:10	2.30	1.50	4.50	2.10	60	High	High	Bo:20 Gr:10 Si/Mu:30 Cl:30 D:10	Overhanging Branches:5 Bottom Branch Debris:10 Undercut Banks:10 Logs:0.3	5 Sedge	NR	2 Duckweed	Canopy(Vertical Shading):25 Ground Vegetation: Shrubs:12.5 Graminoid:12.5	NR	WT:22.55°C DO:4.99mg/L pH:6.88 Con:240µS/cm TDS:.163ppm ORP:-37.5	Agriculture Forested	Agriculture Forested	None Observed

Notes	
	Sample Site Pin-7 is presented as "Route 600" in Appendix E Field Sheets
	Co = Cobble
	Gr = Gravel
	Sa = Sand
	Sm = Silt/Muck
	Cl = Clay
	D = Detritus
	Bo = Boulder
	NR= Not Recorded
	NA= Not Applicable

TABLE 3-7

SUMMARY OF BENTHIC INVERTEBRATE COMMUNITY INDICES DESCRIPTORS: DESCRIPTIVE STATISTICS FOR PINEWOOD RIVER, TAIT CREEK, LOSLO CREEK, UPPER TRIBUTARY 5, MARR CREEK, WEST CREEK, CLARK CREEK AND BLACKHAWK CREEK

Area	Station	Count	TID (#/m2)	Family Richness	Diversity (I-D)	Evenness	EPT (%)	Chiron. (%)
Pinewood River	Pin-1	89	1289.86	9	0.45	0.20	10.11	73.03
	Pin-2	1284	18608.70	16	0.71	0.22	26.79	44.00
	Pin-3	150	2173.91	7	0.52	0.30	0.00	64.67
	Pin-4	1200	17391.30	20	0.77	0.22	2.33	39.67
	Pin-6	117	1695.65	13	0.82	0.43	5.13	19.66
	Pin-7	230	3333.33	18	0.78	0.25	8.70	9.57
	Mean	512	7415.46	14	0.68	0.27	8.84	41.77
	Min.	89	1289.86	7	0.45	0.20	0.00	9.57
	Max.	1284	18608.70	20	0.82	0.43	26.79	73.03
	SD	568	8236.30	5	0.15	0.09	9.57	24.64
	SE	328	4755.23	3	0.09	0.05	5.53	14.23
Tait Creek	Tait-T2-1	1096	15884.06	15	0.46	0.12	2.92	72.63
	Mean	1096	15884.06	15	0.46	0.12	2.92	72.63
	Min.	1096	15884.06	15	0.46	0.12	2.92	72.63
	Max.	1096	15884.06	15	0.46	0.12	2.92	72.63
	SD	NA	NA	NA	NA	NA	NA	NA
	SE	NA	NA	NA	NA	NA	NA	NA
Loslo Creek	Los-1	656	9507.25	6	0.23	0.22	0.00	87.65
	Los-2	508	7362.32	7	0.34	0.22	0.00	80.51
	Los-T2	98	1420.29	13	0.75	0.30	1.02	28.57
	Mean	421	6096.62	9	0.44	0.25	0.34	65.58
	Min.	98	1420.29	6	0.23	0.22	0.00	28.57
	Max.	656	9507.25	13	0.75	0.30	1.02	87.65
	SD	289	4189.42	4	0.27	0.05	0.59	32.25
	SE	167	2418.76	2	0.16	0.03	0.34	18.62

TABLE 3-7 CONTINUED

Area	Station	Count	TID (#/m2)	Family Richness	Diversity (I-D)	Evenness	EPT (%)	Chiron. (%)
Upper Tributary 5	Upp-T5-1	188	2724.64	10	0.42	0.17	2.66	74.47
	Mean	188	2724.64	10	0.42	0.17	2.66	74.47
	Min.	188	2724.64	10	0.42	0.17	2.66	74.47
	Max.	188	2724.64	10	0.42	0.17	2.66	74.47
	SD	NA	NA	NA	NA	NA	NA	NA
	SE	NA	NA	NA	NA	NA	NA	NA
Marr Creek	Marr-1	53	768.12	4	0.48	0.49	0.00	32.08
	Marr-Up-Pond	8	115.94	2	0.50	1.00	0.00	50.00
	Marr-2	47	681.16	7	0.67	0.43	0.00	0.00
	Marr-3	23	333.33	2	0.16	0.59	0.00	91.30
	Marr-4	234	3391.30	10	0.59	0.24	0.85	11.54
	Marr-5	152	2202.90	15	0.64	0.19	1.32	19.08
	Mean	86	1248.79	7	0.51	0.49	0.36	34.00
	Min.	8	115.94	2	0.16	0.19	0.00	0.00
	Max.	234	3391.30	15	0.67	1.00	1.32	91.30
	SD	88	1278.70	5	0.19	0.29	0.58	32.94
	SE	51	738.26	3	0.11	0.17	0.33	19.02
West Creek	Wes-1	438	6347.83	21	0.78	0.22	37.21	34.93
	Wes-2-Pond	87	1260.87	7	0.17	0.17	3.45	90.80
	Wes-2	128	1724.64	13	0.78	0.34	9.38	0.78
	Wes-3	184	2637.68	10	0.47	0.19	0.00	11.96
	Wes-4	496	7188.41	10	0.77	0.44	0.00	22.58
	Mean	267	3831.89	12	0.59	0.27	10.01	32.21
	Min.	87	1260.87	7	0.17	0.17	0.00	0.78
	Max.	496	7188.41	21	0.78	0.44	37.21	90.80
	SD	187	2741.94	5	0.27	0.11	15.68	35.11
	SE	108	1583.06	3	0.16	0.07	9.05	20.27

TABLE 3-7 CONTINUED

Area	Station	Count	TID (#/m2)	Family Richness	Diversity (I-D)	Evenness	EPT (%)	Chiron. (%)
Clark Creek	Cla-1	204	2956.52	14	0.72	0.25	4.90	13.73
	Cla-2	94	1362.32	8	0.75	0.50	12.77	41.49
	Cla-3	36	521.74	6	0.42	0.29	2.78	75.00
	Mean	111	1613.53	9	0.63	0.35	6.82	43.41
	Min.	36	521.74	6	0.42	0.25	2.78	13.73
	Max.	204	2956.52	14	0.75	0.50	12.77	75.00
	SD	85	1236.68	4	0.18	0.13	5.26	30.68
	SE	49	714.00	2	0.11	0.08	3.04	17.71
Blackhawk Creek	Bla-1	5	72.46	3	0.56	0.76	0.00	60.00
	Mean	5	72.46	3	0.56	0.76	0.00	60.00
	Min.	5	72.46	3	0.56	0.76	0.00	60.00
	Max.	5	72.46	3	0.56	0.76	0.00	60.00
	SD	NA	NA	NA	NA	NA	NA	NA
	SE	NA	NA	NA	NA	NA	NA	NA

TABLE 3-8
BENTHIC INVERTEBRATE FAMILY PROPORTIONS BY LOCATION

GROUP	FAMILY	Sample Area																								
		Pinwood Creek						Tait Creek	Loslo Creek			Upper Trib 5	Marr Creek						West Creek					Clark Creek			Blackhawk
		Pin-1	Pin-2	Pin-3	Pin-4	Pin-6	Pin-7	Tait-T2-1	Los-1	Los-2	Los-T2	Upp-T5-1	Marr-1	Marr Up	Marr-2	Marr-3	Marr-4	Marr-5	Wes-1	Wes-2-Pond	Wes-2	Wes-3	Wes-4	Cla-1	Cla-2	Cla-3	Bla-1
ANNELIDA: HIRUDINEA:	ERPOBDELLIDAE:	0.00	0.16	0.00	1.67	0.00	0.43	0.00	0.00	0.00	2.04	0.00	0.00	0.00	23.40	8.70	0.43	0.00	0.00	0.00	0.78	1.09	3.23	0.49	0.00	0.00	0.00
	GLOSSIPHONIIDAE:	1.12	0.00	0.00	0.33	0.00	0.43	0.00	0.00	0.00	1.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.68	0.00	0.00	0.00	3.23	0.98	0.00	0.00	0.00
	HAEMOPIDAE:	0.00	0.00	0.00	0.00	0.00	0.00	0.36	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.43	0.00	0.00	0.00	0.00	0.00	3.23	0.00	0.00	0.00	0.00
ANNELIDA: OLIGOCHAETA	ENCHYTRAEIDAE:	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.49	0.00	0.00	0.00
	LUMBRICIDAE:	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.23	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	LIMBRICULIDAE:	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	15.81	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	NAIDIDAE:	0.00	15.03	0.00	0.33	0.00	0.00	0.00	0.30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	TUBIFICIDAE:	7.87	0.00	23.33	23.00	2.56	1.30	0.73	4.12	8.07	1.02	1.06	0.00	0.00	4.26	0.00	60.68	9.21	0.68	2.30	2.34	71.74	3.23	2.94	6.38	2.78	20.00
ACARINA:	ARRENURIDAE:	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.66	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	HYDROBATIDAE:	0.00	2.34	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	LEBERTIIDAE:	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.23	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	SPERCHONTIDAE:	0.00	0.00	0.00	0.33	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	UNIONICOLIDAE:	0.00	3.12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
CRUSTACEA: AMPHIPODA:	HYALELLIDAE:	0.00	0.00	0.00	6.00	3.42	6.09	3.28	0.00	0.00	31.63	0.00	0.00	0.00	0.00	0.00	0.00	0.66	0.23	0.00	6.25	0.00	12.90	48.04	0.00	0.00	0.00
INSECTA:		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
COLEOPTERA:	CHRYSOMELIDAE:	0.00	0.00	0.00	0.00	1.71	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	DYTISCIDAE:	0.00	0.00	0.00	0.00	0.00	0.43	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	ELMIDAE:	0.00	5.37	6.67	0.00	4.27	33.48	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.66	7.31	0.00	10.94	2.72	0.00	0.00	21.28	5.56	0.00
	HALIPLIDAE:	0.00	0.00	0.00	0.33	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
INSECTA:		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
DIPTERA:	CERATOPOGONIDAE:	4.49	0.39	2.00	0.67	29.91	1.30	2.92	5.49	3.15	2.04	9.04	1.89	0.00	0.00	0.00	0.00	1.32	4.57	1.15	22.66	6.52	6.45	5.88	1.06	0.00	0.00
	CHAOBORIDAE:	0.00	0.00	0.00	0.00	9.40	0.00	0.36	1.37	6.30	0.00	0.00	64.15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	CHIRONOMIDAE:	73.03	44.00	64.67	39.67	19.66	9.57	72.63	87.65	80.51	28.57	74.47	32.08	50.00	0.00	91.30	11.54	19.08	34.93	90.80	0.78	11.96	22.58	13.73	41.49	75.00	60.00
	EMPIDIDAE:	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.23	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	TABANIDAE:	0.00	0.00	0.00	1.00	0.85	0.87	0.36	0.00	0.00	0.00	0.53	0.00	0.00	0.00	0.00	0.85	0.66	4.11	0.00	7.03	1.09	0.00	0.00	2.13	0.00	0.00
	TIPULIDAE:	1.12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	50.00	0.00	0.00	0.43	0.00	0.23	0.00	0.78	1.63	3.23	0.98	0.00	0.00	0.00
EPHEMEROPTERA:	BAETIDAE:	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.34	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	CAENIDAE:	5.62	25.78	0.00	1.33	0.00	3.48	2.55	0.00	0.00	1.02	1.06	0.00	0.00	0.00	0.00	0.00	0.66	0.46	2.30	5.47	0.00	0.00	0.98	6.38	0.00	0.00
	EPHEMERELLIDAE:	0.00	0.31	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	EPHEMERIDAE:	3.37	0.00	0.00	0.00	5.13	3.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.78	0.00
	HEPTAGENIIDAE:	0.00	0.00	0.00	0.00	0.00	0.43	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.91	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	LEPTOPHLEBIIDAE:	0.00	0.23	0.00	0.00	0.00	1.74	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	27.85	1.15	3.13	0.00	0.00	0.00	0.00	0.00	0.00
HEMIPTERA:	CORIXIDAE:	2.25	0.00	1.33	0.00	2.56	0.00	0.00	0.00	0.59	0.00	0.53	0.00	0.00	0.00	0.00	0.00	0.66	0.00	0.00	0.00	0.00	0.00	6.37	0.00	0.00	0.00
	PLEIDAE:	0.00	0.00	0.00	0.00	0.00	0.00	0.73	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MEGALOPTERA:	SIALIDAE:	0.00	0.00	0.00	0.00	0.00	3.48	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
LEPIDOPTERA:	CRAMBIDAE:	0.00	0.00	0.00	0.67	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.23	0.00	0.00	0.00	0.00
ODONATA:	AESHNIDAE:	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.78	0.00	0.00	0.49	0.00	0.00	0.00
	COENAGRIONIDAE:	0.00	0.00	0.00	4.33	0.00	1.30	0.36	0.00	0.00	1.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	CORDULIIDAE:	0.00	0.23	0.00	0.33	0.00	0.00	0.00	0.00	0.00	0.00	0.53	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.09	0.00	0.00	0.00	2.78	0.00
	GOMPHIDAE:	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.54	0.00	0.00	0.00	0.00	0.00
	LIBELLULIDAE:	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.15	0.00	0.00	0.00	0.00	0.00	0.00	0.00

TABLE 3-8 CONTINUED

GROUP	FAMILY	Sample Area																								
		Pinwood Creek						Tait Creek	Loslo Creek			Upper Trib 5	Marr Creek						West Creek					Clark Creek			Blackhawk
		Pin-1	Pin-2	Pin-3	Pin-4	Pin-6	Pin-7	Tait-T2-1	Los-1	Los-2	Los-T2	Upp-T5-1	Marr-1	Marr Up	Marr-2	Marr-3	Marr-4	Marr-5	Wes-1	Wes-2-Pond	Wes-2	Wes-3	Wes-4	Cla-1	Cla-2	Cla-3	Bla-1
TRICHOPTERA:	DIPSEUDOPSIDAE:	1.12	0.16	0.00	0.00	0.00	0.00	0.36	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	6.38	0.00	0.00
	HYDROPSYCHIDAE:	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.46	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	HYDROPTILIDAE:	0.00	0.08	0.00	0.33	0.00	0.00	0.00	0.00	0.00	0.00	0.53	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	LEPIDOSTOMATIDAE:	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.23	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	LIMNEPHILIDAE:	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.92	0.00	0.00	0.00
	PHILOPOTAMIDAE:	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.23	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	PHRYGANAEIDAE:	0.00	0.00	0.00	0.67	0.00	0.00	0.00	0.00	0.00	0.00	1.06	0.00	0.00	0.00	0.00	0.85	0.66	2.74	0.00	0.78	0.00	0.00	0.00	0.00	0.00	0.00
	POLYCENTROPODIDAE:	0.00	0.23	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MOLLUSCA: BIVALVIA:	SPHAERIIDAE:	0.00	0.55	0.67	1.67	0.00	0.87	3.65	1.07	1.18	26.53	11.17	1.89	0.00	4.26	0.00	8.55	4.61	8.68	0.00	38.28	1.63	38.71	14.22	14.89	11.11	20.00
	UNIONIDAE:	0.00	0.00	0.00	0.00	0.85	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MOLLUSCA: GASTROPODA:	ANCYLIDAE:	0.00	2.02	0.00	0.00	0.00	0.00	1.46	0.00	0.20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.66	0.68	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	HYDROBIIDAE:	0.00	0.00	1.33	8.33	18.80	30.87	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	55.26	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	LYMNAEIDAE:	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	PHYSIDAE:	0.00	0.00	0.00	0.67	0.85	0.87	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.26	0.00	0.00	0.66	0.00	0.00	0.00	0.00	0.00	0.49	0.00	0.00	0.00
	PLANORBIDAE:	0.00	0.00	0.00	8.33	0.00	0.00	7.66	0.00	0.00	1.02	0.00	0.00	0.00	10.64	0.00	0.43	4.61	0.00	1.15	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	VALVATIDAE:	0.00	0.00	0.00	0.00	0.00	0.00	2.55	0.00	0.00	0.00	0.00	0.00	0.00	51.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total		**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**

Notes Sample Site Pin-7 is presented as "Route 600" in Appendix F - Raw Benthic Invertebrate Data

TABLE 3-9
SPECIES SPECIFIC CATCH PER UNIT EFFORT FOR GILLNETS (15m x 6m)

Watercourse Name	Sample Location ID	Date	Set Length (hrs)	Area Sampled (m^2)	Mesh(s) Size (Inches)	Total Effort (Hrs*Area Sampled)	Species Specific CPUE (Fish per Net Hour)					Total CPUE
							Creek Chub	White Sucker	Spottail Shiner	Golden Shiner	Nothern Pike	
Pinewood River	PIN-1	22/07/11	22	90	1.5	1980.0	0.23	0.00	0.00	0.00	0.00	**0.23**
	Pin-2	21/07/11	20	90	1.5	1800.0	0.00	0.00	0.00	0.00	0.00	**0.00**
	Pin-3	22/07/11	3	90	1.5	270.0	0.00	0.67	0.67	0.33	0.00	**1.67**
	Pin-4	23/07/11	1.33	90	2	119.7	0.00	0.00	0.00	0.00	1.50	**1.50**
	Pin-6	25/07/11	1.75	90	2	157.5	0.00	0.00	0.00	0.00	2.86	**2.86**
	Pin-7	30/09/11	20	90	1.5	1800.0	0.00	0.00	0.00	0.00	0.10	**0.10**
Loslo Creek	Los-2	25/07/11	1	90	2	90.0	0.00	0.00	0.00	0.00	0.00	**0.00**
Marr Creek	Marr-Up-Pond	21/07/11	23	90	1.5	2070.0	0.00	0.00	0.00	0.00	0.00	**0.00**
Total						**8287.20**	**0.23**	**0.67**	**0.67**	**0.33**	**4.46**	**6.36**

TABLE 3-10
SPECIES SPECIFIC CATCH PER UNIT EFFORT FOR MINNOW TRAPS

Watercourse Name	Sample Location ID	Date	Set Length (hrs)	Number of Traps Set	Total Effort (hrs*Num. traps)	Species Specific CPUE (Fish per Trap Hour)															Total CPUE
						Brook Stickleback	Northern Redbelly Dace	Finescale Dace	Brassy Minnow	Common Shiner	Central Mudminnow	Brown Bullhead	Pearl Dace	Blackchin Shiner	Creek Chub	Emerald Shiner	White Sucker	Spottail Shiner	Blackside Darter	Darter Species	
Pinewood River	Pin-1	22/07/11	1.5	3	4.5	0.444	0.889	0.222	0.000	4.889	0.000	0.000	0.444	0.000	1.556	0.000	0.444	0.000	0.000	0.000	**8.889**
	Pin-2	21/07/11	18.16	4	72.64	0.000	0.014	0.110	0.000	1.680	0.000	0.000	0.014	0.000	0.138	0.000	0.041	0.482	0.000	0.055	**2.533**
	Pin-3	22/07/11	2.5	4	10	0.800	0.000	0.600	1.700	1.900	0.000	0.000	0.000	0.000	0.100	0.000	0.300	2.000	0.000	0.100	**7.500**
	Pin-4	23/07/11	1.3	4	5.2	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	**0.000**
	Pin-5	19/07/11	2	7	14	0.071	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	**0.071**
	Pin-6	25/07/11	1.3	4	5.2	0.000	0.000	0.000	0.000	0.000	0.000	0.192	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	**0.192**
	Pin-7	30/09/11	19.25	5	96.25	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	**0.000**
Tait Creek	Tait-T2-1	26/07/11	1	4	4	0.250	0.000	0.000	1.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	**1.250**
Loslo Creek	Los-1	24/07/11	1	4	4	0.000	0.000	0.000	0.000	0.000	0.250	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	**0.250**
	Los-2	25/07/11	1	4	4	0.250	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	**0.250**
	Los-T-2	24/07/11	1	4	4	0.000	0.000	0.000	0.000	0.000	0.250	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	**0.250**
Marr Creek	Marr-1	20/07/11	16.75	3	50.25	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	**0.000**
	Marr-Up-Pond	21/07/11	21	4	84	0.000	0.048	0.071	0.000	0.000	0.155	0.000	0.036	0.000	0.000	0.000	0.000	0.000	0.000	0.000	**0.310**
	Marr-2	21/07/11	1.5	4	6	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	**0.000**
	Marr-3	20/07/11	3	4	12	0.250	0.000	0.000	0.000	0.000	0.083	0.000	0.333	0.000	0.000	0.000	0.000	0.250	0.000	0.000	**0.917**
	Marr-4	19/07/11	1.5	5	7.5	0.400	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	**0.400**
West Creek	Wes-1	21/07/11	2.0	3	6	0.500	0.833	0.500	0.000	0.000	0.000	0.000	0.833	0.000	0.000	0.000	0.000	0.000	0.000	0.000	**2.667**
	Wes-2-Pond	20/07/11	3.5	3	10.5	0.095	6.762	0.000	0.000	0.000	0.000	0.000	0.095	0.190	0.000	0.000	0.000	0.000	0.000	0.000	**7.143**
	Wes-3-Pond	21/07/11	23.5	3	70.5	0.113	0.028	0.000	0.184	0.511	0.000	0.000	0.000	0.000	0.326	0.043	0.057	0.000	0.000	0.000	**1.262**
	Wes-4	23/07/11	1	4	4	3.250	0.000	0.000	1.750	0.000	0.500	0.000	0.000	0.000	0.250	0.000	0.000	0.000	0.250	0.000	**6.000**
	West Trib. 3	21/07/11	24.5	1	24.5	0.980	0.041	0.245	0.694	0.000	0.041	0.000	0.000	0.000	0.245	0.000	0.000	0.000	0.000	0.000	**2.245**
Clark Creek	Cla-2	23/07/11	1.25	4	5	1.600	1.000	2.000	6.200	1.400	0.000	0.000	0.000	0.000	0.200	0.000	0.200	2.800	0.000	0.000	**15.400**
	Cla-1	25/07/11	1	4	4	1.250	0.000	0.250	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	**1.500**
	Cla-3	25/07/11	1	4	4	2.250	0.000	0.000	2.500	2.250	0.000	0.000	3.000	0.000	0.250	0.000	0.500	0.000	0.000	0.000	**10.750**
Blackhawk Creek	Bla-1	22/07/11	1	3	3	0.333	0.333	4.333	2.667	4.333	0.000	0.000	3.667	0.000	3.000	0.000	0.333	0.000	0.000	0.000	**19.000**
Totals			**153**	**96**	**515**	**12.8375**	**9.9480**	**8.3320**	**16.6949**	**16.9624**	**1.2789**	**0.1923**	**8.4225**	**0.1905**	**6.0644**	**0.0426**	**1.8758**	**5.5318**	**0.2500**	**0.1551**	**88.779**

TABLE 3-11
SPECIES SPECIFIC CATCH PER UNIT EFFORT FOR SEINE NETS

Watercourse Name	Sample Location ID	Date	# Of Seine Pulls	Area Sampled	Total Effort (Area Sampled * # of Seine Pulls)	Species Specific CPUE (Fish per Number of Seines Pulled)																	Total Fish Captured
						Brook Stickleback	Northern Redbelly Dace	Finescale Dace	Pearl Dace	Creek Chub	White Sucker	Spottail Shiner	Golden Shiner	Nothern Pike	Blackchin Shiner	Central Mudminnow	Common Shiner	Fathead Minnow	Johnny Darter	Blackside Darter	Brassy Minnow	Unknown Darter	Blacknose Dace	
Pinewood River	Pin-1	22/07/11	2	70	140	11.500	0.000	0.000	0.000	0.500	0.000	0.000	0.000	0.000	0.000	1.500	12.000	0.000	6.500	0.500	0.000	0.000	0.000	**32.500**
	Pin-2	22/07/11	1	70	70	1.000	1.000	6.000	1.000	8.000	2.000	30.000	0.000	0.000	0.000	1.000	27.000	0.000	0.000	0.000	0.000	3.000	0.000	**80.000**
	Pin-3	22/07/11	3	70	210	42.000	0.333	1.000	0.667	0.000	0.000	0.667	0.000	0.000	0.000	8.000	5.000	0.000	0.000	1.000	1.667	0.000	1.333	**61.667**
	Pin-4	23/07/11	2	70	140	6.500	0.000	0.000	0.000	0.000	0.000	0.500	0.000	0.000	0.000	1.500	0.000	0.000	0.000	0.000	0.000	0.000	1.000	**9.500**
	Pin-5	19/07/11	4	70	280	0.750	0.000	0.500	0.000	0.250	0.000	1.500	0.000	0.000	1.250	0.000	0.250	0.000	0.000	0.000	0.000	0.000	0.000	**4.500**
	Pin-6	25/07/11	12	70	840	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.083	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	**0.083**
	Pin-7	26/07/11	3	70	210	0.000	0.000	0.000	0.333	0.000	0.000	0.000	4.000	0.667	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	**5.000**
Loslo Creek	Los-1	24/07/11	1	70	70	5.000	3.000	2.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	9.000	0.000	0.000	0.000	0.000	13.000	0.000	0.000	**32.000**
	Los-2	25/07/11	2	70	140	0.500	0.000	0.000	0.000	0.000	0.500	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	**1.000**
Marr Creek	Marr-1	20/07/11	1	70	70	1.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	3.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	**4.000**
	Marr-Up-Pond	21/07/11	2	70	140	1.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.500	0.000	0.000	0.000	0.000	0.000	0.000	0.000	**1.500**
	Marr-3	20/07/11	2	70	140	49.000	0.000	1.000	4.500	0.500	0.000	1.500	0.000	0.000	0.000	1.000	2.500	0.500	0.000	0.000	0.000	0.000	0.000	**60.500**
Clark Creek	Cla-2	23/07/11	1	70	70	8.000	5.000	10.000	0.000	1.000	1.000	14.000	0.000	0.000	0.000	0.000	7.000	0.000	0.000	0.000	31.000	0.000	0.000	**77.000**
Blackhawk Creek	Bla-1	22/07/11	1	70	70	15.000	2.000	17.000	0.000	22.000	27.000	0.000	0.000	0.000	0.000	6.000	35.000	2.000	0.000	0.000	23.000	0.000	0.000	**149.000**
Total						**141.250**	**11.333**	**37.500**	**6.500**	**32.250**	**30.500**	**48.167**	**4.000**	**0.750**	**1.250**	**31.500**	**88.750**	**2.500**	**6.500**	**1.500**	**68.667**	**3.000**	**2.333**	**518.250**

TABLE 3-12
SPECIES SPECIFIC CATCH PER UNIT EFFORT FOR BACKPACK ELECTROFISHING

Watercourse Name	Sample Location ID	Date	Effort (electrosec)	Species Specific CPUE [(Fish per ElectroSecond)*1000]											Total CPUE
				Brook Stickleback	Northern Redbelly Dace	Finescale Dace	Brassy Minnow	White Sucker	Common Shiner	Central Mudminnow	Pearl Dace	Blackchin Shiner	Creek Chub	Spottail Shiner	
Upper Trib. 5	Upp-T5-1	26/07/11	48	104.17	0.00	0.00	0.00	0.00	0.00	83.33	0.00	0.00	0.00	0.00	**187.50**
West Creek	Wes-1	21/07/11	199	5.03	5.03	15.08	0.00	0.00	0.00	20.10	15.08	0.00	0.00	0.00	**60.30**
	Wes-2	20/07/11	125	0.00	72.00	48.00	0.00	24.00	8.00	0.00	48.00	112.00	0.00	0.00	**312.00**
Clark Creek	Cla-3	25/07/11	149	33.56	0.00	0.00	20.13	6.71	33.56	60.40	46.98	0.00	26.85	6.71	**234.90**
Total			**521**	**142.75**	**77.03**	**63.08**	**20.13**	**30.71**	**41.56**	**163.84**	**110.06**	**112.00**	**26.85**	**6.71**	**794.70**

TABLE 3-13
SPECIES SPECIFIC CATCH PER UNIT EFFORT FOR DIP NETTING

Watercourse Name	Sample Location ID	Date	Effort (Dips)	Species Specific CPUE (Fish per Dip)								Total Fish Captured
				Brook Stickleback	Northern Redbelly Dace	Finescale Dace	Brassy Minnow	Central Mudminnow	Pearl Dace	Creek Chub	Blacknose Dace	
Loslo Creek	Los-2	25/07/11	20	0.15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	**0.15**
	Los-T-2	24/07/11	**3**	2.00	0.00	0.00	36.33	0.00	0.00	0.00	0.00	**38.33**
Marr Creek	Marr-1	20/07/11	5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	**0.00**
	Marr-Up-Pond	21/07/11	2	2.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	**2.00**
	Marr-2	21/07/11	33	0.61	0.00	0.00	0.00	0.03	0.00	0.00	0.00	**0.64**
	Marr-4	19/07/11	43	0.42	0.00	0.00	0.00	0.02	0.00	0.00	0.00	**0.44**
	Marr-4A	19/07/11	3	3.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	**3.00**
Tait Creek	Tai-T2-1	26/07/11	14	0.43	0.00	0.00	1.57	0.00	0.71	0.00	0.00	**2.71**
West Creek	Wes-4	23/07/11	35	0.31	0.00	0.03	0.26	0.00	0.00	0.23	0.00	**0.83**
	West Trib.3	21/07/11	2	1.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	**1.50**
Clark Creek	Cla-1	24/07/11	12	1.42	0.00	2.42	0.17	0.00	0.00	0.00	0.00	**4.00**
	Cla-2	23/07/11	26	0.08	0.08	0.00	0.00	0.00	0.00	0.00	0.50	**0.65**
Total			**198**	**11.91**	**0.08**	**2.45**	**38.33**	**0.05**	**0.71**	**0.23**	**0.50**	**54.26**

TABLE 3-14
SPECIES DISTRIBUTION ACROSS STUDY AREA BETWEEN 2008 AND 2011

Family	Common Name	Scientific Name	Pinewood	West	Marr	Loslo	Clark	Tait
Esocidae	Northern Pike	Esox lucius	X					
Gasterosteiformes	Brook Stickleback	Culaea inconstans	X	X	X	X	X	X
Catostomidae	White Sucker	Catostomus comersonii	X	X			X	
Cyprinidae	Creek Chub	Semotilus atromaculatus	X	X	X	X	X	
Cyprinidae	Lake Chub	Couesues plumbeus	X	X	X	X	X	
Cyprinidae	Common Shiner	Luxius cornutnus	X	X			X	
Cyprinidae	Brassy Minnow	Hybognathus hankinsoni	X	X	X	X	X	X
Cyprinidae	Northern Redbelly Dace	Phoxinus eos	X	X	X	X	X	X
Cyprinidae	Finescale Dace	Phoxinus neogaes		X				
Cyprinidae	Dace spp.	P. eos XP. Neogaeus	X	X	X	X	X	X
Cyprinidae	Northern Pearl Dace	Margariscus nachtriebi		X				
Cyprinidae	Fathead Minnow	Pimephales promelas		X				
Cyprinidae	Emerald Shiner	Notropis atherinoides	X	X	X	X	X	
Cyprinidae	Spottail Shiner	Notropis hudsonius	X	X	X	X	X	
Cyprinidae	Mimic Shiner	Notropis volcellus	X					
Cyprinidae	Golden Shiner	Notemogonis crysoleucas	X				X	
Ictaluridae	Brown Bullhead	Ameiurus nebulosus	X					
Percidae	Blackside Darter	Percina maculata					X	
Percidae	Iowa Darter	Ethiostoma exile		X				
Umbridae	Central Mudminnow	Umbra limi	X	X	X		X	X

4.0 DISCUSSION

Water quality typically met the majority of provincial and federal objective and guidelines, however, aluminum, iron and phosphorus were consistently present at elevated concentrations, and did not meet water quality objectives. The interim PWQO for phosphorus states that excessive plant growth in rivers and streams should be eliminated at total phosphorus concentrations below 30 µg/L (0.03 mg/L). The majority of samples collected in the study area had phosphorus concentrations above this value. Increased phosphorus levels are typical of historic and long-term agricultural use of mineral fertilizers. As such, elevated concentrations of phosphorus may be indicative of past land use within the vicinity of the site. Despite elevated levels of aluminum and iron in surface waters, these metals were not elevated within the sediment substrates of the watercourses, indicating these parameters may enter the watercourses through surface runoff. Elevated phosphorus, aluminum and iron levels are indicative of the baseline condition observed during the 2011 field study.

Sediment grain size was consistently dominated by smaller particles (clay and silt) with some sample locations showing a greater proportion of sand and in some cases gravel. Larger particles (cobble and boulder) were a typical for the study area, but were present at those locations exhibiting higher gradients. Areas with some larger particle sizes in the distribution were more typical of habitat for EPT taxa within the benthic invertebrate community.

TKN is a method/measure of the total organic nitrogen in the sediment which is in the form of ammonia and ammonium. TKN was consistently elevated at watercourse sampling locations despite ammonia, nitrate and nitrite being below detection levels in water quality samples. Elevated levels of nitrogen and ammonia are consistent with agricultural drainages fertilization and the presence of organic waste. Similarly TOC in sediment was elevated at the majority of sampling locations. These results are believed to indicate past land use history and reflect current baseline conditions for the site.

Benthic invertebrate community diversity and species richness indicated generally robust communities both within the smaller tributaries and the mainstem Pinewood River. Tributaries generally showed a lower value of family richness in comparison to the Pinewood River which is expected as larger systems are characterized by increased diversity and taxa richness. Chironomids and the family Sphaeriidae (fingernail clams) which were present in large proportions at many sample locations are generally relatively tolerant to degraded sediment and water quality environments. The communities represented by sampling are indicative of low flow watercourses which are influenced by beaver activity and have silt/clay/muck dominant substrates.

Aquatic habitat supports a variety of small-bodied forage fish species. The tributaries of the Pinewood River support warmwater fish communities and habitats, while the lower reaches of these tributaries at their confluence with the Pinewood River as well as the Pinewood River itself, support a warm / coolwater fish community. These habitats are consistently affected by

beaver activity and water temperatures are influenced in many locations, specifically in Marr Creek, where watercourses have been manipulated to provide water sources for livestock. In these areas riparian vegetation had been reduced to grass and sedge species in lower densities which provide little cover for thermal refuge.

The lower sections of each tributary of the Pinewood River were characterized by larger flood-prone widths and likely provide spawning and nursery habitat for Northern Pike during periods of inundation. Northern Pike were not captured within the downstream sections of these tributaries (i.e., Loslo Creek, West creek, Marr Creek and Clark Creek) in 2011 likely due to a lack of inundation of the flood-plain at low water levels during the field survey. Northern Pike were however, consistently captured at Pinewood River mainstem sampling locations.

In comparison to sampling programs conducted in previous years (Klohn Crippen Berger 2011), species' distribution across all sampling locations remained the same. Fish species as recorded at each sampling station between 2008 and 2010 were also captured during the 2011 sampling program. As such, species presence / absence and richness was unchanged.

Sampling during 2011 in the vicinity of the RRGP area did not provide evidence of any aquatic species at risk either under federal (*Species at Risk Act*) or provincial (*Endangered Species Act*) legislation.

5.0 ADDITIONAL WATER QUALITY DATA

The environmental data presented earlier in this report are in response to the findings of a gap analysis with respect to current project site considerations. The report focuses on the new information collected by AMEC, but where appropriate historic data have been included to provide a broader context. In parallel with this stand-alone aquatics investigation, RRR has continued to conduct the comprehensive monthly water quality sampling program established in early 2010.

Surface water samples were collected for chemical analysis from the RRGP site area, starting in 2007 and as part of the ongoing monthly surface water sampling program. An overview of these sampling locations is provided in Appendix H along with the original data. A summary of results from 2011 to 2012 is provided herein in Table 5-1. Data from sampling programs prior to 2011 are summarized in KCB (2011).

All parameters were compared to the PWQO and CEQG. With the exception of parameters discussed below, all sampling results met PWQO and CEQG standards.

Aluminum

The PWQO for total aluminum is 0.075 mg/L for clay-free samples; since analyzed samples were not clay-free (i.e., not filtered), total aluminum was only compared to the CEQG criteria. Eleven of fifteen sampling locations had a calculated median value that was above the total aluminum CEQG guideline of 0.1 mg/L. Elevated aluminum values are to be expected in an area which drains clay soils, as aluminum is a predominant clay mineral, occurring mainly as alumino-silicates.

Cobalt

The PWQO value for cobalt is 0.0009 mg/L. There is no CEQG guideline for cobalt. A number of individual monthly analysis results exceeded the PWQO guideline for total cobalt as indicated by the maximum value calculation performed for each sampling location. Ten of fifteen sampling locations reported a maximum total cobalt concentration value that exceeded the PWQO value of 0.0009 mg/L. Clay minerals can adsorb cobalt.

Copper

All total copper analyses met both PWQO and CEQG criteria of 0.005 mg/L and 0.002 mg/L, respectively, with the exception of two sampling events (from a total of 237 sampling events) that reported a total copper concentration value that exceeded both guidelines; 0.018 mg/L for SW 7/7A on February 22, 2011 and 0.036 mg/L for SW/10 on February 15, 2012 were reported for total copper. The highest copper value was associated with unusually high suspended solids. These may be related to sediment disturbance when sampling below ice.

Iron

The PWQO and CEQG criteria for total iron are both 0.3 mg/L. All sampling locations (fifteen locations in total) reported a calculated maximum concentration value and 75th percentile value that exceeded both PWQO / CEQG criteria of 0.3 mg/L. All sampling locations (fifteen locations in total), with the exception of two locations, reported a calculated median value for each sampling location that was above the PWQO / CEQG criteria of 0.3 mg/L. Elevated iron concentrations are typical of background conditions, as iron is a common soil mineral, and iron is typically closely correlated with the level of suspended solids.

Zinc

The PWQO and CEQG criteria for total zinc are both 0.3 mg/L. All total zinc analyses met both PWQO / CEQG guidelines with the exception of three sampling events (from a total of 237 sampling events) at locations SW2, SW6, and SW10 that reported a total zinc concentration value that exceeded both PWQO / CEQG criteria of 0.3 mg/L (0.05 mg/L, 0.04 mg/L, 0.2 mg/L, respectively). Occasional exceedances of zinc are not uncommon for background conditions. Samples, collected in December of 2011 and February of 2012 at SW2 and SW6 respectively, had concentrations only marginally above the PWQO / CEQG criteria. Samples collected in winter with use of ice augers, sometimes show elevated zinc concentrations because of galvanized shims used on the auger. The much higher concentration of zinc in the sample collected from SW10 in February of 2010 is a function of the abnormally high level of total suspended solids associated with this sample (1,340 mg/L), which reflects substrate disturbance during sampling. Elevated zinc concentrations can also occur where samples are collected in association with galvanized culverts, especially during low flow conditions in winter.

TABLE 5-1
SUMMARY OF 2011 / 2012 SURFACE WATER ANALYTICAL RESULTS

		pH	Conductivity	Hardness as $CaCO_3$	Dissolved Organic Carbon	TSS	Total Ammonia-N	Fluoride	Nitrate	Nitrite	Cyanide-Total	Aluminum-Dissolved	Aluminum-Total	Antimony-Total	Arsenic-Total	Boron-Total	Cadmium-Total	Chromium-Total	Cobalt-Total	Copper-Total	Iron-Total	Lead-Total	Mercury	Molybdenum-Total	Nickel-Total	Phosphorus-Total	Selenium-Total	Thallium-Total	Uranium-Total	Vanadium-Total	Zinc-Total
PWQO		6.5-8.5	-	-	-	-	-	-	-	-	0.005[A]	-	0.075[1,B]	0.02[J]	0.1(0.005[I])	0.2[J]	0.0002	0.001 / 0.0089[E]	0.0009	0.005 (0.005[I])[F]	0.3	0.020/0.025 (0.003/0.005)[H]	0.0002	0.04[I]	0.025	0.03[I]	0.1	0.0003[I]	0.005[I]	0.006[I]	0.03(0.02[I])
CEQG		6.5-9.0	-	-	-	-	-	0.12	2.935	0.06	0.005[A]	-	0.1[C]	-	0.005	1.5	0.000015-0.000088[D]	0.001 / 0.0089[E]	-	0.002-0.00622[G]	0.3	0.00102-0.01343[J]	0.000026	0.073[J]	0.025[J]	-	0.001	0.0008	0.015	-	0.03
RDL		-	1	1	0.2	1*	0.05*	0.1*	0.1*	0.01*	0.005*	0.005*	0.005	0.0005*	0.001	0.01	0.0001*	0.005*	0.0005	0.001*	0.1	0.0005*	0.0001	0.001*	0.001	0.002	0.002*	0.00005*	0.0001	0.001	0.005*
		pH units	uS/cm	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
SW1/1A	Min	7.17	180	79	11.1	4.7	0.020	0.030	0.030	0.010	0.0020	0.0025	0.0420	0.00008	0.00068	0.0100	0.000010	0.00050	0.000226	0.00093	0.360	0.00019	0.000010	0.00030	0.00100	0.02790	0.00020	0.000006	0.00030	0.00060	0.0010
	Max	8.83	574	301	29.3	74.0	0.134	0.107	0.795	0.020	0.0050	0.0290	0.5060	0.00050	0.00300	0.0276	0.00010	0.00500	0.000600	0.00200	0.942	0.00360	0.0001	0.00100	0.00300	0.13000	0.00200	0.000050	0.00245	0.00203	0.0318
	Median	7.70	313	165	21.0	8.7	0.050	0.100	0.100	0.015	0.0035	0.0102	0.2740	0.00030	0.00101	0.0200	0.00006	0.00310	0.000500	0.00100	0.658	0.00047	0.0001	0.00095	0.00200	0.06935	0.00200	0.000040	0.00065	0.00114	0.0050
	St Dev.	0.35	106	65	4.3	18.3	0.028	0.025	0.185	0.005	0.0015	0.0069	0.1114	0.00021	0.00081	0.0061	0.00004	0.00217	0.000095	0.00028	0.198	0.00081	-	0.00026	0.00064	0.02511	7.500E-04	0.000018	0.00065	0.00047	0.0081
	N	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	9	16	16	16	16	16	16	16	16
	75th %	7.74	367	205	24.2	20.9	0.060	0.100	0.100	0.020	0.0050	0.0143	0.3538	0.0005	0.00168	0.0230	0.00010	0.00500	0.000500	0.001213	0.855	0.00050	0.0001	0.00100	0.00223	0.09155	0.00200	0.0000500	0.001418	0.00166	0.0055
SW2	Min	7.30	136	72	8.9	2.0	0.020	0.030	0.030	0.010	0.0020	0.0021	0.0193	0.00005	0.00053	0.0077	0.000005	0.00050	0.000073	0.00070	0.195	0.00005	0.0000	0.00031	0.00100	0.01280	0.00020	0.000003	0.00030	0.00058	0.0022
	Max	9.38	447	256	22.2	142.0	0.088	0.114	0.383	0.020	0.0050	0.0220	0.6100	0.00050	0.00217	0.0173	0.00010	0.00500	0.000998	0.00400	1.030	0.00123	0.0001	0.00100	0.00230	0.12600	0.00200	0.000050	0.00131	0.00320	0.0506
	Median	7.81	261	150	18.6	6.1	0.050	0.100	0.100	0.010	0.0050	0.0083	0.1400	0.00050	0.00100	0.0100	0.00010	0.00500	0.000500	0.00113	0.650	0.00050	0.0001	0.00080	0.00190	0.03700	0.00200	0.000050	0.00040	0.00100	0.0050
	St Dev.	0.46	95	61	4.0	35.4	0.021	0.027	0.086	0.005	0.0015	0.0079	0.1571	0.00022	0.00049	0.0027	0.00004	0.00218	0.000225	0.00090	0.278	0.00029	0.000030	0.00028	0.00050	0.03098	0.00072	0.000020	0.00034	0.00066	0.0119
	N	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	9	15	15	15	15	15	15	15	15
	75th %	7.94	317	200	20.3	19.1	0.050	0.100	0.100	0.020	0.0050	0.0195	0.2575	0.0005	0.00119	0.0138	0.00010	0.00500	0.000500	0.001725	0.885	0.00050	0.0001	0.00100	0.00200	0.06000	0.00200	0.0000500	0.000743	0.00115	0.0050
SW3	Min	7.27	181	83	9.0	7.0	0.020	0.030	0.030	0.010	0.0020	0.0029	0.0821	0.00008	0.00074	0.0100	0.000011	0.00050	0.000218	0.00070	0.366	0.00014	0.0000	0.00041	0.00100	0.02920	0.00031	0.000004	0.00040	0.00071	0.0030
	Max	8.61	780	450	27.1	40.0	0.467	0.136	0.381	0.020	0.0050	0.0267	2.7700	0.00050	0.00400	0.0332	0.00010	0.00500	0.004710	0.00377	3.720	0.00169	0.0001	0.00141	0.00497	0.19400	0.00200	0.000050	0.00196	0.00839	0.0101
	Median	7.68	344	190	19.4	14.5	0.050	0.100	0.100	0.015	0.0035	0.0095	0.2995	0.00035	0.00134	0.0166	0.00007	0.00454	0.000568	0.00129	0.830	0.00050	0.0001	0.00090	0.00225	0.08110	0.00200	0.000045	0.00095	0.00125	0.0050
	St Dev.	0.32	150	91	4.8	10.9	0.107	0.026	0.086	0.005	0.0015	0.0061	0.6324	0.00020	0.00120	0.0065	0.00004	0.00212	0.001354	0.00083	0.906	0.00036	0.000030	0.00029	0.00125	0.04792	0.00074	0.000017	0.00046	0.00185	0.0023
	N	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	9	16	16	16	16	16	16	16	16
	75th %	7.88	371	211	21.4	27.3	0.050	0.100	0.100	0.020	0.0050	0.0115	0.4133	0.0005	0.0030525	0.0200	0.00010	0.00500	0.000793	0.002000	0.92725	0.00051	0.0001	0.00100	0.00345	0.11100	0.00200	0.0000500	0.001130	0.00203	0.0056
SW4	Min	6.64	74	35	7.9	2.0	0.020	0.030	0.030	0.010	0.0020	0.0056	0.0210	0.00003	0.00030	0.0051	0.000005	0.00050	0.000085	0.00050	0.140	0.00009	0.0000	0.00005	0.00042	0.01230	0.00020	0.000003	0.00001	0.00020	0.0024
	Max	8.32	168	81	32.7	13.0	0.199	0.100	0.100	0.020	0.0050	0.0220	0.2050	0.00050	0.00100	0.0128	0.00010	0.00500	0.000700	0.00100	1.200	0.00050	0.0001	0.00100	0.00100	0.03700	0.00200	0.000130	0.00500	0.00100	0.0129
	Median	6.96	137	62	18.5	4.3	0.057	0.069	0.079	0.015	0.0035	0.0101	0.0440	0.00030	0.00084	0.0100	0.00006	0.00295	0.000425	0.00088	0.363	0.00036	0.0001	0.00035	0.00100	0.02405	0.00200	0.000050	0.00027	0.00060	0.0050
	St Dev.	0.37	24	13	7.7	3.2	0.064	0.035	0.033	0.005	0.0015	0.0048	0.0491	0.00022	0.00025	0.0019	0.00004	0.00225	0.000205	0.00017	0.314	0.00018	0.000030	0.00043	0.00015	0.00702	0.00075	0.000031	0.00253	0.00036	0.0025
	N	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	9	16	16	16	16	16	16	16	16
	75th %	7.06	152	69	25.7	5.9	0.125	0.100	0.100	0.020	0.0050	0.0135	0.0658	0.0005	0.001	0.0100	0.00010	0.00500	0.000500	0.001000	0.48075	0.00050	0.0001	0.00100	0.00100	0.02915	0.00200	0.0000500	0.005000	0.00100	0.0050
SW6	Min	6.87	125	63	12.2	1.0	0.020	0.000	0.030	0.010	0.0020	0.0023	0.0380	0.00004	0.00064	0.0087	0.000009	0.00050	0.000177	0.00083	0.130	0.00009	0.0000	0.00009	0.00100	0.01600	0.00020	0.000004	0.00002	0.00043	0.0029
	Max	8.65	431	244	41.0	238.0	0.768	0.101	0.300	0.020	0.0050	0.0380	1.4400	0.00050	0.00400	0.0251	0.00010	0.00500	0.003170	0.00407	6.740	0.00110	0.0001	0.00113	0.00400	0.20800	0.00200	0.000051	0.00500	0.00389	0.0456
	Median	7.72	245	126	22.5	9.2	0.050	0.084	0.100	0.020	0.0035	0.0092	0.1750	0.00031	0.00100	0.0142	0.00008	0.00364	0.000500	0.00100	0.650	0.00050	0.0001	0.00081	0.00190	0.06145	0.00200	0.000050	0.00078	0.00100	0.0050
	St Dev.	0.45	100	65	7.0	61.1	0.180	0.035	0.079	0.005	0.0015	0.0105	0.3902	0.00021	0.00087	0.0052	0.00004	0.00199	0.000687	0.00095	1.568	0.00027	0.000030	0.00034	0.00095	0.05979	0.00075	0.000019	0.00154	0.00104	0.0103
	N	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	9	16	16	16	16	16	16	16	16
	75th %	7.83	346	210	25.3	21.0	0.083	0.100	0.100	0.020	0.0050	0.0213	0.3958	0.0005	0.0019775	0.0178	0.00010	0.00500	0.000604	0.001483	0.93675	0.00050	0.0001	0.00100	0.00239	0.09925	0.00200	0.0000500	0.001025	0.00202	0.0050
SW7/7A	Min	7.58	202	110	8.6	2.0	0.020	0.030	0.030	0.010	0.0020	0.0023	0.0181	0.00004	0.00071	0.0100	0.000005	0.00050	0.000076	0.00052	0.291	0.00007	0.0000	0.00086	0.00072	0.01960	0.00020	0.000003	0.00040	0.00056	0.0030
	Max	10.10	829	462	22.1	34.6	1.360	0.102	0.262	0.020	0.0050	0.0300	0.7100	0.00050	0.00215	0.0366	0.00010	0.00500	0.001160	0.01800	1.890	0.00057	0.0001	0.00246	0.00220	0.45800	0.00200	0.000050	0.00406	0.00291	0.0051
	Median	7.91	380	210	14.8	18.0	0.050	0.100	0.100	0.010	0.0050	0.0095	0.2070	0.00050	0.00100	0.0155	0.00010	0.00500	0.000500	0.00100	0.680	0.00050	0.0001	0.00100	0.00135	0.06345	0.00200	0.000050	0.00091	0.00100	0.0050
	St Dev.	0.62	164	96	3.4	10.5	0.348	0.021	0.061	0.005	0.0015	0.0069	0.1874	0.00021	0.00049	0.0084	0.00004	0.00214	0.000248	0.00452	0.454	0.00018	0.000030	0.00044	0.00053	0.11129	0.00074	0.000019	0.00096	0.00072	0.0006
	N	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	9	14	14	14	14	14	14	14	14
	75th %	7.99	518	287	15.8	21.5	0.103	0.100	0.100	0.020	0.0050	0.0116	0.3355	0.0005	0.0015925	0.0223	0.00010	0.00500	0.000500	0.001665	1.0625	0.00050	0.0001	0.00114	0.00200	0.10400	0.00200	0.0000500	0.001568	0.00148	0.0050
SW10	Min	7.29	167	71	12.7	2.0	0.020	0.030	0.030	0.010	0.0020	0.0028	0.0705	0.00007	0.00064	0.0100	0.000006	0.00050	0.000187	0.00070	0.314	0.00012	0.0000	0.00035	0.00100	0.02430	0.00020	0.000004	0.00032	0.00055	0.0025
	Max	8.89	558	323	31.8	1340.0	0.219	0.111	0.606	0.020	0.0050	0.0350	32.3000	0.00050	0.01290	0.0477	0.00074	0.06150	0.021600	0.03610	42.300	0.02320	0.0001	0.00126	0.05100	1.40000	0.00282	0.000392	0.00302	0.07150	0.2030
	Median	7.67	312	160	20.7	7.2	0.050	0.100	0.100	0.015	0.0035	0.0090	0.2000	0.00031	0.00100	0.0185	0.00010	0.00500	0.000500	0.00100	0.559	0.00050	0.0001	0.00100	0.00175	0.06000	0.00200	0.000050	0.00075	0.00100	0.0050
	St Dev.	0.38	126	79	4.9	332.7	0.047	0.026	0.137	0.005	0.0015	0.0094	8.0217	0.00021	0.00296	0.0107	0.00018	0.01477	0.005287	0.00875	10.425	0.00570	0.000030	0.00028	0.01232	0.33588	0.00077	0.000092	0.00078	0.01757	0.0496
	N	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	9	16	16	16	16	16	16	16	16
	75th %	7.97	408	235	23.9	13.3	0.053	0.100	0.100	0.020	0.0050	0.0175	0.2538	0.0005	0.0016075	0.0278	0.00010	0.00500	0.000500	0.001223	0.66375	0.00050	0.0001	0.00100	0.00240	0.08535	0.00200	0.0000500	0.001355	0.00200	0.0054
SW11	Min	6.84	83	53	10.7	1.0	0.020	0.030	0.030	0.010	0.0020	0.0064	0.0282	0.00004	0.00043	0.0070	0.000009	0.00050	0.000178	0.00070	0.190	0.00006	0.0000	0.00009	0.00100	0.01520	0.00020	0.000004	0.00007	0.00023	0.0024
	Max	7.64	364	208	53.2	52.4	1.060	0.100	0.348	0.020	0.0050	0.0460	1.0500	0.00050	0.00300	0.0141	0.00010	0.00500	0.004480	0.00320	11.000	0.00065	0.0001	0.00100	0.00300	0.69300	0.00200	0.000050	0.00500	0.00255	0.0130
	Median	7.18	195	113	27.6	4.5	0.055	0.086	0.100	0.015	0.0035	0.0205	0.0830	0.00038	0.00100	0.0100	0.00007	0.00354	0.001400	0.00100	1.780	0.00050	0.0001	0.00061	0.00100	0.03885	0.00200	0.000040	0.00031	0.00100	0.0050
	St Dev.	0.19	78	46	10.0	13.8	0.255	0.031	0.077	0.005	0.0015	0.0134	0.3094	0.00021	0.00073	0.0018	0.00004	0.00210	0.001375	0.00060	3.114	0.00020	0.000030	0.00043	0.00066	0.16354	0.00075	0.000018	0.00248	0.00066	0.0024
	N	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	9	16	16	16	16	16	16	16	16
	75th %	7.26	247	145	35.9	16.1	0.110	0.100	0.100	0.020	0.0050	0.0377	0.1400	0.0005	0.002	0.0100	0.00010	0.00500	0.002623	0.001000	2.375	0.00050	0.0001	0.00100	0.00176	0.06440	0.00200	0.0000500	0.005000	0.00100	0.0058
SW12/12A	Min	6.54	57	23	1.9	4.0	0.020	0.030	0.030	0.010	0.0020	0.0109	0.0630	0.00003	0.00058	0.0054	0.000006	0.00050	0.000182	0.00075	0.360	0.00011	0.0000	0.00005	0.00096	0.01860	0.00020	0.000004	0.00006	0.00050	0.0010
	Max	7.35	238	123	47.1	108.0	0.744	0.100	0.200	0.020	0.0050	0.1500	1.8500	0.00050	0.00255	0.0150	0.00010	0.00500	0.005100	0.00545	8.090	0.00108	0.0001	0.00100	0.00410	0.20500	0.00200	0.000050	0.00500	0.00413	0.0173
	Median	6.92	96	49	16.1	12.0	0.050	0.066	0.100	0.015	0.0035	0.0367	0.2600	0.00030	0.00100	0.0100	0.00007	0.00385	0.000593	0.00140	1.140	0.00050	0.0001	0.00060	0.00100	0.03475	0.00200	0.000040	0.00018	0.00100	0.0050
	St Dev.	0.24	58	31	12.1	27.6	0.209	0.036	0.053	0.005	0.0015	0.0483	0.4905	0.00022	0.00068	0.0022	0.00004	0.00207	0.001749	0.00126	2.485	0.00022	0.000030	0.00044	0.00098	0.05190	0.00070	0.000019	0.00233	0.00111	0.0038
	N	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	9	16	16	16	16	16	16	16	16
	75th %	7.05	157	77	25.8	28.5	0.325	0.100	0.100	0.020	0.0050	0.0673	0.4883	0.0005	0.002	0.0100	0.00010	0.00500	0.003225	0.002000	4.625	0.00050	0.0001	0.00100	0.00200	0.05463	0.00200	0.0000500	0.005000	0.00225	0.0066
SW13	Min	7.35	172	83	10.7	1.0	0.020	0.030	0.030	0.010	0.0020	0.0018	0.0210	0.00006	0.00046	0.0100	0.000010	0.00050	0.000062	0.00070	0.059	0.00010	0.0000	0.00025	0.00100	0.01130	0.00020	0.000004	0.00030	0.00051	0.0020
	Max	8.90	662	409	37.2	35.7	0.714	0.116	0.260	0.020	0.0050	0.0090	0.7850	0.00050	0.00391	0.0200	0.00010	0.00500	0.004760	0.00190	4.770	0.00061	0.0001	0.00100	0.00370	0.25300	0.00200	0.000050	0.00415	0.00398	0.0068
	Median	7.72	344	180	17.9	10.0	0.050	0.100	0.100	0.015	0.0035	0.0050	0.1940	0.00032	0.00100	0.0110	0.00006	0.00314	0.000500	0.00100	0.461	0.00050	0.0001	0.00089	0.00105	0.04350	0.00200	0.000040	0.00084	0.00100	0.0050
	St Dev.	0.43	122	80	5.8	11.3	0.169	0.030	0.070	0.005	0.0015	0.0019	0.1773	0.00021	0.00090	0.0033	0.00004	0.00220	0.001152	0.00033	1.176	0.00015	0.000030	0.00033	0.00084	0.05837	0.00071	0.000019	0.00095	0.00094	0.0012
	N	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	9	16	16	16	16	16	16	16	16
	75th %	7.82	386	234	20.4	18.6	0.075	0.100	0.100	0.020	0.0050	0.0061	0.2305	0.0005	0.0020425	0.0143	0.00010	0.00500	0.000719	0.001000	0.9575	0.00050	0.0001	0.00100	0.00201	0.08430	0.00200	0.0000500	0.001240	0.00132	0.0050
SW14	Min	6.99	91	48	11.7	1.0	0.020	0.030	0.020	0.010	0.0020	0.0077	0.0230	0.00004	0.00033	0.0043	0.000005	0.00050	0.000073	0.00050	0.170	0.00007	0.0000	0.00009	0.00052	0.00680	0.00020	0.000002	0.00004	0.00016	0.0020
	Max	9.38	297	169	28.4	28.0	1.230	0.100	0.282	0.906	0.0050	0.0460	0.3250	0.00050	0.00100	0.0106	0.00010	0.00500	0.001770	0.00100	1.600	0.00050	0.0001	0.00100	0.00100	0.05240	0.00200	0.000050	0.00500	0.00100	0.0084
	Median	7.25	154	89	24.1	2.6	0.055	0.067	0.100	0.015	0.0035	0.0186	0.0755	0.00035	0.00089	0.0100	0.00007	0.00295	0.000500	0.00099	0.400	0.00037	0.0001	0.00061	0.00100	0.02100	0.00200	0.000040	0.00254	0.00083	0.0050
	St Dev.	0.57	52	31	4.6	6.8	0.305	0.036	0.065	0.223	0.0015	0.0130	0.0740	0.00021	0.00024	0.0025	0.00005	0.00224	0.000402	0.00017	0.386	0.00020	0.000030	0.00044	0.00012	0.01078	0.00075	0.000020	0.00255	0.00037	0.0015
	N	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	9	16	16	16	16	16	16	16	16
	75th %	7.58	179	102	25.9	7.2	0.130	0.100	0.100	0.020	0.0050	0.0309	0.1023	0.0005	0.001	0.0100	0.00010	0.00500	0.000525	0.001000	0.7325	0.00050	0.0001	0.00100	0.00100	0.02528	0.00200	0.0000500	0.005000	0.00100	0.0050
SW15	Min	7.38	140	61	8.7	2.0	0.020	0.030	0.030	0.010	0.0020	0.0050	0.0690	0.00007	0.00056	0.0096	0.000013	0.00050	0.000072	0.00100	0.146	0.00014	0.0000	0.00021	0.00100	0.02290	0.00020	0.000004	0.00016	0.00020	0.0010
	Max	9.54	327	200	32.3	55.9	0.280	0.100	0.523	0.020	0.0050	0.0650	1.2900	0.00050	0.00300	0.0354	0.00020	0.00500	0.900000	0.00309	1.730	0.00101	0.0001	0.00100	0.00330	0.15000	0.00200	0.000050	0.00500	0.00357	0.0245
	Median	7.75	181	89	14.6	14.5	0.050	0.079	0.100	0.020	0.0035	0.0248	0.4940	0.00030	0.00100	0.0119	0.00010	0.00373	0.000500	0.00203	0.845	0.00050	0.0001	0.00097	0.00193	0.05950	0.00200	0.000040	0.00052	0.00200	0.0047
	St Dev.	0.50	58	40	8.6	14.8	0.065	0.032	0.138	0.005	0.0015	0.0180	0.3251	0.00021	0.00063	0.0063	0.00005	0.00201	0.261798	0.00076	0.477	0.00027	0.000030	0.00034	0.00086	0.03812	0.00071	0.000018	0.00115	0.00089	0.0056
	N	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	9	16	16	16	16	16	16	16	16
	75th %	7.93	255	133	27.4	24.3	0.065	0.100	0.100	0.020	0.0050	0.0375	0.6355	0.0005	0.0012675	0.0143	0.00010	0.00500	0.000772	0.002873	1.125	0.00076	0.0001	0.00100	0.00300	0.08525	0.00200	0.0000500	0.000725	0.00259	0.0073
SW16	Min	6.95	66	24	8.1	2.0	0.020	0.030	0.030	0.010	0.0020	0.0087	0.0435	0.00005	0.00037	0.0065	0.000010	0.00050	0.000050	0.00100	0.064	0.00009	0.0000	0.00014	0.00100	0.01490	0.00020	0.000004	0.00006	0.00020	0.0023
	Max	9.89	131	50	26.5	110.0	0.070	0.100	0.430	0.020	0.0057	0.0380	0.8000	0.00070	0.00100	0.0118	0.00010	0.00500	0.800000	0.00300	1.200	0.00090	0.0002	0.00100	0.00300	0.07510	0.00200	0.000050	0.00500	0.00200	0.0110
	Median	7.38	83	32	10.0	9.8	0.050	0.068	0.100	0.015	0.0050	0.0201	0.1300	0.00033	0.00081	0.0100	0.00007	0.00306	0.000458	0.00137	0.219	0.00046	0.0001	0.00068	0.00100	0.02700	0.00200	0.000041	0.00015	0.00100	0.0050
	St Dev.	0.67	18	7	4.4	26.4	0.014	0.036	0.093	0.005	0.0016	0.0073	0.2187	0.00023	0.00028	0.0017	0.00004	0.00219	0.199918	0.00055	0.353	0.00022	0.000048	0.00041	0.00054	0.01853	0.00074	0.000018	0.00195	0.00054	0.0019
	N	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	9	16	16	16	16	16	16	16	16
	75th %	7.50	97	36	10.8	15.6	0.050	0.100	0.100	0.020	0.0050	0.0235	0.3680	0.0005	0.001	0.0100	0.00010	0.00500	0.000500	0.002000	0.45625	0.00050	0.0001	0.00100	0.00107	0.04125	0.00200	0.0000500

TABLE 5-1
SUMMARY OF 2011 / 2012 SURFACE WATER ANALYTICAL RESULTS

		pH	Conductivity	Hardness as $CaCO_3$	Dissolved Organic Carbon	TSS	Total Ammonia-N	Fluoride	Nitrate	Nitrite	Cyanide-Total	Aluminum-Dissolved	Aluminum-Total	Antimony-Total	Arsenic-Total	Boron-Total	Cadmium-Total	Chromium-Total	Cobalt-Total	Copper-Total	Iron-Total	Lead-Total	Mercury	Molybdenum-Total	Nickel-Total	Phosphorus-Total	Selenium-Total	Thallium-Total	Uranium-Total	Vanadium-Total	Zinc-Total
PWQO		6.5-8.5	-	-	-	-	-	-	-	-	0.005[A]	-	0.075[i,B]	0.02[i]	0.1(0.005[i])	0.2[i]	0.0002	0.001 / 0.0089[E]	0.0009	0.005 (0.005[i])[F]	0.3	0.020/0.025 (0.003/0.005)[i,H]	0.0002	0.04[i]	0.025	0.03[i]	0.1	0.0003[i]	0.005[i]	0.006[i]	0.03(0.02[i])
CEQG		6.5-9.0	-	-	-	-	-	0.12	2.935	0.06	0.005[A]	-	0.1[C]	-	0.005	1.5	0.000015-0.000088[D]	0.001 / 0.0089[E]	-	0.002-0.0622[G]	0.3	0.00102-0.01343[I]	0.000026	0.073[i]	0.025[J]	-	0.001	0.0008	0.015	-	0.03
RDL		-	1	1	0.2	1*	0.05*	0.1*	0.1*	0.01*	0.005*	0.005*	0.005	0.0005*	0.001	0.01	0.0001*	0.005*	0.0005	0.001*	0.1	0.0005*	0.0001	0.001*	0.001	0.002	0.002*	0.00005*	0.0001	0.001	0.005*
		pH units	uS/cm	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
SW17	**Min**	7.04	86	35	7.9	1.0	0.020	0.030	0.030	0.010	0.0020	0.0113	0.0475	0.00006	0.00042	0.0074	0.000010	0.00050	0.000050	0.00100	0.089	0.00008	0.0000	0.00017	0.00086	0.01680	0.00020	0.000004	0.00009	0.00020	0.0003
	Max	9.73	180	76	22.5	74.0	0.080	0.100	0.300	0.020	0.0050	0.0360	0.3800	0.00050	0.00100	0.0130	0.00015	0.00500	0.000500	0.00300	0.920	0.00050	0.0001	0.00100	0.00110	0.06240	0.00200	0.000050	0.00500	0.00109	0.0159
	Median	7.48	110	42	11.2	4.0	0.050	0.070	0.100	0.015	0.0035	0.0205	0.1285	0.00030	0.00079	0.0100	0.00010	0.00295	0.000430	0.00119	0.214	0.00042	0.0001	0.00071	0.00100	0.03090	0.00200	0.000040	0.00011	0.00100	0.0050
	St Dev.	0.61	24	12	3.4	18.2	0.019	0.035	0.068	0.005	0.0015	0.0073	0.1091	0.00021	0.00026	0.0015	0.00005	0.00219	0.000198	0.00055	0.240	0.00018	0.000030	0.00040	0.00004	0.01614	0.00075	0.000019	0.00121	0.00030	0.0033
	N	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	9	16	16	16	16	16	16	16	16
	75th %	7.61	113	49	13	14.4	0.050	0.100	0.100	0.020	0.0050	0.0250	0.2490	0.0005	0.001	0.0107	0.00010	0.00500	0.000500	0.001518	0.4305	0.00050	0.0001	0.00100	0.00100	0.04528	0.00200	0.0000500	0.000208	0.00100	0.0050
SW18	**Min**	7.12	167	72	9.3	1.0	0.020	0.030	0.030	0.010	0.0020	0.0010	0.0160	0.00005	0.00051	0.0100	0.000005	0.00050	0.000075	0.00068	0.078	0.00010	0.0000	0.00032	0.00100	0.01330	0.00020	0.000003	0.00010	0.00063	0.0021
	Max	7.93	1030	653	25.6	225.0	3.810	0.130	0.301	0.020	0.0050	0.0300	1.4700	0.00050	0.00544	0.0275	0.00010	0.00500	0.005430	0.00300	56.600	0.00085	0.0001	0.00160	0.00540	1.23000	0.00200	0.000050	0.00240	0.00464	0.0121
	Median	7.62	395	205	19.0	5.6	0.050	0.100	0.100	0.015	0.0035	0.0085	0.0910	0.00031	0.00100	0.0150	0.00006	0.00384	0.000688	0.00100	1.150	0.00050	0.0001	0.00100	0.00200	0.08365	0.00200	0.000040	0.00040	0.00100	0.0050
	St Dev.	0.21	219	144	4.1	59.4	0.937	0.033	0.068	0.005	0.0015	0.0091	0.3997	0.00021	0.00136	0.0053	0.00004	0.00210	0.001783	0.00066	15.909	0.00023	0.000030	0.00032	0.00127	0.35228	0.00075	0.000019	0.00061	0.00111	0.0028
	N	16	16	16	16.0	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	9	16	16	16	16	16	16	16	16
	75th %	7.70	531	304	20.3	10.3	0.068	0.100	0.100	0.020	0.0050	0.0138	0.2280	0.0005	0.00225	0.0178	0.00010	0.00500	0.003233	0.001330	4.925	0.00050	0.0001	0.00100	0.00231	0.14750	0.00200	0.0000500	0.000675	0.00100	0.0050

Notes:

PWQO Provincial Water Quality Objectives, taken from "Policies, Guidelines, Provincial Water Quality Objectives ("PWQO") of the Ministry of Environment and Energy," July, 1994; Table 2; Table of PWQOs and Interim PWQOs ("IPWQO"). IPWQOs denoted by superscript "i".

CEQG Canadian Environmental Quality Guidelines ("CEQG") from the Canadian Council of Ministers of the Environment, Summary Table: "Canadian Water Quality Guidelines for the Protection of Aquatic Life" Summary Table Accessed Online @ http://st-ts.ccme.ca/, November 15, 2011.

Station locations shown in Appendix H.

100 indicates exceedance of an interim PWQO.

100 indicates exceedance of the PWQO.

100 indicates exceedance of the CEQG.

100 indicates exceedance of both the PWQO and CEQG.

Others RDL - Reportable Detection Limit; Min - minimum; Max - maximum; St Dev. - Standard Deviation; N - number of samples; 75th % - 75th percentile

* indicates more than one RDL value.

i indicates values is an Interim PWQO.

A PWQO/CCME for free cyanide is 0.005 mg/L.

B PWQO is for total aluminum measured in a clay-free sample; analyzed samples are not clay-free.

C CCME for aluminum where pH is ≥6.5.

D CCME for cadmium = $10^{0.86[\log 10(\text{hardness})]-3.2}$ µg/L.

E PWQO/CCME for hexavalent chromium is 1 µg/L, PWQO/CCME for trivalent chromium is 8.9 µg/L; total chromium reported.

F PWQO for copper is 5 µg/L; IPWQO is 5 µg/L where hardness is >20 mg/L.

G CCME for copper = $e^{0.8545[\ln(\text{hardness})]-1.465}$ × 0.2µg/L; Minimum of 2 µg/L.

H PWQO for lead is 20 µg/L where alkalinity is 40-80 mg/L and 25 µg/L where alkalinity is >80 mg/L; IPWQO is 3 µg/L where alkalinity is 30-80 mg/L and 5 µg/L where alkalinity is >80 mg/L.

I CCME for lead = $e^{1.273[\ln(\text{hardness})]-4.705}$; Minimum of 1 µg/L.

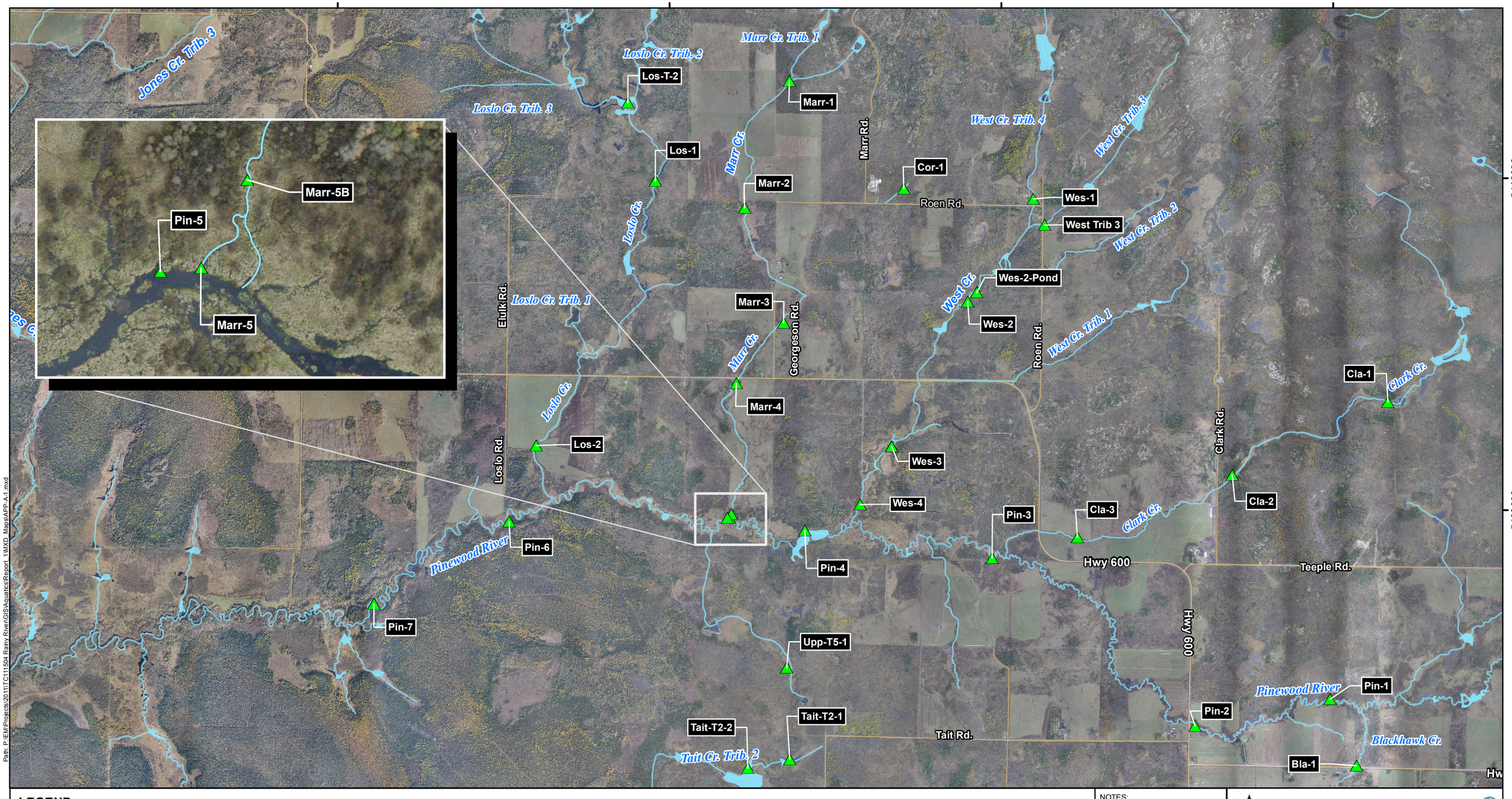
J CCME for nickel is a minimum of 25 µg/L regardless of water hardness.

6.0 REFERENCES

Klohn Crippen Berger. 2011. Rainy River Gold Project Baseline Report 2008 – 2010.

APPENDIX A

PHOTOGRAPHIC RECORD



Path: P:\EM\Projects\2011\TC111504 Rainy River\GIS\Aquatics\Report 1\MXD_Maps\APP-A-1.mxd

LEGEND

- Habitat and Bathymetry Sampling Locations
- Watercourse
- Road
- Waterbody

NOTES:
- Road data extracted from Land Information Ontario, Ontario Road Network, MNR
- Background LIDAR surveyed in Fall 2010

Datum: NAD83
Projection: UTM Zone 15N

0 1 2 4 6 8 Kilometres

RAINY RIVER amec

RAINY RIVER GOLD PROJECT

Photo Record Station Location Key Map

PROJECT N°: TC111504	**FIGURE: APP-A-1**
SCALE: 1:33,000	DATE: June 2012



Photo 1: Looking west from north shore where water has recently receded and vegetation is sparse on high banks. Grass stands are dense and there is little to no flow. **Site ID# Pin-1**



Photo 2: Looking east from north bank, the lack of precipitation caused water levels to drop about 2 feet since last site visit exposing much of the banks. Substrate is mainly fines and organics with some gravel and sand. **Site ID# Pin-1**



Photo 3: Looking west from south shore of Pinewood R. this reach is very shallow and choked with submergent and emergent macrophytes. **Site ID# Pin-2**



Photo 4: Looking east from south shore, this reach has many small coves. Substrate composition is mainly gravel with some cobble and small amount of sand. **Site ID# Pin-2**



Photo 5: Looking east along a reach of the Pinewood R. Edges of site consist of dense grass mats and willow saplings. **Site ID# Pin-3 (alternate)**



Photo 6: Looking west from the north bank of the Pinewood R. Water at site is deep (>1m) but is 12-24" shallower than last site visit in July. Substrate consists mainly of fine sediments with some coarse sand. **Site ID# Pin-3 (alternate)**



Photo 7: Looking east from the north shore of Pinewood R. site is a small flooded area, likely the result of beaver damming. Banks are covered in grasses with some saplings present. **Site ID# Pin-4**



Photo 8: Looking south across Pinewood R. a large amount of duckweed and other macrophytes floating on surface. Substrate is mostly fines with high proportion of organics. **Site ID# Pin-4**



Photo 9: Seine netting in the Pinewood R. Banks are very entrenched, channel is 6m wide and the vegetation is dominated by Yellow Pond Lily. **Site ID# Pin-5**



Photo 10: Looking across the Pinewood R. at the cover provided by floating vegetation. The gradient is very low and the mean water depth is 0.4m. **Site ID# Pin-5**



Photo 11: Looking north from the west shore of a reach on the Pinewood R. water is ~1m deep, roughly one foot lower than in July. Edges are covered with emergent aquatic vegetation. **Site ID# Pin-6**



Photo 12: Looking east across the same section of river. Midstream reach is dominated by submergent macrophytes. Substrate type is fine muck, mostly silt and clay with a small amount of sand. **Site ID# Pin-6**



Photo 13: Looking north towards Loslo Rd. over a section of the Pinewood R. there was very little current and water was very turbid. Beaver runs were evident along the shoreline. **Site ID# Pin-7**



Photo 14: Looking south from the northeast shore of a curve in the Pinewood R. Shoreline area dotted with a mix of grasslands, willow/dogwood saplings and mature spruce forest. Bottom substrate consists of fines and muck. **Site ID# Pin-7**



Photo 15: Encountered a beaver pond on walk to Tait-T2-1. UTM 15U 0423820 5406740. **Site ID# Tait-T2-1 (walk)**



Photo 16: Site is a large beaver pond with little discernable flow, looking east from north shore. Shoreline is inundated with grasses and rushes, and many macrophytes are visible in the water column. **Site ID# Tait-T2-1**



Photo 17: Looking west from north shore, water is heavily stained and bottom substrate has high organic content. **Site ID# Tait-T2-1**



Photo 18: Photo showing the defined shoreline around the periphery of the (dry) lake, looking north. Determined to be a seasonal wetland during spring thaw and after heavy rain events. **Site ID# Tait-T2-2**



Photo 19: Picture of small dry channel encountered walking around lake, 0.4m wide and looks to have been dry for some time. Surrounding vegetation is graminoids and wildflowers. **Site ID# Tait-T2-2**.



Photo 20: Looking at where watercourse should be on map but is completely dry. No defined channel observed. **Site ID# Upp-T5-1**



Photo 21: Defined channel found but has been dry for some time. Measurements are 0.5m wide and 0.4m deep. Dominate vegetation is graminoids. Watercourse appears to be a seasonal drainage. Substrate is sand and silt. **Site ID# Upp-T5-1**



Photo 22: Found a beaver dam at UTM 15U 0424008 5407669. No flow into beaver dam observed at present time. **Site ID# Upp-T5-1**



Photo 23: Dry but channel evident, meander length ~7m, amplitude ~1.5m, and 1m in width. Substrate is mostly fines, silt with some clay. **Site ID# Upp-T5-1**



Photo 24: Looking south (downstream) from the east shore of Loslo Cr. Narrow reach is crowded by dense vegetation. Water is >1m deep. **Site ID# Los-1**



Photo 25: Same reach in Loslo Cr. looking north (upstream). Multiple beaver dams throughout the creek north and south. Substrate consists mainly of gravel and sand with some fines. **Site ID# Los-1**



Photo 26: Looking north from the west bank of Loslo Cr. Reach is surrounded by cow pastures and the banks show evidence of cows entering water. Shores are covered in tall stands of grass and some tree saplings. **Site ID# Los-2**



Photo 27: Looking south along same reach of Loslo Cr, water depth is ~1m and slope from banks is gradual. Substrate is mostly sand with some gravel and fines. Some submergent macrophytes present. **Site ID# Los-2**



Photo 28: Looking south along the shore of an isthmus in a large beaver pond. Shoreline is covered heavily with grasses, sedges and rushes. Pond is deep and drops off sharply from banks. **Site ID# Los-T2**



Photo 29: Looking west across a large beaver pond towards Loslo Cr. Trib. 3. Substrate is mainly organics. Surrounding woodlands are mainly spruce and poplar. **Site ID# Los-T2**



Photo 30: Old beaver pond and lodge encountered on walk from Marr Rd. to Marr-1. Vegetation is dominated by graminoid with lots of dead standing trees. **Site ID# Unknown/Unmarked Pond**



Photo 31: Looking northwest across a large beaver pond from the southeastern shore. Water is muddy and stagnant, however water was observed trickling through the beaver dam. **Site ID# Mar-1**



Photo 32: Photo shows a long beaver dam obstructing flows at the southeast corner of the site. **Site ID# Mar-1**



Photo 33: Looking west toward the right hand bank of Marr Creek. Vegetation is dominated by grasses and sedges. Very little or no flow present and water is ~0.3 m deep. **Site ID# Marr-2**



Photo 34: Looking upstream in Marr Cr. a dense grass canopy overhangs this narrow section of the creek. Water is pooled in low areas and substrate is composed of silt and clay, covered by a large organic layer. **Site ID# Mar-2**



Photo 35: Describe vie Photo 21: Looking east towards culvert under Georgeson Rd. from north edge of small outlet pond. Original site on east side of road was dry, so sampling was conducted in pond at west side of road crossing. **Site ID# Mar-3**



Photo 36: Looking west across small outlet pond from culvert at Georgeson Rd. During site visit pond was stagnant with little to no flow. There is evidence of heavy use by cattle. **Site ID# Mar-3**



Photo 37: Looking east across a shallow, stagnant reach of Marr Cr. near cow pasture. **Site ID# Mar-4**



Photo 38: Looking upstream (north) towards Hwy. 600 along Marr Cr. Substrate composed mainly of silt with some clay and sand. **Site ID# Mar-4**



Photo 39: Looking north at curve (northwesterly) in Marr Creek. Dense beds of Lily pads are prevalent throughout this reach. Creek bordered by dense grasses. **Site ID# Mar-5**



Photo 40: Looking south from the same location, Lily pads are less prominent just downstream. Obvious beaver runs along banks. **Site ID# Mar-5**



Photo 41: Marr Cr. just north of confluence with the Pinewood R. ~1m wide and 0.5m deep. Dominate vegetation is graminoid. No flow observed and banks are steep. Substrate consists of clay, silt, and detritus. **Site ID# Marr-5B**



Photo 42: Picture taken on summer visit, creek is dry, intermittent and lies in a depression. Substrate is clay, gravel, and cobble. Bankfull width and depth is 1.1m and 0.42m. **Site ID# Cor-1**



Photo 43: Picture taken on fall visit, creek is dry. Vegetation consists of graminoids, Bedstraw, Violet Alder, Pyeweed, and Goldenrod. **Site ID# Cor-1**



Photo 44: Looking south along a very narrow reach of West Cr. Trib 4. Water is shallow but flowing well. Substrate is mainly gravel and sand. **Site ID# Wes-1**



Photo 45: Looking east across the same reach. Bordered closely by many tree saplings, the creek is full of fallen leaves. Banks are dominated by grasses. **Site ID# Wes-1**



Photo 46: Looking east through an Alder thicket, watercourse is very narrow and shallow, 0.05m deep. Flow is diffuse and substrate is silt/muck, clay, and detritus. **Site ID# Wes-Cr-Trib-3**



Photo 47: Looking west on the same reach downstream from culvert passing under Roen Rd. Watercourse has a pool where roadside drainage flows. Trib. becomes channelized downstream from the pool. (No site access) **Site ID# Wes-Cr-Trib-3**



Photo 48: Looking upstream, site is a very narrow, shallow reach of West Cr. with very little flow, most likely influenced by beaver activity. Instream vegetation is dense and substrate is mostly clay. **Site ID# Wes-2**



Photo 49: Same reach looking downstream, changes in substrate composition moving downstream from clay to gravel and sand. **Site ID# Wes-2**



Photo 50: Looking north along the west bank of a small beaver pond. All sides of pond are bordered by long grass and interspersed saplings. **Site ID# Wes-2 (pond)**



Photo 51: Eastward view across the pond, a beaver dam overgrown with grasses is visible in the top left corner. **Site ID# Wes-2 (pond)**



Photo 52: Looking south from east bank of West Creek. Shoreline is covered in rushes and burrs. Water is deep and visibly devoid of macrophytes. **Site ID# Wes-3**



Photo 53: Looking north from east bank of same reach, water is shallow ~0.5m deep. Substrate is composed of gravel and sand with fines. **Site ID# Wes-3**



Photo 54: Looking north across Wes-4 from a large beaver dam at the south end. Pond is deep (>1m) and drops steeply from banks. **Site ID# Wes-4**



Photo 55: Looking west along beaver dam at the south end of the pond, patches of Lily pads and other submergent vegetation are evident. Substrate is almost purely organic. **Site ID# Wes-4**



Photo 56: Looking east (upstream) in a narrow section of Clark Cr. Water is shallow and very slow moving. **Site ID# Cla-1**



Photo 57: Looking south across Clark Cr. Water was dark and stained. **Site ID# Cla-1**



Photo 58: Looking southwest along Clark Cr. dense stands of grass overhang the edges of the creek. **Site ID# Cla-2**



Photo 59: Looking north across a small pool in the channel. Substrate is composed mainly of coarse gravel, sand, silt, and clay. Many small cyprinids were visible in the pool. **Site ID# Cla-2**



Photo 60: Looking west along north shore of Clark Cr. cow pastures border both the north and south sides of the reach. Grasses and shrubs dominate the immediate shoreline. **Site ID# Cla-3**



Photo 61: Looking south across Clark Cr. banks are very steep although reach is narrow. Depth is ~ 1-1.5m. Emergent macrophytes are common. **Site ID# Cla-3**



Photo 62: Looking north on Blackhawk Cr. from Hwy 600 crossing. Reach is deep (~2m) and drops steeply from banks. Edges are covered with dense grass mats and stands of saplings. **Site ID# Bla-1**



Photo 63: Looking south to wooden box culvert under Hwy 600. Substrate consists of fines with some gravel and sand. **Site ID# Bla-1**

APPENDIX B

WATER QUALITY DATA AND CERTIFICATES OF ANALYSIS

Your Project #: TC111504.2003
Site Location: RAINY RIVER RESOURCES
Your C.O.C. #: 28218603, 282186-03-01

Attention: Jason Dietrich
AMEC Earth & Environmental Ltd
160 Traders Blvd
Mississauga, ON
CANADA

Report Date: 2011/10/13

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B1F4570
Received: 2011/10/05, 09:52

Sample Matrix: Water
Samples Received: 29

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Method Reference
Alkalinity	4	N/A	2011/10/06	CAM SOP-00448	SM 2320B
Alkalinity	21	N/A	2011/10/07	CAM SOP-00448	SM 2320B
Alkalinity	4	N/A	2011/10/08	CAM SOP-00448	SM 2320B
Conductivity	4	N/A	2011/10/06	CAM SOP-00448	SM 2510
Conductivity	21	N/A	2011/10/07	CAM SOP-00448	SM 2510
Conductivity	4	N/A	2011/10/08	CAM SOP-00448	SM 2510
Dissolved Organic Carbon (DOC)	23	N/A	2011/10/06	CAM SOP-00446	SM 5310 B
Dissolved Organic Carbon (DOC)	6	N/A	2011/10/07	CAM SOP-00446	SM 5310 B
Hardness (calculated as CaCO3)	29	N/A	2011/10/12	CAM SOP 00102	SM 2340 B
Mercury	2	2011/10/06	2011/10/06	CAM SOP-00453	EPA 7470
Mercury	27	2011/10/06	2011/10/07	CAM SOP-00453	EPA 7470
Dissolved Calcium and Magnesium	16	2011/10/06	2011/10/07	CAM SOP-00408	EPA 6010
Dissolved Calcium and Magnesium	13	2011/10/06	2011/10/11	CAM SOP-00408	EPA 6010
Total Metals Analysis by ICPMS	22	N/A	2011/10/12	CAM SOP-00447	EPA 6020
Total Metals Analysis by ICPMS	7	N/A	2011/10/13	CAM SOP-00447	EPA 6020
Ammonia-N (low level)	29	N/A	2011/10/12	CAM SOP-00441	US GS I-2522-90
Nitrate (NO3) and Nitrite (NO2) in Water ◊	3	N/A	2011/10/07	CAM SOP-00440	SM 4500 NO3I/NO2B
Nitrate (NO3) and Nitrite (NO2) in Water ◊	26	N/A	2011/10/08	CAM SOP-00440	SM 4500 NO3I/NO2B
pH	4	N/A	2011/10/06	CAM SOP-00448	SM 4500H
pH	21	N/A	2011/10/07	CAM SOP-00448	SM 4500H
pH	4	N/A	2011/10/08	CAM SOP-00448	SM 4500H
Sulphate by Automated Colourimetry	10	N/A	2011/10/07	CAM SOP-00464	EPA 375.4
Sulphate by Automated Colourimetry	19	N/A	2011/10/10	CAM SOP-00464	EPA 375.4
Total Phosphorus (Colourimetric)	29	2011/10/11	2011/10/12	CAM SOP-00407	APHA 4500 P,B,F
Low Level Total Suspended Solids	24	N/A	2011/10/06	CAM SOP-00428	SM 2540D
Low Level Total Suspended Solids	5	N/A	2011/10/07	CAM SOP-00428	SM 2540D

Remarks:

Maxxam Analytics has performed all analytical testing herein in accordance with ISO 17025 and the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act. All methodologies comply with this document and are validated for use in the laboratory. The methods and techniques employed in this analysis conform to the performance criteria (detection limits, accuracy and precision) as outlined in the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act.

The CWS PHC methods employed by Maxxam conform to all prescribed elements of the reference method and performance based elements have been validated. All modifications have been validated and proven equivalent following the 'Alberta Environment Draft Addenda to the CWS-PHC, Appendix 6, Validation of Alternate Methods'. Documentation is available upon request. Maxxam has made the following improvements to the CWS-PHC reference benchmark method: (i) Headspace for F1; and, (ii) Mechanical extraction for F2-F4. Note: F4G cannot be added to the C6 to C50 hydrocarbons. The extraction date for samples field preserved with methanol for F1 and Volatile Organic Compounds is considered to be the date

Maxxam Job #: B1F4570
Report Date: 2011/10/13

AMEC Earth & Environmental Ltd
Client Project #: TC111504.2003
Site Location: RAINY RIVER RESOURCES
Sampler Initials: P.M

sampled.

Maxxam Analytics is accredited by SCC (Lab ID 97) for all specific parameters as required by Ontario Regulation 153/04. Maxxam Analytics is limited in liability to the actual cost of analysis unless otherwise agreed in writing. There is no other warranty expressed or implied. Samples will be retained at Maxxam Analytics for three weeks from receipt of data or as per contract.

* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.
* Results relate only to the items tested.

(1) Values for calculated parameters may not appear to add up due to rounding of raw data and significant figures.

Encryption Key

Please direct all questions regarding this Certificate of Analysis to your Project Manager.

GINA BAYBAYAN,
Email: GBAYBAYAN@maxxam.ca
Phone# (905) 817-5766

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Maxxam has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per section 5.10.2 of ISO/IEC 17025:2005(E), signing the reports. For Service Group specific validation please refer to the Validation Signature Page.

Total cover pages: 2

Maxxam Job #: B1F4570
Report Date: 2011/10/13

AMEC Earth & Environmental Ltd
Client Project #: TC111504.2003
Site Location: RAINY RIVER RESOURCES
Sampler Initials: P.M

RESULTS OF ANALYSES OF WATER

Maxxam ID		LD6188		LD6189		LD6190		LD6191		LD6192		
Sampling Date		2011/10/01 14:00				2011/10/01 15:00		2011/09/29 12:45		2011/10/01 12:00		
	Units	**PIN 6**	**QC Batch**	**DUP2**	**QC Batch**	**LOS2**	**QC Batch**	**WES1**	**QC Batch**	**LOS1**	**RDL**	**QC Batch**
Calculated Parameters												
Hardness (CaCO3)	mg/L	200	2638219	210	2638219	240	2638219	85	2638219	180	1	2638219
Inorganics												
Total Ammonia-N	mg/L	0.02	2640801	<0.01	2640801	<0.01	2640801	<0.01	2640801	0.02	0.01	2640785
Conductivity	umho/cm	406	2640321	404	2639773	482	2640321	171	2639773	355	1	2639773
Dissolved Organic Carbon	mg/L	20.5	2639381	20.5	2639381	18.8	2639381	20.1	2639381	21.6	0.2	2639381
pH	pH	7.87	2640322	7.94	2639771	7.92	2640322	7.78	2639771	7.87		2639771
Total Phosphorus	mg/L	0.053	2642714	0.056	2642714	0.038	2642714	0.022	2642714	0.061	0.002	2642715
Total Suspended Solids	mg/L	4	2639182	4	2639182	6	2639182	2	2639182	12	1	2639182
Dissolved Sulphate (SO4)	mg/L	<1	2641094	<1	2640380	<1	2640380	<1	2641094	<1	1	2641094
Alkalinity (Total as CaCO3)	mg/L	213	2640316	211	2639766	254	2640316	88	2639766	190	1	2639766
Nitrite (N)	mg/L	<0.01	2640390	<0.01	2639819	<0.01	2640390	<0.01	2640390	<0.01	0.01	2640390
Nitrate (N)	mg/L	<0.1	2640390	<0.1	2639819	<0.1	2640390	<0.1	2640390	<0.1	0.1	2640390
Nitrate + Nitrite	mg/L	<0.1	2640390	<0.1	2639819	<0.1	2640390	<0.1	2640390	<0.1	0.1	2640390

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Maxxam Job #: B1F4570
Report Date: 2011/10/13

AMEC Earth & Environmental Ltd
Client Project #: TC111504.2003
Site Location: RAINY RIVER RESOURCES
Sampler Initials: P.M

RESULTS OF ANALYSES OF WATER

Maxxam ID		LD6193		LD6194		LD6195		LD6196		LD6197		
Sampling Date		2011/09/29 11:15				2011/09/28 08:15		2011/09/30 09:30		2011/10/01 11:00		
	Units	**WES4**	**QC Batch**	**DUP1**	**QC Batch**	**MAR UP POND**	**QC Batch**	**PIN1**	**QC Batch**	**LOS T2**	**RDL**	**QC Batch**
Calculated Parameters												
Hardness (CaCO3)	mg/L	79	2638219	87	2638219	41	2638219	170	2638219	140	1	2638219
Inorganics												
Total Ammonia-N	mg/L	<0.01	2640801	<0.01	2640801	0.04	2640801	<0.01	2640801	<0.01	0.01	2640785
Conductivity	umho/cm	150	2639773	174	2640321	83	2639773	366	2639773	264	1	2640321
Dissolved Organic Carbon	mg/L	21.7	2639381	20.4	2639381	16.0	2639381	23.6	2639381	23.3	0.2	2639422
pH	pH	7.82	2639771	7.71	2640322	7.13	2639771	8.06	2639771	7.87		2640322
Total Phosphorus	mg/L	0.025	2642714	0.027	2642714	0.020	2642714	0.058	2642714	0.058	0.002	2642715
Total Suspended Solids	mg/L	<1	2639182	2	2639182	6	2639182	13	2639661	5	1	2639182
Dissolved Sulphate (SO4)	mg/L	<1	2640380	<1	2640380	<1	2641094	14	2641094	<1	1	2640380
Alkalinity (Total as CaCO3)	mg/L	80	2639766	89	2640316	42	2639766	168	2639766	134	1	2640316
Nitrite (N)	mg/L	<0.01	2640390	<0.01	2640390	<0.01	2640390	<0.01	2640390	<0.01	0.01	2640390
Nitrate (N)	mg/L	<0.1	2640390	<0.1	2640390	<0.1	2640390	<0.1	2640390	<0.1	0.1	2640390
Nitrate + Nitrite	mg/L	<0.1	2640390	<0.1	2640390	<0.1	2640390	<0.1	2640390	<0.1	0.1	2640390

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Maxxam Job #: B1F4570
Report Date: 2011/10/13

AMEC Earth & Environmental Ltd
Client Project #: TC111504.2003
Site Location: RAINY RIVER RESOURCES
Sampler Initials: P.M

RESULTS OF ANALYSES OF WATER

Maxxam ID		LD6198			LD6199		LD6200		
Sampling Date		2011/09/30 14:10			2011/09/30 11:25		2011/09/30 10:19		
	Units	**ROUTE 600**	**RDL**	**QC Batch**	**PIN 2**	**QC Batch**	**BLA 1**	**RDL**	**QC Batch**
Calculated Parameters									
Hardness (CaCO3)	mg/L	170	1	2638219	250	2638219	160	1	2638219
Inorganics									
Total Ammonia-N	mg/L	0.02	0.01	2640801	<0.01	2640801	<0.01	0.01	2640785
Conductivity	umho/cm	368	1	2640321	512	2640321	350	1	2640321
Dissolved Organic Carbon	mg/L	20.2	0.2	2639422	16.8	2639385	26.9	0.2	2639385
pH	pH	7.84		2640322	8.06	2640322	7.62		2640322
Total Phosphorus	mg/L	0.14	0.002	2642714	0.049	2642714	0.061	0.002	2642715
Total Suspended Solids	mg/L	41	2	2639182	2	2639182	5	1	2639661
Dissolved Sulphate (SO4)	mg/L	<1	1	2640380	8	2640380	<1	1	2640380
Alkalinity (Total as CaCO3)	mg/L	187	1	2640316	258	2640316	163	1	2640316
Nitrite (N)	mg/L	<0.01	0.01	2640390	<0.01	2640390	<0.01	0.01	2640390
Nitrate (N)	mg/L	<0.1	0.1	2640390	<0.1	2640390	<0.1	0.1	2640390
Nitrate + Nitrite	mg/L	<0.1	0.1	2640390	<0.1	2640390	<0.1	0.1	2640390

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Maxxam Analytics International Corporation o/a Maxxam Analytics 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.maxxam.ca

Maxxam Job #: B1F4570
Report Date: 2011/10/13

AMEC Earth & Environmental Ltd
Client Project #: TC111504.2003
Site Location: RAINY RIVER RESOURCES
Sampler Initials: P.M

RESULTS OF ANALYSES OF WATER

Maxxam ID		LD6201		LD6202		LD6203		LD6204		
Sampling Date		2011/09/29 16:00		2011/09/29 14:45		2011/09/29 14:00		2011/10/02 09:00		
	Units	**PIN 3**	**QC Batch**	**WES2**	**QC Batch**	**WES 2 POND**	**QC Batch**	**WES3**	**RDL**	**QC Batch**
Calculated Parameters										
Hardness (CaCO3)	mg/L	250	2638219	190	2638219	180	2638219	230	1	2638219
Inorganics										
Total Ammonia-N	mg/L	<0.01	2640801	<0.01	2640801	0.02	2641516	0.02	0.01	2640785
Conductivity	umho/cm	477	2640321	383	2639773	329	2640321	491	1	2640321
Dissolved Organic Carbon	mg/L	18.0	2639381	14.8	2639381	18.1	2639385	18.2	0.2	2639385
pH	pH	7.97	2640322	8.12	2639771	8.08	2640322	8.15		2640322
Total Phosphorus	mg/L	0.086	2642714	0.068	2642714	0.041	2642715	0.036	0.002	2642715
Total Suspended Solids	mg/L	15	2639661	86	2639661	8	2639661	2	1	2639182
Dissolved Sulphate (SO4)	mg/L	<1	2640380	<1	2641094	<1	2641094	28	1	2640380
Alkalinity (Total as CaCO3)	mg/L	238	2640316	205	2639766	178	2640316	218	1	2640316
Nitrite (N)	mg/L	<0.01	2640390	<0.01	2640389	<0.01	2640389	<0.01	0.01	2640390
Nitrate (N)	mg/L	<0.1	2640390	<0.1	2640389	<0.1	2640389	<0.1	0.1	2640390
Nitrate + Nitrite	mg/L	<0.1	2640390	<0.1	2640389	<0.1	2640389	<0.1	0.1	2640390

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Maxxam Job #: B1F4570
Report Date: 2011/10/13

AMEC Earth & Environmental Ltd
Client Project #: TC111504.2003
Site Location: RAINY RIVER RESOURCES
Sampler Initials: P.M

RESULTS OF ANALYSES OF WATER

Maxxam ID		LD6205	LD6206		LD6207		LD6208		
Sampling Date		2011/10/02 13:25			2011/10/02 11:00		2011/10/02 12:15		
	Units	**TAIT T2-1**	**DUP3**	**QC Batch**	**PIN 4**	**QC Batch**	**CLA 3**	**RDL**	**QC Batch**
Calculated Parameters									
Hardness (CaCO3)	mg/L	150	310	2638219	200	2638219	310	1	2638219
Inorganics									
Total Ammonia-N	mg/L	0.12	0.01	2640801	<0.01	2640801	<0.01	0.01	2640801
Conductivity	umho/cm	280	632	2640321	405	2639773	630	1	2640321
Dissolved Organic Carbon	mg/L	29.8	7.9	2639381	18.1	2639381	7.8	0.2	2639381
pH	pH	8.06	8.18	2640322	8.13	2639771	8.19		2640322
Total Phosphorus	mg/L	0.053	0.051	2642714	0.064	2642714	0.074	0.002	2642714
Total Suspended Solids	mg/L	6	38	2639182	14	2639182	15	1	2639182
Dissolved Sulphate (SO4)	mg/L	<1	12	2641094	4	2641094	12	1	2641094
Alkalinity (Total as CaCO3)	mg/L	149	338	2640316	203	2639766	338	1	2640316
Nitrite (N)	mg/L	<0.01	<0.01	2640390	<0.01	2639819	<0.01	0.01	2640390
Nitrate (N)	mg/L	<0.1	<0.1	2640390	<0.1	2639819	<0.1	0.1	2640390
Nitrate + Nitrite	mg/L	<0.1	<0.1	2640390	<0.1	2639819	<0.1	0.1	2640390

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Maxxam Job #: B1F4570
Report Date: 2011/10/13

AMEC Earth & Environmental Ltd
Client Project #: TC111504.2003
Site Location: RAINY RIVER RESOURCES
Sampler Initials: P.M

RESULTS OF ANALYSES OF WATER

Maxxam ID		LD6209		LD6210	LD6211		LD6212		
Sampling Date		2011/10/02 14:30		2011/09/27 09:50	2011/09/27 11:35		2011/09/28 14:50		
	Units	**TAIT T5 -1**	**QC Batch**	**MAR4**	**MAR3**	**QC Batch**	**CLA 1**	**RDL**	**QC Batch**
Calculated Parameters									
Hardness (CaCO3)	mg/L	170	2638219	280	200	2638219	150	1	2638219
Inorganics									
Total Ammonia-N	mg/L	<0.01	2640801	0.02	0.04	2641516	<0.01	0.01	2641516
Conductivity	umho/cm	327	2640321	554	377	2640337	267	1	2640337
Dissolved Organic Carbon	mg/L	15.6	2639381	15.4	22.3	2639385	21.1	0.2	2639381
pH	pH	8.16	2640322	7.96	8.02	2640338	7.98		2640338
Total Phosphorus	mg/L	0.070	2642714	0.078	0.066	2642715	0.024	0.002	2642715
Total Suspended Solids	mg/L	8	2639182	17	3	2639080	11	1	2639080
Dissolved Sulphate (SO4)	mg/L	<1	2641094	10	17	2641094	<1	1	2641094
Alkalinity (Total as CaCO3)	mg/L	176	2640316	239	182	2640336	140	1	2640336
Nitrite (N)	mg/L	<0.01	2640389	<0.01	<0.01	2640392	<0.01	0.01	2640392
Nitrate (N)	mg/L	<0.1	2640389	<0.1	<0.1	2640392	<0.1	0.1	2640392
Nitrate + Nitrite	mg/L	<0.1	2640389	<0.1	<0.1	2640392	<0.1	0.1	2640392

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Maxxam Job #: B1F4570
Report Date: 2011/10/13

AMEC Earth & Environmental Ltd
Client Project #: TC111504.2003
Site Location: RAINY RIVER RESOURCES
Sampler Initials: P.M

RESULTS OF ANALYSES OF WATER

Maxxam ID		LD6213			LD6214		LD6215		LD6216		
Sampling Date		2011/09/28 09:45			2011/09/27 14:20		2011/09/28 13:30		2011/09/28 11:15		
	Units	**MAR1**	**RDL**	**QC Batch**	**MAR5**	**QC Batch**	**CLA 2**	**QC Batch**	**MAR 2**	**RDL**	**QC Batch**
Calculated Parameters											
Hardness (CaCO3)	mg/L	220	1	2638219	170	2638219	310	2638219	92	1	2638356
Inorganics											
Total Ammonia-N	mg/L	0.01	0.01	2641516	<0.01	2640801	<0.01	2640801	0.06	0.01	2640801
Conductivity	umho/cm	419	1	2640337	336	2639773	616	2640321	194	1	2639773
Dissolved Organic Carbon	mg/L	25.8	0.2	2639381	21.9	2639381	8.8	2639422	17.1	0.2	2639422
pH	pH	7.91		2640338	8.06	2639771	8.10	2640322	7.54		2639771
Total Phosphorus	mg/L	0.17	0.002	2642715	0.065	2642714	0.035	2642714	0.16	0.002	2642714
Total Suspended Solids	mg/L	78	3	2639080	6	2639182	5	2639182	8	1	2639182
Dissolved Sulphate (SO4)	mg/L	<1	1	2641094	<1	2641094	9	2642217	29	1	2641094
Alkalinity (Total as CaCO3)	mg/L	222	1	2640336	170	2639766	332	2640316	66	1	2639766
Nitrite (N)	mg/L	<0.01	0.01	2640392	<0.01	2639819	<0.01	2640390	<0.01	0.01	2640390
Nitrate (N)	mg/L	<0.1	0.1	2640392	<0.1	2639819	0.4	2640390	<0.1	0.1	2640390
Nitrate + Nitrite	mg/L	<0.1	0.1	2640392	<0.1	2639819	0.4	2640390	<0.1	0.1	2640390

RDL = Reportable Detection Limit
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Maxxam Job #: B1F4570
Report Date: 2011/10/13

AMEC Earth & Environmental Ltd
Client Project #: TC111504.2003
Site Location: RAINY RIVER RESOURCES
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ELEMENTS BY ATOMIC SPECTROSCOPY (WATER)

Maxxam ID		LD6188		LD6189		LD6190	LD6191		LD6192	LD6193		
Sampling Date		2011/10/01 14:00				2011/10/01 15:00	2011/09/29 12:45		2011/10/01 12:00	2011/09/29 11:15		
	Units	**PIN 6**	**QC Batch**	**DUP2**	**QC Batch**	**LOS2**	**WES1**	**QC Batch**	**LOS1**	**WES4**	**RDL**	**QC Batch**
Metals												
Dissolved Calcium (Ca)	mg/L	49.0	2640388	52.5	2640375	56.2	20.9	2640388	44.0	19.3	0.0500	2640388
Dissolved Magnesium (Mg)	mg/L	19.4	2640388	19.8	2640375	23.1	8.00	2640388	16.9	7.52	0.0500	2640388
Mercury (Hg)	ug/L	<0.1	2639424	<0.1	2639424	<0.1	<0.1	2639424	<0.1	<0.1	0.1	2639424
Total Aluminum (Al)	ug/L	180	2644102	200	2644102	58	56	2644102	310	21	5	2644284
Total Antimony (Sb)	ug/L	<0.5	2644102	<0.5	2644102	<0.5	<0.5	2644102	<0.5	<0.5	0.5	2644284
Total Arsenic (As)	ug/L	2	2644102	2	2644102	1	<1	2644102	1	<1	1	2644284
Total Barium (Ba)	ug/L	17	2644102	17	2644102	18	12	2644102	22	8	2	2644284
Total Beryllium (Be)	ug/L	<0.5	2644102	<0.5	2644102	<0.5	<0.5	2644102	<0.5	<0.5	0.5	2644284
Total Bismuth (Bi)	ug/L	<1	2644102	<1	2644102	<1	<1	2644102	<1	<1	1	2644284
Total Boron (B)	ug/L	20	2644102	20	2644102	26	<10	2644102	10	<10	10	2644284
Total Cadmium (Cd)	ug/L	<0.1	2644102	<0.1	2644102	<0.1	<0.1	2644102	<0.1	<0.1	0.1	2644284
Total Calcium (Ca)	ug/L	53000	2644102	55000	2644102	62000	23000	2644102	46000	20000	200	2644284
Total Chromium (Cr)	ug/L	<5	2644102	<5	2644102	<5	<5	2644102	<5	<5	5	2644284
Total Cobalt (Co)	ug/L	<0.5	2644102	<0.5	2644102	<0.5	<0.5	2644102	0.7	<0.5	0.5	2644284
Total Copper (Cu)	ug/L	2	2644102	<1	2644102	<1	<1	2644102	<1	<1	1	2644284
Total Iron (Fe)	ug/L	370	2644102	380	2644102	370	270	2644102	630	<100	100	2644284
Total Lead (Pb)	ug/L	<0.5	2644102	<0.5	2644102	<0.5	<0.5	2644102	<0.5	<0.5	0.5	2644284
Total Lithium (Li)	ug/L	6	2644102	7	2644102	8	<5	2644102	<5	<5	5	2644284
Total Magnesium (Mg)	ug/L	21000	2644102	22000	2644102	26000	8900	2644102	18000	8100	50	2644284
Total Manganese (Mn)	ug/L	320	2644102	330	2644102	74	49	2644102	500	16	2	2644284
Total Molybdenum (Mo)	ug/L	<0.5	2644102	<0.5	2644102	<0.5	<0.5	2644102	<0.5	<0.5	0.5	2644284
Total Nickel (Ni)	ug/L	2	2644102	1	2644102	2	<1	2644102	1	<1	1	2644284
Total Potassium (K)	ug/L	790	2644102	860	2644102	1000	1000	2644102	1500	490	200	2644284
Total Silicon (Si)	ug/L	4200	2644102	4100	2644102	1600	6700	2644102	8200	7100	50	2644284
Total Selenium (Se)	ug/L	<2	2644102	<2	2644102	<2	<2	2644102	<2	<2	2	2644284
Total Silver (Ag)	ug/L	<0.1	2644102	<0.1	2644102	<0.1	<0.1	2644102	<0.1	<0.1	0.1	2644284
Total Sodium (Na)	ug/L	3600	2644102	3700	2644102	3600	1100	2644102	1800	980	100	2644284
Total Strontium (Sr)	ug/L	110	2644102	110	2644102	130	38	2644102	95	35	1	2644284
Total Tellurium (Te)	ug/L	<1	2644102	<1	2644102	<1	<1	2644102	<1	<1	1	2644284
Total Thallium (Tl)	ug/L	<0.05	2644102	<0.05	2644102	<0.05	<0.05	2644102	<0.05	<0.05	0.05	2644284
Total Tin (Sn)	ug/L	<1	2644102	<1	2644102	<1	<1	2644102	<1	<1	1	2644284
Total Titanium (Ti)	ug/L	7	2644102	17	2644102	<5	<5	2644102	10	<5	5	2644284
Total Tungsten (W)	ug/L	<1	2644102	<1	2644102	<1	<1	2644102	<1	<1	1	2644284
Total Uranium (U)	ug/L	0.6	2644102	0.6	2644102	0.7	<0.1	2644102	0.8	<0.1	0.1	2644284

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Maxxam Job #: B1F4570
Report Date: 2011/10/13

AMEC Earth & Environmental Ltd
Client Project #: TC111504.2003
Site Location: RAINY RIVER RESOURCES
Sampler Initials: P.M

ELEMENTS BY ATOMIC SPECTROSCOPY (WATER)

Maxxam ID		LD6188		LD6189		LD6190	LD6191		LD6192	LD6193		
Sampling Date		2011/10/01 14:00				2011/10/01 15:00	2011/09/29 12:45		2011/10/01 12:00	2011/09/29 11:15		
	Units	**PIN 6**	**QC Batch**	**DUP2**	**QC Batch**	**LOS2**	**WES1**	**QC Batch**	**LOS1**	**WES4**	**RDL**	**QC Batch**
Total Vanadium (V)	ug/L	0.7	2644102	0.6	2644102	<0.5	<0.5	2644102	0.9	<0.5	0.5	2644284
Total Zinc (Zn)	ug/L	<5	2644102	<5	2644102	<5	<5	2644102	9	<5	5	2644284
Total Zirconium (Zr)	ug/L	<1	2644102	<1	2644102	<1	<1	2644102	<1	<1	1	2644284

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Maxxam Job #: B1F4570
Report Date: 2011/10/13

AMEC Earth & Environmental Ltd
Client Project #: TC111504.2003
Site Location: RAINY RIVER RESOURCES
Sampler Initials: P.M

ELEMENTS BY ATOMIC SPECTROSCOPY (WATER)

Maxxam ID		LD6194		LD6195	LD6196		LD6197		LD6198	LD6199		
Sampling Date				2011/09/28 08:15	2011/09/30 09:30		2011/10/01 11:00		2011/09/30 14:10	2011/09/30 11:25		
	Units	**DUP1**	**QC Batch**	**MAR UP POND**	**PIN1**	**QC Batch**	**LOS T2**	**QC Batch**	**ROUTE 600**	**PIN 2**	**RDL**	**QC Batch**
Metals												
Dissolved Calcium (Ca)	mg/L	21.2	2640388	10.9	39.7	2640388	33.2	2640375	42.2	60.0	0.0500	2640388
Dissolved Magnesium (Mg)	mg/L	8.13	2640388	3.48	17.3	2640388	13.3	2640375	16.8	24.0	0.0500	2640388
Mercury (Hg)	ug/L	<0.1	2639424	<0.1	<0.1	2639424	<0.1	2639424	<0.1	<0.1	0.1	2639424
Total Aluminum (Al)	ug/L	48	2644284	360	400	2644102	77	2644102	2700	150	5	2644102
Total Antimony (Sb)	ug/L	<0.5	2644284	<0.5	<0.5	2644102	<0.5	2644102	<0.5	<0.5	0.5	2644102
Total Arsenic (As)	ug/L	<1	2644284	<1	1	2644102	1	2644102	3	1	1	2644102
Total Barium (Ba)	ug/L	12	2644284	12	21	2644102	14	2644102	51	32	2	2644102
Total Beryllium (Be)	ug/L	<0.5	2644284	<0.5	<0.5	2644102	<0.5	2644102	<0.5	<0.5	0.5	2644102
Total Bismuth (Bi)	ug/L	<1	2644284	<1	<1	2644102	<1	2644102	<1	<1	1	2644102
Total Boron (B)	ug/L	<10	2644284	<10	22	2644102	13	2644102	25	26	10	2644102
Total Cadmium (Cd)	ug/L	<0.1	2644284	<0.1	<0.1	2644102	<0.1	2644102	<0.1	<0.1	0.1	2644102
Total Calcium (Ca)	ug/L	23000	2644284	12000	43000	2644102	34000	2644102	48000	66000	200	2644102
Total Chromium (Cr)	ug/L	<5	2644284	<5	<5	2644102	<5	2644102	<5	<5	5	2644102
Total Cobalt (Co)	ug/L	<0.5	2644284	<0.5	<0.5	2644102	<0.5	2644102	1.6	<0.5	0.5	2644102
Total Copper (Cu)	ug/L	<1	2644284	1	2	2644102	<1	2644102	4	<1	1	2644102
Total Iron (Fe)	ug/L	230	2644284	580	530	2644102	260	2644102	2100	440	100	2644102
Total Lead (Pb)	ug/L	<0.5	2644284	<0.5	<0.5	2644102	<0.5	2644102	1.2	<0.5	0.5	2644102
Total Lithium (Li)	ug/L	<5	2644284	<5	11	2644102	5	2644102	9	12	5	2644102
Total Magnesium (Mg)	ug/L	9300	2644284	3900	19000	2644102	14000	2644102	20000	27000	50	2644102
Total Manganese (Mn)	ug/L	50	2644284	47	84	2644102	110	2644102	660	120	2	2644102
Total Molybdenum (Mo)	ug/L	<0.5	2644284	<0.5	<0.5	2644102	<0.5	2644102	1.2	0.8	0.5	2644102
Total Nickel (Ni)	ug/L	<1	2644284	<1	2	2644102	1	2644102	6	1	1	2644102
Total Potassium (K)	ug/L	980	2644284	580	2500	2644102	1900	2644102	3000	2800	200	2644102
Total Silicon (Si)	ug/L	6700	2644284	3000	3400	2644102	1600	2644102	11000	3700	50	2644102
Total Selenium (Se)	ug/L	<2	2644284	<2	<2	2644102	<2	2644102	<2	<2	2	2644102
Total Silver (Ag)	ug/L	<0.1	2644284	<0.1	<0.1	2644102	<0.1	2644102	<0.1	<0.1	0.1	2644102
Total Sodium (Na)	ug/L	1100	2644284	510	6400	2644102	2200	2644102	4400	6800	100	2644102
Total Strontium (Sr)	ug/L	40	2644284	22	120	2644102	58	2644102	100	190	1	2644102
Total Tellurium (Te)	ug/L	<1	2644284	<1	<1	2644102	<1	2644102	<1	<1	1	2644102
Total Thallium (Tl)	ug/L	<0.05	2644284	<0.05	<0.05	2644102	<0.05	2644102	<0.05	<0.05	0.05	2644102
Total Tin (Sn)	ug/L	<1	2644284	<1	<1	2644102	<1	2644102	<1	<1	1	2644102
Total Titanium (Ti)	ug/L	<5	2644284	13	16	2644102	<5	2644102	120	10	5	2644102
Total Tungsten (W)	ug/L	<1	2644284	<1	<1	2644102	<1	2644102	<1	<1	1	2644102
Total Uranium (U)	ug/L	<0.1	2644284	<0.1	1.6	2644102	1.2	2644102	1.5	1.2	0.1	2644102

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Maxxam Job #: B1F4570
Report Date: 2011/10/13

AMEC Earth & Environmental Ltd
Client Project #: TC111504.2003
Site Location: RAINY RIVER RESOURCES
Sampler Initials: P.M

ELEMENTS BY ATOMIC SPECTROSCOPY (WATER)

Maxxam ID		LD6194		LD6195	LD6196		LD6197		LD6198	LD6199		
Sampling Date				2011/09/28 08:15	2011/09/30 09:30		2011/10/01 11:00		2011/09/30 14:10	2011/09/30 11:25		
	Units	**DUP1**	**QC Batch**	**MAR UP POND**	**PIN1**	**QC Batch**	**LOS T2**	**QC Batch**	**ROUTE 600**	**PIN 2**	**RDL**	**QC Batch**
Total Vanadium (V)	ug/L	<0.5	2644284	1.1	2.0	2644102	0.5	2644102	7.1	0.8	0.5	2644102
Total Zinc (Zn)	ug/L	<5	2644284	<5	<5	2644102	<5	2644102	11	<5	5	2644102
Total Zirconium (Zr)	ug/L	<1	2644284	<1	<1	2644102	<1	2644102	5	<1	1	2644102

RDL = Reportable Detection Limit
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Maxxam Job #: B1F4570
Report Date: 2011/10/13

AMEC Earth & Environmental Ltd
Client Project #: TC111504.2003
Site Location: RAINY RIVER RESOURCES
Sampler Initials: P.M

ELEMENTS BY ATOMIC SPECTROSCOPY (WATER)

Maxxam ID		LD6200		LD6201		LD6202		LD6203		LD6204		
Sampling Date		2011/09/30 10:19		2011/09/29 16:00		2011/09/29 14:45		2011/09/29 14:00		2011/10/02 09:00		
	Units	**BLA 1**	**QC Batch**	**PIN 3**	**QC Batch**	**WES2**	**QC Batch**	**WES 2 POND**	**QC Batch**	**WES3**	**RDL**	**QC Batch**
Metals												
Dissolved Calcium (Ca)	mg/L	40.3	2640388	61.2	2640375	49.6	2640388	45.0	2640375	55.3	0.0500	2640388
Dissolved Magnesium (Mg)	mg/L	15.6	2640388	22.7	2640375	17.0	2640388	15.7	2640375	21.5	0.0500	2640388
Mercury (Hg)	ug/L	<0.1	2639424	0.1	2639424	<0.1	2639424	<0.1	2639424	<0.1	0.1	2639424
Total Aluminum (Al)	ug/L	180	2644102	250	2643437	1100	2644102	240	2644102	49	5	2644102
Total Antimony (Sb)	ug/L	<0.5	2644102	<0.5	2643437	<0.5	2644102	<0.5	2644102	<0.5	0.5	2644102
Total Arsenic (As)	ug/L	1	2644102	2	2643437	2	2644102	1	2644102	1	1	2644102
Total Barium (Ba)	ug/L	23	2644102	33	2643437	27	2644102	16	2644102	46	2	2644102
Total Beryllium (Be)	ug/L	<0.5	2644102	<0.5	2643437	<0.5	2644102	<0.5	2644102	<0.5	0.5	2644102
Total Bismuth (Bi)	ug/L	<1	2644102	<1	2643437	<1	2644102	<1	2644102	<1	1	2644102
Total Boron (B)	ug/L	23	2644102	24	2643437	17	2644102	12	2644102	24	10	2644102
Total Cadmium (Cd)	ug/L	<0.1	2644102	<0.1	2643437	<0.1	2644102	<0.1	2644102	<0.1	0.1	2644102
Total Calcium (Ca)	ug/L	45000	2644102	62000	2643437	54000	2644102	47000	2644102	62000	200	2644102
Total Chromium (Cr)	ug/L	<5	2644102	<5	2643437	<5	2644102	<5	2644102	<5	5	2644102
Total Cobalt (Co)	ug/L	<0.5	2644102	<0.5	2643437	1.0	2644102	<0.5	2644102	<0.5	0.5	2644102
Total Copper (Cu)	ug/L	<1	2644102	1	2643437	2	2644102	1	2644102	2	1	2644102
Total Iron (Fe)	ug/L	460	2644102	1000	2643437	1500	2644102	320	2644102	180	100	2644102
Total Lead (Pb)	ug/L	<0.5	2644102	<0.5	2643437	0.5	2644102	<0.5	2644102	<0.5	0.5	2644102
Total Lithium (Li)	ug/L	9	2644102	<5	2643437	5	2644102	<5	2644102	9	5	2644102
Total Magnesium (Mg)	ug/L	17000	2644102	27000	2643437	19000	2644102	17000	2644102	24000	50	2644102
Total Manganese (Mn)	ug/L	240	2644102	590	2643437	320	2644102	77	2644102	18	2	2644102
Total Molybdenum (Mo)	ug/L	0.7	2644102	0.6	2643437	1.2	2644102	<0.5	2644102	2.3	0.5	2644102
Total Nickel (Ni)	ug/L	1	2644102	2	2643437	4	2644102	2	2644102	2	1	2644102
Total Potassium (K)	ug/L	3400	2644102	2000	2643437	2300	2644102	1400	2644102	3700	200	2644102
Total Silicon (Si)	ug/L	7400	2644102	7900	2643437	8700	2644102	4500	2644102	3600	50	2644102
Total Selenium (Se)	ug/L	<2	2644102	<2	2643437	<2	2644102	<2	2644102	<2	2	2644102
Total Silver (Ag)	ug/L	<0.1	2644102	<0.1	2643437	<0.1	2644102	<0.1	2644102	<0.1	0.1	2644102
Total Sodium (Na)	ug/L	4600	2644102	6500	2643437	1600	2644102	1700	2644102	6800	100	2644102
Total Strontium (Sr)	ug/L	150	2644102	130	2643437	86	2644102	72	2644102	120	1	2644102
Total Tellurium (Te)	ug/L	<1	2644102	<1	2643437	<1	2644102	<1	2644102	<1	1	2644102
Total Thallium (Tl)	ug/L	<0.05	2644102	<0.05	2643437	<0.05	2644102	<0.05	2644102	<0.05	0.05	2644102
Total Tin (Sn)	ug/L	<1	2644102	<1	2643437	<1	2644102	<1	2644102	<1	1	2644102
Total Titanium (Ti)	ug/L	9	2644102	23	2643437	43	2644102	8	2644102	<5	5	2644102
Total Tungsten (W)	ug/L	<1	2644102	<1	2643437	<1	2644102	<1	2644102	<1	1	2644102
Total Uranium (U)	ug/L	0.6	2644102	1.7	2643437	0.4	2644102	0.9	2644102	1.5	0.1	2644102

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Maxxam Job #: B1F4570
Report Date: 2011/10/13

AMEC Earth & Environmental Ltd
Client Project #: TC111504.2003
Site Location: RAINY RIVER RESOURCES
Sampler Initials: P.M

ELEMENTS BY ATOMIC SPECTROSCOPY (WATER)

Maxxam ID		LD6200		LD6201		LD6202		LD6203		LD6204		
Sampling Date		2011/09/30 10:19		2011/09/29 16:00		2011/09/29 14:45		2011/09/29 14:00		2011/10/02 09:00		
	Units	**BLA 1**	**QC Batch**	**PIN 3**	**QC Batch**	**WES2**	**QC Batch**	**WES 2 POND**	**QC Batch**	**WES3**	**RDL**	**QC Batch**
Total Vanadium (V)	ug/L	0.7	2644102	1.6	2643437	4.0	2644102	1.1	2644102	1.0	0.5	2644102
Total Zinc (Zn)	ug/L	<5	2644102	<5	2643437	7	2644102	<5	2644102	6	5	2644102
Total Zirconium (Zr)	ug/L	<1	2644102	<1	2643437	2	2644102	<1	2644102	<1	1	2644102

RDL = Reportable Detection Limit
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Maxxam Job #: B1F4570
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AMEC Earth & Environmental Ltd
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Site Location: RAINY RIVER RESOURCES
Sampler Initials: P.M

ELEMENTS BY ATOMIC SPECTROSCOPY (WATER)

Maxxam ID		LD6205		LD6206		LD6207		LD6208		
Sampling Date		2011/10/02 13:25				2011/10/02 11:00		2011/10/02 12:15		
	Units	**TAIT T2-1**	**QC Batch**	**DUP3**	**QC Batch**	**PIN 4**	**QC Batch**	**CLA 3**	**RDL**	**QC Batch**
Metals										
Dissolved Calcium (Ca)	mg/L	37.5	2640375	76.1	2640388	46.4	2640375	76.7	0.0500	2640388
Dissolved Magnesium (Mg)	mg/L	13.9	2640375	28.9	2640388	21.5	2640375	29.1	0.0500	2640388
Mercury (Hg)	ug/L	<0.1	2639866	<0.1	2639866	<0.1	2639866	<0.1	0.1	2639866
Total Aluminum (Al)	ug/L	120	2644102	640	2644102	300	2644102	750	5	2644102
Total Antimony (Sb)	ug/L	<0.5	2644102	<0.5	2644102	<0.5	2644102	<0.5	0.5	2644102
Total Arsenic (As)	ug/L	<1	2644102	2	2644102	2	2644102	2	1	2644102
Total Barium (Ba)	ug/L	21	2644102	50	2644102	23	2644102	52	2	2644102
Total Beryllium (Be)	ug/L	<0.5	2644102	<0.5	2644102	<0.5	2644102	<0.5	0.5	2644102
Total Bismuth (Bi)	ug/L	<1	2644102	<1	2644102	<1	2644102	<1	1	2644102
Total Boron (B)	ug/L	13	2644102	29	2644102	28	2644102	31	10	2644102
Total Cadmium (Cd)	ug/L	<0.1	2644102	<0.1	2644102	<0.1	2644102	<0.1	0.1	2644102
Total Calcium (Ca)	ug/L	39000	2644102	86000	2644102	47000	2644102	88000	200	2644102
Total Chromium (Cr)	ug/L	<5	2644102	<5	2644102	<5	2644102	<5	5	2644102
Total Cobalt (Co)	ug/L	<0.5	2644102	<0.5	2644102	<0.5	2644102	<0.5	0.5	2644102
Total Copper (Cu)	ug/L	<1	2644102	3	2644102	<1	2644102	2	1	2644102
Total Iron (Fe)	ug/L	190	2644102	640	2644102	520	2644102	690	100	2644102
Total Lead (Pb)	ug/L	<0.5	2644102	<0.5	2644102	<0.5	2644102	<0.5	0.5	2644102
Total Lithium (Li)	ug/L	<5	2644102	15	2644102	12	2644102	17	5	2644102
Total Magnesium (Mg)	ug/L	15000	2644102	34000	2644102	23000	2644102	35000	50	2644102
Total Manganese (Mn)	ug/L	51	2644102	48	2644102	120	2644102	57	2	2644102
Total Molybdenum (Mo)	ug/L	<0.5	2644102	1.5	2644102	1.2	2644102	1.6	0.5	2644102
Total Nickel (Ni)	ug/L	1	2644102	3	2644102	1	2644102	1	1	2644102
Total Potassium (K)	ug/L	2000	2644102	3700	2644102	2400	2644102	3900	200	2644102
Total Silicon (Si)	ug/L	1200	2644102	8900	2644102	1100	2644102	9400	50	2644102
Total Selenium (Se)	ug/L	<2	2644102	<2	2644102	<2	2644102	<2	2	2644102
Total Silver (Ag)	ug/L	<0.1	2644102	<0.1	2644102	<0.1	2644102	<0.1	0.1	2644102
Total Sodium (Na)	ug/L	1900	2644102	5900	2644102	6400	2644102	6100	100	2644102
Total Strontium (Sr)	ug/L	95	2644102	200	2644102	140	2644102	210	1	2644102
Total Tellurium (Te)	ug/L	<1	2644102	<1	2644102	<1	2644102	<1	1	2644102
Total Thallium (Tl)	ug/L	<0.05	2644102	<0.05	2644102	<0.05	2644102	<0.05	0.05	2644102
Total Tin (Sn)	ug/L	<1	2644102	<1	2644102	<1	2644102	<1	1	2644102
Total Titanium (Ti)	ug/L	<5	2644102	24	2644102	11	2644102	28	5	2644102
Total Tungsten (W)	ug/L	<1	2644102	<1	2644102	<1	2644102	<1	1	2644102
Total Uranium (U)	ug/L	0.4	2644102	4.4	2644102	1.3	2644102	4.5	0.1	2644102

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Maxxam Job #: B1F4570
Report Date: 2011/10/13

AMEC Earth & Environmental Ltd
Client Project #: TC111504.2003
Site Location: RAINY RIVER RESOURCES
Sampler Initials: P.M

ELEMENTS BY ATOMIC SPECTROSCOPY (WATER)

Maxxam ID		LD6205		LD6206		LD6207		LD6208		
Sampling Date		2011/10/02 13:25				2011/10/02 11:00		2011/10/02 12:15		
	Units	**TAIT T2-1**	**QC Batch**	**DUP3**	**QC Batch**	**PIN 4**	**QC Batch**	**CLA 3**	**RDL**	**QC Batch**
Total Vanadium (V)	ug/L	0.7	2644102	2.5	2644102	1.1	2644102	2.5	0.5	2644102
Total Zinc (Zn)	ug/L	<5	2644102	36	2644102	<5	2644102	40	5	2644102
Total Zirconium (Zr)	ug/L	<1	2644102	<1	2644102	<1	2644102	<1	1	2644102

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Maxxam Job #: B1F4570
Report Date: 2011/10/13

AMEC Earth & Environmental Ltd
Client Project #: TC111504.2003
Site Location: RAINY RIVER RESOURCES
Sampler Initials: P.M

ELEMENTS BY ATOMIC SPECTROSCOPY (WATER)

Maxxam ID		LD6209		LD6210		LD6211		LD6212		
Sampling Date		2011/10/02 14:30		2011/09/27 09:50		2011/09/27 11:35		2011/09/28 14:50		
	Units	**TAIT T5 -1**	**QC Batch**	**MAR4**	**QC Batch**	**MAR3**	**QC Batch**	**CLA 1**	**RDL**	**QC Batch**
Metals										
Dissolved Calcium (Ca)	mg/L	37.3	2640375	67.8	2640375	48.5	2640375	34.9	0.0500	2640375
Dissolved Magnesium (Mg)	mg/L	19.0	2640375	25.9	2640375	18.2	2640375	14.1	0.0500	2640375
Mercury (Hg)	ug/L	<0.1	2639866	<0.1	2639066	<0.1	2639066	<0.1	0.1	2639424
Total Aluminum (Al)	ug/L	150	2644102	390	2644102	52	2643437	81	5	2643437
Total Antimony (Sb)	ug/L	<0.5	2644102	<0.5	2644102	<0.5	2643437	<0.5	0.5	2643437
Total Arsenic (As)	ug/L	2	2644102	1	2644102	1	2643437	<1	1	2643437
Total Barium (Ba)	ug/L	22	2644102	30	2644102	11	2643437	12	2	2643437
Total Beryllium (Be)	ug/L	<0.5	2644102	<0.5	2644102	<0.5	2643437	<0.5	0.5	2643437
Total Bismuth (Bi)	ug/L	<1	2644102	<1	2644102	<1	2643437	<1	1	2643437
Total Boron (B)	ug/L	17	2644102	23	2644102	<10	2643437	<10	10	2643437
Total Cadmium (Cd)	ug/L	<0.1	2644102	<0.1	2644102	<0.1	2643437	<0.1	0.1	2643437
Total Calcium (Ca)	ug/L	39000	2644102	70000	2644102	50000	2643437	36000	200	2643437
Total Chromium (Cr)	ug/L	<5	2644102	<5	2644102	<5	2643437	<5	5	2643437
Total Cobalt (Co)	ug/L	<0.5	2644102	1.0	2644102	<0.5	2643437	<0.5	0.5	2643437
Total Copper (Cu)	ug/L	1	2644102	2	2644102	<1	2643437	1	1	2643437
Total Iron (Fe)	ug/L	230	2644102	1300	2644102	560	2643437	330	100	2643437
Total Lead (Pb)	ug/L	<0.5	2644102	<0.5	2644102	<0.5	2643437	<0.5	0.5	2643437
Total Lithium (Li)	ug/L	5	2644102	9	2644102	<5	2643437	<5	5	2643437
Total Magnesium (Mg)	ug/L	21000	2644102	28000	2644102	22000	2643437	17000	50	2643437
Total Manganese (Mn)	ug/L	78	2644102	470	2644102	100	2643437	72	2	2643437
Total Molybdenum (Mo)	ug/L	0.6	2644102	0.8	2644102	0.9	2643437	<0.5	0.5	2643437
Total Nickel (Ni)	ug/L	1	2644102	2	2644102	2	2643437	1	1	2643437
Total Potassium (K)	ug/L	2200	2644102	2000	2644102	3800	2643437	790	200	2643437
Total Silicon (Si)	ug/L	820	2644102	8100	2644102	2100	2643437	8000	50	2643437
Total Selenium (Se)	ug/L	<2	2644102	<2	2644102	<2	2643437	<2	2	2643437
Total Silver (Ag)	ug/L	<0.1	2644102	<0.1	2644102	<0.1	2643437	<0.1	0.1	2643437
Total Sodium (Na)	ug/L	2600	2644102	6000	2644102	3100	2643437	1700	100	2643437
Total Strontium (Sr)	ug/L	76	2644102	140	2644102	95	2643437	66	1	2643437
Total Tellurium (Te)	ug/L	<1	2644102	<1	2644102	<1	2643437	<1	1	2643437
Total Thallium (Tl)	ug/L	<0.05	2644102	<0.05	2644102	<0.05	2643437	<0.05	0.05	2643437
Total Tin (Sn)	ug/L	<1	2644102	<1	2644102	<1	2643437	<1	1	2643437
Total Titanium (Ti)	ug/L	6	2644102	20	2644102	<5	2643437	6	5	2643437
Total Tungsten (W)	ug/L	<1	2644102	<1	2644102	<1	2643437	<1	1	2643437
Total Uranium (U)	ug/L	1.1	2644102	0.8	2644102	1.2	2643437	0.2	0.1	2643437

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Maxxam Job #: B1F4570
Report Date: 2011/10/13

AMEC Earth & Environmental Ltd
Client Project #: TC111504.2003
Site Location: RAINY RIVER RESOURCES
Sampler Initials: P.M

ELEMENTS BY ATOMIC SPECTROSCOPY (WATER)

Maxxam ID		LD6209		LD6210		LD6211		LD6212		
Sampling Date		2011/10/02 14:30		2011/09/27 09:50		2011/09/27 11:35		2011/09/28 14:50		
	Units	**TAIT T5 -1**	**QC Batch**	**MAR4**	**QC Batch**	**MAR3**	**QC Batch**	**CLA 1**	**RDL**	**QC Batch**
Total Vanadium (V)	ug/L	1.1	2644102	1.4	2644102	<0.5	2643437	<0.5	0.5	2643437
Total Zinc (Zn)	ug/L	<5	2644102	12	2644102	21	2643437	<5	5	2643437
Total Zirconium (Zr)	ug/L	<1	2644102	<1	2644102	<1	2643437	<1	1	2643437

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Maxxam Job #: B1F4570
Report Date: 2011/10/13

AMEC Earth & Environmental Ltd
Client Project #: TC111504.2003
Site Location: RAINY RIVER RESOURCES
Sampler Initials: P.M

ELEMENTS BY ATOMIC SPECTROSCOPY (WATER)

Maxxam ID		LD6213	LD6214		LD6215		LD6216		
Sampling Date		2011/09/28 09:45	2011/09/27 14:20		2011/09/28 13:30		2011/09/28 11:15		
	Units	**MAR1**	**MAR5**	**QC Batch**	**CLA 2**	**QC Batch**	**MAR 2**	**RDL**	**QC Batch**
Metals									
Dissolved Calcium (Ca)	mg/L	56.5	40.3	2640375	75.9	2640388	22.7	0.0500	2640375
Dissolved Magnesium (Mg)	mg/L	20.0	17.2	2640375	29.6	2640388	8.52	0.0500	2640375
Mercury (Hg)	ug/L	<0.1	<0.1	2639424	<0.1	2639866	<0.1	0.1	2639866
Total Aluminum (Al)	ug/L	2000	170	2643437	210	2643437	530	5	2643437
Total Antimony (Sb)	ug/L	<0.5	<0.5	2643437	<0.5	2643437	<0.5	0.5	2643437
Total Arsenic (As)	ug/L	4	2	2643437	<1	2643437	2	1	2643437
Total Barium (Ba)	ug/L	55	19	2643437	39	2643437	43	2	2643437
Total Beryllium (Be)	ug/L	<0.5	<0.5	2643437	<0.5	2643437	<0.5	0.5	2643437
Total Bismuth (Bi)	ug/L	<1	<1	2643437	<1	2643437	<1	1	2643437
Total Boron (B)	ug/L	17	17	2643437	27	2643437	31	10	2643437
Total Cadmium (Cd)	ug/L	<0.1	<0.1	2643437	<0.1	2643437	<0.1	0.1	2643437
Total Calcium (Ca)	ug/L	62000	41000	2643437	85000	2643437	46000	200	2643437
Total Chromium (Cr)	ug/L	<5	<5	2643437	<5	2643437	<5	5	2643437
Total Cobalt (Co)	ug/L	2.7	<0.5	2643437	<0.5	2643437	2.6	0.5	2643437
Total Copper (Cu)	ug/L	3	1	2643437	<1	2643437	5	1	2643437
Total Iron (Fe)	ug/L	2900	290	2643437	790	2643437	3900	100	2643437
Total Lead (Pb)	ug/L	1.6	<0.5	2643437	<0.5	2643437	0.9	0.5	2643437
Total Lithium (Li)	ug/L	<5	<5	2643437	13	2643437	<5	5	2643437
Total Magnesium (Mg)	ug/L	26000	21000	2643437	37000	2643437	11000	50	2643437
Total Manganese (Mn)	ug/L	960	70	2643437	190	2643437	480	2	2643437
Total Molybdenum (Mo)	ug/L	0.7	<0.5	2643437	1.2	2643437	0.6	0.5	2643437
Total Nickel (Ni)	ug/L	6	2	2643437	1	2643437	3	1	2643437
Total Potassium (K)	ug/L	4000	1700	2643437	1600	2643437	3300	200	2643437
Total Silicon (Si)	ug/L	14000	1100	2643437	8400	2643437	3300	50	2643437
Total Selenium (Se)	ug/L	<2	<2	2643437	<2	2643437	<2	2	2643437
Total Silver (Ag)	ug/L	<0.1	<0.1	2643437	<0.1	2643437	<0.1	0.1	2643437
Total Sodium (Na)	ug/L	2400	5000	2643437	6300	2643437	2300	100	2643437
Total Strontium (Sr)	ug/L	110	96	2643437	230	2643437	65	1	2643437
Total Tellurium (Te)	ug/L	<1	<1	2643437	<1	2643437	<1	1	2643437
Total Thallium (Tl)	ug/L	<0.05	<0.05	2643437	<0.05	2643437	<0.05	0.05	2643437
Total Tin (Sn)	ug/L	<1	<1	2643437	<1	2643437	<1	1	2643437
Total Titanium (Ti)	ug/L	71	6	2643437	8	2643437	16	5	2643437
Total Tungsten (W)	ug/L	<1	<1	2643437	<1	2643437	<1	1	2643437
Total Uranium (U)	ug/L	3.6	1.3	2643437	5.5	2643437	0.5	0.1	2643437

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Maxxam Job #: B1F4570
Report Date: 2011/10/13

AMEC Earth & Environmental Ltd
Client Project #: TC111504.2003
Site Location: RAINY RIVER RESOURCES
Sampler Initials: P.M

ELEMENTS BY ATOMIC SPECTROSCOPY (WATER)

Maxxam ID		LD6213	LD6214		LD6215		LD6216		
Sampling Date		2011/09/28 09:45	2011/09/27 14:20		2011/09/28 13:30		2011/09/28 11:15		
	Units	**MAR1**	**MAR5**	**QC Batch**	**CLA 2**	**QC Batch**	**MAR 2**	**RDL**	**QC Batch**
Total Vanadium (V)	ug/L	7.0	0.8	2643437	0.9	2643437	2.5	0.5	2643437
Total Zinc (Zn)	ug/L	11	<5	2643437	8	2643437	39	5	2643437
Total Zirconium (Zr)	ug/L	2	<1	2643437	<1	2643437	<1	1	2643437

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Maxxam Analytics International Corporation o/a Maxxam Analytics 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.maxxam.ca

Maxxam Job #: B1F4570
Report Date: 2011/10/13

AMEC Earth & Environmental Ltd
Client Project #: TC111504.2003
Site Location: RAINY RIVER RESOURCES
Sampler Initials: P.M

Test Summary

Maxxam ID LD6188 **Collected** 2011/10/01
Sample ID PIN 6 **Shipped**
Matrix Water **Received** 2011/10/05

Test Description	Instrumentation	Batch	Extracted	Analyzed	Analyst
Alkalinity	PH	2640316	N/A	2011/10/07	YOGESH PATEL
Conductivity	COND	2640321	N/A	2011/10/07	YOGESH PATEL
Dissolved Organic Carbon (DOC)	TOCV/NDIR	2639381	N/A	2011/10/06	CHARLES OPOKU-WARE
Hardness (calculated as CaCO3)		2638219	N/A	2011/10/12	AUTOMATED STATCHK
Mercury	CVAA	2639424	2011/10/06	2011/10/07	MAGDALENA CARLOS
Dissolved Calcium and Magnesium	ICP	2640388	2011/10/06	2011/10/07	JOLLY JOHN
Total Metals Analysis by ICPMS	ICP/MS	2644102	N/A	2011/10/12	AREFA DABHAD
Ammonia-N (low level)	LACH/NH4	2640801	N/A	2011/10/12	ALINA DOBREANU
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	2640390	N/A	2011/10/08	HELEN HE
pH	PH	2640322	N/A	2011/10/07	YOGESH PATEL
Sulphate by Automated Colourimetry	AC	2641094	N/A	2011/10/10	DEONARINE RAMNARINE
Total Phosphorus (Colourimetric)	LACH/P	2642714	2011/10/11	2011/10/12	VIORICA ROTARU
Low Level Total Suspended Solids	SLDS	2639182	N/A	2011/10/06	TEJPRATAP MISHRA

Maxxam ID LD6189 **Collected**
Sample ID DUP2 **Shipped**
Matrix Water **Received** 2011/10/05

Test Description	Instrumentation	Batch	Extracted	Analyzed	Analyst
Alkalinity	PH	2639766	N/A	2011/10/06	YOGESH PATEL
Conductivity	COND	2639773	N/A	2011/10/06	YOGESH PATEL
Dissolved Organic Carbon (DOC)	TOCV/NDIR	2639381	N/A	2011/10/06	CHARLES OPOKU-WARE
Hardness (calculated as CaCO3)		2638219	N/A	2011/10/12	AUTOMATED STATCHK
Mercury	CVAA	2639424	2011/10/06	2011/10/07	MAGDALENA CARLOS
Dissolved Calcium and Magnesium	ICP	2640375	2011/10/06	2011/10/11	JOLLY JOHN
Total Metals Analysis by ICPMS	ICP/MS	2644102	N/A	2011/10/12	AREFA DABHAD
Ammonia-N (low level)	LACH/NH4	2640801	N/A	2011/10/12	ALINA DOBREANU
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	2639819	N/A	2011/10/07	HELEN HE
pH	PH	2639771	N/A	2011/10/06	YOGESH PATEL
Sulphate by Automated Colourimetry	AC	2640380	N/A	2011/10/07	CHANDRA NANDLAL
Total Phosphorus (Colourimetric)	LACH/P	2642714	2011/10/11	2011/10/12	VIORICA ROTARU
Low Level Total Suspended Solids	SLDS	2639182	N/A	2011/10/06	TEJPRATAP MISHRA

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Maxxam Job #: B1F4570
Report Date: 2011/10/13

AMEC Earth & Environmental Ltd
Client Project #: TC111504.2003
Site Location: RAINY RIVER RESOURCES
Sampler Initials: P.M

Test Summary

Maxxam ID LD6189 Dup **Collected**
Sample ID DUP2 **Shipped**
Matrix Water **Received** 2011/10/05

Test Description	Instrumentation	Batch	Extracted	Analyzed	Analyst
Sulphate by Automated Colourimetry	AC	2640380	N/A	2011/10/07	CHANDRA NANDLAL

Maxxam ID LD6190 **Collected** 2011/10/01
Sample ID LOS2 **Shipped**
Matrix Water **Received** 2011/10/05

Test Description	Instrumentation	Batch	Extracted	Analyzed	Analyst
Alkalinity	PH	2640316	N/A	2011/10/07	YOGESH PATEL
Conductivity	COND	2640321	N/A	2011/10/07	YOGESH PATEL
Dissolved Organic Carbon (DOC)	TOCV/NDIR	2639381	N/A	2011/10/06	CHARLES OPOKU-WARE
Hardness (calculated as CaCO3)		2638219	N/A	2011/10/12	AUTOMATED STATCHK
Mercury	CVAA	2639424	2011/10/06	2011/10/07	MAGDALENA CARLOS
Dissolved Calcium and Magnesium	ICP	2640388	2011/10/06	2011/10/07	JOLLY JOHN
Total Metals Analysis by ICPMS	ICP/MS	2644102	N/A	2011/10/12	AREFA DABHAD
Ammonia-N (low level)	LACH/NH4	2640801	N/A	2011/10/12	ALINA DOBREANU
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	2640390	N/A	2011/10/08	HELEN HE
pH	PH	2640322	N/A	2011/10/07	YOGESH PATEL
Sulphate by Automated Colourimetry	AC	2640380	N/A	2011/10/07	CHANDRA NANDLAL
Total Phosphorus (Colourimetric)	LACH/P	2642714	2011/10/11	2011/10/12	VIORICA ROTARU
Low Level Total Suspended Solids	SLDS	2639182	N/A	2011/10/06	TEJPRATAP MISHRA

Maxxam ID LD6190 Dup **Collected** 2011/10/01
Sample ID LOS2 **Shipped**
Matrix Water **Received** 2011/10/05

Test Description	Instrumentation	Batch	Extracted	Analyzed	Analyst
Dissolved Calcium and Magnesium	ICP	2640388	2011/10/06	2011/10/07	JOLLY JOHN

Maxxam Job #: B1F4570
Report Date: 2011/10/13

AMEC Earth & Environmental Ltd
Client Project #: TC111504.2003
Site Location: RAINY RIVER RESOURCES
Sampler Initials: P.M

Test Summary

Maxxam ID LD6191 **Collected** 2011/09/29
Sample ID WES1 **Shipped**
Matrix Water **Received** 2011/10/05

Test Description	Instrumentation	Batch	Extracted	Analyzed	Analyst
Alkalinity	PH	2639766	N/A	2011/10/06	YOGESH PATEL
Conductivity	COND	2639773	N/A	2011/10/06	YOGESH PATEL
Dissolved Organic Carbon (DOC)	TOCV/NDIR	2639381	N/A	2011/10/06	CHARLES OPOKU-WARE
Hardness (calculated as CaCO3)		2638219	N/A	2011/10/12	AUTOMATED STATCHK
Mercury	CVAA	2639424	2011/10/06	2011/10/07	MAGDALENA CARLOS
Dissolved Calcium and Magnesium	ICP	2640388	2011/10/06	2011/10/07	JOLLY JOHN
Total Metals Analysis by ICPMS	ICP/MS	2644102	N/A	2011/10/12	AREFA DABHAD
Ammonia-N (low level)	LACH/NH4	2640801	N/A	2011/10/12	ALINA DOBREANU
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	2640390	N/A	2011/10/08	HELEN HE
pH	PH	2639771	N/A	2011/10/06	YOGESH PATEL
Sulphate by Automated Colourimetry	AC	2641094	N/A	2011/10/10	DEONARINE RAMNARINE
Total Phosphorus (Colourimetric)	LACH/P	2642714	2011/10/11	2011/10/12	VIORICA ROTARU
Low Level Total Suspended Solids	SLDS	2639182	N/A	2011/10/06	TEJPRATAP MISHRA

Maxxam ID LD6192 **Collected** 2011/10/01
Sample ID LOS1 **Shipped**
Matrix Water **Received** 2011/10/05

Test Description	Instrumentation	Batch	Extracted	Analyzed	Analyst
Alkalinity	PH	2639766	N/A	2011/10/06	YOGESH PATEL
Conductivity	COND	2639773	N/A	2011/10/06	YOGESH PATEL
Dissolved Organic Carbon (DOC)	TOCV/NDIR	2639381	N/A	2011/10/06	CHARLES OPOKU-WARE
Hardness (calculated as CaCO3)		2638219	N/A	2011/10/12	AUTOMATED STATCHK
Mercury	CVAA	2639424	2011/10/06	2011/10/07	MAGDALENA CARLOS
Dissolved Calcium and Magnesium	ICP	2640388	2011/10/06	2011/10/07	JOLLY JOHN
Total Metals Analysis by ICPMS	ICP/MS	2644284	N/A	2011/10/12	JOHN BOWMAN
Ammonia-N (low level)	LACH/NH4	2640785	N/A	2011/10/12	ALINA DOBREANU
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	2640390	N/A	2011/10/08	HELEN HE
pH	PH	2639771	N/A	2011/10/06	YOGESH PATEL
Sulphate by Automated Colourimetry	AC	2641094	N/A	2011/10/10	DEONARINE RAMNARINE
Total Phosphorus (Colourimetric)	LACH/P	2642715	2011/10/11	2011/10/12	VIORICA ROTARU
Low Level Total Suspended Solids	SLDS	2639182	N/A	2011/10/06	TEJPRATAP MISHRA

Maxxam Job #: B1F4570
Report Date: 2011/10/13

AMEC Earth & Environmental Ltd
Client Project #: TC111504.2003
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Test Summary

Maxxam ID LD6193 **Collected** 2011/09/29
Sample ID WES4 **Shipped**
Matrix Water **Received** 2011/10/05

Test Description	Instrumentation	Batch	Extracted	Analyzed	Analyst
Alkalinity	PH	2639766	N/A	2011/10/06	YOGESH PATEL
Conductivity	COND	2639773	N/A	2011/10/06	YOGESH PATEL
Dissolved Organic Carbon (DOC)	TOCV/NDIR	2639381	N/A	2011/10/06	CHARLES OPOKU-WARE
Hardness (calculated as CaCO3)		2638219	N/A	2011/10/12	AUTOMATED STATCHK
Mercury	CVAA	2639424	2011/10/06	2011/10/07	MAGDALENA CARLOS
Dissolved Calcium and Magnesium	ICP	2640388	2011/10/06	2011/10/07	JOLLY JOHN
Total Metals Analysis by ICPMS	ICP/MS	2644284	N/A	2011/10/12	JOHN BOWMAN
Ammonia-N (low level)	LACH/NH4	2640801	N/A	2011/10/12	ALINA DOBREANU
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	2640390	N/A	2011/10/08	HELEN HE
pH	PH	2639771	N/A	2011/10/06	YOGESH PATEL
Sulphate by Automated Colourimetry	AC	2640380	N/A	2011/10/07	CHANDRA NANDLAL
Total Phosphorus (Colourimetric)	LACH/P	2642714	2011/10/11	2011/10/12	VIORICA ROTARU
Low Level Total Suspended Solids	SLDS	2639182	N/A	2011/10/06	TEJPRATAP MISHRA

Maxxam ID LD6193 Dup **Collected** 2011/09/29
Sample ID WES4 **Shipped**
Matrix Water **Received** 2011/10/05

Test Description	Instrumentation	Batch	Extracted	Analyzed	Analyst
Mercury	CVAA	2639424	2011/10/06	2011/10/07	MAGDALENA CARLOS

Maxxam ID LD6194 **Collected**
Sample ID DUP1 **Shipped**
Matrix Water **Received** 2011/10/05

Test Description	Instrumentation	Batch	Extracted	Analyzed	Analyst
Alkalinity	PH	2640316	N/A	2011/10/07	YOGESH PATEL
Conductivity	COND	2640321	N/A	2011/10/07	YOGESH PATEL
Dissolved Organic Carbon (DOC)	TOCV/NDIR	2639381	N/A	2011/10/06	CHARLES OPOKU-WARE
Hardness (calculated as CaCO3)		2638219	N/A	2011/10/12	AUTOMATED STATCHK
Mercury	CVAA	2639424	2011/10/06	2011/10/07	MAGDALENA CARLOS
Dissolved Calcium and Magnesium	ICP	2640388	2011/10/06	2011/10/07	JOLLY JOHN

Maxxam Job #: B1F4570
Report Date: 2011/10/13

AMEC Earth & Environmental Ltd
Client Project #: TC111504.2003
Site Location: RAINY RIVER RESOURCES
Sampler Initials: P.M

Test Summary

Total Metals Analysis by ICPMS	ICP/MS	2644284	N/A	2011/10/12	JOHN BOWMAN
Ammonia-N (low level)	LACH/NH4	2640801	N/A	2011/10/12	ALINA DOBREANU
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	2640390	N/A	2011/10/08	HELEN HE
pH	PH	2640322	N/A	2011/10/07	YOGESH PATEL
Sulphate by Automated Colourimetry	AC	2640380	N/A	2011/10/07	CHANDRA NANDLAL
Total Phosphorus (Colourimetric)	LACH/P	2642714	2011/10/11	2011/10/12	VIORICA ROTARU
Low Level Total Suspended Solids	SLDS	2639182	N/A	2011/10/06	TEJPRATAP MISHRA

Maxxam ID LD6195 **Collected** 2011/09/28
Sample ID MAR UP POND **Shipped**
Matrix Water **Received** 2011/10/05

Test Description	Instrumentation	Batch	Extracted	Analyzed	Analyst
Alkalinity	PH	2639766	N/A	2011/10/07	YOGESH PATEL
Conductivity	COND	2639773	N/A	2011/10/07	YOGESH PATEL
Dissolved Organic Carbon (DOC)	TOCV/NDIR	2639381	N/A	2011/10/06	CHARLES OPOKU-WARE
Hardness (calculated as CaCO3)		2638219	N/A	2011/10/12	AUTOMATED STATCHK
Mercury	CVAA	2639424	2011/10/06	2011/10/07	MAGDALENA CARLOS
Dissolved Calcium and Magnesium	ICP	2640388	2011/10/06	2011/10/07	JOLLY JOHN
Total Metals Analysis by ICPMS	ICP/MS	2644102	N/A	2011/10/12	AREFA DABHAD
Ammonia-N (low level)	LACH/NH4	2640801	N/A	2011/10/12	ALINA DOBREANU
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	2640390	N/A	2011/10/08	HELEN HE
pH	PH	2639771	N/A	2011/10/07	YOGESH PATEL
Sulphate by Automated Colourimetry	AC	2641094	N/A	2011/10/10	DEONARINE RAMNARINE
Total Phosphorus (Colourimetric)	LACH/P	2642714	2011/10/11	2011/10/12	VIORICA ROTARU
Low Level Total Suspended Solids	SLDS	2639182	N/A	2011/10/06	TEJPRATAP MISHRA

Maxxam ID LD6195 Dup **Collected** 2011/09/28
Sample ID MAR UP POND **Shipped**
Matrix Water **Received** 2011/10/05

Test Description	Instrumentation	Batch	Extracted	Analyzed	Analyst
Dissolved Organic Carbon (DOC)	TOCV/NDIR	2639381	N/A	2011/10/06	CHARLES OPOKU-WARE

Maxxam Job #: B1F4570
Report Date: 2011/10/13

AMEC Earth & Environmental Ltd
Client Project #: TC111504.2003
Site Location: RAINY RIVER RESOURCES
Sampler Initials: P.M

Test Summary

Maxxam ID LD6196 **Collected** 2011/09/30
Sample ID PIN1 **Shipped**
Matrix Water **Received** 2011/10/05

Test Description	Instrumentation	Batch	Extracted	Analyzed	Analyst
Alkalinity	PH	2639766	N/A	2011/10/07	YOGESH PATEL
Conductivity	COND	2639773	N/A	2011/10/07	YOGESH PATEL
Dissolved Organic Carbon (DOC)	TOCV/NDIR	2639381	N/A	2011/10/06	CHARLES OPOKU-WARE
Hardness (calculated as CaCO3)		2638219	N/A	2011/10/12	AUTOMATED STATCHK
Mercury	CVAA	2639424	2011/10/06	2011/10/07	MAGDALENA CARLOS
Dissolved Calcium and Magnesium	ICP	2640388	2011/10/06	2011/10/07	JOLLY JOHN
Total Metals Analysis by ICPMS	ICP/MS	2644102	N/A	2011/10/12	AREFA DABHAD
Ammonia-N (low level)	LACH/NH4	2640801	N/A	2011/10/12	ALINA DOBREANU
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	2640390	N/A	2011/10/08	HELEN HE
pH	PH	2639771	N/A	2011/10/07	YOGESH PATEL
Sulphate by Automated Colourimetry	AC	2641094	N/A	2011/10/10	DEONARINE RAMNARINE
Total Phosphorus (Colourimetric)	LACH/P	2642714	2011/10/11	2011/10/12	VIORICA ROTARU
Low Level Total Suspended Solids	SLDS	2639661	N/A	2011/10/07	SUBHASHCHANDRA PATEL

Maxxam ID LD6196 Dup **Collected** 2011/09/30
Sample ID PIN1 **Shipped**
Matrix Water **Received** 2011/10/05

Test Description	Instrumentation	Batch	Extracted	Analyzed	Analyst
Total Phosphorus (Colourimetric)	LACH/P	2642714	2011/10/11	2011/10/12	VIORICA ROTARU

Maxxam ID LD6197 **Collected** 2011/10/01
Sample ID LOS T2 **Shipped**
Matrix Water **Received** 2011/10/05

Test Description	Instrumentation	Batch	Extracted	Analyzed	Analyst
Alkalinity	PH	2640316	N/A	2011/10/07	YOGESH PATEL
Conductivity	COND	2640321	N/A	2011/10/07	YOGESH PATEL
Dissolved Organic Carbon (DOC)	TOCV/NDIR	2639422	N/A	2011/10/06	CHARLES OPOKU-WARE
Hardness (calculated as CaCO3)		2638219	N/A	2011/10/12	AUTOMATED STATCHK
Mercury	CVAA	2639424	2011/10/06	2011/10/07	MAGDALENA CARLOS
Dissolved Calcium and Magnesium	ICP	2640375	2011/10/06	2011/10/11	JOLLY JOHN

Maxxam Job #: B1F4570
Report Date: 2011/10/13

AMEC Earth & Environmental Ltd
Client Project #: TC111504.2003
Site Location: RAINY RIVER RESOURCES
Sampler Initials: P.M

Test Summary

Total Metals Analysis by ICPMS	ICP/MS	2644102	N/A	2011/10/12	AREFA DABHAD
Ammonia-N (low level)	LACH/NH4	2640785	N/A	2011/10/12	ALINA DOBREANU
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	2640390	N/A	2011/10/08	HELEN HE
pH	PH	2640322	N/A	2011/10/07	YOGESH PATEL
Sulphate by Automated Colourimetry	AC	2640380	N/A	2011/10/07	CHANDRA NANDLAL
Total Phosphorus (Colourimetric)	LACH/P	2642715	2011/10/11	2011/10/12	VIORICA ROTARU
Low Level Total Suspended Solids	SLDS	2639182	N/A	2011/10/06	TEJPRATAP MISHRA

Maxxam ID LD6198 **Collected** 2011/09/30
Sample ID ROUTE 600 **Shipped**
Matrix Water **Received** 2011/10/05

Test Description	Instrumentation	Batch	Extracted	Analyzed	Analyst
Alkalinity	PH	2640316	N/A	2011/10/07	YOGESH PATEL
Conductivity	COND	2640321	N/A	2011/10/07	YOGESH PATEL
Dissolved Organic Carbon (DOC)	TOCV/NDIR	2639422	N/A	2011/10/06	CHARLES OPOKU-WARE
Hardness (calculated as CaCO3)		2638219	N/A	2011/10/12	AUTOMATED STATCHK
Mercury	CVAA	2639424	2011/10/06	2011/10/07	MAGDALENA CARLOS
Dissolved Calcium and Magnesium	ICP	2640388	2011/10/06	2011/10/07	JOLLY JOHN
Total Metals Analysis by ICPMS	ICP/MS	2644102	N/A	2011/10/12	AREFA DABHAD
Ammonia-N (low level)	LACH/NH4	2640801	N/A	2011/10/12	ALINA DOBREANU
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	2640390	N/A	2011/10/08	HELEN HE
pH	PH	2640322	N/A	2011/10/07	YOGESH PATEL
Sulphate by Automated Colourimetry	AC	2640380	N/A	2011/10/07	CHANDRA NANDLAL
Total Phosphorus (Colourimetric)	LACH/P	2642714	2011/10/11	2011/10/12	VIORICA ROTARU
Low Level Total Suspended Solids	SLDS	2639182	N/A	2011/10/06	TEJPRATAP MISHRA

Maxxam ID LD6198 Dup **Collected** 2011/09/30
Sample ID ROUTE 600 **Shipped**
Matrix Water **Received** 2011/10/05

Test Description	Instrumentation	Batch	Extracted	Analyzed	Analyst
Ammonia-N (low level)	LACH/NH4	2640801	N/A	2011/10/12	ALINA DOBREANU

Maxxam Job #: B1F4570
Report Date: 2011/10/13

AMEC Earth & Environmental Ltd
Client Project #: TC111504.2003
Site Location: RAINY RIVER RESOURCES
Sampler Initials: P.M

Test Summary

Maxxam ID LD6199 **Collected** 2011/09/30
Sample ID PIN 2 **Shipped**
Matrix Water **Received** 2011/10/05

Test Description	Instrumentation	Batch	Extracted	Analyzed	Analyst
Alkalinity	PH	2640316	N/A	2011/10/07	YOGESH PATEL
Conductivity	COND	2640321	N/A	2011/10/07	YOGESH PATEL
Dissolved Organic Carbon (DOC)	TOCV/NDIR	2639385	N/A	2011/10/07	CHARLES OPOKU-WARE
Hardness (calculated as CaCO3)		2638219	N/A	2011/10/12	AUTOMATED STATCHK
Mercury	CVAA	2639424	2011/10/06	2011/10/07	MAGDALENA CARLOS
Dissolved Calcium and Magnesium	ICP	2640388	2011/10/06	2011/10/07	JOLLY JOHN
Total Metals Analysis by ICPMS	ICP/MS	2644102	N/A	2011/10/12	AREFA DABHAD
Ammonia-N (low level)	LACH/NH4	2640801	N/A	2011/10/12	ALINA DOBREANU
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	2640390	N/A	2011/10/08	HELEN HE
pH	PH	2640322	N/A	2011/10/07	YOGESH PATEL
Sulphate by Automated Colourimetry	AC	2640380	N/A	2011/10/07	CHANDRA NANDLAL
Total Phosphorus (Colourimetric)	LACH/P	2642714	2011/10/11	2011/10/12	VIORICA ROTARU
Low Level Total Suspended Solids	SLDS	2639182	N/A	2011/10/06	TEJPRATAP MISHRA

Maxxam ID LD6200 **Collected** 2011/09/30
Sample ID BLA 1 **Shipped**
Matrix Water **Received** 2011/10/05

Test Description	Instrumentation	Batch	Extracted	Analyzed	Analyst
Alkalinity	PH	2640316	N/A	2011/10/07	YOGESH PATEL
Conductivity	COND	2640321	N/A	2011/10/07	YOGESH PATEL
Dissolved Organic Carbon (DOC)	TOCV/NDIR	2639385	N/A	2011/10/07	CHARLES OPOKU-WARE
Hardness (calculated as CaCO3)		2638219	N/A	2011/10/12	AUTOMATED STATCHK
Mercury	CVAA	2639424	2011/10/06	2011/10/07	MAGDALENA CARLOS
Dissolved Calcium and Magnesium	ICP	2640388	2011/10/06	2011/10/07	JOLLY JOHN
Total Metals Analysis by ICPMS	ICP/MS	2644102	N/A	2011/10/12	AREFA DABHAD
Ammonia-N (low level)	LACH/NH4	2640785	N/A	2011/10/12	ALINA DOBREANU
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	2640390	N/A	2011/10/08	HELEN HE
pH	PH	2640322	N/A	2011/10/07	YOGESH PATEL
Sulphate by Automated Colourimetry	AC	2640380	N/A	2011/10/07	CHANDRA NANDLAL
Total Phosphorus (Colourimetric)	LACH/P	2642715	2011/10/11	2011/10/12	VIORICA ROTARU
Low Level Total Suspended Solids	SLDS	2639661	N/A	2011/10/07	SUBHASHCHANDRA PATEL

Maxxam Job #: B1F4570
Report Date: 2011/10/13

AMEC Earth & Environmental Ltd
Client Project #: TC111504.2003
Site Location: RAINY RIVER RESOURCES
Sampler Initials: P.M

Test Summary

Maxxam ID LD6201 **Collected** 2011/09/29
Sample ID PIN 3 **Shipped**
Matrix Water **Received** 2011/10/05

Test Description	Instrumentation	Batch	Extracted	Analyzed	Analyst
Alkalinity	PH	2640316	N/A	2011/10/07	YOGESH PATEL
Conductivity	COND	2640321	N/A	2011/10/07	YOGESH PATEL
Dissolved Organic Carbon (DOC)	TOCV/NDIR	2639381	N/A	2011/10/06	CHARLES OPOKU-WARE
Hardness (calculated as CaCO3)		2638219	N/A	2011/10/12	AUTOMATED STATCHK
Mercury	CVAA	2639424	2011/10/06	2011/10/07	MAGDALENA CARLOS
Dissolved Calcium and Magnesium	ICP	2640375	2011/10/06	2011/10/11	JOLLY JOHN
Total Metals Analysis by ICPMS	ICP/MS	2643437	N/A	2011/10/13	JOHN BOWMAN
Ammonia-N (low level)	LACH/NH4	2640801	N/A	2011/10/12	ALINA DOBREANU
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	2640390	N/A	2011/10/08	HELEN HE
pH	PH	2640322	N/A	2011/10/07	YOGESH PATEL
Sulphate by Automated Colourimetry	AC	2640380	N/A	2011/10/07	CHANDRA NANDLAL
Total Phosphorus (Colourimetric)	LACH/P	2642714	2011/10/11	2011/10/12	VIORICA ROTARU
Low Level Total Suspended Solids	SLDS	2639661	N/A	2011/10/07	SUBHASHCHANDRA PATEL

Maxxam ID LD6202 **Collected** 2011/09/29
Sample ID WES2 **Shipped**
Matrix Water **Received** 2011/10/05

Test Description	Instrumentation	Batch	Extracted	Analyzed	Analyst
Alkalinity	PH	2639766	N/A	2011/10/07	YOGESH PATEL
Conductivity	COND	2639773	N/A	2011/10/07	YOGESH PATEL
Dissolved Organic Carbon (DOC)	TOCV/NDIR	2639381	N/A	2011/10/06	CHARLES OPOKU-WARE
Hardness (calculated as CaCO3)		2638219	N/A	2011/10/12	AUTOMATED STATCHK
Mercury	CVAA	2639424	2011/10/06	2011/10/07	MAGDALENA CARLOS
Dissolved Calcium and Magnesium	ICP	2640388	2011/10/06	2011/10/07	JOLLY JOHN
Total Metals Analysis by ICPMS	ICP/MS	2644102	N/A	2011/10/12	AREFA DABHAD
Ammonia-N (low level)	LACH/NH4	2640801	N/A	2011/10/12	ALINA DOBREANU
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	2640389	N/A	2011/10/08	HELEN HE
pH	PH	2639771	N/A	2011/10/07	YOGESH PATEL
Sulphate by Automated Colourimetry	AC	2641094	N/A	2011/10/10	DEONARINE RAMNARINE
Total Phosphorus (Colourimetric)	LACH/P	2642714	2011/10/11	2011/10/12	VIORICA ROTARU
Low Level Total Suspended Solids	SLDS	2639661	N/A	2011/10/07	SUBHASHCHANDRA PATEL

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Maxxam Job #: B1F4570
Report Date: 2011/10/13

AMEC Earth & Environmental Ltd
Client Project #: TC111504.2003
Site Location: RAINY RIVER RESOURCES
Sampler Initials: P.M

Test Summary

Maxxam ID LD6203 **Collected** 2011/09/29
Sample ID WES 2 POND **Shipped**
Matrix Water **Received** 2011/10/05

Test Description	Instrumentation	Batch	Extracted	Analyzed	Analyst
Alkalinity	PH	2640316	N/A	2011/10/07	YOGESH PATEL
Conductivity	COND	2640321	N/A	2011/10/07	YOGESH PATEL
Dissolved Organic Carbon (DOC)	TOCV/NDIR	2639385	N/A	2011/10/07	CHARLES OPOKU-WARE
Hardness (calculated as CaCO3)		2638219	N/A	2011/10/12	AUTOMATED STATCHK
Mercury	CVAA	2639424	2011/10/06	2011/10/07	MAGDALENA CARLOS
Dissolved Calcium and Magnesium	ICP	2640375	2011/10/06	2011/10/11	JOLLY JOHN
Total Metals Analysis by ICPMS	ICP/MS	2644102	N/A	2011/10/12	AREFA DABHAD
Ammonia-N (low level)	LACH/NH4	2641516	N/A	2011/10/12	ALINA DOBREANU
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	2640389	N/A	2011/10/08	HELEN HE
pH	PH	2640322	N/A	2011/10/07	YOGESH PATEL
Sulphate by Automated Colourimetry	AC	2641094	N/A	2011/10/10	DEONARINE RAMNARINE
Total Phosphorus (Colourimetric)	LACH/P	2642715	2011/10/11	2011/10/12	VIORICA ROTARU
Low Level Total Suspended Solids	SLDS	2639661	N/A	2011/10/07	SUBHASHCHANDRA PATEL

Maxxam ID LD6204 **Collected** 2011/10/02
Sample ID WES3 **Shipped**
Matrix Water **Received** 2011/10/05

Test Description	Instrumentation	Batch	Extracted	Analyzed	Analyst
Alkalinity	PH	2640316	N/A	2011/10/07	YOGESH PATEL
Conductivity	COND	2640321	N/A	2011/10/07	YOGESH PATEL
Dissolved Organic Carbon (DOC)	TOCV/NDIR	2639385	N/A	2011/10/07	CHARLES OPOKU-WARE
Hardness (calculated as CaCO3)		2638219	N/A	2011/10/12	AUTOMATED STATCHK
Mercury	CVAA	2639424	2011/10/06	2011/10/07	MAGDALENA CARLOS
Dissolved Calcium and Magnesium	ICP	2640388	2011/10/06	2011/10/07	JOLLY JOHN
Total Metals Analysis by ICPMS	ICP/MS	2644102	N/A	2011/10/12	AREFA DABHAD
Ammonia-N (low level)	LACH/NH4	2640785	N/A	2011/10/12	ALINA DOBREANU
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	2640390	N/A	2011/10/08	HELEN HE
pH	PH	2640322	N/A	2011/10/07	YOGESH PATEL
Sulphate by Automated Colourimetry	AC	2640380	N/A	2011/10/07	CHANDRA NANDLAL
Total Phosphorus (Colourimetric)	LACH/P	2642715	2011/10/11	2011/10/12	VIORICA ROTARU
Low Level Total Suspended Solids	SLDS	2639182	N/A	2011/10/06	TEJPRATAP MISHRA

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Maxxam Job #: B1F4570
Report Date: 2011/10/13

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Client Project #: TC111504.2003
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Test Summary

Maxxam ID LD6205 **Collected** 2011/10/02
Sample ID TAIT T2-1 **Shipped**
Matrix Water **Received** 2011/10/05

Test Description	Instrumentation	Batch	Extracted	Analyzed	Analyst
Alkalinity	PH	2640316	N/A	2011/10/07	YOGESH PATEL
Conductivity	COND	2640321	N/A	2011/10/07	YOGESH PATEL
Dissolved Organic Carbon (DOC)	TOCV/NDIR	2639381	N/A	2011/10/06	CHARLES OPOKU-WARE
Hardness (calculated as CaCO3)		2638219	N/A	2011/10/12	AUTOMATED STATCHK
Mercury	CVAA	2639866	2011/10/06	2011/10/07	MAGDALENA CARLOS
Dissolved Calcium and Magnesium	ICP	2640375	2011/10/06	2011/10/11	JOLLY JOHN
Total Metals Analysis by ICPMS	ICP/MS	2644102	N/A	2011/10/12	AREFA DABHAD
Ammonia-N (low level)	LACH/NH4	2640801	N/A	2011/10/12	ALINA DOBREANU
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	2640390	N/A	2011/10/08	HELEN HE
pH	PH	2640322	N/A	2011/10/07	YOGESH PATEL
Sulphate by Automated Colourimetry	AC	2641094	N/A	2011/10/10	DEONARINE RAMNARINE
Total Phosphorus (Colourimetric)	LACH/P	2642714	2011/10/11	2011/10/12	VIORICA ROTARU
Low Level Total Suspended Solids	SLDS	2639182	N/A	2011/10/06	TEJPRATAP MISHRA

Maxxam ID LD6205 Dup **Collected** 2011/10/02
Sample ID TAIT T2-1 **Shipped**
Matrix Water **Received** 2011/10/05

Test Description	Instrumentation	Batch	Extracted	Analyzed	Analyst
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	2640390	N/A	2011/10/08	HELEN HE

Maxxam ID LD6206 **Collected**
Sample ID DUP3 **Shipped**
Matrix Water **Received** 2011/10/05

Test Description	Instrumentation	Batch	Extracted	Analyzed	Analyst
Alkalinity	PH	2640316	N/A	2011/10/07	YOGESH PATEL
Conductivity	COND	2640321	N/A	2011/10/07	YOGESH PATEL
Dissolved Organic Carbon (DOC)	TOCV/NDIR	2639381	N/A	2011/10/06	CHARLES OPOKU-WARE
Hardness (calculated as CaCO3)		2638219	N/A	2011/10/12	AUTOMATED STATCHK
Mercury	CVAA	2639866	2011/10/06	2011/10/07	MAGDALENA CARLOS
Dissolved Calcium and Magnesium	ICP	2640388	2011/10/06	2011/10/07	JOLLY JOHN

Maxxam Job #: B1F4570
Report Date: 2011/10/13

AMEC Earth & Environmental Ltd
Client Project #: TC111504.2003
Site Location: RAINY RIVER RESOURCES
Sampler Initials: P.M

Test Summary

Total Metals Analysis by ICPMS	ICP/MS	2644102	N/A	2011/10/12	AREFA DABHAD
Ammonia-N (low level)	LACH/NH4	2640801	N/A	2011/10/12	ALINA DOBREANU
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	2640390	N/A	2011/10/08	HELEN HE
pH	PH	2640322	N/A	2011/10/07	YOGESH PATEL
Sulphate by Automated Colourimetry	AC	2641094	N/A	2011/10/10	DEONARINE RAMNARINE
Total Phosphorus (Colourimetric)	LACH/P	2642714	2011/10/11	2011/10/12	VIORICA ROTARU
Low Level Total Suspended Solids	SLDS	2639182	N/A	2011/10/06	TEJPRATAP MISHRA

Maxxam ID LD6207 **Collected** 2011/10/02
Sample ID PIN 4 **Shipped**
Matrix Water **Received** 2011/10/05

Test Description	Instrumentation	Batch	Extracted	Analyzed	Analyst
Alkalinity	PH	2639766	N/A	2011/10/07	YOGESH PATEL
Conductivity	COND	2639773	N/A	2011/10/07	YOGESH PATEL
Dissolved Organic Carbon (DOC)	TOCV/NDIR	2639381	N/A	2011/10/06	CHARLES OPOKU-WARE
Hardness (calculated as CaCO3)		2638219	N/A	2011/10/12	AUTOMATED STATCHK
Mercury	CVAA	2639866	2011/10/06	2011/10/07	MAGDALENA CARLOS
Dissolved Calcium and Magnesium	ICP	2640375	2011/10/06	2011/10/11	JOLLY JOHN
Total Metals Analysis by ICPMS	ICP/MS	2644102	N/A	2011/10/12	AREFA DABHAD
Ammonia-N (low level)	LACH/NH4	2640801	N/A	2011/10/12	ALINA DOBREANU
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	2639819	N/A	2011/10/07	HELEN HE
pH	PH	2639771	N/A	2011/10/07	YOGESH PATEL
Sulphate by Automated Colourimetry	AC	2641094	N/A	2011/10/10	DEONARINE RAMNARINE
Total Phosphorus (Colourimetric)	LACH/P	2642714	2011/10/11	2011/10/12	VIORICA ROTARU
Low Level Total Suspended Solids	SLDS	2639182	N/A	2011/10/06	TEJPRATAP MISHRA

Maxxam ID LD6208 **Collected** 2011/10/02
Sample ID CLA 3 **Shipped**
Matrix Water **Received** 2011/10/05

Test Description	Instrumentation	Batch	Extracted	Analyzed	Analyst
Alkalinity	PH	2640316	N/A	2011/10/07	YOGESH PATEL
Conductivity	COND	2640321	N/A	2011/10/07	YOGESH PATEL
Dissolved Organic Carbon (DOC)	TOCV/NDIR	2639381	N/A	2011/10/06	CHARLES OPOKU-WARE
Hardness (calculated as CaCO3)		2638219	N/A	2011/10/12	AUTOMATED STATCHK
Mercury	CVAA	2639866	2011/10/06	2011/10/07	MAGDALENA CARLOS

Maxxam Job #: B1F4570
Report Date: 2011/10/13

AMEC Earth & Environmental Ltd
Client Project #: TC111504.2003
Site Location: RAINY RIVER RESOURCES
Sampler Initials: P.M

Test Summary

Dissolved Calcium and Magnesium	ICP	2640388	2011/10/06	2011/10/07	JOLLY JOHN
Total Metals Analysis by ICPMS	ICP/MS	2644102	N/A	2011/10/12	AREFA DABHAD
Ammonia-N (low level)	LACH/NH4	2640801	N/A	2011/10/12	ALINA DOBREANU
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	2640390	N/A	2011/10/08	HELEN HE
pH	PH	2640322	N/A	2011/10/07	YOGESH PATEL
Sulphate by Automated Colourimetry	AC	2641094	N/A	2011/10/10	DEONARINE RAMNARINE
Total Phosphorus (Colourimetric)	LACH/P	2642714	2011/10/11	2011/10/12	VIORICA ROTARU
Low Level Total Suspended Solids	SLDS	2639182	N/A	2011/10/06	TEJPRATAP MISHRA

Maxxam ID LD6208 Dup **Collected** 2011/10/02
Sample ID CLA 3 **Shipped**
Matrix Water **Received** 2011/10/05

Test Description	Instrumentation	Batch	Extracted	Analyzed	Analyst
Low Level Total Suspended Solids	SLDS	2639182	N/A	2011/10/06	TEJPRATAP MISHRA

Maxxam ID LD6209 **Collected** 2011/10/02
Sample ID TAIT T5 -1 **Shipped**
Matrix Water **Received** 2011/10/05

Test Description	Instrumentation	Batch	Extracted	Analyzed	Analyst
Alkalinity	PH	2640316	N/A	2011/10/07	YOGESH PATEL
Conductivity	COND	2640321	N/A	2011/10/07	YOGESH PATEL
Dissolved Organic Carbon (DOC)	TOCV/NDIR	2639381	N/A	2011/10/06	CHARLES OPOKU-WARE
Hardness (calculated as CaCO3)		2638219	N/A	2011/10/12	AUTOMATED STATCHK
Mercury	CVAA	2639866	2011/10/06	2011/10/07	MAGDALENA CARLOS
Dissolved Calcium and Magnesium	ICP	2640375	2011/10/06	2011/10/11	JOLLY JOHN
Total Metals Analysis by ICPMS	ICP/MS	2644102	N/A	2011/10/12	AREFA DABHAD
Ammonia-N (low level)	LACH/NH4	2640801	N/A	2011/10/12	ALINA DOBREANU
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	2640389	N/A	2011/10/08	HELEN HE
pH	PH	2640322	N/A	2011/10/07	YOGESH PATEL
Sulphate by Automated Colourimetry	AC	2641094	N/A	2011/10/10	DEONARINE RAMNARINE
Total Phosphorus (Colourimetric)	LACH/P	2642714	2011/10/11	2011/10/12	VIORICA ROTARU
Low Level Total Suspended Solids	SLDS	2639182	N/A	2011/10/06	TEJPRATAP MISHRA

Maxxam Job #: B1F4570
Report Date: 2011/10/13

AMEC Earth & Environmental Ltd
Client Project #: TC111504.2003
Site Location: RAINY RIVER RESOURCES
Sampler Initials: P.M

Test Summary

Maxxam ID LD6210 **Collected** 2011/09/27
Sample ID MAR4 **Shipped**
Matrix Water **Received** 2011/10/05

Test Description	Instrumentation	Batch	Extracted	Analyzed	Analyst
Alkalinity	PH	2640336	N/A	2011/10/08	YOGESH PATEL
Conductivity	COND	2640337	N/A	2011/10/08	YOGESH PATEL
Dissolved Organic Carbon (DOC)	TOCV/NDIR	2639385	N/A	2011/10/07	CHARLES OPOKU-WARE
Hardness (calculated as CaCO3)		2638219	N/A	2011/10/12	AUTOMATED STATCHK
Mercury	CVAA	2639066	2011/10/06	2011/10/06	LAWRENCE CHEUNG
Dissolved Calcium and Magnesium	ICP	2640375	2011/10/06	2011/10/11	JOLLY JOHN
Total Metals Analysis by ICPMS	ICP/MS	2644102	N/A	2011/10/12	AREFA DABHAD
Ammonia-N (low level)	LACH/NH4	2641516	N/A	2011/10/12	ALINA DOBREANU
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	2640392	N/A	2011/10/08	HELEN HE
pH	PH	2640338	N/A	2011/10/08	YOGESH PATEL
Sulphate by Automated Colourimetry	AC	2641094	N/A	2011/10/10	DEONARINE RAMNARINE
Total Phosphorus (Colourimetric)	LACH/P	2642715	2011/10/11	2011/10/12	VIORICA ROTARU
Low Level Total Suspended Solids	SLDS	2639080	N/A	2011/10/06	TEJPRATAP MISHRA

Maxxam ID LD6210 Dup **Collected** 2011/09/27
Sample ID MAR4 **Shipped**
Matrix Water **Received** 2011/10/05

Test Description	Instrumentation	Batch	Extracted	Analyzed	Analyst
Total Metals Analysis by ICPMS	ICP/MS	2644102	N/A	2011/10/12	AREFA DABHAD
Total Phosphorus (Colourimetric)	LACH/P	2642715	2011/10/11	2011/10/12	VIORICA ROTARU

Maxxam ID LD6211 **Collected** 2011/09/27
Sample ID MAR3 **Shipped**
Matrix Water **Received** 2011/10/05

Test Description	Instrumentation	Batch	Extracted	Analyzed	Analyst
Alkalinity	PH	2640336	N/A	2011/10/08	YOGESH PATEL
Conductivity	COND	2640337	N/A	2011/10/08	YOGESH PATEL
Dissolved Organic Carbon (DOC)	TOCV/NDIR	2639385	N/A	2011/10/07	CHARLES OPOKU-WARE
Hardness (calculated as CaCO3)		2638219	N/A	2011/10/12	AUTOMATED STATCHK
Mercury	CVAA	2639066	2011/10/06	2011/10/06	LAWRENCE CHEUNG

Maxxam Job #: B1F4570
Report Date: 2011/10/13

AMEC Earth & Environmental Ltd
Client Project #: TC111504.2003
Site Location: RAINY RIVER RESOURCES
Sampler Initials: P.M

Test Summary

Dissolved Calcium and Magnesium	ICP	2640375	2011/10/06	2011/10/11	JOLLY JOHN
Total Metals Analysis by ICPMS	ICP/MS	2643437	N/A	2011/10/13	JOHN BOWMAN
Ammonia-N (low level)	LACH/NH4	2641516	N/A	2011/10/12	ALINA DOBREANU
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	2640392	N/A	2011/10/08	HELEN HE
pH	PH	2640338	N/A	2011/10/08	YOGESH PATEL
Sulphate by Automated Colourimetry	AC	2641094	N/A	2011/10/10	DEONARINE RAMNARINE
Total Phosphorus (Colourimetric)	LACH/P	2642715	2011/10/11	2011/10/12	VIORICA ROTARU
Low Level Total Suspended Solids	SLDS	2639080	N/A	2011/10/06	TEJPRATAP MISHRA

Maxxam ID LD6211 Dup **Collected** 2011/09/27
Sample ID MAR3 **Shipped**
Matrix Water **Received** 2011/10/05

Test Description	Instrumentation	Batch	Extracted	Analyzed	Analyst
Mercury	CVAA	2639066	2011/10/06	2011/10/06	LAWRENCE CHEUNG

Maxxam ID LD6212 **Collected** 2011/09/28
Sample ID CLA 1 **Shipped**
Matrix Water **Received** 2011/10/05

Test Description	Instrumentation	Batch	Extracted	Analyzed	Analyst
Alkalinity	PH	2640336	N/A	2011/10/08	YOGESH PATEL
Conductivity	COND	2640337	N/A	2011/10/08	YOGESH PATEL
Dissolved Organic Carbon (DOC)	TOCV/NDIR	2639381	N/A	2011/10/06	CHARLES OPOKU-WARE
Hardness (calculated as CaCO3)		2638219	N/A	2011/10/12	AUTOMATED STATCHK
Mercury	CVAA	2639424	2011/10/06	2011/10/07	MAGDALENA CARLOS
Dissolved Calcium and Magnesium	ICP	2640375	2011/10/06	2011/10/11	JOLLY JOHN
Total Metals Analysis by ICPMS	ICP/MS	2643437	N/A	2011/10/13	JOHN BOWMAN
Ammonia-N (low level)	LACH/NH4	2641516	N/A	2011/10/12	ALINA DOBREANU
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	2640392	N/A	2011/10/08	HELEN HE
pH	PH	2640338	N/A	2011/10/08	YOGESH PATEL
Sulphate by Automated Colourimetry	AC	2641094	N/A	2011/10/10	DEONARINE RAMNARINE
Total Phosphorus (Colourimetric)	LACH/P	2642715	2011/10/11	2011/10/12	VIORICA ROTARU
Low Level Total Suspended Solids	SLDS	2639080	N/A	2011/10/06	TEJPRATAP MISHRA

Maxxam Job #: B1F4570
Report Date: 2011/10/13

AMEC Earth & Environmental Ltd
Client Project #: TC111504.2003
Site Location: RAINY RIVER RESOURCES
Sampler Initials: P.M

Test Summary

Maxxam ID LD6212 Dup **Collected** 2011/09/28
Sample ID CLA 1 **Shipped**
Matrix Water **Received** 2011/10/05

Test Description	Instrumentation	Batch	Extracted	Analyzed	Analyst
Alkalinity	PH	2640336	N/A	2011/10/08	YOGESH PATEL
Conductivity	COND	2640337	N/A	2011/10/08	YOGESH PATEL
pH	PH	2640338	N/A	2011/10/08	YOGESH PATEL
Sulphate by Automated Colourimetry	AC	2641094	N/A	2011/10/10	DEONARINE RAMNARINE

Maxxam ID LD6213 **Collected** 2011/09/28
Sample ID MAR1 **Shipped**
Matrix Water **Received** 2011/10/05

Test Description	Instrumentation	Batch	Extracted	Analyzed	Analyst
Alkalinity	PH	2640336	N/A	2011/10/08	YOGESH PATEL
Conductivity	COND	2640337	N/A	2011/10/08	YOGESH PATEL
Dissolved Organic Carbon (DOC)	TOCV/NDIR	2639381	N/A	2011/10/06	CHARLES OPOKU-WARE
Hardness (calculated as CaCO3)		2638219	N/A	2011/10/12	AUTOMATED STATCHK
Mercury	CVAA	2639424	2011/10/06	2011/10/07	MAGDALENA CARLOS
Dissolved Calcium and Magnesium	ICP	2640375	2011/10/06	2011/10/11	JOLLY JOHN
Total Metals Analysis by ICPMS	ICP/MS	2643437	N/A	2011/10/13	JOHN BOWMAN
Ammonia-N (low level)	LACH/NH4	2641516	N/A	2011/10/12	ALINA DOBREANU
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	2640392	N/A	2011/10/08	HELEN HE
pH	PH	2640338	N/A	2011/10/08	YOGESH PATEL
Sulphate by Automated Colourimetry	AC	2641094	N/A	2011/10/10	DEONARINE RAMNARINE
Total Phosphorus (Colourimetric)	LACH/P	2642715	2011/10/11	2011/10/12	VIORICA ROTARU
Low Level Total Suspended Solids	SLDS	2639080	N/A	2011/10/06	TEJPRATAP MISHRA

Maxxam Job #: B1F4570
Report Date: 2011/10/13

AMEC Earth & Environmental Ltd
Client Project #: TC111504.2003
Site Location: RAINY RIVER RESOURCES
Sampler Initials: P.M

Test Summary

Maxxam ID LD6213 Dup **Collected** 2011/09/28
Sample ID MAR1 **Shipped**
Matrix Water **Received** 2011/10/05

Test Description	Instrumentation	Batch	Extracted	Analyzed	Analyst
Total Metals Analysis by ICPMS	ICP/MS	2643437	N/A	2011/10/13	JOHN BOWMAN

Maxxam ID LD6214 **Collected** 2011/09/27
Sample ID MAR5 **Shipped**
Matrix Water **Received** 2011/10/05

Test Description	Instrumentation	Batch	Extracted	Analyzed	Analyst
Alkalinity	PH	2639766	N/A	2011/10/07	YOGESH PATEL
Conductivity	COND	2639773	N/A	2011/10/07	YOGESH PATEL
Dissolved Organic Carbon (DOC)	TOCV/NDIR	2639381	N/A	2011/10/06	CHARLES OPOKU-WARE
Hardness (calculated as CaCO3)		2638219	N/A	2011/10/12	AUTOMATED STATCHK
Mercury	CVAA	2639424	2011/10/06	2011/10/07	MAGDALENA CARLOS
Dissolved Calcium and Magnesium	ICP	2640375	2011/10/06	2011/10/11	JOLLY JOHN
Total Metals Analysis by ICPMS	ICP/MS	2643437	N/A	2011/10/13	JOHN BOWMAN
Ammonia-N (low level)	LACH/NH4	2640801	N/A	2011/10/12	ALINA DOBREANU
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	2639819	N/A	2011/10/07	HELEN HE
pH	PH	2639771	N/A	2011/10/07	YOGESH PATEL
Sulphate by Automated Colourimetry	AC	2641094	N/A	2011/10/10	DEONARINE RAMNARINE
Total Phosphorus (Colourimetric)	LACH/P	2642714	2011/10/11	2011/10/12	VIORICA ROTARU
Low Level Total Suspended Solids	SLDS	2639182	N/A	2011/10/06	TEJPRATAP MISHRA

Maxxam ID LD6215 **Collected** 2011/09/28
Sample ID CLA 2 **Shipped**
Matrix Water **Received** 2011/10/05

Test Description	Instrumentation	Batch	Extracted	Analyzed	Analyst
Alkalinity	PH	2640316	N/A	2011/10/07	YOGESH PATEL
Conductivity	COND	2640321	N/A	2011/10/07	YOGESH PATEL
Dissolved Organic Carbon (DOC)	TOCV/NDIR	2639422	N/A	2011/10/06	CHARLES OPOKU-WARE
Hardness (calculated as CaCO3)		2638219	N/A	2011/10/12	AUTOMATED STATCHK
Mercury	CVAA	2639866	2011/10/06	2011/10/07	MAGDALENA CARLOS
Dissolved Calcium and Magnesium	ICP	2640388	2011/10/06	2011/10/07	JOLLY JOHN

Maxxam Job #: B1F4570
Report Date: 2011/10/13

AMEC Earth & Environmental Ltd
Client Project #: TC111504.2003
Site Location: RAINY RIVER RESOURCES
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Test Summary

Total Metals Analysis by ICPMS	ICP/MS	2643437	N/A	2011/10/13	JOHN BOWMAN
Ammonia-N (low level)	LACH/NH4	2640801	N/A	2011/10/12	ALINA DOBREANU
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	2640390	N/A	2011/10/08	HELEN HE
pH	PH	2640322	N/A	2011/10/07	YOGESH PATEL
Sulphate by Automated Colourimetry	AC	2642217	N/A	2011/10/10	DEONARINE RAMNARINE
Total Phosphorus (Colourimetric)	LACH/P	2642714	2011/10/11	2011/10/12	VIORICA ROTARU
Low Level Total Suspended Solids	SLDS	2639182	N/A	2011/10/06	TEJPRATAP MISHRA

Maxxam ID LD6216 **Collected** 2011/09/28
Sample ID MAR 2 **Shipped**
Matrix Water **Received** 2011/10/05

Test Description	Instrumentation	Batch	Extracted	Analyzed	Analyst
Alkalinity	PH	2639766	N/A	2011/10/07	YOGESH PATEL
Conductivity	COND	2639773	N/A	2011/10/07	YOGESH PATEL
Dissolved Organic Carbon (DOC)	TOCV/NDIR	2639422	N/A	2011/10/06	CHARLES OPOKU-WARE
Hardness (calculated as CaCO3)		2638356	N/A	2011/10/12	AUTOMATED STATCHK
Mercury	CVAA	2639866	2011/10/06	2011/10/07	MAGDALENA CARLOS
Dissolved Calcium and Magnesium	ICP	2640375	2011/10/06	2011/10/11	JOLLY JOHN
Total Metals Analysis by ICPMS	ICP/MS	2643437	N/A	2011/10/13	JOHN BOWMAN
Ammonia-N (low level)	LACH/NH4	2640801	N/A	2011/10/12	ALINA DOBREANU
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	2640390	N/A	2011/10/08	HELEN HE
pH	PH	2639771	N/A	2011/10/07	YOGESH PATEL
Sulphate by Automated Colourimetry	AC	2641094	N/A	2011/10/10	DEONARINE RAMNARINE
Total Phosphorus (Colourimetric)	LACH/P	2642714	2011/10/11	2011/10/12	VIORICA ROTARU
Low Level Total Suspended Solids	SLDS	2639182	N/A	2011/10/06	TEJPRATAP MISHRA

Maxxam Analytics International Corporation o/a Maxxam Analytics 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.maxxam.ca

Maxxam Job #: B1F4570
Report Date: 2011/10/13

AMEC Earth & Environmental Ltd
Client Project #: TC111504.2003
Site Location: RAINY RIVER RESOURCES
Sampler Initials: P.M

Package 1	11.7°C
Package 2	12.0°C
Package 3	14.3°C
Package 4	14.0°C

Each temperature is the average of up to three cooler temperatures taken at receipt

GENERAL COMMENTS

Samples received at a temperature above 10 C. Analysis performed with client's consent.

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Maxxam Job #: B1F4570
Report Date: 2011/10/13

AMEC Earth & Environmental Ltd
Client Project #: TC111504.2003
Site Location: RAINY RIVER RESOURCES
Sampler Initials: P.M

QUALITY ASSURANCE REPORT

			Matrix Spike		Spiked Blank		Method Blank		RPD		QC Standard	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	Units	Value (%)	QC Limits	% Recovery	QC Limits
2639066	Mercury (Hg)	2011/10/06	109	75 - 125	104	80 - 120	<0.1	ug/L	NC	25		
2639080	Total Suspended Solids	2011/10/06					<1	mg/L	NC	25	97	85 - 115
2639182	Total Suspended Solids	2011/10/06					<1	mg/L	1.3	25	96	85 - 115
2639381	Dissolved Organic Carbon	2011/10/06	NC	80 - 120	87	80 - 120	<0.2	mg/L	3.4	20		
2639385	Dissolved Organic Carbon	2011/10/06	93	80 - 120	87	80 - 120	<0.2	mg/L	3.9	20		
2639422	Dissolved Organic Carbon	2011/10/06	90	80 - 120	88	80 - 120	0.2, RDL=0.2	mg/L	0.7	20		
2639424	Mercury (Hg)	2011/10/07	101	75 - 125	106	80 - 120	<0.1	ug/L	NC	25		
2639661	Total Suspended Solids	2011/10/07					<1	mg/L	NC	25	99	85 - 115
2639766	Alkalinity (Total as CaCO3)	2011/10/06					<1	mg/L	NC	25	98	85 - 115
2639773	Conductivity	2011/10/06					<1	umho/cm	NC	25	102	85 - 115
2639819	Nitrite (N)	2011/10/07	104	80 - 120	102	85 - 115	<0.01	mg/L	NC	25		
2639819	Nitrate (N)	2011/10/07	102	80 - 120	99	85 - 115	<0.1	mg/L	NC	25		
2639866	Mercury (Hg)	2011/10/07	98	75 - 125	112	80 - 120	<0.1	ug/L	NC	25		
2640316	Alkalinity (Total as CaCO3)	2011/10/07					<1	mg/L	0.1	25	99	85 - 115
2640321	Conductivity	2011/10/07					<1	umho/cm	0.08	25	103	85 - 115
2640336	Alkalinity (Total as CaCO3)	2011/10/08					<1	mg/L	0.4	25	100	85 - 115
2640337	Conductivity	2011/10/08					<1	umho/cm	0	25	103	85 - 115
2640375	Dissolved Calcium (Ca)	2011/10/11	NC	80 - 120	100	90 - 110	<0.0500	mg/L				
2640375	Dissolved Magnesium (Mg)	2011/10/11	NC	80 - 120	93	90 - 110	<0.0500	mg/L				
2640380	Dissolved Sulphate (SO4)	2011/10/07	105	75 - 125	99	80 - 120	<1	mg/L	NC	25		
2640388	Dissolved Calcium (Ca)	2011/10/07	NC	80 - 120	96	90 - 110	<0.0500	mg/L	2.9	25		
2640388	Dissolved Magnesium (Mg)	2011/10/07	NC	80 - 120	93	90 - 110	<0.0500	mg/L	3.0	25		
2640389	Nitrite (N)	2011/10/08	104	80 - 120	101	85 - 115	<0.01	mg/L	NC	25		
2640389	Nitrate (N)	2011/10/08	102	80 - 120	99	85 - 115	<0.1	mg/L	NC	25		
2640390	Nitrite (N)	2011/10/08	104	80 - 120	102	85 - 115	<0.01	mg/L	NC	25		
2640390	Nitrate (N)	2011/10/08	101	80 - 120	100	85 - 115	<0.1	mg/L	NC	25		
2640392	Nitrite (N)	2011/10/08	105	80 - 120	103	85 - 115	<0.01	mg/L				
2640392	Nitrate (N)	2011/10/08	103	80 - 120	101	85 - 115	<0.1	mg/L	NC	25		
2640785	Total Ammonia-N	2011/10/12	108	80 - 120	99	80 - 120	<0.01	mg/L	NC	20		
2640801	Total Ammonia-N	2011/10/12	103	80 - 120	98	80 - 120	<0.01	mg/L	NC	20		
2641094	Dissolved Sulphate (SO4)	2011/10/10	112	75 - 125	98	80 - 120	<1	mg/L	NC	25		
2641516	Total Ammonia-N	2011/10/12	NC	80 - 120	101	80 - 120	<0.01	mg/L	5.7	20		
2642217	Dissolved Sulphate (SO4)	2011/10/10	NC	75 - 125	98	80 - 120	<1	mg/L	0.1	25		
2642714	Total Phosphorus	2011/10/12	NC	80 - 120	100	85 - 115	<0.002	mg/L	12.4	20	101	85 - 115
2642715	Total Phosphorus	2011/10/12	NC	80 - 120	106	85 - 115	<0.002	mg/L	7.1	20	99	85 - 115
2643437	Total Aluminum (Al)	2011/10/13	NC	80 - 120	116(1)	80 - 120	9, RDL=5	ug/L	0.7	20		
2643437	Total Antimony (Sb)	2011/10/13	109	80 - 120	109	80 - 120	<0.5	ug/L	NC	20		
2643437	Total Arsenic (As)	2011/10/13	102	80 - 120	101	80 - 120	<1	ug/L	NC	20		
2643437	Total Barium (Ba)	2011/10/13	102	80 - 120	101	80 - 120	<2	ug/L	5.7	20		
2643437	Total Beryllium (Be)	2011/10/13	106	80 - 120	105	80 - 120	<0.5	ug/L	NC	20		

Maxxam Job #: B1F4570
Report Date: 2011/10/13

AMEC Earth & Environmental Ltd
Client Project #: TC111504.2003
Site Location: RAINY RIVER RESOURCES
Sampler Initials: P.M

QUALITY ASSURANCE REPORT

			Matrix Spike		Spiked Blank		Method Blank		RPD		QC Standard	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	Units	Value (%)	QC Limits	% Recovery	QC Limits
2643437	Total Bismuth (Bi)	2011/10/13	101	80 - 120	100	80 - 120	<1	ug/L	NC	20		
2643437	Total Boron (B)	2011/10/13	109	80 - 120	105	80 - 120	<10	ug/L	NC	20		
2643437	Total Cadmium (Cd)	2011/10/13	107	80 - 120	106	80 - 120	<0.1	ug/L	NC	20		
2643437	Total Calcium (Ca)	2011/10/13	NC	80 - 120	103	80 - 120	<200	ug/L	3.6	20		
2643437	Total Chromium (Cr)	2011/10/13	104	80 - 120	104	80 - 120	<5	ug/L	NC	20		
2643437	Total Cobalt (Co)	2011/10/13	102	80 - 120	102	80 - 120	<0.5	ug/L	4.2	20		
2643437	Total Copper (Cu)	2011/10/13	100	80 - 120	102	80 - 120	<1	ug/L	NC	20		
2643437	Total Iron (Fe)	2011/10/13	106	80 - 120	104	80 - 120	<100	ug/L	2.7	20		
2643437	Total Lead (Pb)	2011/10/13	99	80 - 120	100	80 - 120	<0.5	ug/L	NC	20		
2643437	Total Lithium (Li)	2011/10/13	101	80 - 120	100	80 - 120	<5	ug/L	NC	20		
2643437	Total Magnesium (Mg)	2011/10/13	NC	80 - 120	109	80 - 120	<50	ug/L	4.8	20		
2643437	Total Manganese (Mn)	2011/10/13	NC	80 - 120	105	80 - 120	<2	ug/L	2.2	20		
2643437	Total Molybdenum (Mo)	2011/10/13	108	80 - 120	106	80 - 120	<0.5	ug/L	NC	20		
2643437	Total Nickel (Ni)	2011/10/13	101	80 - 120	101	80 - 120	<1	ug/L	0.5	20		
2643437	Total Potassium (K)	2011/10/13	106	80 - 120	105	80 - 120	<200	ug/L	4.2	20		
2643437	Total Silicon (Si)	2011/10/13	118	80 - 120	103	80 - 120	<50	ug/L	3.3	20		
2643437	Total Selenium (Se)	2011/10/13	105	80 - 120	104	80 - 120	<2	ug/L	NC	20		
2643437	Total Silver (Ag)	2011/10/13	102	80 - 120	102	80 - 120	<0.1	ug/L	NC	20		
2643437	Total Sodium (Na)	2011/10/13	111	80 - 120	112	80 - 120	<100	ug/L	4.2	20		
2643437	Total Strontium (Sr)	2011/10/13	103	80 - 120	103	80 - 120	<1	ug/L	2.3	20		
2643437	Total Tellurium (Te)	2011/10/13	102	80 - 120	104	80 - 120	<1	ug/L	NC	20		
2643437	Total Thallium (Tl)	2011/10/13	99	80 - 120	100	80 - 120	<0.05	ug/L	NC	20		
2643437	Total Tin (Sn)	2011/10/13	107	80 - 120	106	80 - 120	<1	ug/L	NC	20		
2643437	Total Titanium (Ti)	2011/10/13	110	80 - 120	107	80 - 120	<5	ug/L	4.7	20		
2643437	Total Tungsten (W)	2011/10/13	106	80 - 120	105	80 - 120	<1	ug/L	NC	20		
2643437	Total Uranium (U)	2011/10/13	99	80 - 120	100	80 - 120	<0.1	ug/L	4.6	20		
2643437	Total Vanadium (V)	2011/10/13	106	80 - 120	105	80 - 120	<0.5	ug/L	4.1	20		
2643437	Total Zinc (Zn)	2011/10/13	103	80 - 120	104	80 - 120	<5	ug/L	NC	20		
2643437	Total Zirconium (Zr)	2011/10/13	110	80 - 120	108	80 - 120	<1	ug/L	NC	20		
2644102	Total Aluminum (Al)	2011/10/12	NC	80 - 120	105	80 - 120	6, RDL=5	ug/L	1.8	20		
2644102	Total Antimony (Sb)	2011/10/12	109	80 - 120	108	80 - 120	<0.5	ug/L	NC	20		
2644102	Total Arsenic (As)	2011/10/12	102	80 - 120	105	80 - 120	<1	ug/L	NC	20		
2644102	Total Barium (Ba)	2011/10/12	106	80 - 120	107	80 - 120	<2	ug/L	1.7	20		
2644102	Total Beryllium (Be)	2011/10/12	107	80 - 120	109	80 - 120	<0.5	ug/L	NC	20		
2644102	Total Bismuth (Bi)	2011/10/12	98	80 - 120	99	80 - 120	<1	ug/L	NC	20		
2644102	Total Boron (B)	2011/10/12	107	80 - 120	106	80 - 120	<10	ug/L	NC	20		
2644102	Total Cadmium (Cd)	2011/10/12	106	80 - 120	107	80 - 120	<0.1	ug/L	NC	20		
2644102	Total Calcium (Ca)	2011/10/12	NC	80 - 120	106	80 - 120	<200	ug/L	0.3	20		
2644102	Total Chromium (Cr)	2011/10/12	104	80 - 120	105	80 - 120	<5	ug/L	NC	20		
2644102	Total Cobalt (Co)	2011/10/12	105	80 - 120	106	80 - 120	<0.5	ug/L	NC	20		

Maxxam Job #: B1F4570
Report Date: 2011/10/13

AMEC Earth & Environmental Ltd
Client Project #: TC111504.2003
Site Location: RAINY RIVER RESOURCES
Sampler Initials: P.M

QUALITY ASSURANCE REPORT

			Matrix Spike		Spiked Blank		Method Blank		RPD		QC Standard	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	Units	Value (%)	QC Limits	% Recovery	QC Limits
2644102	Total Copper (Cu)	2011/10/12	106	80 - 120	108	80 - 120	<1	ug/L	NC	20		
2644102	Total Iron (Fe)	2011/10/12	105	80 - 120	107	80 - 120	<100	ug/L	0.2	20		
2644102	Total Lead (Pb)	2011/10/12	101	80 - 120	101	80 - 120	<0.5	ug/L	NC	20		
2644102	Total Lithium (Li)	2011/10/12	104	80 - 120	106	80 - 120	<5	ug/L	NC	20		
2644102	Total Magnesium (Mg)	2011/10/12	NC	80 - 120	101	80 - 120	<50	ug/L	0.8	20		
2644102	Total Manganese (Mn)	2011/10/12	NC	80 - 120	107	80 - 120	<2	ug/L	0.09	20		
2644102	Total Molybdenum (Mo)	2011/10/12	111	80 - 120	109	80 - 120	<0.5	ug/L	NC	20		
2644102	Total Nickel (Ni)	2011/10/12	104	80 - 120	104	80 - 120	<1	ug/L	NC	20		
2644102	Total Potassium (K)	2011/10/12	105	80 - 120	105	80 - 120	<200	ug/L	0.4	20		
2644102	Total Silicon (Si)	2011/10/12	102	80 - 120	101	80 - 120	<50	ug/L	3.6	20		
2644102	Total Selenium (Se)	2011/10/12	103	80 - 120	106	80 - 120	<2	ug/L	NC	20		
2644102	Total Silver (Ag)	2011/10/12	104	80 - 120	103	80 - 120	<0.1	ug/L	NC	20		
2644102	Total Sodium (Na)	2011/10/12	100	80 - 120	102	80 - 120	<100	ug/L	1.2	20		
2644102	Total Strontium (Sr)	2011/10/12	102	80 - 120	103	80 - 120	<1	ug/L	0.8	20		
2644102	Total Tellurium (Te)	2011/10/12	106	80 - 120	107	80 - 120	<1	ug/L	NC	20		
2644102	Total Thallium (Tl)	2011/10/12	103	80 - 120	103	80 - 120	<0.05	ug/L	NC	20		
2644102	Total Tin (Sn)	2011/10/12	109	80 - 120	109	80 - 120	<1	ug/L	NC	20		
2644102	Total Titanium (Ti)	2011/10/12	111	80 - 120	104	80 - 120	<5	ug/L	NC	20		
2644102	Total Tungsten (W)	2011/10/12	107	80 - 120	107	80 - 120	<1	ug/L	NC	20		
2644102	Total Uranium (U)	2011/10/12	105	80 - 120	103	80 - 120	<0.1	ug/L	0.7	20		
2644102	Total Vanadium (V)	2011/10/12	105	80 - 120	106	80 - 120	<0.5	ug/L	NC	20		
2644102	Total Zinc (Zn)	2011/10/12	104	80 - 120	107	80 - 120	<5	ug/L	NC	20		
2644102	Total Zirconium (Zr)	2011/10/12	111	80 - 120	110	80 - 120	<1	ug/L	NC	20		
2644284	Total Aluminum (Al)	2011/10/12	101	80 - 120	105	80 - 120	<5	ug/L	NC	20		
2644284	Total Antimony (Sb)	2011/10/12	107	80 - 120	105	80 - 120	<0.5	ug/L	NC	20		
2644284	Total Arsenic (As)	2011/10/12	101	80 - 120	101	80 - 120	<1	ug/L	NC	20		
2644284	Total Barium (Ba)	2011/10/12	102	80 - 120	103	80 - 120	<2	ug/L	3.2	20		
2644284	Total Beryllium (Be)	2011/10/12	105	80 - 120	106	80 - 120	<0.5	ug/L	NC	20		
2644284	Total Bismuth (Bi)	2011/10/12	103	80 - 120	102	80 - 120	<1	ug/L	NC	20		
2644284	Total Boron (B)	2011/10/12	111	80 - 120	107	80 - 120	<10	ug/L	NC	20		
2644284	Total Cadmium (Cd)	2011/10/12	102	80 - 120	101	80 - 120	<0.1	ug/L	NC	20		
2644284	Total Calcium (Ca)	2011/10/12	NC	80 - 120	99	80 - 120	<200	ug/L	0.9	20		
2644284	Total Chromium (Cr)	2011/10/12	101	80 - 120	101	80 - 120	<5	ug/L	NC	20		
2644284	Total Cobalt (Co)	2011/10/12	100	80 - 120	103	80 - 120	<0.5	ug/L	NC	20		
2644284	Total Copper (Cu)	2011/10/12	100	80 - 120	103	80 - 120	<1	ug/L	NC	20		
2644284	Total Iron (Fe)	2011/10/12	101	80 - 120	102	80 - 120	<100	ug/L	NC	20		
2644284	Total Lead (Pb)	2011/10/12	101	80 - 120	103	80 - 120	<0.5	ug/L	NC	20		
2644284	Total Lithium (Li)	2011/10/12	98	80 - 120	98	80 - 120	<5	ug/L	NC	20		
2644284	Total Magnesium (Mg)	2011/10/12	NC	80 - 120	100	80 - 120	<50	ug/L	5.3	20		
2644284	Total Manganese (Mn)	2011/10/12	102	80 - 120	103	80 - 120	<2	ug/L	2.4	20		

Maxxam Job #: B1F4570
Report Date: 2011/10/13

AMEC Earth & Environmental Ltd
Client Project #: TC111504.2003
Site Location: RAINY RIVER RESOURCES
Sampler Initials: P.M

QUALITY ASSURANCE REPORT

			Matrix Spike		Spiked Blank		Method Blank		RPD		QC Standard	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	Units	Value (%)	QC Limits	% Recovery	QC Limits
2644284	Total Molybdenum (Mo)	2011/10/12	108	80 - 120	104	80 - 120	<0.5	ug/L	NC	20		
2644284	Total Nickel (Ni)	2011/10/12	100	80 - 120	102	80 - 120	<1	ug/L	NC	20		
2644284	Total Potassium (K)	2011/10/12	101	80 - 120	104	80 - 120	<200	ug/L	3.8	20		
2644284	Total Silicon (Si)	2011/10/12	95	80 - 120	99	80 - 120	<50	ug/L	2.4	20		
2644284	Total Selenium (Se)	2011/10/12	103	80 - 120	103	80 - 120	<2	ug/L	NC	20		
2644284	Total Silver (Ag)	2011/10/12	101	80 - 120	100	80 - 120	<0.1	ug/L	NC	20		
2644284	Total Sodium (Na)	2011/10/12	NC	80 - 120	100	80 - 120	<100	ug/L	4.2	20		
2644284	Total Strontium (Sr)	2011/10/12	NC	80 - 120	103	80 - 120	<1	ug/L	1.8	20		
2644284	Total Tellurium (Te)	2011/10/12	100	80 - 120	101	80 - 120	<1	ug/L	NC	20		
2644284	Total Thallium (Tl)	2011/10/12	102	80 - 120	105	80 - 120	<0.05	ug/L	NC	20		
2644284	Total Tin (Sn)	2011/10/12	107	80 - 120	105	80 - 120	<1	ug/L	NC	20		
2644284	Total Titanium (Ti)	2011/10/12	102	80 - 120	101	80 - 120	<5	ug/L	NC	20		
2644284	Total Tungsten (W)	2011/10/12	107	80 - 120	107	80 - 120	<1	ug/L	NC	20		
2644284	Total Uranium (U)	2011/10/12	104	80 - 120	105	80 - 120	<0.1	ug/L	NC	20		
2644284	Total Vanadium (V)	2011/10/12	103	80 - 120	104	80 - 120	<0.5	ug/L	NC	20		
2644284	Total Zinc (Zn)	2011/10/12	100	80 - 120	103	80 - 120	<5	ug/L	NC	20		
2644284	Total Zirconium (Zr)	2011/10/12	108	80 - 120	106	80 - 120	<1	ug/L	NC	20		

N/A = Not Applicable
RDL = Reportable Detection Limit
RPD = Relative Percent Difference
Duplicate: Paired analysis of a separate portion of the same sample. Used to evaluate the variance in the measurement.
Matrix Spike: A sample to which a known amount of the analyte of interest has been added. Used to evaluate sample matrix interference.
QC Standard: A blank matrix to which a known amount of the analyte has been added. Used to evaluate analyte recovery.
Spiked Blank: A blank matrix to which a known amount of the analyte has been added. Used to evaluate analyte recovery.
Method Blank: A blank matrix containing all reagents used in the analytical procedure. Used to identify laboratory contamination.
NC (Matrix Spike): The recovery in the matrix spike was not calculated. The relative difference between the concentration in the parent sample and the spiked amount was not sufficiently significant to permit a reliable recovery calculation.
NC (RPD): The RPD was not calculated. The level of analyte detected in the parent sample and its duplicate was not sufficiently significant to permit a reliable calculation.
(1) - Recovery or RPD for this parameter is outside control limits. The overall quality control for this analysis meets acceptability criteria.

Validation Signature Page

Maxxam Job #: B1F4570

The analytical data and all QC contained in this report were reviewed and validated by the following individual(s).

CRISTINA CARRIERE, Scientific Services

==========

Maxxam has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per section 5.10.2 of ISO/IEC 17025:2005(E), signing the reports. For Service Group specific validation please refer to the Validation Signature Page.

Maxxam Analytics International Corporation o/a Maxxam Analytics 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.maxxam.ca

Maxxam

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CHAIN OF CUS

5-Oct-11 09:52
GINA BAYBAYAN

IMMEDIATE TEST

B1F4570
DES ENV-629

Page of

e Only:

BOTTLE ORDER #: 282186

PROJECT MANAGER: GINA BAYBAYAN

C#282186-03-01

INVOICE INFORMATION:		REPORT INFORMATION (if differs from invoice):		PROJECT INFORMATION:	
Company Name:	#25844 AMEC Earth & Environmental Ltd	Company Name:	#12841 AMEC Earth & Environmental Ltd	Quotation #:	B16203
Contact Name:	Wanda Colbourne	Contact Name:	Jason Dietrich	P.O. #:	
Address:	160 Traders Blvd E Suite 110 Mississauga ON L4Z 3K7	Address:	160 Traders Blvd Mississauga ON	Project #:	TC111504.2003
Phone:	(905)568-2929 Fax: (905)568-1686	Phone:	Fax:	Project Name:	
Email:	wanda.colbourne@amec.com	Email:	Jason.Dietrich@amec.com	Site #:	Rainy River Resources
				Sampled By:	

Regulation 153 (2011): ☐ Table 1 ☐ Table 2 ☐ Table 3 ☐ Table ___ ☐ Res/Park ☐ Ind/Comm ☐ Agri/Other ☐ Medium/Fine ☐ Coarse ☐ For RSC

Other Regulations: ☐ CCME ☐ Reg. 558 ☐ MISA ☐ PWQO ☐ Other ☐ Sanitary Sewer Bylaw ☐ Storm Sewer Bylaw Municipality ___

SPECIAL INSTRUCTIONS

Include Criteria on Certificate of Analysis (Y/N)? ___

Note: For MOE regulated drinking water samples - please use the Drinking Water Chain of Custody Form

SAMPLES MUST BE KEPT COOL (< 10ºC) FROM TIME OF SAMPLING UNTIL DELIVERY TO MAXXAM

	Sample Barcode Label	Sample (Location) Identification	Date Sampled	Time Sampled	Matrix	Regulated Drinking Water ? (Y/N)	Metals Field Filtered ? (Y/N)	Alkalinity	Conductivity	Dissolved Organic Carbon (DOC)	Hardness (calculated as CaCO3)	Dissolved Calcium and Magnesium	Total Metals Analysis by ICPMS -	Ammonia-N (low level)	Nitrate (NO3) and Nitrite (NO2) in Water	pH	Sulphate	# of Bottles	Comments
1	PM 6		01/10/2011	14:00	Water			X	X	X	X	X	X	X	X	X	X	7	
2	Dup 2				Water			X	X	X	X	X	X	X	X	X	X	7	
3	Los 2		01/10/2011	15:00	Water			X	X	X	X	X	X	X	X	X	X	7	
4	Wes 1		29/09/2011	12:45	Water			X	X	X	X	X	X	X	X	X	X	7	
5	Los 1		01/10/2011	12:00	Water			X	X	X	X	X	X	X	X	X	X	7	
6	Wes 4		29/09/2011	11:15	Water			X	X	X	X	X	X	X	X	X	X	7	
7	Dup 1				Water			X	X	X	X	X	X	X	X	X	X	7	
8																			
9																			
10																			

ANALYSIS REQUESTED (Please be specific):

TURNAROUND TIME (TAT) REQUIRED:

PLEASE PROVIDE ADVANCE NOTICE FOR RUSH PROJECTS

Regular (Standard) TAT: ☒
(will be applied if Rush TAT is not specified):
Standard TAT = 5-7 Working days for most tests.
Please note: Standard TAT for certain tests such as BOD and Dioxins/Furans are > 5 days - contact your Project Manager for details.

Job Specific Rush TAT (if applies to entire submission)
Date Required: ___ Time Required: ___ ☐
Rush Confirmation Number: ___ *(call lab for #)*

Note: Some samples may be Proceed with Analysis.

12, 13, 11C, 14, 14, 15C, 14, 13, 15C, 14, 13, 15C

*RELINQUISHED BY: (Signature/Print)	Date: (YY/MM/DD)	Time:	RECEIVED BY: (Signature/Print)	Date: (YY/MM/DD)	Time:	# Jars Used and Not Submitted
Peter Mayan	03/10/2011	8:15	DEEPTHI SHASTI	2011-10-05	09:52	

Laboratory Use Only

Time Sensitive	Temperature (°C) on Receipt	Custody Seal	Yes	No
	11, 11, 13C Warm Ice Pack	Present		
		Intact		

* IT IS THE RESPONSIBILITY OF THE RELINQUISHER TO ENSURE THE ACCURACY OF THE CHAIN OF CUSTODY RECORD. AN INCOMPLETE CHAIN OF CUSTODY MAY RESULT IN ANALYTICAL TAT DELAYS.

White: Maxxam Yellow: Client

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6740 Campobello Road, Mississauga, Ontario Canada L5N 2L8 Tel:(905) 817-5700 Toll-free:800-563-6266 Fax:(905) 817-5779 www.maxxam.ca

CHAIN OF CUSTODY RECORD

Page of

INVOICE INFORMATION:		REPORT INFORMATION (if differs from invoice):		PROJECT INFORMATION:		Laboratory Use Only:	
Company Name:	#25844 AMEC Earth & Environmental Ltd	Company Name:	#12841 AMEC Earth & Environmental Ltd	Quotation #:	B16203	MAXXAM JOB #:	BOTTLE ORDER #: 282186
Contact Name:	Wanda Colbourne	Contact Name:	Jason Dietrich	P.O. #:			
Address:	160 Traders Blvd E Suite 110 Mississauga ON L4Z 3K7	Address:	160 Traders Blvd Mississauga ON	Project #:	TC111504.2003	CHAIN OF CUSTODY #:	PROJECT MANAGER:
Phone:	(905)568-2929 Fax: (905)568-1686	Phone:	Fax:	Project Name:		C#282186-03-02	GINA BAYBAYAN
Email:	wanda.colbourne@amec.com	Email:	Jason.Dietrich@amec.com	Site #:	Rainy River Resources		
				Sampled By:			

Regulation 153 (2011): ☐ Table 1 ☐ Table 2 ☐ Table 3 ☐ Table ___ ☐ Res/Park ☐ Ind/Comm ☐ Agri/Other ☐ Medium/Fine ☐ Coarse ☐ For RSC

Other Regulations: ☐ CCME ☐ Reg. 558 ☐ MISA ☐ PWQO ☐ Other ☐ Sanitary Sewer Bylaw ☐ Storm Sewer Bylaw Municipality ___

SPECIAL INSTRUCTIONS:

Include Criteria on Certificate of Analysis (Y/N)? ___

Note: For MOE regulated drinking water samples - please use the Drinking Water Chain of Custody Form

SAMPLES MUST BE KEPT COOL (<.10°C) FROM TIME OF SAMPLING UNTIL DELIVERY TO MAXXAM

TURNAROUND TIME (TAT) REQUIRED:

PLEASE PROVIDE ADVANCE NOTICE FOR RUSH PROJECTS

Regular (Standard) TAT: ☒
(will be applied if Rush TAT is not specified):
Standard TAT = 5-7 Working days for most tests.
Please note: Standard TAT for certain tests such as BOD and Dioxins/Furans are > 5 days - contact your Project Manager for details.

Job Specific Rush TAT (if applies to entire submission)
Date Required: _____ Time Required: _____ ☐
Rush Confirmation Number: _____ *(call lab for #)*

	Sample Barcode Label	Sample (Location) Identification	Date Sampled	Time Sampled	Matrix	Regulated Drinking Water ? (Y/N)	Metals Field Filtered ? (Y/N)	Total Phosphorus (Colourimetric)	Low Level Total Suspended Solids	Mercury	# of Bottles	Comments
1	Pin 6		01/10/2011	14:00	Water			X	X	X	2	Notes: Some Samples may be past hold time. Proceed to Analysis.
2	Dup 2				Water			X	X	X	2	
3	Los 2		01/10/2011	15:00	Water			X	X	X	2	
4	Wes 1		29/09/2011	12:45	Water			X	X	X	2	
5	Los 1		01/10/2011	12:00	Water			X	X	X	2	
6	Wes 4		29/09/2011	11:15	Water			X	X	X	2	
7	Dup 1				Water			X	X	X	2	
8												
9												
10												14/13/11C 14/14/15C

*RELINQUISHED BY: (Signature/Print)	Date: (YY/MM/DD)	Time:	RECEIVED BY: (Signature/Print)	Date: (YY/MM/DD)	Time:	# Jars Used and Not Submitted
Peter Morrison	03/10/2011	8:15	DEEPTHI SHAJI	2011-10-05	09:52	

Laboratory Use Only

Time Sensitive	Temperature (°C) on Receipt	Custody Seal	Yes	No
	11, 11, 13C Warm ice pack	Present		
		Intact		

White: Maxxam Yellow: Client

* IT IS THE RESPONSIBILITY OF THE RELINQUISHER TO ENSURE THE ACCURACY OF THE CHAIN OF CUSTODY RECORD. AN INCOMPLETE CHAIN OF CUSTODY MAY RESULT IN ANALYTICAL TAT DELAYS.

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CHAIN OF CUSTODY RECORD

IMMEDIATE TEST

Page of

INVOICE INFORMATION:		REPORT INFORMATION (if differs from invoice):		PROJECT INFORMATION:		Laboratory Use Only:	
Company Name:	#25844 AMEC Earth & Environmental Ltd	Company Name:	#12841 AMEC Earth & Environmental Ltd	Quotation #:	B16203	MAXXAM JOB #:	BOTTLE ORDER #: 282186
Contact Name:	Wanda Colbourne	Contact Name:	Jason Dietrich	P.O. #:			
Address:	160 Traders Blvd E Suite 110 Mississauga ON L4Z 3K7	Address:	160 Traders Blvd Mississauga ON	Project #:	TC111504.2003	CHAIN OF CUSTODY #:	PROJECT MANAGER:
Phone:	(905)568-2929 Fax: (905)568-1686	Phone:	Fax:	Project Name:		C#282186-02-01	GINA BAYBAYAN
Email:	wanda.colbourne@amec.com	Email:	Jason.Dietrich@amec.com	Site #:	Rainy River Resources		
				Sampled By:			

Regulation 153 (2011): ☐ Table 1 ☐ Table 2 ☐ Table 3 ☐ Table ___ ☐ Res/Park ☐ Ind/Comm ☐ Agri/Other ☐ Medium/Fine ☐ Coarse ☐ For RSC

Other Regulations: ☐ CCME ☐ Reg. 558 ☐ MISA ☐ PWQO ☐ Other ☐ Sanitary Sewer Bylaw ☐ Storm Sewer Bylaw Municipality ___

SPECIAL INSTRUCTIONS

Include Criteria on Certificate of Analysis (Y/N)? ___

Note: For MOE regulated drinking water samples - please use the Drinking Water Chain of Custody Form

SAMPLES MUST BE KEPT COOL (< 10°C) FROM TIME OF SAMPLING UNTIL DELIVERY TO MAXXAM

TURNAROUND TIME (TAT) REQUIRED:

PLEASE PROVIDE ADVANCE NOTICE FOR RUSH PROJECTS

Regular (Standard) TAT: ☒
(will be applied if Rush TAT is not specified):
Standard TAT = 5-7 Working days for most tests.
Please note: Standard TAT for certain tests such as BOD and Dioxins/Furans are > 5 days - contact your Project Manager for details.

Job Specific Rush TAT (if applies to entire submission)
Date Required: _____ Time Required: _____ ☐
Rush Confirmation Number: _____ *(call lab for #)*

	Sample Barcode Label	Sample (Location) Identification	Date Sampled	Time Sampled	Matrix	Regulated Drinking Water ? (Y/N)	Metals Field Filtered ? (Y/N)	Alkalinity	Conductivity	Dissolved Organic Carbon (DOC)	Hardness (calculated as CaCO3)	Dissolved Calcium and Magnesium	Total Metals Analysis by ICPMS	Ammonia-N (low level)	Nitrate (NO3) and Nitrite (NO2) in Water	pH	Sulphate	# of Bottles	Comments
1	Mar up Pond		28/09/2011	8:15	Water			X	X	X	X	X	X	X	X	X	X	7	
2	PM 1		30/09/2011	9:30	Water			X	X	X	X	X	X	X	X	X	X	7	
3	Los T2		01/10/2011	11:00	Water			X	X	X	X	X	X	X	X	X	X	7	
4	Route 600		30/09/2011	14:10	Water			X	X	X	X	X	X	X	X	X	X	7	
5	PM 2		30/09/2011	11:25	Water			X	X	X	X	X	X	X	X	X	X	7	
6	Bla 1		30/09/2011	10:19	Water			X	X	X	X	X	X	X	X	X	X	7	
7	PM 3		29/09/2011	16:00	Water			X	X	X	X	X	X	X	X	X	X	7	
8																			
9																			
10																			

Note: Some samples may be past hold time. Proceed w Analysis.

11,11,13°C 14,14,15°C 14,13,15°C H# 05 10110-01

*RELINQUISHED BY: (Signature/Print)	Date: (YY/MM/DD)	Time:	RECEIVED BY: (Signature/Print)	Date: (YY/MM/DD)	Time:	# Jars Used and Not Submitted	Laboratory Use Only: Time Sensitive	Temperature (°C) on Receipt	Custody Seal Present	Yes	No
Peter Morrison	03/10/2011	8:15	RS DEEPTHI SHASI	2011-10-05	09:52			12,13,11°C	Intact		

* IT IS THE RESPONSIBILITY OF THE RELINQUISHER TO ENSURE THE ACCURACY OF THE CHAIN OF CUSTODY RECORD. AN INCOMPLETE CHAIN OF CUSTODY MAY RESULT IN ANALYTICAL TAT DELAYS.

White: Maxxam Yellow: Client

Maxxam Analytics International Corporation o/a Maxxam Analytics

Warm Ice Pack

Maxxam Analytics International Corporation o/a Maxxam Analytics
6740 Campobello Road, Mississauga, Ontario Canada L5N 2L8 Tel:(905) 817-5700 Toll-free:800-563-6266 Fax:(905) 817-5779 www.maxxam.ca

CHAIN OF CUSTODY RECORD

Page of

INVOICE INFORMATION:		REPORT INFORMATION (if differs from invoice):		PROJECT INFORMATION:		Laboratory Use Only:	
Company Name:	#25844 AMEC Earth & Environmental Ltd	Company Name:	#12841 AMEC Earth & Environmental Ltd	Quotation #:	B16203	MAXXAM JOB #:	BOTTLE ORDER #: 282186
Contact Name:	Wanda Colbourne	Contact Name:	Jason Dietrich	P.O. #:			
Address:	160 Traders Blvd E Suite 110 Mississauga ON L4Z 3K7	Address:	160 Traders Blvd Mississauga ON	Project #:	TC111504.2003	CHAIN OF CUSTODY #: C#282186-02-02	PROJECT MANAGER: GINA BAYBAYAN
Phone:	(905)568-2929 Fax: (905)568-1686	Phone:	Fax:	Project Name:			
Email:	wanda.colbourne@amec.com	Email:	Jason.Dietrich@amec.com	Site #:	Rainy River Resources		
				Sampled By:			

Regulation 153 (2011): ☐ Table 1 ☐ Table 2 ☐ Table 3 ☐ Table ___ ☐ Res/Park ☐ Ind/Comm ☐ Agri/Other ☐ Medium/Fine ☐ Coarse ☐ For RSC

Other Regulations: ☐ CCME ☐ Reg. 558 ☐ MISA ☐ PWQO ☐ Other ☐ Sanitary Sewer Bylaw ☐ Storm Sewer Bylaw Municipality ___

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PLEASE PROVIDE ADVANCE NOTICE FOR RUSH PROJECTS

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Job Specific Rush TAT (if applies to entire submission) ☐
Date Required: _____ Time Required: _____
Rush Confirmation Number: _____ *(call lab for #)*

	Sample Barcode Label	Sample (Location) Identification	Date Sampled	Time Sampled	Matrix	Regulated Drinking Water ? (Y/N)	Metals Field Filtered ? (Y/N)	Total Phosphorus (Colourimetric)	Low Level Total Suspended Solids	Mercury	# of Bottles	Comments
1	Mar up Pond.		28/09/2011	8:15	Water			X	X	X	7	
2	PM 1		30/09/2011	9:30	Water			X	X	X	7	
3	Los T2		01/10/2011	11:00	Water			X	X	X	7	
4	Route 600		30/09/2011	14:10	Water			X	X	X	7	
5	PM 2		30/09/2011	11:25	Water			X	X	X	7	
6	B/a 1		30/09/2011	10:19	Water			X	X	X	7	
7	PM 3		29/09/2011	16:00	Water			X	X	X	7	
8												
9												
10												

Note: Some samples may be past hold time, proceed w/ Analysis.

11,11,13 C 14,14,15 C 14,13,15 C

*RELINQUISHED BY: (Signature/Print)	Date: (YY/MM/DD)	Time:	RECEIVED BY: (Signature/Print)	Date: (YY/MM/DD)	Time:	# Jars Used and Not Submitted
Peter Morrison	03/10/2011	8:15.	FED DEEPTHI SIMHI	2011-10-05	09:52	

Laboratory Use Only

Time Sensitive	Temperature (°C) on Receipt	Custody Seal	Yes	No
	12,13,11 C	Present		✓
		Intact		

Warm Ice Pack

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IMMEDIATE TEST

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CHAIN OF CUSTODY RECORD

Page of

INVOICE INFORMATION:		REPORT INFORMATION (if differs from invoice):		PROJECT INFORMATION:		Laboratory Use Only:	
Company Name:	#25844 AMEC Earth & Environmental Ltd	Company Name:	#12841 AMEC Earth & Environmental Ltd	Quotation #:	B16203	MAXXAM JOB #:	BOTTLE ORDER #: 282186
Contact Name:	Wanda Colbourne	Contact Name:	Jason Dietrich	P.O. #:			
Address:	160 Traders Blvd E Suite 110 Mississauga ON L4Z 3K7	Address:	160 Traders Blvd Mississauga ON	Project #:	TC111504.2003	CHAIN OF CUSTODY #: C#282186-04-01	PROJECT MANAGER: GINA BAYBAYAN
Phone:	(905)568-2929 , Fax: (905)568-1686	Phone:	Fax:	Project Name:			
Email:	wanda.colbourne@amec.com	Email:	Jason.Dietrich@amec.com	Site #:	Rainy River Resources		
				Sampled By:			

Regulation 153 (2011): ☐ Table 1 ☐ Table 2 ☐ Table 3 ☐ Table ___ ☐ Res/Park ☐ Ind/Comm ☐ Agri/Other ☐ Medium/Fine ☐ Coarse ☐ For RSC

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Job Specific Rush TAT (if applies to entire submission)
Date Required: _____ Time Required: _____ ☐
Rush Confirmation Number: _____ *(call lab for #)*

	Sample Barcode Label	Sample (Location) Identification	Date Sampled	Time Sampled	Matrix	Regulated Drinking Water ? (Y/N)	Metals Field Filtered ? (Y/N)	Alkalinity	Conductivity	Dissolved Organic Carbon (DOC)	Hardness (calculated as CaCO3)	Dissolved Calcium and Magnesium	Total Metals Analysis by ICPMS	Ammonia-N (low level)	Nitrate (NO3) and Nitrite (NO2) in Water	pH	Sulphate	# of Bottles	Comments
1	Wes 2		29/09/2011	14:45	Water			X	X	X	X	X	X	X	X	X	X	7	Some Samples may be past hold times. Proceed w Analysis.
2	Wes 2 Pond		29/09/2011	14:00	Water			X	X	X	X	X	X	X	X	X	X	7	
3	Wes3		02/10/2011	9:00	Water			X	X	X	X	X	X	X	X	X	X	7	
4	Tait T2-1		02/10/2011	13:25	Water			X	X	X	X	X	X	X	X	X	X	7	
5	Dup 3.				Water			X	X	X	X	X	X	X	X	X	X	7	
6	PN 4		02/10/2011	11:00	Water			X	X	X	X	X	X	X	X	X	X	7	
7	Cla 3		02/10/2011	12:15	Water			X	X	X	X	X	X	X	X	X	X	7	
8	Tait T5-1		02/10/2011	14:30	Water			X	X	X	X	X	X	X	X	X	X	7	
9																			
10																			11/11/13°C 12/13/11°C 14/13/15°C

*RELINQUISHED BY: (Signature/Print)	Date: (YY/MM/DD)	Time:	RECEIVED BY: (Signature/Print)	Date: (YY/MM/DD)	Time:	# Jars Used and Not Submitted
Peter Bjarnason	03/10/2011	8:15	BS DEEP THE SHOSE	2011-10-05	09:52	

Laboratory Use Only

Time Sensitive	Temperature (°C) on Receipt	Custody Seal	Yes	No
	14, 14, 15°C	Present		
		Intact		

Warm Ice Packs

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CHAIN OF CUSTODY RECORD

Page of

INVOICE INFORMATION:		REPORT INFORMATION (if differs from invoice):		PROJECT INFORMATION:		Laboratory Use Only:	
Company Name:	#25844 AMEC Earth & Environmental Ltd	Company Name:	#12841 AMEC Earth & Environmental Ltd	Quotation #:	B16203	MAXXAM JOB #:	BOTTLE ORDER #: 282186
Contact Name:	Wanda Colbourne	Contact Name:	Jason Dietrich	P.O. #:			
Address:	160 Traders Blvd E Suite 110 Mississauga ON L4Z 3K7	Address:	160 Traders Blvd Mississauga ON	Project #:	TC111504.2003	CHAIN OF CUSTODY #: C#282186-04-02	PROJECT MANAGER: GINA BAYBAYAN
Phone:	(905)568-2929 Fax: (905)568-1686	Phone:	Fax:	Project Name:			
Email:	wanda.colbourne@amec.com	Email:	Jason.Dietrich@amec.com	Site #:	Rainy River Resources		
				Sampled By:			

Regulation 153 (2011)
☐ Table 1 ☐ Res/Park ☐ Medium/Fine
☐ Table 2 ☐ Ind/Comm ☐ Coarse
☐ Table 3 ☐ Agri/Other
☐ Table ___ ☐ For RSC

Other Regulations
☐ CCME ☐ Sanitary Sewer Bylaw
☐ Reg. 558 ☐ Storm Sewer Bylaw
☐ MISA Municipality _____
☐ PWQO
☐ Other _____

SPECIAL INSTRUCTIONS

Include Criteria on Certificate of Analysis (Y/N)? ___

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Job Specific Rush TAT (if applies to entire submission)
Date Required: _____ Time Required: _____
Rush Confirmation Number: _____ *(call lab for #)*

	Sample Barcode Label	Sample (Location) Identification	Date Sampled	Time Sampled	Matrix	Regulated Drinking Water ? (Y/N)	Metals Field Filtered ? (Y/N)	Total Phosphorus (Colourimetric)	Low Level Total Suspended Solids	Mercury	# of Bottles	Comments
1	Wes 2		29/09/2011	14:45	Water			X	X	X	7	
2	Wes 2 Pond		29/09/2011	14:00	Water			X	X	X	7	
3	Wes 3		02/10/2011	9:00	Water			X	X	X	7	
4	Tait T2-1		02/10/2011	13:25	Water			X	X	X	7	
5	Dup 3				Water			X	X	X	7	
6	Pm 4		02/10/2011	11:00	Water			X	X	X	7	
7	Cla 3		02/10/2011	12:15	Water			X	X	X	7	
8	Tait T5-1		02/10/2011	14:30	Water			X	X	X	7	
9												
10												

Some samples may be past hold times. Proceed w/ Analysis.

11,11,13C 12,13,11C 14,15,13C

*RELINQUISHED BY: (Signature/Print)	Date: (YY/MM/DD)	Time:	RECEIVED BY: (Signature/Print)	Date: (YY/MM/DD)	Time:	# Jars Used and Not Submitted
Peter Morrison	03/10/2011	8:15	DS DEEPTHI SHAH	2011-10-05	09:52	

Laboratory Use Only
Time Sensitive | Temperature (°C) on Receipt: 14, 14, 15°C | Custody Seal: Present ☐ Intact ☐ Yes ☐ No ☐

Warm ice Pack

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Phone:	(905)568-2929 Fax: (905)568-1686	Phone:	Fax:	Project Name:			
Email:	wanda.colbourne@amec.com	Email:	Jason.Dietrich@amec.com	Site #:	Rainy River Resources		
				Sampled By:			

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1		Mar 4	27/09/2011	9:50	water			X	X	X	X	X	X	X	X	X	X	7	
2		Mar 3	27/09/2011	11:35	water			X	X	X	X	X	X	X	X	X	X	7	
3		Cla 1	28/09/2011	14:50	water			X	X	X	X	X	X	X	X	X	X	7	Note: Some samples may be Past Analysis Hold time,
4		Mar 1	28/09/2011	9:45	water			X	X	X	X	X	X	X	X	X	X	7	Proceed w Analysis.
5		Mar 5	27/09/2011	14:20	water			X	X	X	X	X	X	X	X	X	X	7	
6		Cla 2	28/09/2011	13:30	water			X	X	X	X	X	X	X	X	X	X	7	
7		Mar 2	28/09/2011	11:15	water			X	X	X	X	X	X	X	X	X	X	7	
8		~~Mar up Pond~~	~~28/09/2011~~	~~8:15~~	~~water~~			X	X	X	X	X	X	X	X	X	X	7	
9																			~~Note: There are 8 samples take on the second cooler, but not have enough COC's to include.~~ 11,11,13C 12,13,11C 14,14,15C
10																			

*RELINQUISHED BY: (Signature/Print)	Date: (YY/MM/DD)	Time:	RECEIVED BY: (Signature/Print)	Date: (YY/MM/DD)	Time:	# Jars Used and Not Submitted
Peter Morrison	~~2011/09/29~~ 03/10/2011	8:15	DEEPTHI SHASI	2011-10-05	09:52	

Laboratory Use Only

Time Sensitive	Temperature (°C) on Receipt	Custody Seal	Yes	No
	14,13,15°C	Present		
		Intact		

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White: Maxxam Yellow: Client

Warm Ice packs (2)

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Address:	160 Traders Blvd E Suite 110 Mississauga ON L4Z 3K7	Address:	160 Traders Blvd Mississauga ON	Project #:	TC111504.2003	CHAIN OF CUSTODY #: C#282186-01-02	PROJECT MANAGER: GINA BAYBAYAN
Phone:	(905)568-2929 Fax: (905)568-1686	Phone:	Fax:	Project Name:			
Email:	wanda.colbourne@amec.com	Email:	Jason.Dietrich@amec.com	Site #:	Rainy River Resources		
				Sampled By:			

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Job Specific Rush TAT (if applies to entire submission)
Date Required: ___ Time Required: ___
Rush Confirmation Number: ___ *(call lab for #)*

	Sample Barcode Label	Sample (Location) Identification	Date Sampled	Time Sampled	Matrix	Regulated Drinking Water ? (Y/N)	Metals Field Filtered ? (Y/N)	Total Phosphorus (Colourimetric)	Low Level Total Suspended Solids	Mercury	# of Bottles	Comments
1		Mar 4	27/09/2011	9:50	Water			X	X	X	2	
2		Mar 3	27/09/2011	11:35	Water			X	X	X	2	
3		Cla 1	28/09/2011	14:50	Water			X	X	X	2	Note! Some Samples may be past analysis Hold time, proceed to Analysis.
4		Mar 1	28/09/2011	9:45	Water			X	X	X	2	
5		Mar 5	27/09/2011	14:20	Water			X	X	X	2	
6		Cla 2	28/09/2011	13:30	Water			X	X	X	2	
7		Mar 2	28/09/2011	11:15	Water			X	X	X	2	
8		~~Mar 6 / Pond~~	~~28/09/2011~~	~~8:15~~	~~Water~~			X	X	X	2	
9												
10												11,11,13C 12,13,11C 14,14,15C

*RELINQUISHED BY: (Signature/Print)	Date: (YY/MM/DD)	Time:	RECEIVED BY: (Signature/Print)	Date: (YY/MM/DD)	Time:	# Jars Used and Not Submitted
Peter Morrison	~~2011/10/29~~ 03/10/2011	8:15	DEEP THE SHORE	2011-10-05	09:52	

Laboratory Use Only

Time Sensitive	Temperature (°C) on Receipt	Custody Seal	Yes	No
	14, 13, 15 C	Present		
		Intact		

Warm Ice Packs.

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APPENDIX C

SEDIMENT QUALITY DATA AND CERTIFICATES OF ANALYSIS

Your Project #: TC111504.2003
Site#: Rainy River Resources
Site Location: RAINY RIVER RESOURCES
Your C.O.C. #: 28219001, 282190-01-01

Attention: Jason Dietrich
AMEC Earth & Environmental Ltd
160 Traders Blvd
Mississauga, ON
CANADA

Report Date: 2011/10/27

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B1F4584
Received: 2011/10/05, 09:52

Sample Matrix: Soil
Samples Received: 29

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Method Reference
Acid Extr. Metals (aqua regia) by ICPMS	14	2011/10/12	2011/10/12	CAM SOP-00447	EPA 6020
Acid Extr. Metals (aqua regia) by ICPMS	15	2011/10/12	2011/10/13	CAM SOP-00447	EPA 6020
Moisture	29	N/A	2011/10/08	CAM SOP-00445	McKeague 2nd ed 1978
pH CaCl2 EXTRACT	4	2011/10/07	2011/10/07	CAM SOP-00413	SM 4500 H
pH CaCl2 EXTRACT	15	2011/10/09	2011/10/11	CAM SOP-00413	SM 4500 H
pH CaCl2 EXTRACT	10	2011/10/12	2011/10/12	CAM SOP-00413	SM 4500 H
Loss On Ignition (LOI) (1)	29	N/A	2011/10/26	SLA SOP-00093	CAL SOP-0046 Rev.4
Total Kjeldahl Nitrogen - Soil	4	2011/10/07	2011/10/11	CAM SOP-00454	EPA 351.2 Rev 2
Total Kjeldahl Nitrogen - Soil	18	2011/10/10	2011/10/12	CAM SOP-00454	EPA 351.2 Rev 2
Total Kjeldahl Nitrogen - Soil	7	2011/10/11	2011/10/12	CAM SOP-00454	EPA 351.2 Rev 2
Total Organic Carbon in Soil	29	N/A	2011/10/12	CAM SOP-00468	LECO Combustion

Remarks:

Maxxam Analytics has performed all analytical testing herein in accordance with ISO 17025 and the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act. All methodologies comply with this document and are validated for use in the laboratory. The methods and techniques employed in this analysis conform to the performance criteria (detection limits, accuracy and precision) as outlined in the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act.

The CWS PHC methods employed by Maxxam conform to all prescribed elements of the reference method and performance based elements have been validated. All modifications have been validated and proven equivalent following the 'Alberta Environment Draft Addenda to the CWS-PHC, Appendix 6, Validation of Alternate Methods'. Documentation is available upon request. Maxxam has made the following improvements to the CWS-PHC reference benchmark method: (i) Headspace for F1; and, (ii) Mechanical extraction for F2-F4. Note: F4G cannot be added to the C6 to C50 hydrocarbons. The extraction date for samples field preserved with methanol for F1 and Volatile Organic Compounds is considered to be the date sampled.

Maxxam Analytics is accredited by SCC (Lab ID 97) for all specific parameters as required by Ontario Regulation 153/04. Maxxam Analytics is limited in liability to the actual cost of analysis unless otherwise agreed in writing. There is no other warranty expressed or implied. Samples will be retained at Maxxam Analytics for three weeks from receipt of data or as per contract.

* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.
* Results relate only to the items tested.

(1) This test was performed by Maxxam Sladeview Petrochemical
(2) Sample(s) analyzed using methodologies that have not been subjected to Maxxam's standard validation process for the submitted matrix and is not an Accredited method. Analysis performed with client consent, however results should be viewed with discretion

../2

Maxxam Job #: B1F4584
Report Date: 2011/10/27

AMEC Earth & Environmental Ltd
Client Project #: TC111504.2003
Site Location: RAINY RIVER RESOURCES
Sampler Initials: PM

Encryption Key

Please direct all questions regarding this Certificate of Analysis to your Project Manager.

GINA BAYBAYAN,
Email: GBAYBAYAN@maxxam.ca
Phone# (905) 817-5766

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Maxxam has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per section 5.10.2 of ISO/IEC 17025:2005(E), signing the reports. For Service Group specific validation please refer to the Validation Signature Page.

Total cover pages: 2

Maxxam Job #: B1F4584
Report Date: 2011/10/27

AMEC Earth & Environmental Ltd
Client Project #: TC111504.2003
Site Location: RAINY RIVER RESOURCES
Sampler Initials: PM

RESULTS OF ANALYSES OF SOIL

Maxxam ID		LD6272		LD6273	LD6274			LD6275			LD6276		
Sampling Date		2011/09/28 14:50		2011/09/27 14:40	2011/09/28 10:00			2011/09/28 11:35			2011/09/28 08:25		
	Units	**CLA 1**	**QC Batch**	**MAR 5**	**MAR 1**	**RDL**	**QC Batch**	**MAR 2**	**RDL**	**QC Batch**	**MAR UP POND**	**RDL**	**QC Batch**
Inorganics													
Moisture	%	29	2642281	42	42	1	2642281	70	1	2642281	68	1	2642281
Total Organic Carbon	mg/kg	7200	2643089	21000	21000	500	2643089	130000	500	2643089	71000	500	2643089
Available (CaCl2) pH	pH	7.07	2640806	6.16	6.33		2642428	5.82		2640806	5.30		2642428
Total Kjeldahl Nitrogen	ug/g	780	2641135	2250	1900	50	2642481	8630	100	2641135	3990	50	2642481
Subcontracted Analysis													
Loss on Ignition	%	3.7	2646427	8.1	7.0	0.2	2646427	30	0.2	2646427	18	0.2	2646427

Maxxam ID		LD6277	LD6278		LD6279		LD6280		LD6281		
Sampling Date		2011/09/27 11:45	2011/09/27 10:20		2011/09/28 13:50		2011/09/29 11:15		2011/09/30 14:10		
	Units	**MAR 3**	**MAR 4**	**QC Batch**	**CLA 2**	**QC Batch**	**WES 4**	**QC Batch**	**ROUTE 600**	**RDL**	**QC Batch**
Inorganics											
Moisture	%	56	61	2642281	48	2642281	78	2642281	44	1	2642281
Total Organic Carbon	mg/kg	40000	36000	2643089	29000	2643089	87000	2643089	20000	500	2643089
Available (CaCl2) pH	pH	6.40	6.87	2642428	6.87	2640806	6.11	2642428	7.47		2640806
Total Kjeldahl Nitrogen	ug/g	4140	4200	2642481	2260	2641135	8580	2642481	1200	50	2641135
Subcontracted Analysis											
Loss on Ignition	%	12	8.9	2646427	8.6	2646427	22	2646427	5.7	0.2	2646427

Maxxam ID		LD6282	LD6283		LD6284		LD6285		LD6286		
Sampling Date		2011/10/01 11:00	2011/10/02 14:30		2011/10/02 11:00		2011/10/01 14:00		2011/09/30 10:19		
	Units	**LOT T2**	**TAIT T5-1**	**QC Batch**	**PIN 4**	**QC Batch**	**PIN 6**	**QC Batch**	**BLA 1**	**RDL**	**QC Batch**
Inorganics											
Moisture	%	77	54	2642281	56	2642281	33	2642281	36	1	2642247
Total Organic Carbon	mg/kg	75000	33000	2643089	31000	2643089	15000	2643089	23000	500	2643089
Available (CaCl2) pH	pH	6.28	6.59	2642428	6.14	2644086	6.93	2644086	6.44		2644086
Total Kjeldahl Nitrogen	ug/g	7690	3470	2642481	3470	2643060	935	2642481	1930	50	2642481
Subcontracted Analysis											
Loss on Ignition	%	20	10	2646427	12	2646427	4.9	2646427	5.9	0.2	2646427

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Maxxam Job #: B1F4584
Report Date: 2011/10/27

AMEC Earth & Environmental Ltd
Client Project #: TC111504.2003
Site Location: RAINY RIVER RESOURCES
Sampler Initials: PM

RESULTS OF ANALYSES OF SOIL

Maxxam ID		LD6287		LD6288		LD6289	LD6290		LD6291		
Sampling Date		2011/09/29 14:00		2011/10/02 12:15		2011/10/02 09:00	2011/10/02 13:25				
	Units	**WES 2 POND**	**QC Batch**	**CLA 3**	**QC Batch**	**WES 3**	**TAIT T2-1**	**QC Batch**	**DUP 3**	**RDL**	**QC Batch**
Inorganics											
Moisture	%	26	2642247	41	2642247	56	71	2642247	41	1	2642247
Total Organic Carbon	mg/kg	15000	2643485	25000	2643485	30000	47000	2643485	25000	500	2643485
Available (CaCl2) pH	pH	6.57	2642426	7.10	2644086	6.67	6.52	2644086	6.86		2642426
Total Kjeldahl Nitrogen	ug/g	980	2643060	1130	2643060	3350	3260	2642481	1080	50	2643060
Subcontracted Analysis											
Loss on Ignition	%	3.9	2646427	5.3	2646427	8.0	13	2646427	3.9	0.2	2646427

Maxxam ID		LD6292			LD6293			LD6294		
Sampling Date		2011/09/30 11:25			2011/09/29 12:45					
	Units	**PIN 2**	**RDL**	**QC Batch**	**WES 1**	**RDL**	**QC Batch**	**DUP 2**	**RDL**	**QC Batch**
Inorganics										
Moisture	%	23	1	2642247	18	1	2642247	33	1	2642247
Total Organic Carbon	mg/kg	16000	500	2643485	8600	500	2643485	13000	500	2643485
Available (CaCl2) pH	pH	7.07		2642428	6.50		2644086	6.81		2644086
Total Kjeldahl Nitrogen	ug/g	730	50	2642481	429	10	2642481	1170	50	2643060
Subcontracted Analysis										
Loss on Ignition	%	1.1	0.2	2646427	1.2	0.2	2646427	3.9	0.2	2646427

Maxxam ID		LD6295			LD6296		LD6297	LD6298		
Sampling Date		2011/09/29 16:15			2011/09/29 14:15		2011/10/01 12:00	2011/10/01 15:00		
	Units	**PIN 3**	**RDL**	**QC Batch**	**WES 2**	**QC Batch**	**DUP 1**	**LOS 2**	**RDL**	**QC Batch**
Inorganics										
Moisture	%	41	1	2642247	25	2642247	17	15	1	2642247
Total Organic Carbon	mg/kg	20000	500	2643485	6900	2643485	11000	7500	500	2643485
Available (CaCl2) pH	pH	7.12		2642426	7.22	2642428	6.80	7.16		2644086
Total Kjeldahl Nitrogen	ug/g	1360	50	2643060	380	2642481	407	242	10	2642481
Subcontracted Analysis										
Loss on Ignition	%	6.2	0.2	2646427	1.6	2646427	1.7	2.1	0.2	2646427

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Maxxam Job #: B1F4584
Report Date: 2011/10/27

AMEC Earth & Environmental Ltd
Client Project #: TC111504.2003
Site Location: RAINY RIVER RESOURCES
Sampler Initials: PM

RESULTS OF ANALYSES OF SOIL

Maxxam ID		LD6299		LD6300		
Sampling Date		2011/10/01 12:00		2011/09/30 09:30		
	Units	**LOS 1**	**QC Batch**	**PIN 1**	**RDL**	**QC Batch**
Inorganics						
Moisture	%	72	2642247	48	1	2642247
Total Organic Carbon	mg/kg	34000	2643485	15000	500	2643485
Available (CaCl2) pH	pH	6.31	2642428	6.12		2642426
Total Kjeldahl Nitrogen	ug/g	5080	2642481	1670	50	2643060
Subcontracted Analysis						
Loss on Ignition	%	9.8	2646427	7.4	0.2	2646427

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Maxxam Job #: B1F4584
Report Date: 2011/10/27

AMEC Earth & Environmental Ltd
Client Project #: TC111504.2003
Site Location: RAINY RIVER RESOURCES
Sampler Initials: PM

ELEMENTS BY ATOMIC SPECTROSCOPY (SOIL)

Maxxam ID		LD6272	LD6273	LD6274	LD6275	LD6276	LD6277		LD6278		
Sampling Date		2011/09/28 14:50	2011/09/27 14:40	2011/09/28 10:00	2011/09/28 11:35	2011/09/28 08:25	2011/09/27 11:45		2011/09/27 10:20		
	Units	**CLA 1**	**MAR 5**	**MAR 1**	**MAR 2**	**MAR UP POND**	**MAR 3**	**RDL**	**MAR 4**	**RDL**	**QC Batch**
Metals											
Acid Extractable Aluminum (Al)	ug/g	7500	7200	11000	10000	11000	7000	50	6200	50	2643911
Acid Extractable Antimony (Sb)	ug/g	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	0.2	<0.2	0.2	2643911
Acid Extractable Arsenic (As)	ug/g	1	2	3	2	1	1	1	4	1	2643911
Acid Extractable Barium (Ba)	ug/g	55	56	81	80	86	62	0.5	69	0.5	2643911
Acid Extractable Beryllium (Be)	ug/g	0.3	0.5	0.7	0.4	0.6	0.2	0.2	0.3	0.2	2643911
Acid Extractable Bismuth (Bi)	ug/g	<1	<1	<1	<1	<1	<1	1	<1	1	2643911
Acid Extractable Boron (B)	ug/g	<5	<5	<5	<5	<5	<5	5	<5	5	2643911
Acid Extractable Cadmium (Cd)	ug/g	<0.1	0.2	0.2	0.4	0.1	0.2	0.1	0.2	0.1	2643911
Acid Extractable Calcium (Ca)	ug/g	4000	6200	5400	9300	7700	5400	50	5700	50	2643911
Acid Extractable Chromium (Cr)	ug/g	17	17	23	20	19	16	1	15	1	2643911
Acid Extractable Cobalt (Co)	ug/g	5.4	7.5	9.8	5.1	5.2	4.8	0.1	10	0.1	2643911
Acid Extractable Copper (Cu)	ug/g	8.5	9.5	20	17	25	13	0.5	10	0.5	2643911
Acid Extractable Iron (Fe)	ug/g	10000	11000	16000	9100	10000	8000	50	13000	50	2643911
Acid Extractable Lead (Pb)	ug/g	6	6	9	6	8	5	1	5	1	2643911
Acid Extractable Magnesium (Mg)	ug/g	3400	4300	4800	3700	3500	3200	50	3500	50	2643911
Acid Extractable Manganese (Mn)	ug/g	170	360	250	170	150	140	1	1900	5	2643911
Acid Extractable Molybdenum (Mo)	ug/g	<0.5	<0.5	<0.5	0.6	<0.5	<0.5	0.5	<0.5	0.5	2643911
Acid Extractable Nickel (Ni)	ug/g	12	13	23	15	13	13	0.5	12	0.5	2643911
Acid Extractable Phosphorus (P)	ug/g	350	500	290	640	310	400	50	700	50	2643911
Acid Extractable Potassium (K)	ug/g	700	760	1200	740	590	570	200	560	200	2643911
Acid Extractable Selenium (Se)	ug/g	<0.5	<0.5	<0.5	1.0	0.6	0.6	0.5	<0.5	0.5	2643911
Acid Extractable Silver (Ag)	ug/g	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	0.2	<0.2	0.2	2643911
Acid Extractable Sodium (Na)	ug/g	<100	<100	<100	<100	<100	<100	100	<100	100	2643911
Acid Extractable Strontium (Sr)	ug/g	12	16	17	25	20	15	1	15	1	2643911
Acid Extractable Thallium (Tl)	ug/g	0.15	0.09	0.14	0.15	0.10	0.08	0.05	0.07	0.05	2643911
Acid Extractable Tin (Sn)	ug/g	<5	<5	<5	<5	<5	<5	5	<5	5	2643911
Acid Extractable Uranium (U)	ug/g	0.56	0.94	1.2	2.0	1.7	2.9	0.05	0.69	0.05	2643911
Acid Extractable Vanadium (V)	ug/g	20	21	34	23	22	18	5	18	5	2643911
Acid Extractable Zinc (Zn)	ug/g	34	52	52	55	42	49	5	72	5	2643911
Acid Extractable Mercury (Hg)	ug/g	<0.05	<0.05	0.05	0.07	<0.05	<0.05	0.05	<0.05	0.05	2643911

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Maxxam Job #: B1F4584
Report Date: 2011/10/27

AMEC Earth & Environmental Ltd
Client Project #: TC111504.2003
Site Location: RAINY RIVER RESOURCES
Sampler Initials: PM

ELEMENTS BY ATOMIC SPECTROSCOPY (SOIL)

Maxxam ID		LD6279	LD6280	LD6281	LD6282	LD6283	LD6284	LD6285	LD6286		
Sampling Date		2011/09/28 13:50	2011/09/29 11:15	2011/09/30 14:10	2011/10/01 11:00	2011/10/02 14:30	2011/10/02 11:00	2011/10/01 14:00	2011/09/30 10:19		
	Units	**CLA 2**	**WES 4**	**ROUTE 600**	**LOT T2**	**TAIT T5-1**	**PIN 4**	**PIN 6**	**BLA 1**	**RDL**	**QC Batch**
Metals											
Acid Extractable Aluminum (Al)	ug/g	6800	6400	8200	8100	7900	6400	6800	8300	50	2643911
Acid Extractable Antimony (Sb)	ug/g	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	0.2	2643911
Acid Extractable Arsenic (As)	ug/g	3	2	4	3	2	2	2	3	1	2643911
Acid Extractable Barium (Ba)	ug/g	60	60	81	77	68	53	50	60	0.5	2643911
Acid Extractable Beryllium (Be)	ug/g	0.5	<0.2	0.5	0.4	0.4	0.4	0.3	0.4	0.2	2643911
Acid Extractable Bismuth (Bi)	ug/g	<1	<1	<1	<1	<1	<1	<1	<1	1	2643911
Acid Extractable Boron (B)	ug/g	6	<5	7	<5	<5	<5	<5	<5	5	2643911
Acid Extractable Cadmium (Cd)	ug/g	0.2	0.3	0.2	0.4	0.2	0.3	0.1	0.2	0.1	2643911
Acid Extractable Calcium (Ca)	ug/g	8300	9000	37000	11000	8400	5400	8400	5800	50	2643911
Acid Extractable Chromium (Cr)	ug/g	15	13	21	17	16	15	16	20	1	2643911
Acid Extractable Cobalt (Co)	ug/g	5.9	3.9	9.1	7.0	6.1	6.1	5.8	7.4	0.1	2643911
Acid Extractable Copper (Cu)	ug/g	9.4	11	16	17	10	9.0	9.6	11	0.5	2643911
Acid Extractable Iron (Fe)	ug/g	9600	6700	14000	10000	11000	9100	10000	11000	50	2643911
Acid Extractable Lead (Pb)	ug/g	6	6	7	7	7	5	5	7	1	2643911
Acid Extractable Magnesium (Mg)	ug/g	5300	4200	22000	5500	5000	3400	6100	3900	50	2643911
Acid Extractable Manganese (Mn)	ug/g	220	220	1300	480	230	250	180	310	1	2643911
Acid Extractable Molybdenum (Mo)	ug/g	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.5	2643911
Acid Extractable Nickel (Ni)	ug/g	12	11	19	18	13	12	12	15	0.5	2643911
Acid Extractable Phosphorus (P)	ug/g	400	480	600	470	390	470	470	390	50	2643911
Acid Extractable Potassium (K)	ug/g	730	430	1100	730	960	650	650	880	200	2643911
Acid Extractable Selenium (Se)	ug/g	<0.5	<0.5	<0.5	0.5	0.5	<0.5	<0.5	<0.5	0.5	2643911
Acid Extractable Silver (Ag)	ug/g	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	0.2	2643911
Acid Extractable Sodium (Na)	ug/g	<100	<100	100	<100	<100	<100	<100	<100	100	2643911
Acid Extractable Strontium (Sr)	ug/g	17	14	27	22	15	16	15	21	1	2643911
Acid Extractable Thallium (Tl)	ug/g	0.13	0.07	0.15	0.10	0.11	0.10	0.10	0.12	0.05	2643911
Acid Extractable Tin (Sn)	ug/g	<5	<5	<5	<5	<5	<5	<5	<5	5	2643911
Acid Extractable Uranium (U)	ug/g	1.6	1.5	0.83	4.0	0.81	1.2	0.63	1.6	0.05	2643911
Acid Extractable Vanadium (V)	ug/g	19	15	27	23	21	19	20	22	5	2643911
Acid Extractable Zinc (Zn)	ug/g	46	46	46	46	42	54	42	54	5	2643911
Acid Extractable Mercury (Hg)	ug/g	<0.05	0.05	<0.05	0.06	<0.05	<0.05	<0.05	<0.05	0.05	2643911

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Maxxam Job #: B1F4584
Report Date: 2011/10/27

AMEC Earth & Environmental Ltd
Client Project #: TC111504.2003
Site Location: RAINY RIVER RESOURCES
Sampler Initials: PM

ELEMENTS BY ATOMIC SPECTROSCOPY (SOIL)

Maxxam ID		LD6287	LD6288	LD6289	LD6290	LD6291	LD6292	LD6293	LD6294		
Sampling Date		2011/09/29 14:00	2011/10/02 12:15	2011/10/02 09:00	2011/10/02 13:25		2011/09/30 11:25	2011/09/29 12:45			
	Units	**WES 2 POND**	**CLA 3**	**WES 3**	**TAIT T2-1**	**DUP 3**	**PIN 2**	**WES 1**	**DUP 2**	**RDL**	**QC Batch**
Metals											
Acid Extractable Aluminum (Al)	ug/g	9100	9500	6400	6400	8900	4800	2200	7300	50	2643870
Acid Extractable Antimony (Sb)	ug/g	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	0.2	2643870
Acid Extractable Arsenic (As)	ug/g	2	4	2	1	3	1	<1	2	1	2643870
Acid Extractable Barium (Ba)	ug/g	54	77	53	42	73	37	18	57	0.5	2643870
Acid Extractable Beryllium (Be)	ug/g	0.3	0.6	0.4	0.3	0.4	0.3	<0.2	0.4	0.2	2643870
Acid Extractable Bismuth (Bi)	ug/g	<1	<1	<1	<1	<1	<1	<1	<1	1	2643870
Acid Extractable Boron (B)	ug/g	<5	6	<5	<5	5	<5	<5	<5	5	2643870
Acid Extractable Cadmium (Cd)	ug/g	0.1	0.2	0.1	0.1	0.2	<0.1	<0.1	0.1	0.1	2643870
Acid Extractable Calcium (Ca)	ug/g	3800	27000	18000	15000	27000	16000	1800	10000	50	2643870
Acid Extractable Chromium (Cr)	ug/g	19	23	14	14	22	13	5	18	1	2643870
Acid Extractable Cobalt (Co)	ug/g	6.0	8.8	4.8	4.1	8.2	5.2	1.9	6.6	0.1	2643870
Acid Extractable Copper (Cu)	ug/g	7.4	15	10	8.9	16	5.0	2.7	10	0.5	2643870
Acid Extractable Iron (Fe)	ug/g	13000	15000	9500	8100	14000	7400	3600	10000	50	2643870
Acid Extractable Lead (Pb)	ug/g	6	8	5	6	8	5	2	6	1	2643870
Acid Extractable Magnesium (Mg)	ug/g	3400	14000	9500	8600	14000	9000	1100	7100	50	2643870
Acid Extractable Manganese (Mn)	ug/g	270	430	250	130	420	340	240	200	1	2643870
Acid Extractable Molybdenum (Mo)	ug/g	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.5	2643870
Acid Extractable Nickel (Ni)	ug/g	14	20	12	11	19	8.8	4.4	14	0.5	2643870
Acid Extractable Phosphorus (P)	ug/g	380	550	490	430	540	400	290	480	50	2643870
Acid Extractable Potassium (K)	ug/g	1200	1400	560	790	1300	580	<200	720	200	2643870
Acid Extractable Selenium (Se)	ug/g	<0.5	0.7	<0.5	<0.5	<0.5	<0.5	0.5	<0.5	0.5	2643870
Acid Extractable Silver (Ag)	ug/g	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	0.2	2643870
Acid Extractable Sodium (Na)	ug/g	<100	<100	<100	<100	<100	<100	<100	<100	100	2643870
Acid Extractable Strontium (Sr)	ug/g	14	29	18	15	29	16	5	18	1	2643870
Acid Extractable Thallium (Tl)	ug/g	0.11	0.14	0.07	0.10	0.14	0.07	<0.05	0.10	0.05	2643870
Acid Extractable Tin (Sn)	ug/g	<5	<5	<5	<5	<5	<5	<5	<5	5	2643870
Acid Extractable Uranium (U)	ug/g	2.2	1.1	0.95	0.61	1.0	0.54	0.32	0.70	0.05	2643870
Acid Extractable Vanadium (V)	ug/g	24	29	19	16	28	13	7	21	5	2643870
Acid Extractable Zinc (Zn)	ug/g	37	85	32	35	84	30	16	45	5	2643870
Acid Extractable Mercury (Hg)	ug/g	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.05	2643870

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Maxxam Job #: B1F4584
Report Date: 2011/10/27

AMEC Earth & Environmental Ltd
Client Project #: TC111504.2003
Site Location: RAINY RIVER RESOURCES
Sampler Initials: PM

ELEMENTS BY ATOMIC SPECTROSCOPY (SOIL)

Maxxam ID		LD6295	LD6296	LD6297	LD6298	LD6299	LD6300		
Sampling Date		2011/09/29 16:15	2011/09/29 14:15	2011/10/01 12:00	2011/10/01 15:00	2011/10/01 12:00	2011/09/30 09:30		
	Units	**PIN 3**	**WES 2**	**DUP 1**	**LOS 2**	**LOS 1**	**PIN 1**	**RDL**	**QC Batch**
Metals									
Acid Extractable Aluminum (Al)	ug/g	7000	5200	2400	4200	5900	4300	50	2643870
Acid Extractable Antimony (Sb)	ug/g	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	0.2	2643870
Acid Extractable Arsenic (As)	ug/g	3	2	<1	2	2	1	1	2643870
Acid Extractable Barium (Ba)	ug/g	55	41	22	30	49	30	0.5	2643870
Acid Extractable Beryllium (Be)	ug/g	0.4	0.3	<0.2	0.3	0.4	0.2	0.2	2643870
Acid Extractable Bismuth (Bi)	ug/g	<1	<1	<1	<1	<1	<1	1	2643870
Acid Extractable Boron (B)	ug/g	<5	<5	<5	<5	<5	<5	5	2643870
Acid Extractable Cadmium (Cd)	ug/g	0.2	<0.1	<0.1	<0.1	0.1	0.1	0.1	2643870
Acid Extractable Calcium (Ca)	ug/g	12000	9300	2100	9600	7300	4000	50	2643870
Acid Extractable Chromium (Cr)	ug/g	16	12	6	10	13	10	1	2643870
Acid Extractable Cobalt (Co)	ug/g	6.9	4.7	2.2	4.1	5.3	4.1	0.1	2643870
Acid Extractable Copper (Cu)	ug/g	9.4	6.2	2.4	4.9	7.1	5.2	0.5	2643870
Acid Extractable Iron (Fe)	ug/g	10000	8200	3500	7000	8500	5600	50	2643870
Acid Extractable Lead (Pb)	ug/g	6	5	2	3	5	3	1	2643870
Acid Extractable Magnesium (Mg)	ug/g	6900	5100	1200	5800	4100	2500	50	2643870
Acid Extractable Manganese (Mn)	ug/g	240	150	270	150	430	130	1	2643870
Acid Extractable Molybdenum (Mo)	ug/g	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.5	2643870
Acid Extractable Nickel (Ni)	ug/g	12	10	4.4	8.6	9.9	7.5	0.5	2643870
Acid Extractable Phosphorus (P)	ug/g	450	320	270	310	410	440	50	2643870
Acid Extractable Potassium (K)	ug/g	790	630	<200	420	610	440	200	2643870
Acid Extractable Selenium (Se)	ug/g	0.7	<0.5	<0.5	<0.5	0.6	<0.5	0.5	2643870
Acid Extractable Silver (Ag)	ug/g	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	0.2	2643870
Acid Extractable Sodium (Na)	ug/g	<100	<100	<100	<100	<100	<100	100	2643870
Acid Extractable Strontium (Sr)	ug/g	18	12	6	11	15	11	1	2643870
Acid Extractable Thallium (Tl)	ug/g	0.09	0.08	<0.05	0.05	0.09	0.05	0.05	2643870
Acid Extractable Tin (Sn)	ug/g	<5	<5	<5	<5	<5	<5	5	2643870
Acid Extractable Uranium (U)	ug/g	1.1	0.47	0.31	0.39	1.5	0.74	0.05	2643870
Acid Extractable Vanadium (V)	ug/g	19	17	7	13	16	12	5	2643870
Acid Extractable Zinc (Zn)	ug/g	51	27	16	26	36	31	5	2643870
Acid Extractable Mercury (Hg)	ug/g	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.05	2643870

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Maxxam Job #: B1F4584
Report Date: 2011/10/27

AMEC Earth & Environmental Ltd
Client Project #: TC111504.2003
Site Location: RAINY RIVER RESOURCES
Sampler Initials: PM

Test Summary

Maxxam ID LD6272 **Collected** 2011/09/28
Sample ID CLA 1 **Shipped**
Matrix Soil **Received** 2011/10/05

Test Description	Instrumentation	Batch	Extracted	Analyzed	Analyst
Acid Extr. Metals (aqua regia) by ICPMS	ICP/MS	2643911	2011/10/12	2011/10/12	VIVIANA CANZONIERI
Moisture	BAL	2642281	N/A	2011/10/08	CHAMIKA DEEYAGAHA
pH CaCl2 EXTRACT		2640806	2011/10/07	2011/10/07	NEIL DASSANAYAKE
Loss On Ignition (LOI)		2646427	N/A	2011/10/26	GRACE SISON
Total Kjeldahl Nitrogen - Soil	AC	2641135	2011/10/07	2011/10/11	CHANDRA NANDLAL
Total Organic Carbon in Soil	LECO	2643089	N/A	2011/10/12	GODWIN OKEREKE

Maxxam ID LD6273 **Collected** 2011/09/27
Sample ID MAR 5 **Shipped**
Matrix Soil **Received** 2011/10/05

Test Description	Instrumentation	Batch	Extracted	Analyzed	Analyst
Acid Extr. Metals (aqua regia) by ICPMS	ICP/MS	2643911	2011/10/12	2011/10/12	VIVIANA CANZONIERI
Moisture	BAL	2642281	N/A	2011/10/08	CHAMIKA DEEYAGAHA
pH CaCl2 EXTRACT		2642428	2011/10/09	2011/10/11	XUANHONG QIU
Loss On Ignition (LOI)		2646427	N/A	2011/10/26	GRACE SISON
Total Kjeldahl Nitrogen - Soil	AC	2642481	2011/10/10	2011/10/12	CHANDRA NANDLAL
Total Organic Carbon in Soil	LECO	2643089	N/A	2011/10/12	GODWIN OKEREKE

Maxxam ID LD6274 **Collected** 2011/09/28
Sample ID MAR 1 **Shipped**
Matrix Soil **Received** 2011/10/05

Test Description	Instrumentation	Batch	Extracted	Analyzed	Analyst
Acid Extr. Metals (aqua regia) by ICPMS	ICP/MS	2643911	2011/10/12	2011/10/12	VIVIANA CANZONIERI
Moisture	BAL	2642281	N/A	2011/10/08	CHAMIKA DEEYAGAHA
pH CaCl2 EXTRACT		2642428	2011/10/09	2011/10/11	XUANHONG QIU
Loss On Ignition (LOI)		2646427	N/A	2011/10/26	GRACE SISON
Total Kjeldahl Nitrogen - Soil	AC	2642481	2011/10/10	2011/10/12	CHANDRA NANDLAL
Total Organic Carbon in Soil	LECO	2643089	N/A	2011/10/12	GODWIN OKEREKE

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Maxxam Job #: B1F4584
Report Date: 2011/10/27

AMEC Earth & Environmental Ltd
Client Project #: TC111504.2003
Site Location: RAINY RIVER RESOURCES
Sampler Initials: PM

Test Summary

Maxxam ID LD6275 **Collected** 2011/09/28
Sample ID MAR 2 **Shipped**
Matrix Soil **Received** 2011/10/05

Test Description	Instrumentation	Batch	Extracted	Analyzed	Analyst
Acid Extr. Metals (aqua regia) by ICPMS	ICP/MS	2643911	2011/10/12	2011/10/12	VIVIANA CANZONIERI
Moisture	BAL	2642281	N/A	2011/10/08	CHAMIKA DEEYAGAHA
pH CaCl2 EXTRACT		2640806	2011/10/07	2011/10/07	NEIL DASSANAYAKE
Loss On Ignition (LOI)		2646427	N/A	2011/10/26	GRACE SISON
Total Kjeldahl Nitrogen - Soil	AC	2641135	2011/10/07	2011/10/11	CHANDRA NANDLAL
Total Organic Carbon in Soil	LECO	2643089	N/A	2011/10/12	GODWIN OKEREKE

Maxxam ID LD6276 **Collected** 2011/09/28
Sample ID MAR UP POND **Shipped**
Matrix Soil **Received** 2011/10/05

Test Description	Instrumentation	Batch	Extracted	Analyzed	Analyst
Acid Extr. Metals (aqua regia) by ICPMS	ICP/MS	2643911	2011/10/12	2011/10/13	VIVIANA CANZONIERI
Moisture	BAL	2642281	N/A	2011/10/08	CHAMIKA DEEYAGAHA
pH CaCl2 EXTRACT		2642428	2011/10/09	2011/10/11	XUANHONG QIU
Loss On Ignition (LOI)		2646427	N/A	2011/10/26	GRACE SISON
Total Kjeldahl Nitrogen - Soil	AC	2642481	2011/10/10	2011/10/12	CHANDRA NANDLAL
Total Organic Carbon in Soil	LECO	2643089	N/A	2011/10/12	GODWIN OKEREKE

Maxxam ID LD6277 **Collected** 2011/09/27
Sample ID MAR 3 **Shipped**
Matrix Soil **Received** 2011/10/05

Test Description	Instrumentation	Batch	Extracted	Analyzed	Analyst
Acid Extr. Metals (aqua regia) by ICPMS	ICP/MS	2643911	2011/10/12	2011/10/12	VIVIANA CANZONIERI
Moisture	BAL	2642281	N/A	2011/10/08	CHAMIKA DEEYAGAHA
pH CaCl2 EXTRACT		2642428	2011/10/09	2011/10/11	XUANHONG QIU
Loss On Ignition (LOI)		2646427	N/A	2011/10/26	GRACE SISON
Total Kjeldahl Nitrogen - Soil	AC	2642481	2011/10/10	2011/10/12	CHANDRA NANDLAL
Total Organic Carbon in Soil	LECO	2643089	N/A	2011/10/12	GODWIN OKEREKE

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Maxxam Job #: B1F4584
Report Date: 2011/10/27

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Client Project #: TC111504.2003
Site Location: RAINY RIVER RESOURCES
Sampler Initials: PM

Test Summary

Maxxam ID LD6278 **Collected** 2011/09/27
Sample ID MAR 4 **Shipped**
Matrix Soil **Received** 2011/10/05

Test Description	Instrumentation	Batch	Extracted	Analyzed	Analyst
Acid Extr. Metals (aqua regia) by ICPMS	ICP/MS	2643911	2011/10/12	2011/10/12	VIVIANA CANZONIERI
Moisture	BAL	2642281	N/A	2011/10/08	CHAMIKA DEEYAGAHA
pH CaCl2 EXTRACT		2642428	2011/10/09	2011/10/11	XUANHONG QIU
Loss On Ignition (LOI)		2646427	N/A	2011/10/26	GRACE SISON
Total Kjeldahl Nitrogen - Soil	AC	2642481	2011/10/10	2011/10/12	CHANDRA NANDLAL
Total Organic Carbon in Soil	LECO	2643089	N/A	2011/10/12	GODWIN OKEREKE

Maxxam ID LD6278 Dup **Collected** 2011/09/27
Sample ID MAR 4 **Shipped**
Matrix Soil **Received** 2011/10/05

Test Description	Instrumentation	Batch	Extracted	Analyzed	Analyst
Total Kjeldahl Nitrogen - Soil	AC	2642481	2011/10/10	2011/10/12	CHANDRA NANDLAL

Maxxam ID LD6279 **Collected** 2011/09/28
Sample ID CLA 2 **Shipped**
Matrix Soil **Received** 2011/10/05

Test Description	Instrumentation	Batch	Extracted	Analyzed	Analyst
Acid Extr. Metals (aqua regia) by ICPMS	ICP/MS	2643911	2011/10/12	2011/10/12	VIVIANA CANZONIERI
Moisture	BAL	2642281	N/A	2011/10/08	CHAMIKA DEEYAGAHA
pH CaCl2 EXTRACT		2640806	2011/10/07	2011/10/07	NEIL DASSANAYAKE
Loss On Ignition (LOI)		2646427	N/A	2011/10/26	GRACE SISON
Total Kjeldahl Nitrogen - Soil	AC	2641135	2011/10/07	2011/10/11	CHANDRA NANDLAL
Total Organic Carbon in Soil	LECO	2643089	N/A	2011/10/12	GODWIN OKEREKE

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Maxxam Job #: B1F4584
Report Date: 2011/10/27

AMEC Earth & Environmental Ltd
Client Project #: TC111504.2003
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Test Summary

Maxxam ID LD6280 **Collected** 2011/09/29
Sample ID WES 4 **Shipped**
Matrix Soil **Received** 2011/10/05

Test Description	Instrumentation	Batch	Extracted	Analyzed	Analyst
Acid Extr. Metals (aqua regia) by ICPMS	ICP/MS	2643911	2011/10/12	2011/10/12	VIVIANA CANZONIERI
Moisture	BAL	2642281	N/A	2011/10/08	CHAMIKA DEEYAGAHA
pH CaCl2 EXTRACT		2642428	2011/10/09	2011/10/11	XUANHONG QIU
Loss On Ignition (LOI)		2646427	N/A	2011/10/26	GRACE SISON
Total Kjeldahl Nitrogen - Soil	AC	2642481	2011/10/10	2011/10/12	CHANDRA NANDLAL
Total Organic Carbon in Soil	LECO	2643089	N/A	2011/10/12	GODWIN OKEREKE

Maxxam ID LD6280 Dup **Collected** 2011/09/29
Sample ID WES 4 **Shipped**
Matrix Soil **Received** 2011/10/05

Test Description	Instrumentation	Batch	Extracted	Analyzed	Analyst
Acid Extr. Metals (aqua regia) by ICPMS	ICP/MS	2643911	2011/10/12	2011/10/12	VIVIANA CANZONIERI

Maxxam ID LD6281 **Collected** 2011/09/30
Sample ID ROUTE 600 **Shipped**
Matrix Soil **Received** 2011/10/05

Test Description	Instrumentation	Batch	Extracted	Analyzed	Analyst
Acid Extr. Metals (aqua regia) by ICPMS	ICP/MS	2643911	2011/10/12	2011/10/12	VIVIANA CANZONIERI
Moisture	BAL	2642281	N/A	2011/10/08	CHAMIKA DEEYAGAHA
pH CaCl2 EXTRACT		2640806	2011/10/07	2011/10/07	NEIL DASSANAYAKE
Loss On Ignition (LOI)		2646427	N/A	2011/10/26	GRACE SISON
Total Kjeldahl Nitrogen - Soil	AC	2641135	2011/10/07	2011/10/11	CHANDRA NANDLAL
Total Organic Carbon in Soil	LECO	2643089	N/A	2011/10/12	GODWIN OKEREKE

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Maxxam Job #: B1F4584
Report Date: 2011/10/27

AMEC Earth & Environmental Ltd
Client Project #: TC111504.2003
Site Location: RAINY RIVER RESOURCES
Sampler Initials: PM

Test Summary

Maxxam ID LD6281 Dup
Sample ID ROUTE 600
Matrix Soil

Collected 2011/09/30
Shipped
Received 2011/10/05

Test Description	Instrumentation	Batch	Extracted	Analyzed	Analyst
Loss On Ignition (LOI)		2646427	N/A	2011/10/26	GRACE SISON

Maxxam ID LD6282
Sample ID LOT T2
Matrix Soil

Collected 2011/10/01
Shipped
Received 2011/10/05

Test Description	Instrumentation	Batch	Extracted	Analyzed	Analyst
Acid Extr. Metals (aqua regia) by ICPMS	ICP/MS	2643911	2011/10/12	2011/10/12	VIVIANA CANZONIERI
Moisture	BAL	2642281	N/A	2011/10/08	CHAMIKA DEEYAGAHA
pH CaCl2 EXTRACT		2642428	2011/10/09	2011/10/11	XUANHONG QIU
Loss On Ignition (LOI)		2646427	N/A	2011/10/26	GRACE SISON
Total Kjeldahl Nitrogen - Soil	AC	2642481	2011/10/10	2011/10/12	CHANDRA NANDLAL
Total Organic Carbon in Soil	LECO	2643089	N/A	2011/10/12	GODWIN OKEREKE

Maxxam ID LD6283
Sample ID TAIT T5-1
Matrix Soil

Collected 2011/10/02
Shipped
Received 2011/10/05

Test Description	Instrumentation	Batch	Extracted	Analyzed	Analyst
Acid Extr. Metals (aqua regia) by ICPMS	ICP/MS	2643911	2011/10/12	2011/10/12	VIVIANA CANZONIERI
Moisture	BAL	2642281	N/A	2011/10/08	CHAMIKA DEEYAGAHA
pH CaCl2 EXTRACT		2642428	2011/10/09	2011/10/11	XUANHONG QIU
Loss On Ignition (LOI)		2646427	N/A	2011/10/26	GRACE SISON
Total Kjeldahl Nitrogen - Soil	AC	2642481	2011/10/10	2011/10/12	CHANDRA NANDLAL
Total Organic Carbon in Soil	LECO	2643089	N/A	2011/10/12	GODWIN OKEREKE

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Maxxam Job #: B1F4584
Report Date: 2011/10/27

AMEC Earth & Environmental Ltd
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Site Location: RAINY RIVER RESOURCES
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Test Summary

Maxxam ID LD6284 **Collected** 2011/10/02
Sample ID PIN 4 **Shipped**
Matrix Soil **Received** 2011/10/05

Test Description	Instrumentation	Batch	Extracted	Analyzed	Analyst
Acid Extr. Metals (aqua regia) by ICPMS	ICP/MS	2643911	2011/10/12	2011/10/12	VIVIANA CANZONIERI
Moisture	BAL	2642281	N/A	2011/10/08	CHAMIKA DEEYAGAHA
pH CaCl2 EXTRACT		2644086	2011/10/12	2011/10/12	XUANHONG QIU
Loss On Ignition (LOI)		2646427	N/A	2011/10/26	GRACE SISON
Total Kjeldahl Nitrogen - Soil	AC	2643060	2011/10/11	2011/10/12	CHANDRA NANDLAL
Total Organic Carbon in Soil	LECO	2643089	N/A	2011/10/12	GODWIN OKEREKE

Maxxam ID LD6285 **Collected** 2011/10/01
Sample ID PIN 6 **Shipped**
Matrix Soil **Received** 2011/10/05

Test Description	Instrumentation	Batch	Extracted	Analyzed	Analyst
Acid Extr. Metals (aqua regia) by ICPMS	ICP/MS	2643911	2011/10/12	2011/10/12	VIVIANA CANZONIERI
Moisture	BAL	2642281	N/A	2011/10/08	CHAMIKA DEEYAGAHA
pH CaCl2 EXTRACT		2644086	2011/10/12	2011/10/12	XUANHONG QIU
Loss On Ignition (LOI)		2646427	N/A	2011/10/26	GRACE SISON
Total Kjeldahl Nitrogen - Soil	AC	2642481	2011/10/10	2011/10/12	CHANDRA NANDLAL
Total Organic Carbon in Soil	LECO	2643089	N/A	2011/10/12	GODWIN OKEREKE

Maxxam ID LD6286 **Collected** 2011/09/30
Sample ID BLA 1 **Shipped**
Matrix Soil **Received** 2011/10/05

Test Description	Instrumentation	Batch	Extracted	Analyzed	Analyst
Acid Extr. Metals (aqua regia) by ICPMS	ICP/MS	2643911	2011/10/12	2011/10/12	VIVIANA CANZONIERI
Moisture	BAL	2642247	N/A	2011/10/08	CHAMIKA DEEYAGAHA
pH CaCl2 EXTRACT		2644086	2011/10/12	2011/10/12	XUANHONG QIU
Loss On Ignition (LOI)		2646427	N/A	2011/10/26	GRACE SISON
Total Kjeldahl Nitrogen - Soil	AC	2642481	2011/10/10	2011/10/12	CHANDRA NANDLAL
Total Organic Carbon in Soil	LECO	2643089	N/A	2011/10/12	GODWIN OKEREKE

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Maxxam Job #: B1F4584
Report Date: 2011/10/27

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Site Location: RAINY RIVER RESOURCES
Sampler Initials: PM

Test Summary

Maxxam ID LD6287 **Collected** 2011/09/29
Sample ID WES 2 POND **Shipped**
Matrix Soil **Received** 2011/10/05

Test Description	Instrumentation	Batch	Extracted	Analyzed	Analyst
Acid Extr. Metals (aqua regia) by ICPMS	ICP/MS	2643870	2011/10/12	2011/10/13	VIVIANA CANZONIERI
Moisture	BAL	2642247	N/A	2011/10/08	CHAMIKA DEEYAGAHA
pH CaCl2 EXTRACT		2642426	2011/10/09	2011/10/11	XUANHONG QIU
Loss On Ignition (LOI)		2646427	N/A	2011/10/26	GRACE SISON
Total Kjeldahl Nitrogen - Soil	AC	2643060	2011/10/11	2011/10/12	CHANDRA NANDLAL
Total Organic Carbon in Soil	LECO	2643485	N/A	2011/10/12	GODWIN OKEREKE

Maxxam ID LD6287 Dup **Collected** 2011/09/29
Sample ID WES 2 POND **Shipped**
Matrix Soil **Received** 2011/10/05

Test Description	Instrumentation	Batch	Extracted	Analyzed	Analyst
Total Organic Carbon in Soil	LECO	2643485	N/A	2011/10/12	GODWIN OKEREKE

Maxxam ID LD6288 **Collected** 2011/10/02
Sample ID CLA 3 **Shipped**
Matrix Soil **Received** 2011/10/05

Test Description	Instrumentation	Batch	Extracted	Analyzed	Analyst
Acid Extr. Metals (aqua regia) by ICPMS	ICP/MS	2643870	2011/10/12	2011/10/13	VIVIANA CANZONIERI
Moisture	BAL	2642247	N/A	2011/10/08	CHAMIKA DEEYAGAHA
pH CaCl2 EXTRACT		2644086	2011/10/12	2011/10/12	XUANHONG QIU
Loss On Ignition (LOI)		2646427	N/A	2011/10/26	GRACE SISON
Total Kjeldahl Nitrogen - Soil	AC	2643060	2011/10/11	2011/10/12	CHANDRA NANDLAL
Total Organic Carbon in Soil	LECO	2643485	N/A	2011/10/12	GODWIN OKEREKE

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Test Summary

Maxxam ID LD6289 **Collected** 2011/10/02
Sample ID WES 3 **Shipped**
Matrix Soil **Received** 2011/10/05

Test Description	Instrumentation	Batch	Extracted	Analyzed	Analyst
Acid Extr. Metals (aqua regia) by ICPMS	ICP/MS	2643870	2011/10/12	2011/10/13	VIVIANA CANZONIERI
Moisture	BAL	2642247	N/A	2011/10/08	CHAMIKA DEEYAGAHA
pH CaCl2 EXTRACT		2644086	2011/10/12	2011/10/12	XUANHONG QIU
Loss On Ignition (LOI)		2646427	N/A	2011/10/26	GRACE SISON
Total Kjeldahl Nitrogen - Soil	AC	2642481	2011/10/10	2011/10/12	CHANDRA NANDLAL
Total Organic Carbon in Soil	LECO	2643485	N/A	2011/10/12	GODWIN OKEREKE

Maxxam ID LD6290 **Collected** 2011/10/02
Sample ID TAIT T2-1 **Shipped**
Matrix Soil **Received** 2011/10/05

Test Description	Instrumentation	Batch	Extracted	Analyzed	Analyst
Acid Extr. Metals (aqua regia) by ICPMS	ICP/MS	2643870	2011/10/12	2011/10/13	VIVIANA CANZONIERI
Moisture	BAL	2642247	N/A	2011/10/08	CHAMIKA DEEYAGAHA
pH CaCl2 EXTRACT		2644086	2011/10/12	2011/10/12	XUANHONG QIU
Loss On Ignition (LOI)		2646427	N/A	2011/10/26	GRACE SISON
Total Kjeldahl Nitrogen - Soil	AC	2642481	2011/10/10	2011/10/12	CHANDRA NANDLAL
Total Organic Carbon in Soil	LECO	2643485	N/A	2011/10/12	GODWIN OKEREKE

Maxxam ID LD6291 **Collected**
Sample ID DUP 3 **Shipped**
Matrix Soil **Received** 2011/10/05

Test Description	Instrumentation	Batch	Extracted	Analyzed	Analyst
Acid Extr. Metals (aqua regia) by ICPMS	ICP/MS	2643870	2011/10/12	2011/10/13	VIVIANA CANZONIERI
Moisture	BAL	2642247	N/A	2011/10/08	CHAMIKA DEEYAGAHA
pH CaCl2 EXTRACT		2642426	2011/10/09	2011/10/11	XUANHONG QIU
Loss On Ignition (LOI)		2646427	N/A	2011/10/26	GRACE SISON
Total Kjeldahl Nitrogen - Soil	AC	2643060	2011/10/11	2011/10/12	CHANDRA NANDLAL
Total Organic Carbon in Soil	LECO	2643485	N/A	2011/10/12	GODWIN OKEREKE

Maxxam Job #: B1F4584
Report Date: 2011/10/27

AMEC Earth & Environmental Ltd
Client Project #: TC111504.2003
Site Location: RAINY RIVER RESOURCES
Sampler Initials: PM

Test Summary

Maxxam ID LD6291 Dup
Sample ID DUP 3
Matrix Soil

Collected
Shipped
Received 2011/10/05

Test Description	Instrumentation	Batch	Extracted	Analyzed	Analyst
Loss On Ignition (LOI)		2646427	N/A	2011/10/26	GRACE SISON

Maxxam ID LD6292
Sample ID PIN 2
Matrix Soil

Collected 2011/09/30
Shipped
Received 2011/10/05

Test Description	Instrumentation	Batch	Extracted	Analyzed	Analyst
Acid Extr. Metals (aqua regia) by ICPMS	ICP/MS	2643870	2011/10/12	2011/10/13	VIVIANA CANZONIERI
Moisture	BAL	2642247	N/A	2011/10/08	CHAMIKA DEEYAGAHA
pH CaCl2 EXTRACT		2642428	2011/10/09	2011/10/11	XUANHONG QIU
Loss On Ignition (LOI)		2646427	N/A	2011/10/26	GRACE SISON
Total Kjeldahl Nitrogen - Soil	AC	2642481	2011/10/10	2011/10/12	CHANDRA NANDLAL
Total Organic Carbon in Soil	LECO	2643485	N/A	2011/10/12	GODWIN OKEREKE

Maxxam ID LD6292 Dup
Sample ID PIN 2
Matrix Soil

Collected 2011/09/30
Shipped
Received 2011/10/05

Test Description	Instrumentation	Batch	Extracted	Analyzed	Analyst
Acid Extr. Metals (aqua regia) by ICPMS	ICP/MS	2643870	2011/10/12	2011/10/13	VIVIANA CANZONIERI

Maxxam ID LD6293
Sample ID WES 1
Matrix Soil

Collected 2011/09/29
Shipped
Received 2011/10/05

Test Description	Instrumentation	Batch	Extracted	Analyzed	Analyst
Acid Extr. Metals (aqua regia) by ICPMS	ICP/MS	2643870	2011/10/12	2011/10/13	VIVIANA CANZONIERI
Moisture	BAL	2642247	N/A	2011/10/08	CHAMIKA DEEYAGAHA
pH CaCl2 EXTRACT		2644086	2011/10/12	2011/10/12	XUANHONG QIU
Loss On Ignition (LOI)		2646427	N/A	2011/10/26	GRACE SISON
Total Kjeldahl Nitrogen - Soil	AC	2642481	2011/10/10	2011/10/12	CHANDRA NANDLAL

Maxxam Job #: B1F4584
Report Date: 2011/10/27

AMEC Earth & Environmental Ltd
Client Project #: TC111504.2003
Site Location: RAINY RIVER RESOURCES
Sampler Initials: PM

Test Summary

Total Organic Carbon in Soil	LECO	2643485	N/A	2011/10/12	GODWIN OKEREKE

Maxxam ID LD6294 **Collected**
Sample ID DUP 2 **Shipped**
Matrix Soil **Received** 2011/10/05

Test Description	Instrumentation	Batch	Extracted	Analyzed	Analyst
Acid Extr. Metals (aqua regia) by ICPMS	ICP/MS	2643870	2011/10/12	2011/10/13	VIVIANA CANZONIERI
Moisture	BAL	2642247	N/A	2011/10/08	CHAMIKA DEEYAGAHA
pH CaCl2 EXTRACT		2644086	2011/10/12	2011/10/12	XUANHONG QIU
Loss On Ignition (LOI)		2646427	N/A	2011/10/26	GRACE SISON
Total Kjeldahl Nitrogen - Soil	AC	2643060	2011/10/11	2011/10/12	CHANDRA NANDLAL
Total Organic Carbon in Soil	LECO	2643485	N/A	2011/10/12	GODWIN OKEREKE

Maxxam ID LD6295 **Collected** 2011/09/29
Sample ID PIN 3 **Shipped**
Matrix Soil **Received** 2011/10/05

Test Description	Instrumentation	Batch	Extracted	Analyzed	Analyst
Acid Extr. Metals (aqua regia) by ICPMS	ICP/MS	2643870	2011/10/12	2011/10/13	VIVIANA CANZONIERI
Moisture	BAL	2642247	N/A	2011/10/08	CHAMIKA DEEYAGAHA
pH CaCl2 EXTRACT		2642426	2011/10/09	2011/10/11	XUANHONG QIU
Loss On Ignition (LOI)		2646427	N/A	2011/10/26	GRACE SISON
Total Kjeldahl Nitrogen - Soil	AC	2643060	2011/10/11	2011/10/12	CHANDRA NANDLAL
Total Organic Carbon in Soil	LECO	2643485	N/A	2011/10/12	GODWIN OKEREKE

Maxxam ID LD6296 **Collected** 2011/09/29
Sample ID WES 2 **Shipped**
Matrix Soil **Received** 2011/10/05

Test Description	Instrumentation	Batch	Extracted	Analyzed	Analyst
Acid Extr. Metals (aqua regia) by ICPMS	ICP/MS	2643870	2011/10/12	2011/10/13	VIVIANA CANZONIERI
Moisture	BAL	2642247	N/A	2011/10/08	CHAMIKA DEEYAGAHA
pH CaCl2 EXTRACT		2642428	2011/10/09	2011/10/11	XUANHONG QIU
Loss On Ignition (LOI)		2646427	N/A	2011/10/26	GRACE SISON
Total Kjeldahl Nitrogen - Soil	AC	2642481	2011/10/10	2011/10/12	CHANDRA NANDLAL

Maxxam Job #: B1F4584
Report Date: 2011/10/27

AMEC Earth & Environmental Ltd
Client Project #: TC111504.2003
Site Location: RAINY RIVER RESOURCES
Sampler Initials: PM

Test Summary

Total Organic Carbon in Soil	LECO	2643485	N/A	2011/10/12	GODWIN OKEREKE

Maxxam ID LD6297 **Collected** 2011/10/01
Sample ID DUP 1 **Shipped**
Matrix Soil **Received** 2011/10/05

Test Description	Instrumentation	Batch	Extracted	Analyzed	Analyst
Acid Extr. Metals (aqua regia) by ICPMS	ICP/MS	2643870	2011/10/12	2011/10/13	VIVIANA CANZONIERI
Moisture	BAL	2642247	N/A	2011/10/08	CHAMIKA DEEYAGAHA
pH CaCl2 EXTRACT		2644086	2011/10/12	2011/10/12	XUANHONG QIU
Loss On Ignition (LOI)		2646427	N/A	2011/10/26	GRACE SISON
Total Kjeldahl Nitrogen - Soil	AC	2642481	2011/10/10	2011/10/12	CHANDRA NANDLAL
Total Organic Carbon in Soil	LECO	2643485	N/A	2011/10/12	GODWIN OKEREKE

Maxxam ID LD6298 **Collected** 2011/10/01
Sample ID LOS 2 **Shipped**
Matrix Soil **Received** 2011/10/05

Test Description	Instrumentation	Batch	Extracted	Analyzed	Analyst
Acid Extr. Metals (aqua regia) by ICPMS	ICP/MS	2643870	2011/10/12	2011/10/13	VIVIANA CANZONIERI
Moisture	BAL	2642247	N/A	2011/10/08	CHAMIKA DEEYAGAHA
pH CaCl2 EXTRACT		2644086	2011/10/12	2011/10/12	XUANHONG QIU
Loss On Ignition (LOI)		2646427	N/A	2011/10/26	GRACE SISON
Total Kjeldahl Nitrogen - Soil	AC	2642481	2011/10/10	2011/10/12	CHANDRA NANDLAL
Total Organic Carbon in Soil	LECO	2643485	N/A	2011/10/12	GODWIN OKEREKE

Maxxam ID LD6299 **Collected** 2011/10/01
Sample ID LOS 1 **Shipped**
Matrix Soil **Received** 2011/10/05

Test Description	Instrumentation	Batch	Extracted	Analyzed	Analyst
Acid Extr. Metals (aqua regia) by ICPMS	ICP/MS	2643870	2011/10/12	2011/10/13	VIVIANA CANZONIERI
Moisture	BAL	2642247	N/A	2011/10/08	CHAMIKA DEEYAGAHA
pH CaCl2 EXTRACT		2642428	2011/10/09	2011/10/11	XUANHONG QIU
Loss On Ignition (LOI)		2646427	N/A	2011/10/26	GRACE SISON
Total Kjeldahl Nitrogen - Soil	AC	2642481	2011/10/10	2011/10/12	CHANDRA NANDLAL

Maxxam Job #: B1F4584
Report Date: 2011/10/27

AMEC Earth & Environmental Ltd
Client Project #: TC111504.2003
Site Location: RAINY RIVER RESOURCES
Sampler Initials: PM

Test Summary

Total Organic Carbon in Soil	LECO	2643485	N/A	2011/10/12	GODWIN OKEREKE

Maxxam ID LD6299 Dup
Sample ID LOS 1
Matrix Soil

Collected 2011/10/01
Shipped
Received 2011/10/05

Test Description	Instrumentation	Batch	Extracted	Analyzed	Analyst
pH CaCl2 EXTRACT		2642428	2011/10/09	2011/10/11	XUANHONG QIU

Maxxam ID LD6300
Sample ID PIN 1
Matrix Soil

Collected 2011/09/30
Shipped
Received 2011/10/05

Test Description	Instrumentation	Batch	Extracted	Analyzed	Analyst
Acid Extr. Metals (aqua regia) by ICPMS	ICP/MS	2643870	2011/10/12	2011/10/13	VIVIANA CANZONIERI
Moisture	BAL	2642247	N/A	2011/10/08	CHAMIKA DEEYAGAHA
pH CaCl2 EXTRACT		2642426	2011/10/09	2011/10/11	XUANHONG QIU
Loss On Ignition (LOI)		2646427	N/A	2011/10/26	GRACE SISON
Total Kjeldahl Nitrogen - Soil	AC	2643060	2011/10/11	2011/10/12	CHANDRA NANDLAL
Total Organic Carbon in Soil	LECO	2643485	N/A	2011/10/12	GODWIN OKEREKE

Maxxam ID LD6300 Dup
Sample ID PIN 1
Matrix Soil

Collected 2011/09/30
Shipped
Received 2011/10/05

Test Description	Instrumentation	Batch	Extracted	Analyzed	Analyst
Loss On Ignition (LOI)		2646427	N/A	2011/10/26	GRACE SISON

Maxxam Job #: B1F4584
Report Date: 2011/10/27

AMEC Earth & Environmental Ltd
Client Project #: TC111504.2003
Site Location: RAINY RIVER RESOURCES
Sampler Initials: PM

Package 1	15.3°C
Package 2	13.7°C
Package 3	15.7°C

Each temperature is the average of up to three cooler temperatures taken at receipt

GENERAL COMMENTS

Samples received at a temperature above 10 C. Analysis performed with client's consent.

Maxxam Analytics International Corporation o/a Maxxam Analytics 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.maxxam.ca

Maxxam Job #: B1F4584
Report Date: 2011/10/27

AMEC Earth & Environmental Ltd
Client Project #: TC111504.2003
Site Location: RAINY RIVER RESOURCES
Sampler Initials: PM

QUALITY ASSURANCE REPORT

			Matrix Spike		Spiked Blank		Method Blank		RPD		QC Standard	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	Units	Value (%)	QC Limits	% Recovery	QC Limits
2641135	Total Kjeldahl Nitrogen	2011/10/11	NC	75 - 125			<10	ug/g	2.0	40	96	75 - 125
2642247	Moisture	2011/10/08							9.7	20		
2642281	Moisture	2011/10/08							3.5	20		
2642481	Total Kjeldahl Nitrogen	2011/10/12	NC	75 - 125			<10	ug/g	11.0	40	99	75 - 125
2643060	Total Kjeldahl Nitrogen	2011/10/12	NC	75 - 125			<10	ug/g	6.8	40	86	75 - 125
2643089	Total Organic Carbon	2011/10/12					<500	mg/kg	5.3	35	97	80 - 120
2643485	Total Organic Carbon	2011/10/12					<500	mg/kg	2.4	35	90	80 - 120
2643870	Acid Extractable Aluminum (Al)	2011/10/13	NC	75 - 125	106	75 - 125	<50	ug/g	2.9	30		
2643870	Acid Extractable Antimony (Sb)	2011/10/13	99	75 - 125	101	75 - 125	<0.2	ug/g	NC	30		
2643870	Acid Extractable Arsenic (As)	2011/10/13	97	75 - 125	97	75 - 125	<1	ug/g	NC	30		
2643870	Acid Extractable Barium (Ba)	2011/10/13	NC	75 - 125	99	75 - 125	<0.5	ug/g	4.4	30		
2643870	Acid Extractable Beryllium (Be)	2011/10/13	104	75 - 125	102	75 - 125	<0.2	ug/g	NC	30		
2643870	Acid Extractable Bismuth (Bi)	2011/10/13	100	75 - 125	97	75 - 125	<1	ug/g	NC	30		
2643870	Acid Extractable Boron (B)	2011/10/13	101	75 - 125	104	75 - 125	<5	ug/g	NC	30		
2643870	Acid Extractable Cadmium (Cd)	2011/10/13	102	75 - 125	102	75 - 125	<0.1	ug/g	NC	30		
2643870	Acid Extractable Calcium (Ca)	2011/10/13	NC	75 - 125	101	75 - 125	<50	ug/g	8.3	30		
2643870	Acid Extractable Chromium (Cr)	2011/10/13	102	75 - 125	99	75 - 125	<1	ug/g	11.6	30		
2643870	Acid Extractable Cobalt (Co)	2011/10/13	99	75 - 125	98	75 - 125	<0.1	ug/g	4.4	30		
2643870	Acid Extractable Copper (Cu)	2011/10/13	96	75 - 125	99	75 - 125	<0.5	ug/g	5.8	30		
2643870	Acid Extractable Iron (Fe)	2011/10/13	NC	75 - 125	105	75 - 125	<50	ug/g	5.4	30		
2643870	Acid Extractable Lead (Pb)	2011/10/13	100	75 - 125	97	75 - 125	<1	ug/g	NC	30		
2643870	Acid Extractable Magnesium (Mg)	2011/10/13	NC	75 - 125	100	75 - 125	<50	ug/g	9.0	30		
2643870	Acid Extractable Manganese (Mn)	2011/10/13	NC	75 - 125	99	75 - 125	<1	ug/g	5.7	30		
2643870	Acid Extractable Molybdenum (Mo)	2011/10/13	101	75 - 125	99	75 - 125	<0.5	ug/g	NC	30		
2643870	Acid Extractable Nickel (Ni)	2011/10/13	100	75 - 125	100	75 - 125	<0.5	ug/g	8.1	30		
2643870	Acid Extractable Phosphorus (P)	2011/10/13	NC	75 - 125	88	75 - 125	<50	ug/g	7.4	30		
2643870	Acid Extractable Potassium (K)	2011/10/13	NC	75 - 125	94	75 - 125	<200	ug/g	NC	30		
2643870	Acid Extractable Selenium (Se)	2011/10/13	104	75 - 125	101	75 - 125	<0.5	ug/g	NC	30		
2643870	Acid Extractable Silver (Ag)	2011/10/13	102	75 - 125	100	75 - 125	<0.2	ug/g	NC	30		
2643870	Acid Extractable Sodium (Na)	2011/10/13	96	75 - 125	97	75 - 125	<100	ug/g	NC	30		
2643870	Acid Extractable Strontium (Sr)	2011/10/13	109	75 - 125	98	75 - 125	<1	ug/g	2.9	30		
2643870	Acid Extractable Thallium (Tl)	2011/10/13	103	75 - 125	99	75 - 125	<0.05	ug/g	NC	30		
2643870	Acid Extractable Tin (Sn)	2011/10/13	106	75 - 125	102	75 - 125	<5	ug/g	NC	30		
2643870	Acid Extractable Uranium (U)	2011/10/13	101	75 - 125	98	75 - 125	<0.05	ug/g	7.2	30		
2643870	Acid Extractable Vanadium (V)	2011/10/13	105	75 - 125	102	75 - 125	<5	ug/g	NC	30		
2643870	Acid Extractable Zinc (Zn)	2011/10/13	NC	75 - 125	104	75 - 125	<5	ug/g	22.5	30		
2643870	Acid Extractable Mercury (Hg)	2011/10/13	98	75 - 125	96	75 - 125	<0.05	ug/g	NC	30		
2643911	Acid Extractable Aluminum (Al)	2011/10/12	NC	75 - 125	100	75 - 125	<50	ug/g	5.4	30		
2643911	Acid Extractable Antimony (Sb)	2011/10/12	86	75 - 125	100	75 - 125	<0.2	ug/g	NC	30		
2643911	Acid Extractable Arsenic (As)	2011/10/12	93	75 - 125	94	75 - 125	<1	ug/g	NC	30		

Maxxam Job #: B1F4584
Report Date: 2011/10/27

AMEC Earth & Environmental Ltd
Client Project #: TC111504.2003
Site Location: RAINY RIVER RESOURCES
Sampler Initials: PM

QUALITY ASSURANCE REPORT

			Matrix Spike		Spiked Blank		Method Blank		RPD		QC Standard	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	Units	Value (%)	QC Limits	% Recovery	QC Limits
2643911	Acid Extractable Barium (Ba)	2011/10/12	NC	75 - 125	94	75 - 125	<0.5	ug/g	6.3	30		
2643911	Acid Extractable Beryllium (Be)	2011/10/12	93	75 - 125	95	75 - 125	<0.2	ug/g	NC	30		
2643911	Acid Extractable Bismuth (Bi)	2011/10/12	92	75 - 125	95	75 - 125	<1	ug/g	NC	30		
2643911	Acid Extractable Boron (B)	2011/10/12	89	75 - 125	91	75 - 125	<5	ug/g	NC	30		
2643911	Acid Extractable Cadmium (Cd)	2011/10/12	93	75 - 125	99	75 - 125	<0.1	ug/g	NC	30		
2643911	Acid Extractable Calcium (Ca)	2011/10/12	NC	75 - 125	95	75 - 125	<50	ug/g	1.9	30		
2643911	Acid Extractable Chromium (Cr)	2011/10/12	100	75 - 125	95	75 - 125	<1	ug/g	0.5	30		
2643911	Acid Extractable Cobalt (Co)	2011/10/12	96	75 - 125	94	75 - 125	<0.1	ug/g	6.4	30		
2643911	Acid Extractable Copper (Cu)	2011/10/12	96	75 - 125	95	75 - 125	<0.5	ug/g	5.6	30		
2643911	Acid Extractable Iron (Fe)	2011/10/12	NC	75 - 125	103	75 - 125	<50	ug/g	8.3	30		
2643911	Acid Extractable Lead (Pb)	2011/10/12	94	75 - 125	96	75 - 125	<1	ug/g	6.1	30		
2643911	Acid Extractable Magnesium (Mg)	2011/10/12	NC	75 - 125	99	75 - 125	<50	ug/g	1.8	30		
2643911	Acid Extractable Manganese (Mn)	2011/10/12	NC	75 - 125	95	75 - 125	<1	ug/g	4.2	30		
2643911	Acid Extractable Molybdenum (Mo)	2011/10/12	91	75 - 125	97	75 - 125	<0.5	ug/g	NC	30		
2643911	Acid Extractable Nickel (Ni)	2011/10/12	97	75 - 125	93	75 - 125	<0.5	ug/g	1.3	30		
2643911	Acid Extractable Phosphorus (P)	2011/10/12	NC	75 - 125	115	75 - 125	<50	ug/g	1.1	30		
2643911	Acid Extractable Potassium (K)	2011/10/12	115	75 - 125	90	75 - 125	<200	ug/g	NC	30		
2643911	Acid Extractable Selenium (Se)	2011/10/12	93	75 - 125	96	75 - 125	<0.5	ug/g	NC	30		
2643911	Acid Extractable Silver (Ag)	2011/10/12	92	75 - 125	97	75 - 125	<0.2	ug/g	NC	30		
2643911	Acid Extractable Sodium (Na)	2011/10/12	95	75 - 125	94	75 - 125	<100	ug/g	NC	30		
2643911	Acid Extractable Strontium (Sr)	2011/10/12	98	75 - 125	92	75 - 125	<1	ug/g	4.6	30		
2643911	Acid Extractable Thallium (Tl)	2011/10/12	91	75 - 125	99	75 - 125	<0.05	ug/g	NC	30		
2643911	Acid Extractable Tin (Sn)	2011/10/12	99	75 - 125	98	75 - 125	<5	ug/g	NC	30		
2643911	Acid Extractable Uranium (U)	2011/10/12	92	75 - 125	94	75 - 125	<0.05	ug/g	1.5	30		
2643911	Acid Extractable Vanadium (V)	2011/10/12	107	75 - 125	98	75 - 125	<5	ug/g	NC	30		
2643911	Acid Extractable Zinc (Zn)	2011/10/12	NC	75 - 125	99	75 - 125	<5	ug/g	4.1	30		
2643911	Acid Extractable Mercury (Hg)	2011/10/12	99	75 - 125	102	75 - 125	<0.05	ug/g	NC	30		
2646427	Loss on Ignition	2011/10/26							0	N/A		

N/A = Not Applicable
RPD = Relative Percent Difference
Duplicate: Paired analysis of a separate portion of the same sample. Used to evaluate the variance in the measurement.
Matrix Spike: A sample to which a known amount of the analyte of interest has been added. Used to evaluate sample matrix interference.
QC Standard: A blank matrix to which a known amount of the analyte has been added. Used to evaluate analyte recovery.
Spiked Blank: A blank matrix to which a known amount of the analyte has been added. Used to evaluate analyte recovery.
Method Blank: A blank matrix containing all reagents used in the analytical procedure. Used to identify laboratory contamination.
NC (Matrix Spike): The recovery in the matrix spike was not calculated. The relative difference between the concentration in the parent sample and the spiked amount was not sufficiently significant to permit a reliable recovery calculation.
NC (RPD): The RPD was not calculated. The level of analyte detected in the parent sample and its duplicate was not sufficiently significant to permit a reliable calculation.

Validation Signature Page

Maxxam Job #: B1F4584

The analytical data and all QC contained in this report were reviewed and validated by the following individual(s).



GRACE SISON, Technical and Customer Service Coordinator

CRISTINA CARRIERE, Scientific Services

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Maxxam has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per section 5.10.2 of ISO/IEC 17025:2005(E), signing the reports. For Service Group specific validation please refer to the Validation Signature Page.

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B1F4584

SEL ENV-223

Page of

For Lab Use Only:

BOTTLE ORDER #: 282190

PROJECT MANAGER: GINA BAYBAYAN

C#282190-01-01

INVOICE INFORMATION:		REPORT INFORMATION (if differs from invoice):		PROJECT INFORMATION:	
Company Name:	#25844 AMEC Earth & Environmental Ltd	Company Name:	#12841 AMEC Earth & Environmental Ltd	Quotation #:	B16203
Contact Name:	Wanda Colbourne	Contact Name:	Jason Dietrich	P.O. #:	
Address:	160 Traders Blvd E Suite 110 Mississauga ON L4Z 3K7	Address:	160 Traders Blvd Mississauga ON	Project #:	TC111504.2003
				Project Name:	
Phone:	(905)568-2929 Fax: (905)568-1686	Phone:	Fax:	Site #:	Rainy River Resources
Email:	wanda.colbourne@amec.com	Email:	Jason.Dietrich@amec.com	Sampled By:	

Regulation 153 (2011): ☐ Table 1 ☐ Table 2 ☐ Table 3 ☐ Table ___ ☐ Res/Park ☐ Ind/Comm ☐ Agri/Other ☐ Medium/Fine ☐ Coarse ☐ For RSC

Other Regulations: ☐ CCME ☐ Reg. 558 ☐ MISA ☐ PWQO ☐ Other ☐ Sanitary Sewer Bylaw ☐ Storm Sewer Bylaw Municipality _____

SPECIAL INSTRUCTIONS

Include Criteria on Certificate of Analysis (Y/N)? ___

Note: For MOE regulated drinking water samples - please use the Drinking Water Chain of Custody Form

SAMPLES MUST BE KEPT COOL (< 10°C) FROM TIME OF SAMPLING UNTIL DELIVERY TO MAXXAM

TURNAROUND TIME (TAT) REQUIRED:

PLEASE PROVIDE ADVANCE NOTICE FOR RUSH PROJECTS

Regular (Standard) TAT: ☒
(will be applied if Rush TAT is not specified):
Standard TAT = 5-7 Working days for most tests.
Please note: Standard TAT for certain tests such as BOD and Dioxins/Furans are > 5 days - contact your Project Manager for details.

Job Specific Rush TAT (if applies to entire submission)
Date Required: _____ Time Required: _____ ☐
Rush Confirmation Number: _____ (call lab for #)

	Sample Barcode Label	Sample (Location) Identification	Date Sampled	Time Sampled	Matrix	Regulated Drinking Water ? (Y/N)	Metals Field Filtered ? (Y/N)	Acid Extr. Metals (aqua regia) by ICPMS	pH	Total Kjeldahl Nitrogen - Soil	Total Organic Carbon in Soil	Grain Size (Bag)	# of Bottles	Comments
1	Cla 1		28/09/2011	14:50	Soil			X	X	X	X	X	2+1	1 Bag
2	Mar 5		27/09/2011	14:40	Soil			X	X	X	X	X	2+1	1 Bag
3	Mar 1		28/09/2011	10:00	Soil			X	X	X	X	X	2+1	Note: some samples may be past analysis Hold time 1 Day proceed to analysis.
4	Mar 2.		28/09/2011	11:35	Soil			X	X	X	X	X	2+1	1 Bag
5	Mar up Pond.		28/09/2011	8:25	Soil			X	X	X	X	X	2+1	1 Bag
6	Mar 3.		27/09/2011	11:45	Soil			X	X	X	X	X	2+1	1 Bag
7	Mar 4		27/09/2011	10:20	Soil			X	X	X	X	X	2+1	1 Bag
8	Cla 2.		28/09/2011	13:50	Soil			X	X	X	X	X	2+1	1 Bag. Due to not enough co
9	Wes 4		29/09/2011	11:15	Soil			X	X	X	X	X	2+1	[illegible]
10	Route 600		30/09/2011	14:10	Soil			X	X	X	X	X	2+1	[illegible]

*RELINQUISHED BY: (Signature/Print)	Date: (YY/MM/DD)	Time:	RECEIVED BY: (Signature/Print)	Date: (YY/MM/DD)	Time:	# Jars Used and Not Submitted
Peter Marriage	03/10/2011	8:10	DEEPTHI SHINE	2011-10-05	09:52	

Laboratory Use Only

Time Sensitive	Temperature (°C) on Receipt	Custody Seal	Yes	No
	15, 16, 15 °C	Present		✓
		Intact		

* IT IS THE RESPONSIBILITY OF THE RELINQUISHER TO ENSURE THE ACCURACY OF THE CHAIN OF CUSTODY RECORD. AN INCOMPLETE CHAIN OF CUSTODY MAY RESULT IN ANALYTICAL TAT DELAYS.

White: Maxxam Yellow: Clien

Maxxam Analytics International Corporation o/a Maxxam Analytics

Melted Ice Packs
15, 13, 13
15, 16, 16

INVOICE INFORMATION:		REPORT INFORMATION (if differs from invoice):		PROJECT INFORMATION:		Laboratory Use Only:	
Company Name:	#25844 AMEC Earth & Environmental Ltd	Company Name:	#12841 AMEC Earth & Environmental Ltd	Quotation #:	B16203	MAXXAM JOB #:	BOTTLE ORDER #: 282190
Contact Name:	Wanda Colbourne	Contact Name:	Jason Dietrich	P.O. #:			
Address:	160 Traders Blvd E Suite 110 Mississauga ON L4Z 3K7	Address:	160 Traders Blvd Mississauga ON	Project #:	TC111804.2003	CHAIN OF CUSTODY #:	PROJECT MANAGER:
Phone:	(905)568-2929 Fax: (905)568-1686	Phone:	Fax:	Project Name:		C#282190-03-01	GINA BAYBAYAN
Email:	wanda.colbourne@amec.com	Email:	Jason.Dietrich@amec.com	Site #:	Rainy River Resources		
				Sampled By:			

Regulation 153 (2011): ☐ Table 1 ☐ Table 2 ☐ Table 3 ☐ Table ___ ☐ Res/Park ☐ Ind/Comm ☐ Agri/Other ☐ Medium/Fine ☐ Coarse ☐ For RSC

Other Regulations: ☐ CCME ☐ Reg. 558 ☐ MISA ☐ PWQO ☐ Other ___ ☐ Sanitary Sewer Bylaw ☐ Storm Sewer Bylaw Municipality ___

SPECIAL INSTRUCTIONS

Include Criteria on Certificate of Analysis (Y/N)? ___

Note: For MOE regulated drinking water samples - please use the Drinking Water Chain of Custody Form

SAMPLES MUST BE KEPT COOL (< 10°C) FROM TIME OF SAMPLING UNTIL DELIVERY TO MAXXAM

ANALYSIS REQUESTED (Please be specific):

	Sample Barcode Label	Sample (Location) Identification	Date Sampled	Time Sampled	Matrix	Regulated Drinking Water? (Y/N)	Metals Field Filtered? (Y/N)	Acid Extr. Metals (aqua regia) by ICPMS	pH	Total Kjeldahl Nitrogen - Soil	Total Organic Carbon in Soil	Grain size (1 Bag)	# of Bottles	Comments
1	Los T2		01/10/2011	11:00	Soil			X	X	X	X	X	2+1 Bag	
2	Tait T5-1		02/10/2011	14:30	Soil			X	X	X	X	X	2+1 Bag	
3	Pin 4		02/10/2011	11:00	Soil			X	X	X	X	X	2+1 Bag	
4	Pin 6		01/10/2011	14:00	Soil			X	X	X	X	X	2+1 Bag	
5	Bla 1		30/09/2011	10:19	Soil			X	X	X	X	X	2+1 Bag	
6	Wes 2 Pond		29/09/2011	14:00	Soil			X	X	X	X	X	2+1 Bag	
7	Cla 3		02/10/2011	12:15	Soil			X	X	X	X	X	2+1 Bag	
8	Wes 3		02/10/2011	9:00	Soil			X	X	X	X	X	2+1 Bag	
9	Tait T2-1		02/10/2011	13:25	Soil			X	X	X	X	X	2+1 Bag	
10	Dup 3				Soil			X	X	X	X	X	2+1 Bag	

Note! Some samples may be past hold time. Proceed w Analysis

TURNAROUND TIME (TAT) REQUIRED:

PLEASE PROVIDE ADVANCE NOTICE FOR RUSH PROJECTS

Regular (Standard) TAT: ☒
(will be applied if Rush TAT is not specified):
Standard TAT = 5-7 Working days for most tests.
Please note: Standard TAT for certain tests such as BOD and Dioxins/Furans are > 5 days - contact your Project Manager for details.

Job Specific Rush TAT (if applies to entire submission)
Date Required: ___ Time Required: ___ ☐
Rush Confirmation Number: ___ *(call lab for #)*

*RELINQUISHED BY: (Signature/Print)	Date: (YY/MM/DD)	Time:	RECEIVED BY: (Signature/Print)	Date: (YY/MM/DD)	Time:	# Jars Used and Not Submitted
Peter Morrison	07/10/2011	8:10	BOS DEEPHIL SINGH	2011-10-05	09:52	

Laboratory Use Only				
Time Sensitive	Temperature (°C) on Receipt	Custody Seal	Yes	No
	15, 13, 13°C	Present		
		Intact		

White: Maxxam Yellow: Client

* IT IS THE RESPONSIBILITY OF THE RELINQUISHER TO ENSURE THE ACCURACY OF THE CHAIN OF CUSTODY RECORD. AN INCOMPLETE CHAIN OF CUSTODY MAY RESULT IN ANALYTICAL TAT DELAYS.

Maxxam Analytics International Corporation o/a Maxxam Analytics

Coolers on Ice Pack
15, 16, 15°C
15, 16, 16°C

Page of

INVOICE INFORMATION:

Company Name: #25844 AMEC Earth & Environmental Ltd
Contact Name: Wanda Colbourne
Address: 160 Traders Blvd E Suite 110
Mississauga ON L4Z 3K7
Phone: (905)568-2929 Fax: (905)568-1686
Email: wanda.colbourne@amec.com

REPORT INFORMATION (if differs from invoice):

Company Name: #12841 AMEC Earth & Environmental Ltd
Contact Name: Jason Dietrich
Address: 160 Traders Blvd
Mississauga ON
Phone: Fax:
Email: Jason.Dietrich@amec.com

PROJECT INFORMATION:

Quotation #: B16203
P.O. #:
Project #: TC111504.2003
Project Name:
Site #: Rainy River Resources
Sampled By:

Laboratory Use Only:

MAXXAM JOB #:
BOTTLE ORDER #: 282190
CHAIN OF CUSTODY #: C#282190-02-01
PROJECT MANAGER: GINA BAYBAYAN

Regulation 153 (2011)

☐ Table 1 ☐ Res/Park ☐ Medium/Fine
☐ Table 2 ☐ Ind/Comm ☐ Coarse
☐ Table 3 ☐ Agri/Other
☐ Table ___ ☐ For RSC

Other Regulations

☐ CCME ☐ Sanitary Sewer Bylaw
☐ Reg. 558 ☐ Storm Sewer Bylaw
☐ MISA Municipality ___
☐ PWQO
☐ Other ___

SPECIAL INSTRUCTIONS

Include Criteria on Certificate of Analysis (Y/N)? ___

Note: For MOE regulated drinking water samples - please use the Drinking Water Chain of Custody Form

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☒

Job Specific Rush TAT (if applies to entire submission)
Date Required: ___ Time Required: ___ ☐
Rush Confirmation Number: ___ (call lab for #)

	Sample Barcode Label	Sample (Location) Identification	Date Sampled	Time Sampled	Matrix	Regulated Drinking Water ? (Y/N)	Metals Field Filtered ? (Y/N)	Acid Extr. Metals (aqua regia) by ICPMS	pH	Total Kjeldahl Nitrogen - Soil	Total Organic Carbon in Soil	Grain Size (Coarse)	# of Bottles	Comments
1	Pm 2	~~30/09/11~~	30/09/2011	11:25	Soil			X	X	X	X	X	2+1Bag	
2	Wes 1		29/09/2011	12:45	Soil			X	X	X	X	X	2+1Bag	
3	Dup 2				Soil			X	X	X	X	X	2+1Bag	
4	Pm 3	~~29/09/2011~~	29/09/2011	16:15	Soil			X	X	X	X	X	2+1Bag	
5	Wes 2		29/09/2011	14:15	Soil			X	X	X	X	X	2+1Bag	
6	Dup 1				Soil			X	X	X	X	X	2+1Bag	
7	Los 2		01/10/2011	15:00	Soil			X	X	X	X	X	2+1Bag	
8	Los 1		01/10/2011	12:00	Soil			X	X	X	X	X	2+1Bag	
9	Pm 1		30/09/2011	9:30	Soil			X	X	X	X	X	2+1Bag	
10														

Some Samples may be past Hold time. Proceed with Analysis.

*RELINQUISHED BY: (Signature/Print)	Date: (YY/MM/DD)	Time:	RECEIVED BY: (Signature/Print)	Date: (YY/MM/DD)	Time:	# Jars Used and Not Submitted
Peter Morrison	03/10/2011	8:10	DEEPTHI SHAKI	2011-10-05	09:52	

Laboratory Use Only

Time Sensitive	Temperature (°C) on Receipt	Custody Seal	Yes	No
	15, 16, 16°C	Present		
		Intact		

15, 16, 15°C
15, 13, 13°C

* IT IS THE RESPONSIBILITY OF THE RELINQUISHER TO ENSURE THE ACCURACY OF THE CHAIN OF CUSTODY RECORD. AN INCOMPLETE CHAIN OF CUSTODY MAY RESULT ANALYTICAL TAT DELAYS.

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White: Maxxam Yellow: Client

APPENDIX D

SEDIMENT GRAIN SIZE DATA

Your Project #: MB1F4584

Attention: SUB CONTRACTOR
MAXXAM ANALYTICS
CAMPOBELLO
6740 CAMPOBELLO ROAD
MISSISSAUGA, ON
CANADA L5N 2L8

Report Date: 2011/10/17

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B196555
Received: 2011/10/07, 8:45

Sample Matrix: Soil
Samples Received: 29

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Analytical Method
Moisture	29	N/A	2011/10/11	CAL SOP-00023	McKeague MSSMA 2.411
Particle Size by Sieve (Dry) (1)	6	N/A	2011/10/13	AB SOP-00022	SSMA 55.4
Particle Size by Sieve (Dry) (1)	13	N/A	2011/10/14	AB SOP-00022	SSMA 55.4
Particle Size by Sieve (Dry) (1)	10	N/A	2011/10/17	AB SOP-00022	SSMA 55.4
Particle Size by Sieve (Grain Size)	6	N/A	2011/10/13	AB SOP-00022	SSMA 55.4
Particle Size by Sieve (Grain Size)	13	N/A	2011/10/14	AB SOP-00022	SSMA 55.4
Particle Size by Sieve (Grain Size)	10	N/A	2011/10/17	AB SOP-00022	SSMA 55.4
Texture by Hydrometer	17	N/A	2011/10/14	AB SOP-00030	MMFSPA Ch9
Texture by Hydrometer	12	N/A	2011/10/15	AB SOP-00030	MMFSPA Ch9
Texture Class	17	N/A	2011/10/14	AB SOP-00030	MMFSPA Ch9
Texture Class	12	N/A	2011/10/15	AB SOP-00030	MMFSPA Ch9

* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.

(1) Result indicates % of sample retained on the sieve.

Encryption Key

Please direct all questions regarding this Certificate of Analysis to your Project Manager.

Joyce Kimani, Project Manager Assistant
Email: JKimani@maxxam.ca
Phone# (403) 291-3077

==========

Maxxam has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per section 5.10.2 of ISO/IEC 17025:2005(E), signing the reports. For Service Group specific validation please refer to the Validation Signature Page.

Total cover pages: 1

Maxxam Job #: B196555
Report Date: 2011/10/17

MAXXAM ANALYTICS
Client Project #: MB1F4584

RESULTS OF CHEMICAL ANALYSES OF SOIL

Maxxam ID		BT7051	BT7051		BT7092		BT7093		
Sampling Date		2011/09/29	2011/09/29		2011/09/29		2011/09/29		
	Units	**CLA 1 (LD6272-02R)**	**CLA 1 (LD6272-02R) Lab-Dup**	**QC Batch**	**MAR 5 (LD62723-02R)**	**QC Batch**	**MAR 1 (LD6274-02R)**	**RDL**	**QC Batch**
Physical Properties									
% sand by hydrometer	%	47	N/A	5266531	37	5263511	31	2	5266531
% silt by hydrometer	%	20	N/A	5266531	27	5263511	20	2	5266531
Clay Content	%	33	N/A	5266531	36	5263511	50	2	5266531
Grain Size	N/A	FINE	N/A	5250467	FINE	5250467	FINE	N/A	5250467
Texture	N/A	SNDY CL LO	N/A	5249826	CLAY LOAM	5249826	CLAY	N/A	5249826
Moisture	%	31	N/A	5254437	45	5254437	42	0.3	5254437
Sieve - #4 (>4.75mm)	%	<0.2	<0.2	5259971	<0.2	5259965	<0.2	0.2	5259965
Sieve - #10 (>2.00mm)	%	0.3	0.9	5259971	1.3	5259965	0.3	0.2	5259965
Sieve - #40 (>0.425mm)	%	2.3	2.4	5259971	4.5	5259965	4.8	0.2	5259965
Sieve - #200 (>0.075mm)	%	47	46	5259971	23	5259965	17	0.2	5259965
Sieve - Pan	%	51	51	5259971	71	5259965	78	0.2	5259965

N/A = Not Applicable
RDL = Reportable Detection Limit

Maxxam Job #: B196555
Report Date: 2011/10/17

MAXXAM ANALYTICS
Client Project #: MB1F4584

RESULTS OF CHEMICAL ANALYSES OF SOIL

Maxxam ID		BT7094	BT7095	BT7096	BT7097	BT7098	BT7099		
Sampling Date		2011/09/29	2011/09/29	2011/09/29	2011/09/29	2011/09/29	2011/09/29		
	Units	**MAR 2 (LD6275-02R)**	**MAR UP POND (LD6276-02R)**	**MAR 3 (LD6277-02R)**	**MAR 4 (LD6278-02R)**	**CLA 2 (LD6279-02R)**	**WES 4 (LD6280-02R)**	**RDL**	**QC Batch**
Physical Properties									
% sand by hydrometer	%	30	59	43	60	60	53	2	5263511
% silt by hydrometer	%	36	12	29	25	22	31	2	5263511
Clay Content	%	34	30	28	16	19	16	2	5263511
Grain Size	N/A	FINE	COARSE	FINE	COARSE	FINE	COARSE	N/A	5250467
Texture	N/A	CLAY LOAM	SNDY CL LO	CLAY LOAM	SANDY LOAM	SANDY LOAM	SANDY LOAM	N/A	5249826
Moisture	%	73	55	62	54	51	71	0.3	5254437
Sieve - #4 (>4.75mm)	%	0.6	20	<0.2	0.2	3.8	1.4	0.2	5259965
Sieve - #10 (>2.00mm)	%	1.3	19	1.3	4.2	0.9	5.8	0.2	5259965
Sieve - #40 (>0.425mm)	%	3.4	22	3.3	24	11	21	0.2	5259965
Sieve - #200 (>0.075mm)	%	7.2	15	16	31	34	29	0.2	5259965
Sieve - Pan	%	88	23	79	41	51	43	0.2	5259965

RDL = Reportable Detection Limit

Maxxam Job #: B196555
Report Date: 2011/10/17

MAXXAM ANALYTICS
Client Project #: MB1F4584

RESULTS OF CHEMICAL ANALYSES OF SOIL

Maxxam ID		BT7100	BT7100	BT7101	BT7102	BT7103		
Sampling Date		2011/09/29	2011/09/29	2011/09/29	2011/09/29	2011/09/29		
	Units	**ROUTE 600 (LD6281-02R)**	**ROUTE 600 (LD6281-02R) Lab-Dup**	**LOT T2 (LD6282-02R)**	**TAIT T5-1 (LD6283-02R)**	**PIN 4 (LD6284-02R)**	**RDL**	**QC Batch**
Physical Properties								
% sand by hydrometer	%	26	25	44	45	36	2	5263511
% silt by hydrometer	%	35	36	25	25	35	2	5263511
Clay Content	%	39	39	31	31	29	2	5263511
Grain Size	N/A	FINE	N/A	FINE	FINE	FINE	N/A	5250467
Texture	N/A	CLAY LOAM	N/A	CLAY LOAM	CLAY LOAM	CLAY LOAM	N/A	5249826
Moisture	%	41	N/A	65	38	53	0.3	5254437
Sieve - #4 (>4.75mm)	%	<0.2	N/A	2.0	<0.2	0.5	0.2	5259965
Sieve - #10 (>2.00mm)	%	0.5	N/A	5.5	2.0	0.5	0.2	5259965
Sieve - #40 (>0.425mm)	%	1.2	N/A	13	7.5	2.0	0.2	5259965
Sieve - #200 (>0.075mm)	%	11	N/A	26	25	15	0.2	5259965
Sieve - Pan	%	87	N/A	53	65	82	0.2	5259965

N/A = Not Applicable
RDL = Reportable Detection Limit

Maxxam Job #: B196555
Report Date: 2011/10/17

MAXXAM ANALYTICS
Client Project #: MB1F4584

RESULTS OF CHEMICAL ANALYSES OF SOIL

Maxxam ID		BT7104	BT7104	BT7105		BT7106		
Sampling Date		2011/09/29	2011/09/29	2011/09/29		2011/09/29		
	Units	**PIN 6 (LD6285-02R)**	**PIN 6 (LD6285-02R) Lab-Dup**	**BLA 1 (LD6286-02R)**	**QC Batch**	**WES 2POND (LD6287-02R)**	**RDL**	**QC Batch**
Physical Properties								
% sand by hydrometer	%	41	N/A	56	5263511	47	2	5266531
% silt by hydrometer	%	30	N/A	16	5263511	23	2	5266531
Clay Content	%	29	N/A	28	5263511	30	2	5266531
Grain Size	N/A	FINE	N/A	COARSE	5250467	COARSE	N/A	5250467
Texture	N/A	CLAY LOAM	N/A	SNDY CL LO	5249826	SNDY CL LO	N/A	5249826
Moisture	%	35	35	34	5254501	29	0.3	5254501
Sieve - #4 (>4.75mm)	%	<0.2	N/A	22	5259965	3.6	0.2	5259965
Sieve - #10 (>2.00mm)	%	<0.2	N/A	12	5259965	3.4	0.2	5259965
Sieve - #40 (>0.425mm)	%	1.0	N/A	9.9	5259965	14	0.2	5259965
Sieve - #200 (>0.075mm)	%	25	N/A	18	5259965	36	0.2	5259965
Sieve - Pan	%	74	N/A	38	5259965	44	0.2	5259965

N/A = Not Applicable
RDL = Reportable Detection Limit

Maxxam Job #: B196555
Report Date: 2011/10/17

MAXXAM ANALYTICS
Client Project #: MB1F4584

RESULTS OF CHEMICAL ANALYSES OF SOIL

Maxxam ID		BT7107	BT7108	BT7109	BT7110		BT7111		
Sampling Date		2011/09/29	2011/09/29	2011/09/29	2011/09/29		2011/09/29		
	Units	**CLA 3 (LD6288-02R)**	**WES 3 (LD6289-02R)**	**TAIT T2-1 (LD6290-02R**	**DUP 3 (LD6291-02R)**	**QC Batch**	**PIN 2 (LD6292-02R)**	**RDL**	**QC Batch**
Physical Properties									
% sand by hydrometer	%	45	43	48	48	5263511	82	2	5266531
% silt by hydrometer	%	19	33	30	16	5263511	10	2	5266531
Clay Content	%	36	24	21	36	5263511	8	2	5266531
Grain Size	N/A	FINE	FINE	FINE	FINE	5250467	COARSE	N/A	5250467
Texture	N/A	CLAY LOAM	LOAM	LOAM	SANDY CLAY	5249826	LOAMY SAND	N/A	5249826
Moisture	%	41	47	65	46	5254501	14	0.3	5254501
Sieve - #4 (>4.75mm)	%	<0.2	<0.2	2.9	0.8	5259965	35	0.2	5259971
Sieve - #10 (>2.00mm)	%	2.1	<0.2	0.8	3.9	5259965	25	0.2	5259971
Sieve - #40 (>0.425mm)	%	21	3.6	4.2	18	5259965	20	0.2	5259971
Sieve - #200 (>0.075mm)	%	19	28	20	18	5259965	17	0.2	5259971
Sieve - Pan	%	58	68	72	59	5259965	3.4	0.2	5259971

RDL = Reportable Detection Limit

Maxxam Job #: B196555
Report Date: 2011/10/17

MAXXAM ANALYTICS
Client Project #: MB1F4584

RESULTS OF CHEMICAL ANALYSES OF SOIL

Maxxam ID		BT7112	BT7113	BT7114	BT7115	BT7116		
Sampling Date		2011/09/29	2011/09/29	2011/09/29	2011/09/29	2011/09/29		
	Units	**WES 1 (LD6293-02R)**	**DUP 2 (LD6294-02R)**	**PIN 3 (LD6295-02R)**	**WES 2 (LD6296-02R)**	**DUP 1 (LD6297-02R)**	**RDL**	**QC Batch**
Physical Properties								
% sand by hydrometer	%	93	38	51	72	92	2	5266531
% silt by hydrometer	%	3	29	20	9	6	2	5266531
Clay Content	%	4	33	29	20	3	2	5266531
Grain Size	N/A	COARSE	FINE	COARSE	COARSE	COARSE	N/A	5250467
Texture	N/A	SAND	CLAY LOAM	SNDY CL LO	SANDY LOAM	SAND	N/A	5249826
Moisture	%	11	34	45	22	12	0.3	5254501
Sieve - #4 (>4.75mm)	%	13	<0.2	<0.2	<0.2	41	0.2	5259971
Sieve - #10 (>2.00mm)	%	33	<0.2	2.1	1.2	26	0.2	5259971
Sieve - #40 (>0.425mm)	%	26	1.3	9.6	36	21	0.2	5259971
Sieve - #200 (>0.075mm)	%	21	29	39	36	12	0.2	5259971
Sieve - Pan	%	5.9	70	49	27	0.4	0.2	5259971

RDL = Reportable Detection Limit

Maxxam Job #: B196555
Report Date: 2011/10/17

MAXXAM ANALYTICS
Client Project #: MB1F4584

RESULTS OF CHEMICAL ANALYSES OF SOIL

Maxxam ID		BT7117	BT7118	BT7119		
Sampling Date		2011/09/29	2011/09/29	2011/09/29		
	Units	**LOS 2 (LD6298-02R)**	**LOS 1 (LD6299-02R)**	**PIN 1 (LD6300-02R)**	**RDL**	**QC Batch**
Physical Properties						
% sand by hydrometer	%	85	65	58	2	5266531
% silt by hydrometer	%	4	13	21	2	5266531
Clay Content	%	11	22	20	2	5266531
Grain Size	N/A	COARSE	COARSE	FINE	N/A	5250467
Texture	N/A	LOAMY SAND	SNDY CL LO	SNDY CL LO	N/A	5250472
Moisture	%	17	42	57	0.3	5254501
Sieve - #4 (>4.75mm)	%	<0.2	11	<0.2	0.2	5259971
Sieve - #10 (>2.00mm)	%	6.4	18	0.6	0.2	5259971
Sieve - #40 (>0.425mm)	%	55	29	6.4	0.2	5259971
Sieve - #200 (>0.075mm)	%	27	20	33	0.2	5259971
Sieve - Pan	%	13	21	60	0.2	5259971

RDL = Reportable Detection Limit

Maxxam Job #: B196555
Report Date: 2011/10/17

MAXXAM ANALYTICS
Client Project #: MB1F4584

Package 1	8.9°C
Package 2	5.9°C
Package 3	3.5°C

Each temperature is the average of up to three cooler temperatures taken at receipt

General Comments

Sample BT7051-01: SNDY CL LO = SANDY CLAY LOAM

Sample BT7095-01: SNDY CL LO = SANDY CLAY LOAM

Sample BT7105-01: SNDY CL LO = SANDY CLAY LOAM

Sample BT7106-01: SNDY CL LO = SANDY CLAY LOAM

Sample BT7114-01: SNDY CL LO = SANDY CLAY LOAM

Sample BT7118-01: SNDY CL LO = SANDY CLAY LOAM

Sample BT7119-01: SNDY CL LO = SANDY CLAY LOAM

Results relate only to the items tested.

MAXXAM ANALYTICS
Attention: SUB CONTRACTOR
Client Project #: MB1F4584
P.O. #:
Site Location:

Quality Assurance Report

Maxxam Job Number: CB196555

QA/QC Batch Num	Init	QC Type	Parameter	Date Analyzed yyyy/mm/dd	Value	Recovery	Units	QC Limits
5254437	TL0	RPD	Moisture	2011/10/11	3.0		%	20
5254501	TL0	RPD [BT7104-01]	Moisture	2011/10/11	1.1		%	20
5259965	RK3	QC Standard	Sieve - #200 (>0.075mm)	2011/10/13		100	%	90 - 110
			Sieve - Pan	2011/10/13		100	%	96 - 104
		RPD	Sieve - #4 (>4.75mm)	2011/10/13	NC		%	35
			Sieve - #10 (>2.00mm)	2011/10/13	NC		%	35
			Sieve - #40 (>0.425mm)	2011/10/13	3.7		%	35
			Sieve - #200 (>0.075mm)	2011/10/13	9.0		%	35
			Sieve - Pan	2011/10/13	5.5		%	35
5259971	YU	QC Standard	Sieve - #200 (>0.075mm)	2011/10/17		103	%	90 - 110
			Sieve - Pan	2011/10/17		99	%	96 - 104
		RPD [BT7051-01]	Sieve - #4 (>4.75mm)	2011/10/17	NC		%	35
			Sieve - #10 (>2.00mm)	2011/10/17	NC		%	35
			Sieve - #40 (>0.425mm)	2011/10/17	6.0		%	35
			Sieve - #200 (>0.075mm)	2011/10/17	1.7		%	35
			Sieve - Pan	2011/10/17	0.08		%	35
5263511	LD3	QC Standard	% sand by hydrometer	2011/10/14		103	%	80 - 120
			% silt by hydrometer	2011/10/14		101	%	85 - 115
			Clay Content	2011/10/14		95	%	79 - 121
		RPD [BT7100-01]	% sand by hydrometer	2011/10/14	6.3		%	35
			% silt by hydrometer	2011/10/14	5.1		%	35
			Clay Content	2011/10/14	0.5		%	35
5266531	LD3	QC Standard	% sand by hydrometer	2011/10/15		97	%	80 - 120
			% silt by hydrometer	2011/10/15		100	%	85 - 115
			Clay Content	2011/10/15		103	%	79 - 121
		RPD	% sand by hydrometer	2011/10/15	0.2		%	35
			% silt by hydrometer	2011/10/15	2.2		%	35
			Clay Content	2011/10/15	1.2		%	35

Duplicate: Paired analysis of a separate portion of the same sample. Used to evaluate the variance in the measurement.
QC Standard: A blank matrix to which a known amount of the analyte has been added. Used to evaluate analyte recovery.
NC (RPD): The RPD was not calculated. The level of analyte detected in the parent sample and its duplicate was not sufficiently significant to permit a reliable calculation.

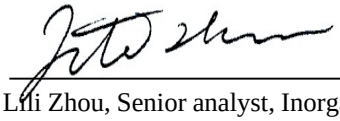
Validation Signature Page

Maxxam Job #: B196555

The analytical data and all QC contained in this report were reviewed and validated by the following individual(s).



LUBA SHYMUSHOVSKA, Senior Analyst, Organic Department



Lili Zhou, Senior analyst, Inorganic department.

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Maxxam has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per section 5.10.2 of ISO/IEC 17025:2005(E), signing the reports. For Service Group specific validation please refer to the Validation Signature Page.

APPENDIX E

AQUATIC HABITAT DATA

CREEK PROFILE SHEETS

1. Creek/Reach Name: Pin-1 Field Dates: July 22/11

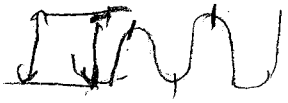
GPS Start: 15U 0428932 5407270 Weather: Sunny

End: _____ Time Start: 1115

Field Crew: JD, SA End: _____

2. Reach Length: Valley Line 40 m Channel Line _____ m

Surrounding Land Use: Agriculture



Surrounding Pollution: Agriculture



3. Channel Features:

Sinuosity		m/m	Gradient	0.03	m/m
Meander Length	30	m	Meander amplitude	17	m
Entrenchment	H/W	m			

Notes: Left 1.3/1.0 bank ratio (Slope)
Right - 1.5/2.5

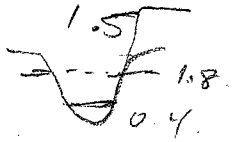
4. Channel Type:

Stream/River	Stream	Intermittent	
Channelized		Ephemeral	
Permanent	permanent		

Notes:

5. Channel Dimensions:

Floodplain width (m)	45 m	Channel depth (bank full) (m)	1.8
Channel width (wetted) (m)	5.4	Top of Bank (m)	0.5
Channel width (bank full) (m)	6.8	Average thaleg depth (m)	0.4 wetted depth



Notes:

6. Channel Morphology (%)

Pools	80	%	Flats	—	%	Runs	—	%
Riffles	—	%	Braided/diffuse	10	%	Beaver ponds	10	%

Notes:

7. Other Channel Features:

Undercut banks	5	%	Beaver dams	10	%
Amount (m):	0.2		Number Observed:	1	
Eroding banks	30	%	Woody structure	2	%
Organic debris	10	%			

Notes:

8. Summer Temperature/Dissolved Oxygen

See field book.

Summer Temperature	-water	°C	
	-air	°C	
Dissolved oxygen			mg/l
pH			
Conductivity			v/s

9. Key Water Quality Parameters (units, mg/l)

pH		Turbidity	
Conductivity		Phosphorus	
Alkalinity			
TDS			

PIN-1

10. Substrates (%)

Boulder	Cobble	Gravel	Sand	Silt/Muck	Clay	Detritus
A) 2	~~0~~	5	3	10	80	~~0~~
B) ~~0~~	~~0~~	~~0~~	5	5	90	~~0~~
C) 1	0	5	4	5	85	~~0~~

Notes:

11. Upwellings/Seeps None observed.

Upwellings confirmed	—	m
Upwellings suspected	None	m
Supra water level seeps		#/m

Notes:

12. Vegetation Composition – Supralittoral/Eulittoral (%)

Supralittoral

JP	BS	WS	BF	Ce	La	TA	BP	WB
						20		20

Alder 20 | willow ~~10~~

Notes:

Eulittoral

Alder	Willow	Dogwood	Ericaceous	Graminoid	Width (m)
10	20	—	5	60	17.

Notes:

Vegetation Key

JP=Jack Pine BP=Bolar Poplar BS=Black Spruce WB=White Birch WS=White Spruce BF=Balsam Fir Ce=Cedar La= Larch TA=Trembling Aspen

13. Stream Cover (%)

In Water	Overhanging branches	0	%
	Bottom branch debris		%
	Undercut banks	10	%
	Logs	0.3	#/m
Overhead Cover	Canopy (vertical shading)	25	%
	Ground Vegetation — Shrubs	5	%
	Ground Vegetation — Graminoid	20	%

Notes:

14. Vegetation Composition (Macrophytes) – in-stream (%)

	Emergent	Submergent
Vegetation cover (%)	30	10
Dominant species (%)	Sedges 20%	Pondweed (floating)
	Water parsnip 5%	

15. Current velocity m/s: 0.1

Notes:

Bank stability: Left bank low-moderate Right bank moderate

Notes:

CREEK PROFILE SHEETS

1. Creek/Reach Name: Pm - 2 Field Dates: July 21, 2011

GPS Start: 427252 5407048. Weather: Sunny, clear

End: 427732 5407051 (UTM). Time Start: 16:40

Field Crew: Bruce, Peter End: 17:35

2. Reach Length: Valley Line 18.0. m Channel Line 28.0. m

Surrounding Land Use: Agriculture (Hay fields); Forested

Surrounding Pollution: Agri-run off.

3. Channel Features:

Sinuosity		m/m	Gradient	low / Moderate (some flow)	m/m
Meander Length	18.0	m	Meander amplitude	3,4	m
Entrenchment	1/1	m			

Notes: Box channel (steep banks).

4. Channel Type:

Stream/River	✓	Intermittent	
Channelized	✓	Ephemeral	
Permanent	✓		

Notes:

5. Channel Dimensions:

Floodplain width (m) 35	Channel depth (bank full) (m) ~~0.21~~ 0.47
Channel width (wetted) (m) 1,8m.	Top of Bank (m) ~~0.56~~ 0.82
Channel width (bank full) (m) 2.75	Average thaleg depth (m) 0,26.

Notes:

0055 - u/s.
0056 - D/s.
0057 - left Bank } Pete's camera.

6. Channel Morphology (%)

Pools	60. %	Flats	10 %	Runs	30 %
Riffles	0. %	Braided/diffuse	0 %	Beaver ponds	0 %

Notes:

- Pools located at Bends of meanders.
- Flow = run.

7. Other Channel Features:

Undercut banks Amount (m): 5	%	Beaver dams Number Observed: 0	%
Eroding banks 60	%	Woody structure 10.	%
Organic debris 5.	%		

Notes:

8. Summer Temperature/Dissolved Oxygen

Summer Temperature	-water	27 °C	°C
	-air	25°C	°C
Dissolved oxygen			mg/l
pH	7.75		
Conductivity	312 µs/cm.		v/s

9. Key Water Quality Parameters (units, mg/l)

pH		Turbidity	
Conductivity		Phosphorus	
Alkalinity			
TDS 156 ppm			

Pm-2

10. Substrates (%)

Boulder	Cobble	Gravel	Sand	Silt/Muck	Clay	Detritus
A) 0%.	60%.	30%	5%	5%	0%	0%.
B) 0%	30%.	20%.	20%.	15%	5%	10%.
C)						

Notes:
- Some larger rocks observed throughout reach
- larger substrates observed in thalweg. ie cobble + gravel. fines in stillwater at edges of pools.

11. Upwellings/Seeps

Upwellings confirmed N/A	m
Upwellings suspected	m
Supra water level seeps	#/m

Notes:

12. Vegetation Composition – Supralittoral/Eulittoral (%)

Supralittoral

JP	BS	WS	BF	Ce	La	TA	BP	WB
	60%.					30%.	5%	

Willow 5%

Notes:

Eulittoral

Alder	Willow	Dogwood	Ericaceous	Graminoid	Width (m)
5%.	15%.	5%.	5%.	70%.	

Notes:

Vegetation Key
JP=Jack Pine BP=Bolar Poplar BS=Black Spruce WB=White Birch WS=White Spruce BF=Balsam Fir Ce=Cedar La= Larch TA=Trembling Aspen

13. Stream Cover (%)

In Water	Overhanging branches	5%.	%
	Bottom branch debris	5%.	%
	Undercut banks	5%.	%
	Logs #1 - 1m / #2 - 0.5m / #3 - 0.5m.		#/m
Overhead Cover	Canopy (vertical shading)	10%.	%
	Ground Vegetation — Shrubs	0%.	%
	Graminoid	0%.	%

Notes:

14. Vegetation Composition (Macrophytes) – in-stream (%)

	Emergent	Submergent
Vegetation cover (%)	15%.	25%.
Dominant species (%)	Arrow weed. 20%	[redacted] 90% myriophyllum
	[redacted]	Broad leaf Pondweed. 10%
	[redacted] Burr Reed 80%.	[redacted]

15. Current velocity m/s: _____

Notes:

Bank stability: Left bank Poor - Moderate Right bank Poor

Notes:

* Algae mats observed along shore.

CREEK PROFILE SHEETS

1. Creek/Reach Name: Pm-3 Field Dates: July 22, 2010

GPS Start: 0425917 5408565 Weather: Sunny, few clouds.

End: 0425897 5408600 Time Start: 15:10

Field Crew: PM / BM. End: 15:50

2. Reach Length: Valley Line 43,6 m Channel Line 50.0 m

Surrounding Land Use: Forested, Agriculture (Hay)

Run-off from Agriculture & road run-off ie. Seds.

Surrounding Pollution: Run-off and sediment load from agriculture and road (Hwy 16)

3. Channel Features:

Sinuosity	m/m	Gradient Very low: No flow @ surface	m/m
Meander Length	30,4 m	Meander amplitude	6,5 m
Entrenchment 1:1 or Steeper	m		

Notes:
Very entrenched. Steep Banks vertical into deep (>5') water.

4. Channel Type:

Stream/River	✓	Intermittent	
Channelized	✓	Ephemeral	
Permanent	✓		

Notes:
- Very deep. measured >5' at shore / bank.
- Stream is very channelized w steep U-shaped banks.

5. Channel Dimensions:

Floodplain width (m) >200m (difficult to tell due to width and Tall Veg).	Channel depth (bank full) (m) ~~0.25~~ > 1.75m.
Channel width (wetted) (m) 7m.	Top of Bank (m) ~~0.42~~ > 1.92m
Channel width (bank full) (m) 7m	Average thaleg depth (m) unknown (Too Deep to measure) > 1.5m

Notes: Photos: 0059 - Gillnet (left bank).
0060 - Upstrm.
0061 - Dwnstrm
0062 - Across stream (left bank).

6. Channel Morphology (%)

Pools	/ %	Flats	100 %	Runs	/ %
Riffles	/ %	Braided/diffuse	/ %	Beaver ponds	/ %

Notes: Very slow moving water, zero flow at surface.

7. Other Channel Features:

Undercut banks Amount (m):	5% %	Beaver dams Number Observed:	0; large Beaver Dam 100 m Upstream. %
Eroding banks	5% (Beaver Trails). %	Woody structure	0 %
Organic debris	0. %		

Notes: Very uniform throughout reach.

8. Summer Temperature/Dissolved Oxygen

Summer Temperature	-water	28.2	°C
	-air	29.0	°C
Dissolved oxygen			mg/l
pH			
Conductivity			v/s

9. Key Water Quality Parameters (units, mg/l)

pH	8.80	Turbidity	/
Conductivity	25 ms/cm	Phosphorus	/
Alkalinity	/		
TDS	212		

PM-3

10. Substrates (%)

Boulder	Cobble	Gravel	Sand	Silt/Muck	Clay	Detritus
A)	0	0	5%	30%	60%	5%.
B)						
C)						

Notes:
Very deep :. difficult to get a good idea of substrate. used not to retrieve same sediment.

11. Upwellings/Seeps

Upwellings confirmed	m
Upwellings suspected	m
Supra water level seeps	#/m

Notes:
None observed.

12. Vegetation Composition – Supralittoral/Eulittoral (%)

Supralittoral

JP	BS	WS	BF	Ce	La	TA	BP	WB
	60%					20%	20%.	

Notes: Difficult to tell due to width of flood plain.

Eulittoral

Alder	Willow	Dogwood	Ericaceous	Graminoid	Width (m)
25%.	30%.		5%	40%.	80m

Notes:
Difficult to tell full extent of eulittoral zone ~~due~~ due to high veg.

* Species in Eulittoral include: • canada bluejoint.
• cut grass
• Carex

Vegetation Key
JP=Jack Pine BP=Bolar Poplar BS=Black Spruce WB=White Birch WS=White Spruce BF=Balsam Fir Ce=Cedar La= Larch TA=Trembling Aspen

13. Stream Cover (%)

In Water	Overhanging branches		0	%
	Bottom branch debris		0	%
	Undercut banks		5	%
	Logs		0	#/m
Overhead Cover	Canopy (vertical shading)		5%	%
	Ground Vegetation	Shrubs	5%	%
		Graminoid	5%	%

Notes:

14. Vegetation Composition (Macrophytes) – in-stream (%)

	Emergent	Submergent
Vegetation cover (%)	5%.	15%.
Dominant species (%)	Slender Arrowweed: 25%.	Yellow lily: 50%.
	Marshy Spikerush: 25%	Broad leaf Pondweed: 30%.
	Branching Spikerush: 40%.	Slender pondweed: 5%.
	Broad Arrowweed: 10%.	Myriophyllum: 15%

Richardson's pondweed also observed

15. Current velocity m/s: <0.01 likely.

Notes:

Bank stability: Left bank ~~poor~~ good Right bank good.

Notes: a few beaver trails that may contribute to erosion

CREEK PROFILE SHEETS

1. Creek/Reach Name: Pine River (Pin-4) Field Dates: July 23/11

GPS Start: 15U 0424224 5408815 Weather: Overcast

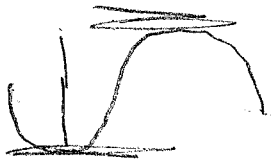
End: _____ Time Start: 1300

Field Crew: JD, SA, BM, PM End: _____

2. Reach Length: Valley Line 140 m Channel Line _____ m

Surrounding Land Use: Forrest, Drilling (temporary)

Surrounding Pollution: Drilling



3. Channel Features:

Sinuosity		m/m	Gradient	Low - moderate	m/m
Meander Length	260	m	Meander amplitude	17	m
Entrenchment	1 : 2.5	m			

Notes:

4. Channel Type:

Stream/River	River	Intermittent	
Channelized	X	Ephemeral	
Permanent	X		

Notes:

5. Channel Dimensions:

Floodplain width (m) 200	Channel depth (bank full) (m) 0.3
Channel width (wetted) (m) 15	Top of Bank (m) 0.14 = 0.44
Channel width (bank full) (m) 17	Average thaleg depth (m) 0.3

Notes: Pin 4 Pin-4

6. Channel Morphology (%)

Pools	50	%	Flats	45	%	Runs	— %
Riffles	—	%	Braided/diffuse	5	%	Beaver ponds	— %

Notes: low Velocity

7. Other Channel Features:

Undercut banks Amount (m):	∅ %	Beaver dams Number Observed:	∅ %
Eroding banks	5 %	Woody structure	1 %
Organic debris	5 %		

Notes:

8. Summer Temperature/Dissolved Oxygen

Summer Temperature	-water 19.2	°C	
	-air	°C	
Dissolved oxygen	60.2%	5.49 mg/L ~~mg/l~~	
pH	7.26		
Conductivity	0.346 mS/cm³	308 µS/cm	v/s

ORP 8.6

9. Key Water Quality Parameters (units, mg/l)

pH		Turbidity	
Conductivity		Phosphorus	
Alkalinity			
TDS	0.225 g/L		

Pin-4 Pin-4

10. Substrates (%)

Boulder	Cobble	Gravel	Sand	Silt/Muck	Clay	Detritus
A) Ø	Ø	Ø	Ø	60	25	15
B) Ø	Ø	Ø	Ø	65	15	20
C)						

Notes:

11. Upwellings/Seeps Ø

Upwellings confirmed	—	m
Upwellings suspected	—	m
Supra water level seeps		#/m

Notes:

12. Vegetation Composition – Supralittoral/Eulittoral (%)

Supralittoral

JP	BS	WS	BF	Ce	La	TA	BP	WB
	65			5				

Alder 20 | willow 10

Notes:

Eulittoral

Alder	Willow	Dogwood	Ericaceous	Graminoid	Width (m)
5	10	2	3	80	

Notes:

high percent of cattail

Vegetation Key

JP=Jack Pine BP=Bolar Poplar BS=Black Spruce WB=White Birch WS=White Spruce BF=Balsam Fir Ce=Cedar La= Larch TA=Trembling Aspen

Pin-4

13. Stream Cover (%)

In Water	Overhanging branches	Ø	%
	Bottom branch debris	Ø	%
	Undercut banks	1	%
	Logs	0.5	#/m
Overhead Cover	Canopy (vertical shading)	10	%
	Ground Vegetation — Shrubs	1	%
	Ground Vegetation — Graminoid	9	%

Notes:

14. Vegetation Composition (Macrophytes) – in-stream (%)

	Emergent	Submergent
Vegetation cover (%)	8	70
Dominant species (%)	Sedges	Floating pondweed
	Cattails	Yellow pond lilly
	Water parsnip	Coontail
		-Slender leaf pondweed.
		-duckweed.

15. Current velocity m/s: 0.01

Notes:

Bank stability: Left bank High Right bank High.

Notes:

CREEK PROFILE SHEETS

1. Creek/Reach Name: [redacted] Pm-5 Field Dates: July 19.

GPS Start: 48.82842 094.04323 ↘

End: 48.82860 094.04202 ↙

Weather: Sunny, Hot, some cloud cover.

Time Start: 14:40

End: 15:30.

Field Crew: Jason, Steve, Bruce, Peter.

2. Reach Length: Valley Line [redacted] 70 m. m Channel Line 107 m

Surrounding Land Use: Agricultural & Forested to south.

Surrounding Pollution: Agri - runoff

3. Channel Features:

Sinuosity	m/m	Gradient low - little to no current.	m/m
Meander Length 65 m.	m	Meander amplitude 22 m.	m
Entrenchment V/I	m		

Notes:

Steep Banks ∴ very entrenched.

4. Channel Type:

Stream/River	X	Intermittent	
Channelized	X	Ephemeral	
Permanent	X		

Notes:

Slow, little to no current.
Deep (too deep to sense).

5. Channel Dimensions:

Floodplain width (m) 250 m.	Channel depth (bank full) (m) 0.64 [redacted]
Channel width (wetted) (m) 5 m. / 16 ft 8 in	Top of Bank (m) 0.64 m.
Channel width (bank full) (m) 6 m.	Average thaleg depth (m)

Notes: Photos: 0016 - Setting.
0017 - Upstream.
0018 - Downstream
0019 - Across. (left bank)
0023
0024 } unknown Veg

6. Channel Morphology (%)

Pools	25 %	Flats	75% %	Runs	/ %
Riffles	/ %	Braided/diffuse	/ %	Beaver ponds	/ %

Notes:

- Pool = corner of meanders
- old beaver dam @ western end of reach

7. Other Channel Features:

Undercut banks Amount (m): 5%	%	Beaver dams Number Observed: 1	5% %
Eroding banks 0 %	%	Woody structure	5% %
Organic debris 5%	%		

Notes:

8. Summer Temperature/Dissolved Oxygen

Summer Temperature	-water	27.6	°C
	-air	42 °C	°C
Dissolved oxygen	9.5 mg/L		mg/l
pH	6.31		
Conductivity	0.331 ms/cm³ / 343 µs/cm		v/s

96.3 ORP

9. Key Water Quality Parameters (units, mg/l)

pH		Turbidity	
Conductivity		Phosphorus	
Alkalinity			
TDS			

Pm-5

10. Substrates (%)

Boulder	Cobble	Gravel	Sand	Silt/Muck	Clay	Detritus
A)	/	/	/	30%	50%	20%
B)						
C)						

Notes:

11. Upwellings/Seeps

Upwellings confirmed	NA	m
Upwellings suspected	NA	m
Supra water level seeps	NA	#/m

Notes:

12. Vegetation Composition – Supralittoral/Eulittoral (%)

Supralittoral

JP	BS	WS	BF	Ce	La	TA	BP	WB
10%	10%					10%	70%	

Notes:

Eulittoral

Alder	Willow	Dogwood	Ericaceous	Graminoid	Width (m)
10%	30%		5%	55%	70 m

Notes:

Vegetation Key

JP=Jack Pine BP=Bolar Poplar BS=Black Spruce WB=White Birch WS=White Spruce BF=Balsam Fir Ce=Cedar La= Larch TA=Trembling Aspen

13. Stream Cover (%)

In Water	Overhanging branches		0.	%
	Bottom branch debris		0.	%
	Undercut banks		5	%
	Logs #1 / 2m.			#/m
Overhead Cover	Canopy (vertical shading)		0%	%
	Ground Vegetation	Shrubs	0%	%
		Graminoid	95	%

Notes:

14. Vegetation Composition (Macrophytes) – in-stream (%)

	Emergent		Submergent	
Vegetation cover (%)	15%.		85%	
Dominant species (%) Broad leaf	Arrow weed	10%	Lily Pad (yellow)	40%
~~pipewort~~, ~~Pencil Weed~~ ? Spikerush	~~Pencil Weed~~ ?	5%	Ceratophyllum	5%
	Burr Reed.	5%	~~Narrow leaf~~ Slender Pond weed	20%
			Broad leaf Pond weed.	5%
			~~Pencil weed?~~ myriophyllum ? Richardson's Pond weed	5%

15. Current velocity m/s: 0.02 m/s @ 40cm depth

Notes: Too deep to get proper flow measurement

Bank stability: Left bank Moderate → High Right bank Moderate → High.

Notes:

Pin – 6

Rainy River

CREEK PROFILE SHEETS

1. Creek/Reach Name: Pinewood River Field Dates: July 25/11

GPS Start: 15U 0421549 5408894 Weather: Sunny

End: Time Start: 0900

Field Crew: SA, PM, BM End:

2. Reach Length: Valley Line 120 m Channel Line 140 m

Surrounding Land Use: Agriculture, Forrest

Surrounding Pollution: Agriculture, Forest, Road

3. Channel Features:

Sinuosity		m/m	Gradient	LOW	m/m
Meander Length	70	m	Meander amplitude	25m	m
Entrenchment		m			

Notes: - Huge trough + short amplitude



4. Channel Type:

Stream/River	River	Intermittent	
Channelized	X	Ephemeral	
Permanent	X		

Notes:

- Water present above Bank-full Height ∴ possibly a beaver Dam D/S.

5. Channel Dimensions:

Floodplain width (m) 30	Channel depth (bank full) (m) > 2.2
Channel width (wetted) (m) 5	Top of Bank (m) 0.2
Channel width (bank full) (m) 5.4	Average thaleg depth (m) 2.0 (very deep) to measure

☆ Pics # 43 + 42

Notes:

6. Channel Morphology (%)

Pools	30	%	Flats	70	%	Runs	— %
Riffles	—	%	Braided/diffuse	—	%	Beaver ponds	%

Notes: - long valley reach with large trough
- short meanders + straight trough

7. Other Channel Features:

Undercut banks Amount (m):	Ø	%	Beaver dams Number Observed:	0 0	%
Eroding banks	5	%	Woody structure	10	%
Organic debris	10	%			

Notes:

8. Summer Temperature/Dissolved Oxygen

Summer Temperature	-water 20.40	°C	
	-air	°C	
Dissolved oxygen	3.43 mg/L / 37.4%		mg/l
pH			
Conductivity			v/s

9. Key Water Quality Parameters (units, mg/l)

pH	7.16	Turbidity	
Conductivity	0.396 mS/cm	Phosphorus	
~~Alkalinity~~ conductivity	360 µs/cm		
TDS	0.257		

ORP 1.6

July 25/11 Rainy River PIN-6

10. Substrates (%)

	Boulder	Cobble	Gravel	Sand	Silt/Muck	Clay	Detritus
A)	Ø	Ø	Ø	Ø	75	15	10
B)	Ø	Ø	Ø	Ø	80	15	5
C)	Ø	Ø	Ø	5	70	20	5

Notes:

11. Upwellings/Seeps Ø

Upwellings confirmed	—	m
Upwellings suspected	—	m
Supra water level seeps		#/m

Notes:

12. Vegetation Composition – Supralittoral/Eulittoral (%)

Supralittoral

JP	BS	WS	BF	Ce	La	TA	BP	WB
—	70	Ø	Ø	Ø	Ø	5	20	5

Notes:

Eulittoral

Alder	Willow	Dogwood	Ericaceous	Graminoid	Width (m)
30	5	5	10	50	30

Notes:

Vegetation Key

JP=Jack Pine BP=Bolar Poplar BS=Black Spruce WB=White Birch WS=White Spruce BF=Balsam Fir Ce=Cedar La= Larch TA=Trembling Aspen

13. Stream Cover (%)

In Water	Overhanging branches	5	%
	Bottom branch debris	5	%
	Undercut banks	0	%
	Logs	0.1 (10/0)	#/m
Overhead Cover	Canopy (vertical shading)	10	%
	Ground Vegetation	Shrubs 5	%
		Graminoid 5	%

Notes:

14. Vegetation Composition (Macrophytes) – in-stream (%)

	Emergent	Submergent
Vegetation cover (%)	15	5
Dominant species (%)	Similar to spike rush	Floating pondweed
	sedges	
	Yellow pond lilly	

15. Current velocity m/s: 0.01

Notes:

Bank stability: Left bank Low/moderate Right bank Low/moderate

Notes:

CREEK PROFILE SHEETS

1. Creek/Reach Name: Pinewood River → Route 600 Field Dates: 30/09/2011

GPS Start: 0420348 5408113 Weather: Sunny, clear, warm breeze

End: 15U 0420325 5402151 Time Start: 14:15

Field Crew: MB, PM End:

2. Reach Length: Valley Line 80 m Channel Line 100 m

Surrounding Land Use: Forested (agriculture in area, adjacent properties previously logged.

Surrounding Pollution: No immediate sources, agriculture (cattle) in the area

3. Channel Features:

Sinuosity		m/m	Gradient	low	m/m
Meander Length	75	m	Meander amplitude	60	m
Entrenchment	2:1	m			

Notes: Photo #: 0063, 0064, 0065.

4. Channel Type:

Stream/River	✓	Intermittent	
Channelized	✓	Ephemeral	
Permanent	✓		

Notes: Very slow moving, most likely dammed (beaver runs & downed trees evident.)

5. Channel Dimensions:

Floodplain width (m)	90 m	Channel depth (bank full) (m)	3.5m
Channel width (wetted) (m)	8m	Top of Bank (m)	4m
Channel width (bank full) (m)	10 m	Average thaleg depth (m)	1 m

Notes:

6. Channel Morphology (%)

Pools	%	Flats 100	%	Runs	%
Riffles	%	Braided/diffuse	%	Beaver ponds	%

Notes: could be deeper pools in trough areas, albeit with little difference in current.

7. Other Channel Features:

Undercut banks 5 % Amount (m):		Beaver dams 0 % Number Observed: *none seen, likely are downstream	
Eroding banks	%	Woody structure 5 %	
Organic debris 15	%		

Notes:

8. Summer Temperature/Dissolved Oxygen

Summer Temperature	-water	°C	
	-air	°C	
Dissolved oxygen			mg/l
pH			
Conductivity			v/s

9. Key Water Quality Parameters (units, mg/l)

pH		Turbidity	
Conductivity		Phosphorus	
Alkalinity			
TDS			

Route 600 30/09/2011

13. Stream Cover (%)

In Water	Overhanging branches		3	%
	Bottom branch debris		10	%
	Undercut banks		5	%
	Logs		2%	#/m
Overhead Cover	Canopy (vertical shading)		25	%
	Ground Vegetation	Shrubs	5	%
		Graminoid	5	%

Notes:

14. Vegetation Composition (Macrophytes) – in-stream (%)

	Emergent	Submergent	
Vegetation cover (%)	5%	15%	
Dominant species (%)	Marshy Spike Rush 15%	Richardson's Pondweed	60%
	Bull rush 85%	Bladderwort	5%
		coontail	5%
		Broadleafed Pondweed	20%
		Narrow leafed Pondweed	10%

15. Current velocity m/s: Very little to no flow

Notes:

Bank stability: Left bank stable Right bank stable

Notes:

10. Substrates (%)

Boulder	Cobble	Gravel	Sand	Silt/Muck	Clay	Detritus
A) 0	0	0	5%	60%	35%	0
B)						
C)						

Notes:

11. Upwellings/Seeps

Upwellings confirmed	0 m
Upwellings suspected	0 m
Supra water level seeps	0 #/m

Notes:

12. Vegetation Composition – Supralittoral/Eulittoral (%)

Supralittoral

JP	BS	WS	BF	Ce	La	TA	BP	WB
	90%					5%		5%

Notes:

Eulittoral

Alder	Willow	Dogwood	Ericaceous	Graminoid	Width (m)
	10%	15%	15%	60%	90.

Notes:

Vegetation Key

JP=Jack Pine BP=Bolar Poplar BS=Black Spruce WB=White Birch WS=White Spruce BF=Balsam Fir Ce=Cedar La= Larch TA=Trembling Aspen

LAKE PROFILE SHEETS Rainy River Project

1. Waterbody ID/Name: Tal – T2 – 1 Field Dates: July 26/11

GPS Start: 15U0424087 5406743 Weather: Sunny 28°C

End: Time Start: 910

Field Crew: SA, BM, PM End:

2. Area (approx.): 0.3 ha 30 m X 100m = 3000 m^2

4. Secchi: — m Colour:

5. Surrounding Land Use Scrubland / Forrested,

Surrounding Pollution: Road / culvert, Drilling

Dissolved Oxygen (mg/L) / Temperature (°C) Profile – Summer (S), Winter (W)

	0	1m	2m	4m	6m	8m	10m	15m	20m	25m
Dissolved Oxygen (S)	10.13 mg/L	—	—	—	—	—	—	—	—	—
Temperature (S)	21.87	—	—	—	—	—	—	—	—	—
~~Dissolved Oxygen (W)~~										
~~Temperature (W)~~										

7. Key Water Quality Parameters (units, mg/L)

pH	6.73	Turbidity	
Conductivity	0.278 mS/cm	Phosphorus	
~~Alkalinity~~ Conductivity	260 µS/cm	Other ORP	28.2
TDS	0.181 g/L	Other DO	116.8%

Notes: DO seems off ?

LAKE PROFILE SHEETS

amec

8. Substrates (%) organics/substrate

Habitat View	Type	Depth (M)	Cobble (%)	Gravel (%)	Sand (%)	Silt/Muck (%)	Clay (%)	Detritus (%)	Boulders	Bedrock
950 (E) Littoral	A_L	0-1	Ø	Ø	Ø	60	10	30	Ø	Ø
		1-2	Ø	Ø	Ø	65	5	30	Ø	Ø
		2-5								
		5+								
175 (S) Littoral	B_L	0-1	Ø	Ø	Ø	50	10	40	Ø	Ø
		1-2	Ø	Ø	Ø	65	5	30	Ø	Ø
		2-5								
		5+								
2720 W Littoral	C_L	0-1	Ø	Ø	Ø	40	50	10	Ø	Ø
		1-2	Ø	Ø	Ø	45	50	5	Ø	Ø
		2-5								
		5+								
Littoral	D_L	0-1								
		1-2								
		2-5								
		5+								
Littoral	E_L	0-1								
		1-2								
		2-5								
		5+								
Profundal	A_P									
Profundal	B_P									

Notes:

LAKE PROFILE SHEETS

TA1 - T2 - 1 July 26/11 Rainy River

9. Vegetation – Supralittoral/Eulittoral (%)

Supralittoral												
	JP (%)	BS (%)	WS (%)	BF (%)	Ce (%)	La (%)	TA (%)	BP (%)	WB (%)	Other (%)	Length (m)	Slope (%)
$A_{S/E}$	Ø	50	Ø	Ø	Ø	Ø	30	20	Ø	–	20	–
$B_{S/E}$	Ø	50	Ø	Ø	Ø	Ø	15	10	10	–	15	–
$C_{S/E}$	Ø	60	Ø	Ø	Ø	5	20	15	Ø	–	20	–
$D_{S/E}$												
$E_{S/E}$												

Eulittoral							
	Alder (%)	Willow (%)	Dogwood (%)	Graminoid (%)	Ericaceous (%)	Other (%)	Width (m)
$A_{S/E}$	30	5	5	50	5	5	20
$B_{S/E}$	40	5	5	40	Ø	10	15
$C_{S/E}$	50	5	5	30	5	5	20
$D_{S/E}$							
$E_{S/E}$							

Notes: - Poplar growth in eulitoral (new) along floodplain
- Beaver dam present to the west
- High o/o Muck/Detritus

Legend:
JP = Jack Pine BS = Black Spruce WS = White Spruce BF = Balsam Fir Ce = Cedar La = Larch TA = Trembling Aspen BP = Balsam Poplar WB = White Birch

LAKE PROFILE SHEETS

10. Vegetation – Littoral (%)

	Upper Littoral (Emergent M)	Middle Littoral (Floating M)	Lower Littoral (Submergent M)
Littoral A_L			
Length/width (m/m)	20 X 20	5 X 15	5 X 5
Area (m^2)	400	75	125
Vegetation cover (%)	10	5	5
Dominant species (%)	Cattails 20%	5% Yellow Pond Lilly	Coontail 5%
	Sedges 10%	5% Floating Pondweed	Coontail
	5% Broad Leaf Arrowhead		
Littoral B_L			
Length/width (m/m)	5X 15	5X10	5X10
Area (m^2)	75	50	50
Vegetation cover (%)	10	5	5
Dominant species (%)	Cattails 20%	30% Yellow Pond Lilly	Coontail 5%
	Sedges 5%	Floating Pondweed 5%	

LAKE PROFILE SHEETS

TAI-T2-1 July 26/11 Rainy River Project

Littoral C_L			
Length/width (m/m)	Ø	2X 20	2X20
Area (m^2)	Ø	200	200
Vegetation cover (%)	10%	10%	10%
Dominant species (%)	10% Broad Leaf Arrowhead	1% Yellow Pond Lilly	1% Coontail
Littoral D_L			
Length/width (m/m)			
Area (m^2)			
Vegetation cover (%)			
Dominant species (%)			

Littoral E_L			
Length/width (m/m)			
Area (m^2)			
Vegetation cover (%)			
Dominant species (%)			

11. Underwater Cover 5 %
Overhanging Shrubs Ø %
Boulders Ø %
Logs 5 %
Macrophytes 10 %
Detritus 40 %
Undercut Banks Ø %

Area with available cover 5 %

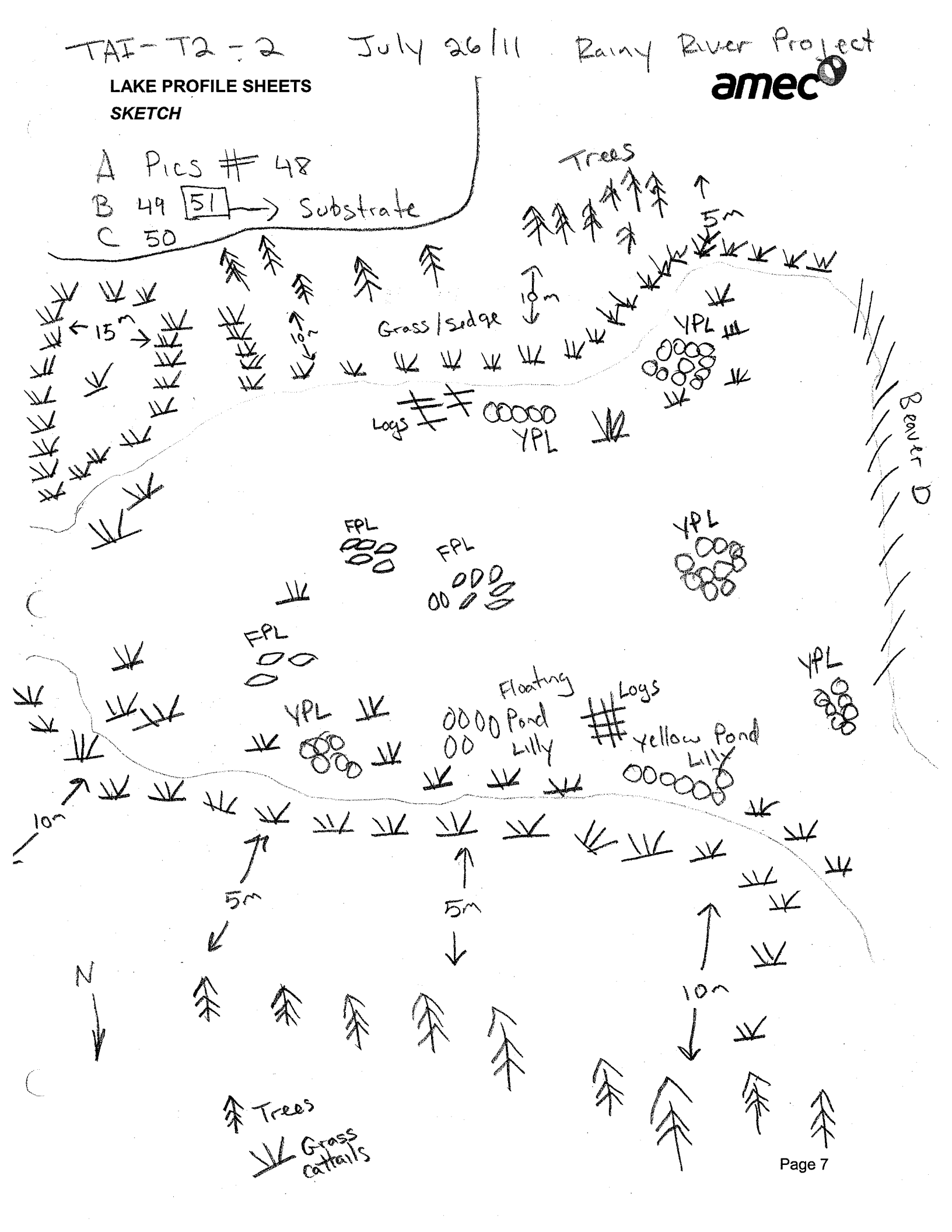
12. Comments:
Very little selection/variance of veg (littoral)

TAI-T2-2 July 26/11 Rainy River Project

amec

LAKE PROFILE SHEETS

SKETCH



Los-1 ; July 24

CREEK PROFILE SHEETS

amec

1. Creek/Reach Name: Los-1 Field Dates: July, 24, 2011.

GPS Start: 0422870 5411973 Weather: Sunny, few clouds.

End: 0422881 5411940. Time Start: 13:40.

Field Crew: PM/BM/SA End: 14:35.

2. Reach Length: Valley Line 35.0 m Channel Line 46.0 m

Surrounding Land Use: Forrested (some cut).

Surrounding Pollution: Deforestation although significant poplar regrowth on left bank.

3. Channel Features:

Sinuosity	m/m	Gradient low (little flow)	m/m
Meander Length ~~[illegible]~~ 70.0.	m	Meander amplitude 7.9.	m
Entrenchment * 1:1	m		

Notes:
- Beaver dam D/S from site causing flooding into cultural zone. (very wet)
- Stream too deep to cross.
- * Appears to be very entrenched but difficult to determine due to ~~High~~ flooding.

4. Channel Type:

Stream/River	X	Intermittent	
Channelized	X	Ephemeral	
Permanent	X.		

Notes:
Beaver dam ~200m D/S from site and another ~ 50 m U/S from site.

5. Channel Dimensions:

Floodplain width (m) ~18 m.	Channel depth (bank full) (m) [illegible] 1.06
Channel width (wetted) (m) * measured from submerged bank to submerged bank. current wet width would be >10 m. 2.8m.	Top of Bank (m) 1.15
Channel width (bank full) (m) 2.8 m.	Average thaleg depth (m) 1.06.

Notes:

Photos: 0086 U/S
0087 D/S
0088 Across. } Pete's Camera.

6. Channel Morphology (%) All slow moving water

Pools	0 %	Flats	0. %	Runs	0 %
Riffles	0 %	Braided/diffuse	0. %	Beaver ponds	* 100. %

Notes:

* Top end of beaver pond. Entire reach is affected by Pond.

7. Other Channel Features:

Undercut banks Amount (m): [redacted] 5-10%.	%	Beaver dams Yes. Number Observed: 2. (outside of reach).	%
Eroding banks 0.	%	Woody structure 5%.	%
Organic debris 15% (beaver cut limbs)	%		

Notes:

8. Summer Temperature/Dissolved Oxygen

Summer Temperature	-water	18.84°C.	°C
	-air	30°C.	°C
Dissolved oxygen	3.96 mg/L ; 40.4%.		mg/l
pH	6.67		
Conductivity			v/s

14.2 ORP

9. Key Water Quality Parameters (units, mg/l)

pH	6.67.	Turbidity	
Conductivity	0.274 ms/cm³	Phosphorus	
~~Alkalinity~~	242 µs/cm.		
TDS	0.178 g/L		

Los-1 July 24

10. Substrates (%)

Boulder	Cobble	Gravel	Sand	Silt/Muck	Clay	Detritus
A) /	/	10%	15%.	40%	20%.	5%.
B)						
C)						

Notes:

11. Upwellings/Seeps None observed.

Upwellings confirmed	m
Upwellings suspected	m
Supra water level seeps	#/m

Notes:

12. Vegetation Composition – Supralittoral/Eulittoral (%)

Supralittoral

JP	BS	WS	BF	Ce	La	TA	BP	WB
	80%.						10%.	

Alder 10%.

Notes:

Eulittoral

Alder	Willow	Dogwood	Ericaceous	Graminoid	Width (m)
5%.	5%.		5%.	85%.	

Notes:

Almost 90-95% of eulittoral zone is currently submerged (wet) (~10-40 cm de

Vegetation Key

JP=Jack Pine BP=Bolar Poplar BS=Black Spruce WB=White Birch WS=White Spruce BF=Balsam Fir Ce=Cedar La= Larch TA=Trembling Aspen

13. Stream Cover (%)

In Water	Overhanging branches	0 %	%
	Bottom branch debris	0 %	%
	Undercut banks	5 %	%
	Logs	<5 %	#/m
Overhead Cover	Canopy (vertical shading)	0 %	%
	Ground Vegetation	Shrubs 0 %	%
		Graminoid 10 %	%

Notes:

14. Vegetation Composition (Macrophytes) – in-stream (%) * only assumed bankfull width ∴ did not include entire full wetted area of reach.

	Emergent	Submergent
Vegetation cover (%)	10 %	15 %
Dominant species (%)	Burr reed. 40 %	Broad leaf Pond weed: 50 %
	Marshy spikerush. 40 %	lemna: 50 %
	Broad Arrowweed 15 %	[redacted]
	Marsh Marigold. 3 %	
	Cat tail 2 %	

15. Current velocity m/s: 0.01 m/s

Notes:

Bank stability: Left bank High Right bank High.

Notes:

LOS-2

CREEK PROFILE SHEETS

1. Creek/Reach Name: Loslo Creek Field Dates: July 25/11

GPS Start: 15U 0421792 5409583 Weather: Sunny

End: Time Start: 1220

Field Crew: SA, PM, BM End:

2. Reach Length: Valley Line 60 m Channel Line 75 m

Surrounding Land Use: Agriculture

Surrounding Pollution: Agriculture

☆ Agriculture Culvert in place for Crossing

3. Channel Features:

Sinuosity	m/m	Gradient	LOW	m/m
Meander Length	40 m	Meander amplitude	11.5	m
Entrenchment	>1:1 very steep m			

Notes: Very hard to determine meander sequence

4. Channel Type:

Stream/River	Stream	Intermittent	
Channelized	X	Ephemeral	
Permanent	X		

Notes:

5. Channel Dimensions:

Floodplain width (m): 50	Channel depth (bank full) (m): >2.0m To deep to measure
Channel width (wetted) (m): 5.0m	Top of Bank (m): 0.5 m
Channel width (bank full) (m): 6.5	Average thaleg depth (m): >1.5 m Too deep to measure

Pics # 45-44

Notes:

6. Channel Morphology (%)

Pools	20	%	Flats	80	%	Runs	—	%
Riffles	Ø	%	Braided/diffuse	—	%	Beaver ponds	—	%

Notes:

7. Other Channel Features:

Undercut banks Amount (m): 5	%	Beaver dams Number Observed: Ø	%
Eroding banks 5	%	Woody structure 5	%
Organic debris 10	%		

Notes:

8. Summer Temperature/Dissolved Oxygen

Summer Temperature	-water	20.82	°C	
	-air		°C	
Dissolved oxygen	34%		2.75	mg/l
pH				
Conductivity				v/s

9. Key Water Quality Parameters (units, mg/l)

pH	6.05	Turbidity	
Conductivity	0.383 mS/cm	Phosphorus	
~~Alkalinity~~ conductivity	353 µS/cm		
TDS	0.250		

LOS-2

July 25/1

LOSLO Creek

Rainy River

10. Substrates (%)

	Boulder	Cobble	Gravel	Sand	Silt/Muck	Clay	Detritus
A)	Ø	Ø	5	5	50	35	5
B)	5	Ø	Ø	5	50	35	5
C)	5	5	5	5	45	30	5

Notes:

11. Upwellings/Seeps

Ø

Upwellings confirmed	Ø	m
Upwellings suspected	-	m
Supra water level seeps	-	#/m

Notes:

12. Vegetation Composition – Supralittoral/Eulittoral (%)

Supralittoral

JP	BS	WS	BF	Ce	La	TA	BP	WB
Ø	10	Ø	Ø	Ø	Ø	10	30	

Alder-willow
5 | 45

Notes:

Eulittoral

Alder	Willow	Dogwood	Ericaceous	Graminoid	Width (m)
Ø	35	Ø	5	60	20

Notes:

Vegetation Key

JP=Jack Pine BP=Bolar Poplar BS=Black Spruce WB=White Birch WS=White Spruce BF=Balsam Fir Ce=Cedar La= Larch TA=Trembling Aspen

13. Stream Cover (%)

In Water	Overhanging branches	Ø	%
	Bottom branch debris	Ø	%
	Undercut banks	Ø	%
	Logs	10%	#/m
Overhead Cover	Canopy (vertical shading)	10	%
	Ground Vegetation	Shrubs 4	%
		Graminoid 6	%

Notes:

14. Vegetation Composition (Macrophytes) – in-stream (%)

	Emergent	Submergent
Vegetation cover (%)	20	5
Dominant species (%)	Sedges	Floating Pondweed
	Water Carrot	
	Broad Leaf arrowhead	
	Spike rush	

15. Current velocity m/s: 0.00

Notes:

Bank stability: Left bank Low/moderate Right bank Low/moderate

Notes:

LAKE PROFILE SHEETS

1. Waterbody ID/Name: LOS-T-2 Field Dates: July 24/11

GPS Start: 15U 0422622 5412681 Weather: Cloudy

End: Time Start: 1040

Field Crew: SA, BM, PM End:

2. Area (approx.): 1.5 ha

4. Secchi: — m Colour: Copper/Brownish/yellowish

5. Surrounding Land Use Agriculture, Forrested

Surrounding Pollution: Agriculture, Forrested

Dissolved Oxygen (mg/L) / Temperature (°C) Profile – Summer (S), Winter (W)

	0	1m	2m	4m	6m	8m	10m	15m	20m	25m
Dissolved Oxygen (S)	5.53									
Temperature (S)	19.08									
Dissolved Oxygen (W)										
Temperature (W)										

7. Key Water Quality Parameters (units, mg/L)

pH	7.48	Turbidity	
Conductivity	0.218 mS/cm³	Phosphorus	
~~Alkalinity~~ Conductivity	193 µS/cm	Other	
TDS	0.142	Other	

Notes: ORP 6.7

% DO = 59.1

LAKE PROFILE SHEETS

8. Substrates (%) organics/substrate

Habitat	Type	Depth (M)	Cobble (%)	Gravel (%)	Sand (%)	Silt/Muck (%)	Clay (%)	Detritus (%)	Boulders	Bedrock
Littoral	A_L	0-1	Ø	Ø	10	50	20	20	Ø	Ø
		1-2								
		2-5								
		5+								
Littoral	B_L	0-1	Ø	Ø	5	65	20	10	Ø	Ø
		1-2								
		2-5								
		5+								
Littoral	C_L	0-1	Ø	Ø	10	40	30	20	Ø	Ø
		1-2								
		2-5								
		5+								
Littoral	D_L	0-1								
		1-2								
		2-5								
		5+								
Littoral	E_L	0-1								
		1-2								
		2-5								
		5+								
Profundal	A_P									
Profundal	B_P									

Notes: - Beaver pond created lake, very deep + likely uniform substrate with exception of possible increase in detritus + clay

LAKE PROFILE SHEETS

9. Vegetation – Supralittoral/Eulittoral (%)

Supralittoral												
	JP (%)	BS (%)	WS (%)	BF (%)	Ce (%)	La (%)	TA (%)	BP (%)	WB (%)	Other (%)	Length (m)	Slope (%)
$A_{S/E}$	Ø	60	Ø	Ø	Ø	5	25	10	Ø	–	50	Low/ moderate
$B_{S/E}$	Ø	10	Ø	Ø	Ø	5	20	10	55	–	75	Low/ moderate
$C_{S/E}$	Ø	50	Ø	Ø	Ø	5	20	20	5	–	50	Low
~~$D_{S/E}$~~												
~~$E_{S/E}$~~												

Eulittoral							
	Alder (%)	Willow (%)	Dogwood (%)	Graminoid (%)	Ericaceous (%)	Other (%)	Width (m)
$A_{S/E}$	5	10	Ø	65	20	–	–
$B_{S/E}$	Ø	Ø	Ø	70	20	10	–
$C_{S/E}$	10	25	Ø	60	5	–	–
~~$D_{S/E}$~~							
~~$E_{S/E}$~~							

Notes: – Old Beaver pond
- very deep from edge of pond out
- unable to wade
- from map this appears to be confluence of LOSLO & LOSLO Trib
- very large wetted area
- upstream approx 100m is second beaver dam (likely waypoint of LOS-T-2)
- old barn on west side of pond
- Lots of YOY schools observed near banks
- Veg. dominated by cattails around perimeter of pond
-

Legend:
JP = Jack Pine BS = Black Spruce WS = White Spruce BF = Balsam Fir Ce = Cedar La = Larch TA = Trembling Aspen BP = Balsam Poplar WB = White Birch

LAKE PROFILE SHEETS

10. Vegetation – Littoral (%)

	Upper Littoral (Emergent M)	Middle Littoral (Floating M)	Lower Littoral (Submergent M)
Littoral A_L			
Length/width (m/m)	2	5	10
Area (m^2)	20	50	100
Vegetation cover (%)	5	10	60
Dominant species (%)	Cattails 80%	Floating Pondweed 80%	Coontails 50%
	Narrowleaf arrowhead 5%	Duckweed 20%	Narrow Pondweed 30%
	Broadleaf arrowhead 5%		Myriofylum 20%
	Bureweed 10%		
Littoral B_L			
Length/width (m/m)	2	5	10
Area (m^2)	40	100	200
Vegetation cover (%)	5	20	60
Dominant species (%)	Cattails 80%	Floating Pondweed 80%	Coontails 50%
★	Burweed 10%	Duckweed 20%	Pondweed 30%
★	Arrowhead 10%		Myriofylum 20%

★ Unable to I.D. from distance but % based on visual of overall site

July 24/11

LOS-T-2

LAKE PROFILE SHEETS

Littoral C_L			
Length/width (m/m)	1	2	10
Area (m^2)	10	20	100
Vegetation cover (%)	5	5	20
Dominant species (%)	Cattails 80%	Floating Pondweed 90%	Coontails 80%
	Narrow leaf pondweed 100%	Duckweed 100%	Pondweed 100%
	Burweed 10%		Myriofylum 100%
Littoral D_L			
Length/width (m/m)			
Area (m^2)			
Vegetation cover (%)			
Dominant species (%)			

July 24/11

LOS-T-2

R-River Project

LAKE PROFILE SHEETS

Littoral E_L			
Length/width (m/m)			
Area (m^2)			
Vegetation cover (%)			
Dominant species (%)			

11. Underwater Cover 20 %
Overhanging Shrubs 5 %
Boulders Ø %
Logs 5 %
Macrophytes 20 %
Detritus 5 %
Undercut Banks Ø %

Area with available cover 55 %

12. Comments:

July 24/11 R- River Project LOS-T-2

LAKE PROFILE SHEETS

SKETCH



LAKE PROFILE SHEETS

1. Waterbody ID/Name: Mar-1 (Beaver Pond). Field Dates: July 20, 2011

GPS Start: 424084 5412880 (UTM). Weather: Overcast / Showers.

End: (Stationary). Time Start: 15:54

Field Crew: Bruce + Pete. End: 16:45.

2. Area (approx.): 0.48 ha 80 x 60 m.

4. Secchi: NA m Colour: Brown / Tannins.

5. Surrounding Land Use Forested.

Surrounding Pollution: NA.

Dissolved Oxygen (mg/L) / Temperature (°C) Profile – Summer (S), Winter (W)

	0	1m	2m	4m	6m	8m	10m	15m	20m	25m
Dissolved Oxygen (S)										
Temperature (S)										
Dissolved Oxygen (W)										
Temperature (W)										

7. Key Water Quality Parameters (units, mg/L)

pH	7.77	Turbidity	
Conductivity	348 µS/cm.	Phosphorus	
Alkalinity		Other	
TDS	174 ppm	Other	

Notes:

Series of Beaver Ponds @ Mar-1

↳ 5 Beaver Dams observed.

Photos: 0036 - downstream } Pete's Camera.
0037 - Left Bank.
0038 - Right Bank.
0039 } Eastern end of Pond.
0040

LAKE PROFILE SHEETS

8. Substrates (%) organics/substrate

Habitat	Type	Depth (M)	Cobble (%)	Gravel (%)	Sand (%)	Silt/Muck (%)	Clay (%)	Detritus (%)	Boulders	Bedrock
Littoral	A_L	0-1	0	0	5	35	50	10	0	0
		1-2	0	10%	5	30	50	5	0	0
		2-5								
		5+								
Littoral	B_L	0-1								
		1-2								
		2-5								
		5+								
Littoral	C_L	0-1								
		1-2								
		2-5								
		5+								
Littoral	D_L	0-1								
		1-2								
		2-5								
		5+								
Littoral	E_L	0-1								
		1-2								
		2-5								
		5+								
Profundal	A_P									
Profundal	B_P									

Notes:

Mar-1

LAKE PROFILE SHEETS

amec

9. Vegetation – Supralittoral/Eulittoral (%)

Supralittoral												
	JP (%)	BS (%)	WS (%)	BF (%)	Ce (%)	La (%)	TA (%)	BP (%)	WB (%)	Other (%)	Length (m)	Slope (%)
$A_{S/E}$		20%					20%	20%	10%	30% willow.	20m.	low.
$B_{S/E}$	30%	50%						10%	10%		10m	low.
$C_{S/E}$	10%	60%						25%	5%		10m	low.
$D_{S/E}$												
$E_{S/E}$												

Eulittoral							
	Alder (%)	Willow (%)	Dogwood (%)	Graminoid (%)	Ericaceous (%)	Other (%)	Width (m)
~~$A_{S/E}$~~	5%	20%		65%	10%		3m
~~$B_{S/E}$~~		30%		10%		60%	2m — BS WB Poplar.
$C_{S/E}$	5%	25%		20%		50%	3m
$D_{S/E}$							
$E_{S/E}$							

A B

Notes:
- Beaver Pond : very short Eulittoral and Supralittoral zones. Some of Eulittoral is flooded
- Recent beaver activity ie. fresh cuts and fresh mud on dams.
- Series of dams, ranging from 30 to 80 m apart. 5 dams observed but likely more.
- Main Pond, where Mar-1 is located is very deep close to dam > 2 m.

Legend:
JP = Jack Pine BS = Black Spruce WS = White Spruce BF = Balsam Fir Ce = Cedar La = Larch TA = Trembling Aspen BP = Balsam Poplar WB = White Birch

LAKE PROFILE SHEETS

10. Vegetation – Littoral (%)

	Upper Littoral (Emergent M)	Middle Littoral (Floating M)	Lower Littoral (Submergent M)
Littoral A_L			
Length/width (m/m)	60m / 2m.	60 m / 1.5	60m / 1.0m.
Area (m^2)			
Vegetation cover (%)	100%	25%.	50%
Dominant species (%)	Grass spp 85%.	Lemna 100%	~~Ceratophyllum~~ Common Bladderwort 100%.
	Arrowweed. 10%		
	Carex spp. 5%.		
Littoral B_L	~~No. due to flooding into forested Area.~~		
Length/width (m/m)	35m. / 0.5m.	35m / 1.0m	35m / 0.5m.
Area (m^2)			
Vegetation cover (%)	85%.	25%.	5%.
Dominant species (%)	Grass spp 70%	Lemna 100%.	~~Ceratophyllum~~ 10% Common Bladderwort
	Carex spp 15%.		

Mar-1

LAKE PROFILE SHEETS

Littoral C_L			
Length/width (m/m)	70m / 1.5m	70m / 2.0m.	70m / 4.0m.
Area (m^2)			
Vegetation cover (%)	100%	45%.	10%.
Dominant species (%)	Grass spp. 85%	Lemna. 90%	~~Ceratophyllum?(Hornwort)~~ Common Bladderwort 100%
	Arrow weed. 10%	Pondweed. (Broad). 10%	~~Lemna~~.
	Carex spp. 5%	~~Ceratophyllum (Hornwort)~~.	
Littoral D_L			
Length/width (m/m)			
Area (m^2)			
Vegetation cover (%)			
Dominant species (%)			

Littoral E_L			
Length/width (m/m)			
Area (m^2)			
Vegetation cover (%)			
Dominant species (%)			

11. Underwater Cover [redacted] 10 %
Overhanging Shrubs 5 %
Boulders 0 %
Logs 5 %
Macrophytes 10 %
Detritus 40 % * flooded into forest edge.
Undercut Banks 0 %

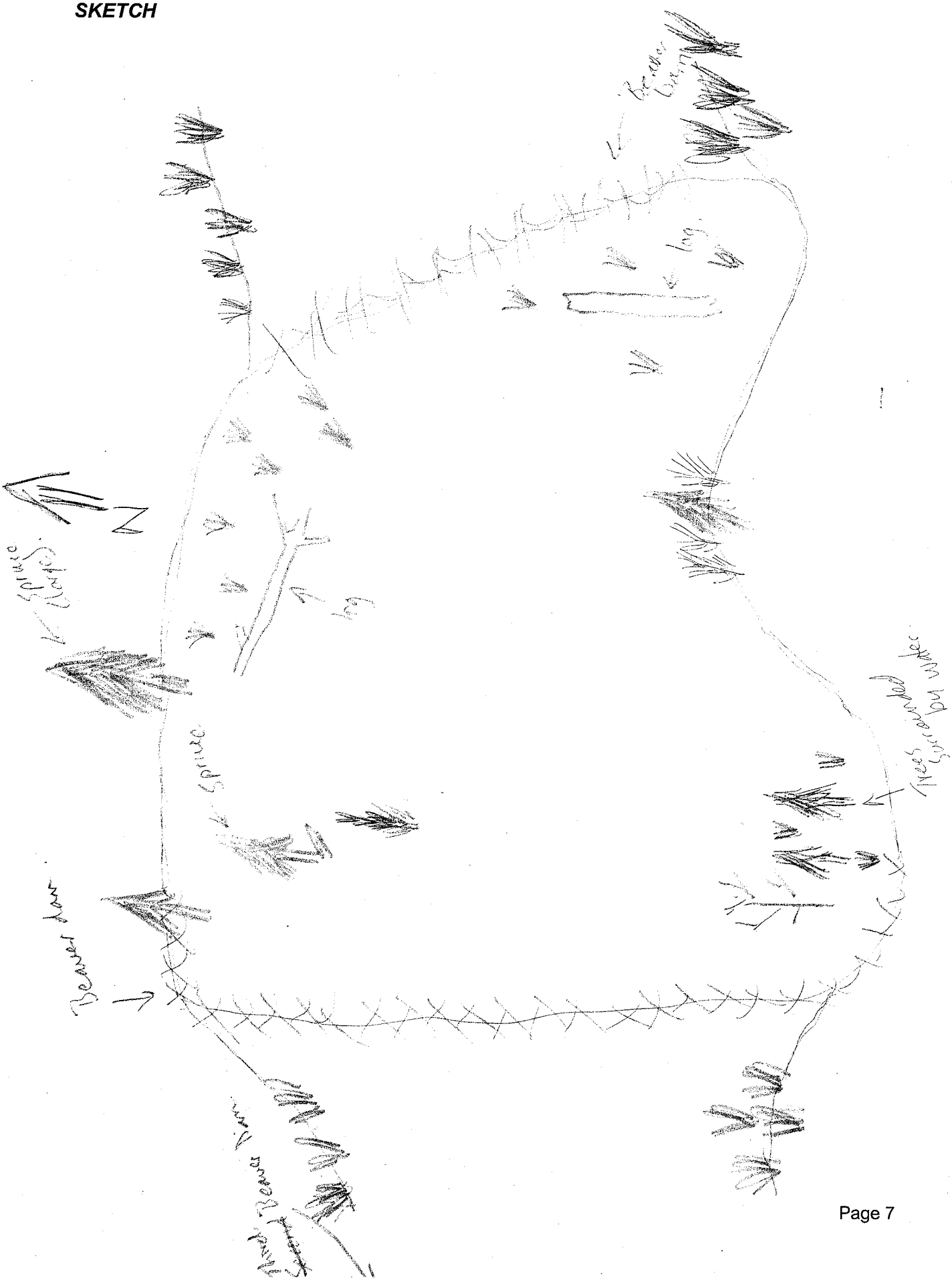
Area with available cover 70 % * Detritus increases available cover %

12. Comments: Synthetically, this is high due to the fact that this area was also averaged in veg + Trees.

Mar-1.

LAKE PROFILE SHEETS

SKETCH



LAKE PROFILE SHEETS

1. Waterbody ID/Name: Upper Marr Pond Field Dates: July 21, 2011

GPS Start: 424640 5413193 Weather: Sunny, clear

End: _____ Time Start: 9:54 am

Field Crew: BM / PM End: _____

2. Area (approx.): _____ ha

4. Secchi: _____ m Colour: amber

5. Surrounding Land Use Forested, Marr Rd to East

Surrounding Pollution: Possible contaminant / sediment run-off from road

Dissolved Oxygen (mg/L) / Temperature (°C) Profile – Summer (S), Winter (W)

	0	1m	2m	4m	6m	8m	10m	15m	20m	25m
Dissolved Oxygen (S)										
Temperature (S)										
Dissolved Oxygen (W)										
Temperature (W)										

7. Key Water Quality Parameters (units, mg/L)

pH	7.07	Turbidity	
Conductivity	97	Phosphorus	
Alkalinity		Other	
TDS	48	Other	

Notes:

LAKE PROFILE SHEETS

8. Substrates (%) organics/substrate

Habitat	Type	Depth (M)	Cobble (%)	Gravel (%)	Sand (%)	Silt/Muck (%)	Clay (%)	Detritus (%)	Boulders	Bedrock
Littoral	A_L	0-1	—	—	—	~~0~~ 5	—	20	—	75
		1-2				15		35		50
		2-5								
		5+								
Littoral	B_L	0-1								
		1-2								
		2-5								
		5+								
Littoral	C_L	0-1								
		1-2								
		2-5								
		5+								
Littoral	D_L	0-1								
		1-2								
		2-5								
		5+								
Littoral	E_L	0-1								
		1-2								
		2-5								
		5+								
Profundal	A_P									
Profundal	B_P									

Notes:

Upper Mar Pond

LAKE PROFILE SHEETS

9. Vegetation – Supralittoral/Eulittoral (%)

Supralittoral

	JP (%)	BS (%)	WS (%)	BF (%)	Ce (%)	La (%)	TA (%)	BP (%)	WB (%)	Other (%)	Length (m)	Slope (%)	
$A_{S/E}$		50						10	30	10 [a]	60	moderate	[a] white pine
$B_{S/E}$	[x] 10	[x] 65						[x] 20		[x] 5	50	high/mod	white pine
$C_{S/E}$		[x] 80						[x] 5	[x] 10	[x] 5	70	mod/low	white spruce
$D_{S/E}$		[x] 20						[x] 55	[x] 25		30	mod	
$E_{S/E}$													

Eulittoral

	Alder (%)	Willow (%)	Dogwood (%)	Graminoid (%)	Ericaceous (%)	Other (%)	Width (m)	
$A_{S/E}$	15			75		10	35	cattails
$B_{S/E}$	15			35		40 grass 10	25	grass cattails
$C_{S/E}$	10			70		5 grass 15	20	grass cattails
$D_{S/E}$	25			25		50	40	cattails
$E_{S/E}$								

Notes: Pond has been damned by beaver - lodge at southern end of pond. Shoreline dominated by Black Spruce - large marshy margin with limited water area - several tufts of graminoids + cattails throughout existing watered area. Small island composed of graminoids + cattails.

Bedrock evident around shoreline in supralittoral - substrate is sediment/detritus over bedrock. Small mats of blue-green algae throughout

Photos: 100-0043 - south towards beaver lodge
100-0044 - eastern shore
0045 - NE corner
0046 - N-S shore
0041 - general area
0042 - gill net
0047 - " "
0048 - " "
(AMEC 5) camera

Legend:
JP = Jack Pine BS = Black Spruce WS = White Spruce BF = Balsam Fir Ce = Cedar La = Larch TA = Trembling Aspen BP = Balsam Poplar WB = White Birch

10. Vegetation – Littoral (%)

	Upper Littoral (Emergent M)	Middle Littoral (Floating M)	Lower Littoral (Submergent M)
Littoral A_L			
Length/width (m/m)	similar to B		
Area (m^2)			
Vegetation cover (%)			
Dominant species (%)			
Littoral B_L			
Length/width (m/m)	50 m / 1m	50 m / 2m	50 m / 2m
Area (m^2)			
Vegetation cover (%)	~~60~~ 65	50%	
Dominant species (%)	Pond lily	→ 5%	
	Broad-leaf pond weed	→ 15	
Silted to weed	~~Pond weed Spark~~ Flower	→ 30	
	Arrow weed 5		
	Carex 45 ~~Rush~~		
	grass 10		
Marshy	Spike rush. ~~pipeweed~~ 5		

Littoral C_L			
Length/width (m/m)			
Area (m^2)			
Vegetation cover (%)	same as a/b		
Dominant species (%)			
Littoral D_L			
Length/width (m/m)			
Area (m^2)			
Vegetation cover (%)			
Dominant species (%)			

similar species - more cattails
same as a/b

Upper Mar Pond

LAKE PROFILE SHEETS

Littoral E_L			
Length/width (m/m)			
Area (m^2)			
Vegetation cover (%)			
Dominant species (%)			

11. Underwater Cover 0% %
Overhanging Shrubs 0% %
Boulders 0% %
Logs 10% %
Macrophytes 35% %
Detritus 10% %
Undercut Banks 0% %

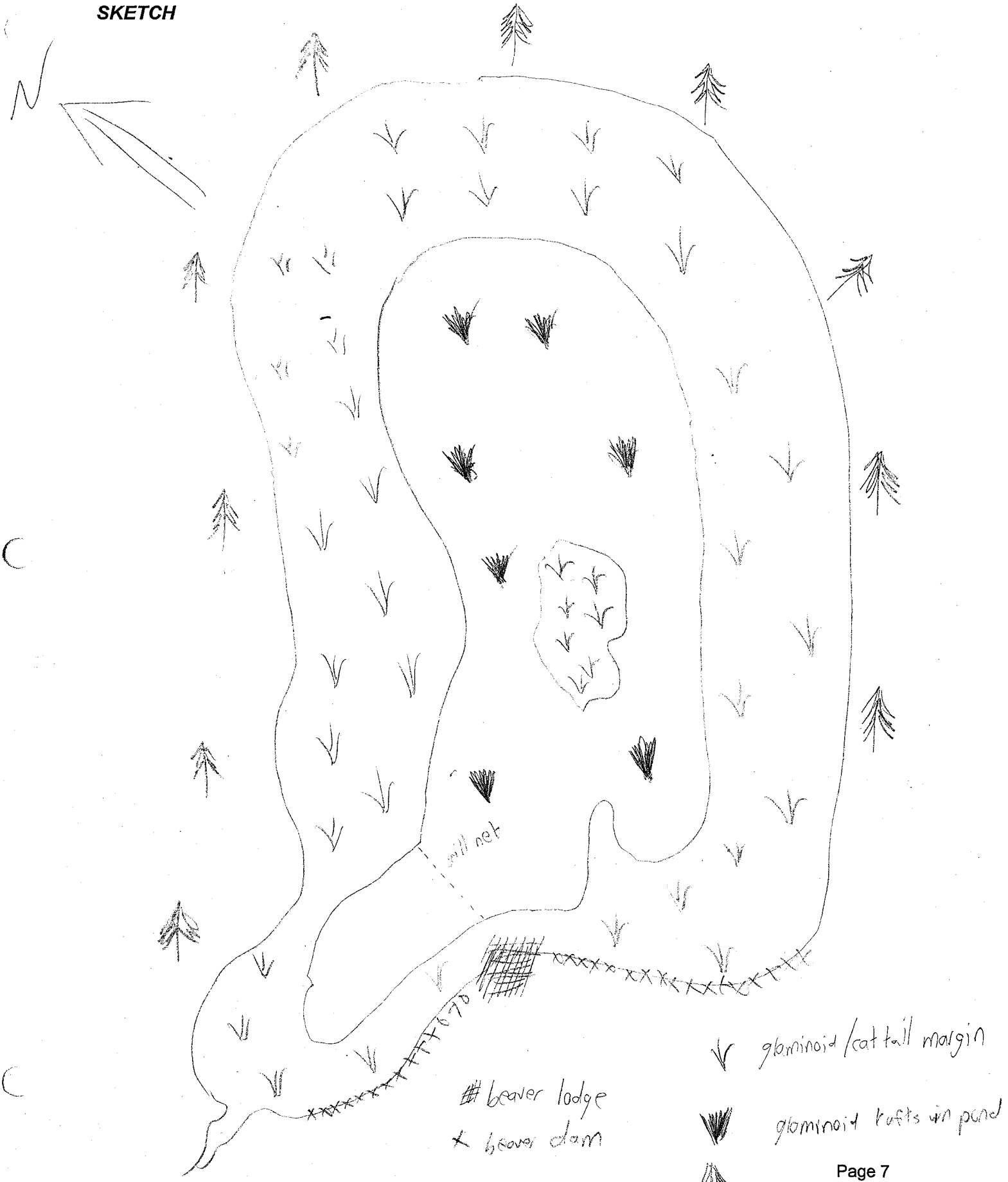
Area with available cover 55% %

12. Comments:

Upper Marr Pond

LAKE PROFILE SHEETS

SKETCH



CREEK PROFILE SHEETS

1. Creek/Reach Name: Mar - 2 Field Dates: July 21/11

GPS Start: 423677 / 5411731 Weather: Sunny · clear

End: ~~5411731~~ 423673 / 5411738 Time Start: 1:45

Field Crew: BM / PM End: 2:20

2. Reach Length: Valley Line 6.5 m Channel Line 7.2 m

Surrounding Land Use: ~~Agricultural~~ (pasture) / Forest

Surrounding Pollution: Agricultural

3. Channel Features:

Sinuosity		m/m	Gradient	low / no flow	m/m
Meander Length	[redacted] 6.5	m	Meander amplitude	1.6	m
Entrenchment	1:1	m			

Notes:

4. Channel Type:

Stream/River	X	Intermittent	
Channelized	X	Ephemeral	
Permanent	X		

Notes:

5. Channel Dimensions:

Floodplain width (m) 85	Channel depth (bank full) (m) ~~0.16~~ 0.55
Channel width (wetted) (m) 0.54	Top of Bank (m) ~~0.27~~ 0.64
Channel width (bank full) (m) 0.62	Average thaleg depth (m) 0.37

Notes:

100-0052 u/s

-0053 d/s

-0054 cross-stream (~~to~~ right bank)

6. Channel Morphology (%)

Pools	%	Flats 100	%	Runs	%
Riffles	%	Braided/diffuse	%	Beaver ponds	%

Notes: No current, some beaver/muskrat activity, depths at crests + troughs slightly deeper

7. Other Channel Features:

Undercut banks Amount (m): 85	%	Beaver dams Number Observed: 0	%
Eroding banks 5	%	Woody structure 0	%
Organic debris 10	%		

Notes:

- banks eroded from beaver trails
- small beaver dam d/s of reach ~ 20 m

8. Summer Temperature/Dissolved Oxygen

Summer Temperature	-water	25.2 °C	
	-air	31 °C	
Dissolved oxygen			mg/l
pH	6.90		
Conductivity	277		v/s

9. Key Water Quality Parameters (units, mg/l)

pH		Turbidity	
Conductivity		Phosphorus	
Alkalinity			
TDS	140		

Marr-2

10. Substrates (%)

Boulder	Cobble	Gravel	Sand	Silt/Muck	Clay	Detritus
A)	—	5	5	10	60	20
B)						
C)						

Notes:

11. Upwellings/Seeps

Upwellings confirmed	\	m
Upwellings suspected	\	m
Supra water level seeps	\	#/m

Notes:

12. Vegetation Composition – Supralittoral/Eulittoral (%)

Supralittoral

JP	BS	WS	BF	Ce	La	TA	BP	WB
	~~20~~ 25						~~5~~ 35	

Tamarack ~~75~~ 40

Notes:

Eulittoral

Alder	Willow	Dogwood	Ericaceous	Graminoid	Width (m)
10	35		5	~~5~~ 50	

~~XXXX~~ WS

Notes:

Vegetation Key

JP=Jack Pine BP=Bolar Poplar BS=Black Spruce WB=White Birch WS=White Spruce BF=Balsam Fir Ce=Cedar La= Larch TA=Trembling Aspen

13. Stream Cover (%)

In Water	Overhanging branches		0	%
	Bottom branch debris		0	%
	Undercut banks		20	%
	Logs		—	#/m
Overhead Cover	Canopy (vertical shading)		9	%
	Ground Vegetation	Shrubs	5	%
		Graminoid	60	%

Notes:

14. Vegetation Composition (Macrophytes) – in-stream (%)

	Emergent	Submergent
Vegetation cover (%)	5	5
Dominant species (%)	pipe weed	pink flower - 3 long slender leaves
	carex	

15. Current velocity m/s: ~~NT~~ <0.001

Notes:

Bank stability: Left bank moderate to good Right bank moderate to good

Notes:

CREEK PROFILE SHEETS

1. Creek/Reach Name: Mar-3 Field Dates: July 20

GPS Start: 0424030 5410691 Weather: Cloudy, Sunny Breaks, rain/ Thunder

End: ~~5410691~~ 0424001 5410671 Time Start: 14:05

Field Crew: Bruce, Pete. End: 14:45

2. Reach Length: Valley Line 35 m Channel Line 37 m

Surrounding Land Use: Agriculture (cattle) & Forrested.

Surrounding Pollution: Agri - run off.

* Cattle crossing @ Western edge of reach.

3. Channel Features:

Sinuosity	—	Gradient little to ~~no~~ very low	m/m
Meander Length	12.0 m	Meander amplitude	1.5 m
Entrenchment	1.5 / 0.25 m		

Notes:

Entrenchment: Flat not well defined Banks. / Marshy

4. Channel Type:

Stream/River	X	Intermittent	
Channelized	X	Ephemeral	
Permanent	X		

Notes:

5. Channel Dimensions:

Floodplain width (m) 50 m.	Channel depth (bank full) (m) ~~0.30~~ 0.62
Channel width (wetted) (m) 2.1	Top of Bank (m) ~~0.40~~ 0.72
Channel width (bank full) (m) 2.9.	~~Average thalweg depth~~ Depth: 0.32

Notes: Photo 0033 ← upstream
0034 → Downstream
0035 ↑ Aerials
} Pete's Camera.

6. Channel Morphology (%)

Pools	0.	%	Flats	90	%	Runs	— %
Riffles	0.	%	Braided/diffuse	10	%	Beaver ponds	— %

Notes:

7. Other Channel Features:

Undercut banks % Amount (m):	0.	Beaver dams % Number Observed:	0.
Eroding banks %	0.	Woody structure %	5
Organic debris %	15		

Notes: Marshy. Lots of Dead / Decaying Grasswood.

8. Summer Temperature/Dissolved Oxygen

Summer Temperature	-water	24.1	°C
	-air	28 C.	°C
Dissolved oxygen			mg/l
pH	6.76		
Conductivity	327 µs/cm.		v/s

164 ppm.

9. Key Water Quality Parameters (units, mg/l)

pH		Turbidity	
Conductivity		Phosphorus	
Alkalinity			
TDS			

Mar-3

10. Substrates (%)

Boulder	Cobble	Gravel	Sand	Silt/Muck	Clay	Detritus
A) 0	0	0	10%	40%	40%.	10%.
B)						
C)						

Notes:
Marshy :. lots of Dead Graminoid.

11. Upwellings/Seeps

Upwellings confirmed	m
Upwellings suspected	m
Supra water level seeps	#/m

Notes:

12. Vegetation Composition – Supralittoral/Eulittoral (%)

Supralittoral

JP	BS	WS	BF	Ce	La	TA	BP	WB
	10%						85%.	

Tamarack. 5%.

Notes:

Eulittoral

Alder	Willow	Dogwood	Ericaceous	Graminoid	Width (m)
5	20		5%.	70%	50 m.

Notes:

Vegetation Key
JP=Jack Pine BP=Bolar Poplar BS=Black Spruce WB=White Birch WS=White Spruce BF=Balsam Fir Ce=Cedar La= Larch TA=Trembling Aspen

13. Stream Cover (%)

In Water	Overhanging branches		5	%
	Bottom branch debris		5	%
	Undercut banks		0	%
	Logs		0	#/m
Overhead Cover	Canopy (vertical shading)		5	%
	Ground Vegetation	Shrubs	5	%
		Graminoid	80	%

Notes:

14. Vegetation Composition (Macrophytes) – in-stream (%)

	Emergent	Submergent
Vegetation cover (%)	1. 25% lake side sedge	5%.
Dominant species (%)	1. ~~lake side~~ 15%.	lemna. 100%.
	2. ~~lake side~~ Carex : 60%	

15. Current velocity m/s: <0.01 m/s.

Notes:

Bank stability: Left bank moderate to good Right bank moderate to good.

Notes:

CREEK PROFILE SHEETS

1. Creek/Reach Name: Mar-4 Field Dates: July 19, 2011

GPS Start: N48. 83957° W094. 04115° Weather: Sunny, light wind, Hot ~36°C

End: N48.83937° W 094. 04166° Time Start: 10:15 am.

Field Crew: Jason, Steve, Bruce, Peter. End: 11:00 am.

2. Reach Length: Valley Line 75 m. m Channel Line 90 m. m

* extreme low water conditions.

Surrounding Land Use: Agriculture, Road to North

Surrounding Pollution: Agri. run-off

3. Channel Features:

Sinuosity	m/m	Gradient low	m/m
Meander Length 17.9.	m	Meander amplitude 8m.	m
Entrenchment ~~0.5~~ 1/1 slope.	m		

Notes:

Reach length ~75m.

4. Channel Type:

Stream/River	X	Intermittent	
Channelized	X	Ephemeral	
Permanent	X		

Notes:
- Some areas of what looks like standing water.
- Low flow.

5. Channel Dimensions:

Floodplain width (m) 180-200 m.	Channel depth (bank full) (m) 0.79. wetted 0.25
Channel width (wetted) (m) 0.63 m.	Top of Bank (m) 0.99
Channel width (bank full) (m) 1.10 m.	Average thaleg depth (m) NA

Notes: Pics: ~~[illegible] Downstream~~ (Jason's Red Camera)
933 Downstream
934 Upstream
935 Fish Processing.
936 left bank.

6. Channel Morphology (%)

Pools	25% %	Flats	75% %	Runs	— %
Riffles	— %	Braided/diffuse	— %	Beaver ponds	— %

Notes:
- Typical riffle / run / Pool NA.
- Pool = slightly larger low flow area
- Flat = very low flow ~ 0%
- Minnow trap @ top of reach w beaver pond.
- some braiding occurs at slightly higher flows.

7. Other Channel Features:

Undercut banks Amount (m): 35%	%	Beaver dams Number Observed: 1 observed.	%
Eroding banks 0%	%	Woody structure	%
Organic debris ~~50%~~ 30	%		

Notes:
undercut depth. 0.13 m

8. Summer Temperature/Dissolved Oxygen

Summer Temperature	-water	19.7°C.	°C
	-air	~ 41°C.	°C
Dissolved oxygen	8.63 mg/L.		mg/l
pH	~~4.75~~ 6.83		
Conductivity	~~0.448 ms/cm / 322 ys/cm~~ // 0.22 ms/cm / 280 ys/cm		v/s

88.7 ORP

9. Key Water Quality Parameters (units, mg/l)

pH		Turbidity	
Conductivity		Phosphorus	
Alkalinity			
TDS			

Mar-4

10. Substrates (%)

Boulder	Cobble	Gravel	Sand	Silt/Muck	Clay	Detritus
A)	—	10%	—	30%	45%	15%
B)						
C)						

Notes:

11. Upwellings/Seeps

Upwellings confirmed	—	m
Upwellings suspected	—	m
Supra water level seeps	—	#/m

Notes:

12. Vegetation Composition – Supralittoral/Eulittoral (%)

Supralittoral Above flood Prone.

JP	BS	WS	BF	Ce	La	TA	BP	WB
	5%					5%	5%	5%

Notes:

Eulittoral Inside flood Prone.

Alder	Willow	Dogwood	Ericaceous	Graminoid	Width (m)
	30%		5%	50%	

Notes: 25% Sedge.

Vegetation Key

JP=Jack Pine BP=Bolar Poplar BS=Black Spruce WB=White Birch WS=White Spruce BF=Balsam Fir Ce=Cedar La= Larch TA=Trembling Aspen

13. Stream Cover (%)

In Water	Overhanging branches	0%	%
	Bottom branch debris	2%	%
	Undercut banks	30%	%
	Logs (Beaver dam)		#/m
Overhead Cover	Canopy (vertical shading)		%
	Ground Vegetation	Shrubs	%
		Graminoid ~~57%~~ 68%	%

Notes:

14. Vegetation Composition (Macrophytes) – in-stream (%)

	Emergent	Submergent
Vegetation cover (%)	35%	~~30%~~ 45%
Dominant species (%)	Carex Ssp. 20%	Pond weed sp. 25%
Broad leaf	Arrowhead. 5%	Lemna 5%
	Burr reed. 5%	ceratophyllum (decaying) 5%
	Marsh Marigold. 5%	~~Narrow leaf~~ slender Pondweed. 5%
		Round Pondweed. 5%

15. Current velocity m/s: < 0,01 m/s.

Notes:

Bank stability: Left bank Moderate → High Right bank moderate → high

Notes:

CREEK PROFILE SHEETS

1. Creek/Reach Name: West Creek ★ Field Dates: July 20/11

GPS Start: 15U 0425696 5410885 Weather: light rain

End: Time Start: 11:40

Field Crew: JD, SA End:

2. Reach Length: Valley Line 25 m Channel Line 56 m

Surrounding Land Use: agriculture, dwellings, forestry, mechanical forestry

Surrounding Pollution: agriculture.

3. Channel Features:

Sinuosity	m/m	Gradient 0.025	m/m
Meander Length 25	m	Meander amplitude 12	m
Entrenchment 0.80 / 1.5	m		

Notes: left 0.83 / 2.5 right.

4. Channel Type:

Stream/River	stream	Intermittent	
Channelized	yes	Ephemeral	
Permanent	yes		

Notes:

- Totally beaver dam influenced
- large moderate lentic hyster flows.

5. Channel Dimensions:

Floodplain width (m) 48m	Channel depth (bank full) (m) 0.95
Channel width (wetted) (m) 1.0 m.	Top of Bank (m) 1.45
Channel width (bank full) (m) 4.0 m	Average thaleg depth (m) 0.10

Notes:

because beaver activity, flow velocity
were typical in morphology
- data below does not fit in main channel flows.

6. Channel Morphology (%)

Pools	10 %	Flats	80 %	Runs	5 %
Riffles	5 %	Braided/diffuse	- %	Beaver ponds	1 %

Notes:

1 upstream.

7. Other Channel Features:

but only 2 counted

Undercut banks Amount (m):	10 % 0.24 m	Beaver dams Number Observed:	50 % 1
Eroding banks	5 %	Woody structure	30 %
Organic debris	5 %		

one upstream of mouth, most in floodplain of secondary channel

Notes:

some grasses cleared since last visit.

8. Summer Temperature/Dissolved Oxygen

Summer Temperature	-water	22.5	°C	
	-air	32	°C	
Dissolved oxygen	67.0 %		5.79	mg/l
pH				
Conductivity	0.282	mS/cm	270	uS/cm v/s

9. Key Water Quality Parameters (units, mg/l)

26.5 ORP

pH	6.90	Turbidity	
Conductivity		Phosphorus	
Alkalinity			
TDS			

West Creek ★ July 20/11 ⑥

10. Substrates (%)

Boulder	Cobble	Gravel	Sand	Silt/Muck	Clay	Detritus
A) 5	5	30	Ø	5	55	
B) 5	Ø	15	Ø	10	70	
C)						

Notes:
- looks like some large particles moved in past years.

11. Upwellings/Seeps

Upwellings confirmed	0 m
Upwellings suspected	m
Supra water level seeps	#/m

Notes:
non observed
- lots of clay aground

12. Vegetation Composition – Supralittoral/Eulittoral (%) support forest vegetation

Supralittoral

JP	BS	WS	BF	Ce	La	TA	BP	WB	Width (m)
	20							20	30 30

Notes:

Eulittoral

Alder	Willow	Dogwood	Ericaceous	Graminoid	Width (m)
15	50		2	80	—

Notes:
- some goldenrod
- wild strawberry
- wild rose

Vegetation Key
JP=Jack Pine BP=Bolar Poplar BS=Black Spruce WB=White Birch WS=White Spruce BF=Balsam Fir Ce=Cedar La= Larch TA=Trembling Aspen

13. Stream Cover (%)

In Water	Overhanging branches	1	%
	Bottom branch debris	25	%
	Undercut banks	5	%
	Logs	1	#/m
Overhead Cover	Canopy (vertical shading)	40	%
	Ground Vegetation — Shrubs		%
	Ground Vegetation — Graminoid	100	%

Notes:

14. Vegetation Composition (Macrophytes) – in-stream (%)

	Emergent	Submergent
Vegetation cover (%)	90	10
Dominant species (%)	burr-reed 80%	Duckweed 10%
	Bur-reed 10%	

15. Current velocity m/s: 0.12 m/s

Notes:

Bank stability: Left bank high Right bank moderate-high

Notes:

CREEK PROFILE SHEETS

1. Creek/Reach Name: West Creek Field Dates: July 21/11

GPS Start: 15U 0426287 5411811 Weather: Sunny

End: Time Start: 12 pm

Field Crew: JD, SA End:

2. Reach Length: Valley Line 30 m Channel Line 42 m

Surrounding Land Use: - Drilling / mine, agriculture, road

Surrounding Pollution: - runoff from road, agriculture

3. Channel Features:

Sinuosity	m/m	Gradient	m/m
Meander Length 12	m	Meander amplitude 8	m
Entrenchment 0.35 / 0.4	m		

Notes:
small scale meanders.

4. Channel Type:

Stream/River Stream.	Intermittent
Channelized	Ephemeral
Permanent ✓	

Notes:
low water conditions.

U-shaped channel ⊔ V ∪

5. Channel Dimensions:

Floodplain width (m) 12.0	Channel depth (bank full) (m) 0.8
Channel width (wetted) (m) 1.1	Top of Bank (m) ~~0.5~~ equal to bankful.
Channel width (bank full) (m) 2.6	Average thaleg depth (m) wetted depth. 0.11

Notes:

morphology on a reduced scale. low water condition.

6. Channel Morphology (%)

Pools	~~70~~ %	Flats	%	Runs	30 %
Riffles	~~25~~ %	Braided/diffuse	%	Beaver ponds	%

Notes:

indicate depth ~ 0.10

indicates larger deeper pockets eg. 0.15 m.

7. Other Channel Features:

Undercut banks 30 %	Beaver dams ~~5~~ %
Amount (m): 0.15 m undercut.	Number Observed: ~~5~~ 0
Eroding banks ~~40~~ 5 %	Woody structure ~~10~~ 30 %
Organic debris ~~30~~ 5 %	

Notes:

8. Summer Temperature/Dissolved Oxygen

Summer Temperature	-water 21.03 °C			
	-air 34 °C			
Dissolved oxygen	68.1 %	/	5.88 mg/L	mg/l
pH	6.63			
Conductivity	0.962 mS/cm³	/	~~1002~~ 149 µS/cm	v/s

ORP = 13.5

9. Key Water Quality Parameters (units, mg/l)

pH		Turbidity	
Conductivity	[illegible]	Phosphorus	
Alkalinity			
TDS			

West Creek

(2)

10. Substrates (%)

	Boulder	Cobble	Gravel	Sand	Silt/Muck	Clay	Detritus
A)	10	ϕ	45	ϕ	20	20	5
B)	~~0~~	5	5	ϕ	10	30	~~50~~
C)	~~10~~	0	0	ϕ	20	30	40

*

A
B
C

Notes:

11. Upwellings/Seeps Non apparent at this time

Upwellings confirmed	m
Upwellings suspected	m
Supra water level seeps	#/m

Notes:

– however, gravel substrate may allow for some upwelling unknown.

12. Vegetation Composition – Supralittoral/Eulittoral (%)

Supralittoral

JP	BS	WS	BF	Ce	La	TA	BP	WB
							10	

Alder | Willow
40 | 50

Notes:

Eulittoral 0/0

Alder	Willow	Dogwood	Ericaceous	Graminoid	Width (m)
~~10~~	~~10~~	–	10	~~20~~ 70	~~1.8~~ 1.2

Notes:

Cwater parsnip

Vegetation Key

JP=Jack Pine BP=Bolar Poplar BS=Black Spruce WB=White Birch WS=White Spruce BF=Balsam Fir Ce=Cedar La= Larch TA=Trembling Aspen

Pics Jay Camera 954 – 956 ☆

13. Stream Cover (%)

In Water	Overhanging branches	30	%
	Bottom branch debris	10	%
	Undercut banks	50	%
	Logs	5	#/m
Overhead Cover	Canopy (vertical shading)	80	%
	Ground Vegetation — Shrubs	20	%
	Ground Vegetation — Graminoid	60	%

Notes:

14. Vegetation Composition (Macrophytes) – in-stream (%)

	Emergent	Submergent
Vegetation cover (%)	35	0
Dominant species (%)	Burreed. 30%	
	water parsnip 5%	

15. Current velocity m/s: 0.03 m/s

Notes:

Bank stability: Left bank high Right bank high

Notes:

CREEK PROFILE SHEETS

1. Creek/Reach Name: WFS - Pond Field Dates: July 22/11

GPS Start: See Book. Weather: Hot & Sunny.

End: _____ Time Start: 16:45

Field Crew: JAY, STEVE End: _____

2. Reach Length: Valley Line _____ m Channel Line _____ m

Surrounding Land Use: _____

agriculture, mining exploration.

Surrounding Pollution: drilling, agriculture, logging.

Habitat Surrounding the pond which is drying up

3. Channel Features:

Sinuosity	N/A.	m/m	Gradient	0.01	m/m
Meander Length	N/A.	m	Meander amplitude		m
Entrenchment	N/A.	m			

Notes:

4. Channel Type: Beaver Pond.

Stream/River	Intermittent
Channelized	Ephemeral
Permanent	

Notes: Part of West Creek drainage former impounded area.

5. Channel Dimensions:

Floodplain width (m) 200 m.	Channel depth (bank full) (m) 1 m.
Channel width (wetted) (m) Pond 30 m & land in middle.	Top of Bank (m) 0.45
Channel width (bank full) (m)	Average thaleg depth (m) 0.40 walked depth.

Notes:

6. Channel Morphology (%)

Pools	%	Flats	%	Runs	%
Riffles	%	Braided/diffuse	%	Beaver ponds 100	%

Notes:

7. Other Channel Features: old.

Undercut banks Amount (m): Ø	%	Beaver dams 60 Number Observed: 1	%
Eroding banks Ø	%	Woody structure 30	%
Organic debris 40	%		

Notes:

8. Summer Temperature/Dissolved Oxygen See field book from July 21/11

Summer Temperature	-water	°C	
	-air	°C	
Dissolved oxygen			mg/l
pH			
Conductivity			v/s

9. Key Water Quality Parameters (units, mg/l)

pH		Turbidity	
Conductivity		Phosphorus	
Alkalinity			
TDS			

WES - Pond.

10. Substrates (%)

Boulder	Cobble	Gravel	Sand	Silt/Muck	Clay	Detritus
A)				20	~~70~~	10
B)						
C)						

Notes:

11. Upwellings/Seeps None.

Upwellings confirmed	m
Upwellings suspected	m
Supra water level seeps	#/m

Notes:

12. Vegetation Composition – Supralittoral/Eulittoral (%)

Supralittoral

JP	BS	WS	BF	Ce	La	TA	BP	WB
	10						20	30

willow / Alder
20 / 20

Notes:

Eulittoral

Alder	Willow	Dogwood	Ericaceous	Graminoid	Width (m)
			60	40	

Notes:

Vegetation Key

JP=Jack Pine BP=Bolar Poplar BS=Black Spruce WB=White Birch WS=White Spruce BF=Balsam Fir Ce=Cedar La= Larch TA=Trembling Aspen

13. Stream Cover (%)

In Water	Overhanging branches	0	%
	Bottom branch debris	0	%
	Undercut banks	0	%
	Logs	1	#/m
Overhead Cover	Canopy (vertical shading)	0	%
	Ground Vegetation — Shrubs		%
	Ground Vegetation — Graminoid		%

Notes:

14. Vegetation Composition (Macrophytes) – in-stream (%)

	Emergent	Submergent
Vegetation cover (%)		
Dominant species (%)	water parsnip	
	cattail	floating pondweed
	sedges	Illinois pondweed
	Narrowleaf Arrowhead	coontail

15. Current velocity m/s: 0.00

Notes:

Bank stability: Left bank high Right bank high

Notes:

LAKE PROFILE SHEETS

1. Waterbody ID/Name: WES-2-Pond Field Dates: July 20/10

GPS Start: 15 U 0425775 Weather: Thundercloud overcast.

End: NA. 5410765 Time Start: 10:25

Field Crew: Jay & Steve End:

2. Area (approx.): _____ ha 90 m(L) x 50 m(W) max.

4. Secchi: 1.0 m Colour: clear - brown

5. Surrounding Land Use agricultural historic cattle grazing

Surrounding Pollution: agriculture, livestock.

May 1.5 m — not applicable

Dissolved Oxygen (mg/L) / Temperature (°C) Profile – Summer (S), Winter (W)

	0	1m	2m	4m	6m	8m	10m	15m	20m	25m
Dissolved Oxygen (S)										
Temperature (S)	24.9 °C									
Dissolved Oxygen (W)										
Temperature (W)										

7. Key Water Quality Parameters (units, mg/L) Surface.

pH		Turbidity	
Conductivity		Phosphorus	
Alkalinity		Other	
TDS		Other	

Notes:

24.92 °C 6.75 pH

0.246 mS/cm 10.6 ORP

246 uS/cm

43.1 ~~CF%~~ DO%

3.52 DO mg/L

Pics 947 & 948 Jay's camera

LAKE PROFILE SHEETS

8. Substrates (%) organics/substrate

Habitat	Type	Depth (M)	Cobble (%)	Gravel (%)	Sand (%)	Silt/Muck (%)	Clay (%)	Detritus (%)	Boulders	Bedrock
Littoral	A_L	0-1				40	20	40		
		1-2				40	20	40		
		2-5								
		5+								
Littoral	B_L	0-1								
		1-2								
		2-5								
		5+								
Littoral	C_L	0-1								
		1-2								
		2-5								
		5+								
Littoral	D_L	0-1								
		1-2								
		2-5								
		5+								
Littoral	E_L	0-1								
		1-2								
		2-5								
		5+								
Profundal	A_P					40	20	40		
Profundal	B_P									

Notes:

9. Vegetation – Supralittoral/Eulittoral (%)

Supralittoral												
	JP (%)	BS (%)	WS (%)	BF (%)	Ce (%)	La (%)	TA (%)	BP (%)	WB (%)	Other (%)	Length (m)	Slope (%)
$A_{S/E}$		30					20		40			
$B_{S/E}$												
$C_{S/E}$												
$D_{S/E}$												
$E_{S/E}$												

Eulittoral							
	Alder (%)	Willow (%)	Dogwood (%)	Graminoid (%)	Ericaceous (%)	Other (%)	Width (m)
$A_{S/E}$	30	30		35	5		45
$B_{S/E}$							
$C_{S/E}$							
$D_{S/E}$							
$E_{S/E}$							

Notes: This is large pond area representative pond area on West Creek system.
- Created by beaver dam approx 60-60 m in width @ downstream end.
- ponding continues upstream through road culvert.

Legend:
JP = Jack Pine BS = Black Spruce WS = White Spruce BF = Balsam Fir Ce = Cedar La = Larch TA = Trembling Aspen BP = Balsam Poplar WB = White Birch

LAKE PROFILE SHEETS

10. Vegetation – Littoral (%)

	Upper Littoral (Emergent M)	Middle Littoral (Floating M)	Lower Littoral (Submergent M)
Littoral A_L	Has both types for whole circumference.		
Length/width (m/m)	180 / 4 m	180 / 12 m	95 / 6 m
Area (m^2)	~~720~~	~~1080~~	~~570~~
Vegetation cover (%)	80	60	45
Dominant species (%)	Carex sp 35	Pondweed sp 60%	Scrubby bog material 20
	grass sp 30		Pondweed sp 25
	pipe weed 20		
	looks like [illegible] 5%		
Littoral B_L			
Length/width (m/m)			
Area (m^2)			
Vegetation cover (%)			
Dominant species (%)			

Littoral C_L			
Length/width (m/m)			
Area (m^2)			
Vegetation cover (%)			
Dominant species (%)			
Littoral D_L			
Length/width (m/m)			
Area (m^2)			
Vegetation cover (%)			
Dominant species (%)			

Littoral E_L			
Length/width (m/m)			
Area (m^2)			
Vegetation cover (%)			
Dominant species (%)			

11. Underwater Cover 70% %
Overhanging Shrubs 0 %
Boulders 0 %
Logs 10% %
Macrophytes 50 %
Detritus 10 % %
Undercut Banks 0 %

Area with available cover 100%. %

12. Comments:

refer to mapping for density of this pond

CREEK PROFILE SHEETS

1. Creek/Reach Name: WES - 4 Field Dates: July 23/11

GPS Start: 15U 0424723 5409049 Weather: Overcast

End: Time Start: 1032

Field Crew: JD, SA, BM, PM End:

2. Reach Length: Valley Line 24.9 m Channel Line m

Surrounding Land Use: Drilling (temp), Agriculture (near), Forrested

Surrounding Pollution: Agriculture, Drilling, Forestry

3. Channel Features:

Sinuosity	m/m	Gradient	LOW (standing water) m/m
Meander Length	24.9 m	Meander amplitude	7.1 m
Entrenchment 1:1	m		

Notes:

4. Channel Type:

Stream/River	Stream	Intermittent	—
Channelized	Channelized	Ephemeral	—
Permanent	Permanent		

Notes:

5. Channel Dimensions:

Floodplain width (m) 120	Channel depth (bank full) (m) 0.84
Channel width (wetted) (m) 1.4	Top of Bank (m) 0.89
Channel width (bank full) (m) 1.2	Average thaleg depth (m) 0.4

West-4

Notes:

6. Channel Morphology (%)

Pools	40 %	Flats	60 %	Runs	Ø %
Riffles	Ø %	Braided/diffuse	%	Beaver ponds	Ø %

Notes: Pools determined to be in crest + trough (Deeper water)

7. Other Channel Features:

Undercut banks	10 %	Beaver dams	%
Amount (m):		Number Observed:	1 (old)
Eroding banks	20 %	Woody structure	%
			10
Organic debris	5 %		

Notes:

8. Summer Temperature/Dissolved Oxygen

Summer Temperature	-water	17.38	°C
	-air	20	°C
Dissolved oxygen	3.82	39.0 %	mg/l
pH			
Conductivity			v/s

9. Key Water Quality Parameters (units, mg/l)

pH	6.74	Turbidity	
Conductivity	0.379 mS/cm³	Phosphorus	
~~Alkalinity~~	326 µS/cm		
TDS	0.248 g/L		

ORP 5.6

Pics #'s 33-38

WCS-41

10. Substrates (%)

	Boulder	Cobble	Gravel	Sand	Silt/Muck	Clay	Detritus
A)	0	0	0	5	15	80	0
B)	0	0	0	5	15	80	
C)							

Notes:

11. Upwellings/Seeps

Upwellings confirmed	m
Upwellings suspected	m
Supra water level seeps	#/m

Notes:

12. Vegetation Composition – Supralittoral/Eulittoral (%)

Supralittoral

JP	BS	WS	BF	Ce	La	TA	BP	WB
	30				10			

Notes:

Eulittoral

Alder	Willow	Dogwood	Ericaceous	Graminoid	Width (m)
5 30	20 15		5	50	

Notes:

Vegetation Key

JP=Jack Pine BP=Bolar Poplar BS=Black Spruce WB=White Birch WS=White Spruce BF=Balsam Fir Ce=Cedar La= Larch TA=Trembling Aspen

WES-4

13. Stream Cover (%)

In Water	Overhanging branches		%
	Bottom branch debris		%
	Undercut banks		%
	Logs		#/m
Overhead Cover	Canopy (vertical shading)		%
	Ground Vegetation	Shrubs	%
		Graminoid	%

Notes:

14. Vegetation Composition (Macrophytes) – in-stream (%)

	Emergent	Submergent
Vegetation cover (%)		
Dominant species (%)		

15. Current velocity m/s: _____

Notes:

Bank stability: Left bank moderate - Good Right bank moderate - Good

Notes:

Cla-1 ; July 24

CREEK PROFILE SHEETS

1. Creek/Reach Name: Cla-1 Field Dates: 24, July, 2011.

GPS Start: 0429495 5409977. Weather: Sunny, few clouds.

End: 0429476 5409982. Time Start: 16:50

Field Crew: BM / SA / PM. End: 17:25

2. Reach Length: Valley Line 18.5 m Channel Line 21.0 m

Surrounding Land Use: Forrested ; Dumping Area? (Tires, garbage, etc.) (No agriculture in immediate vicinity).

Surrounding Pollution: Road crossing ∴ erosion + run-off ; contaminants from Tires + garbage.

3. Channel Features:

Sinuosity	m/m	Gradient low (little / No flow)	m/m
Meander Length 9.8.	m	Meander amplitude 0.89.	m
Entrenchment 2:1	m		

Notes: low water level. Barely enough water to set minnow traps.

4. Channel Type:

Stream/River	✓	Intermittent	
Channelized	✓	Ephemeral	
Permanent	✓		

Notes:

5. Channel Dimensions:

Floodplain width (m) 20m.	Channel depth (bank full) (m) 0.36
Channel width (wetted) (m) 0.66.	Top of Bank (m) 0.57.
Channel width (bank full) (m) 1.08	Average thaleg depth (m) 0.12

Notes: Photos: 0091 u/s
0092 D/s
0093 Across
} Rob's camera.

6. Channel Morphology (%)

Pools	0 %	Flats	100 %	Runs	0 %
Riffles	0 %	Braided/diffuse*	0 %	Beaver ponds	0 %

Notes:
* Some side channels would be present at higher water flows.

7. Other Channel Features:

Undercut banks Amount (m):	2 %	Beaver dams Number Observed:	* 0 %
Eroding banks	10 %	Woody structure	5 %
Organic debris	5 %		

Notes:
*. one very large Beaver dam ~ 50 m u/s from reach.
. one old dam ~ 20 m D/s from reach.

8. Summer Temperature/Dissolved Oxygen

Summer Temperature	-water	25.16°C.	°C
	-air	32°C	°C
Dissolved oxygen	6.9% mg/L	83.2%	mg/l
pH	[redacted]. 6.88		
Conductivity			v/s

ORP: −8.6

9. Key Water Quality Parameters (units, mg/l)

pH	[redacted] 6.88	Turbidity	
Conductivity	223 µs/cm	Phosphorus	
~~Alkalinity~~ Conductivity	0.222 ms/cm³		
TDS	144 g/L		

Cla-1 ; July 24

10. Substrates (%)

Boulder	Cobble	Gravel	Sand	Silt/Muck	Clay	Detritus
A) 0%	0%	0%	0%	10%.	75%.	15%.
B)						
C)						

Notes:
* Substrate very consistent throughout reach.

11. Upwellings/Seeps None observed.

Upwellings confirmed	m
Upwellings suspected	m
Supra water level seeps	#/m

Notes:

12. Vegetation Composition – Supralittoral/Eulittoral (%)

Supralittoral

JP	BS	WS	BF	Ce	La	TA	BP	WB
	40%						40%	

Other: Alder: 20%.

Notes:

Eulittoral

Alder	Willow	Dogwood	Ericaceous	Graminoid	Width (m)
10%.			20%.	70%.	15m.

Notes:

Vegetation Key
JP=Jack Pine BP=Bolar Poplar BS=Black Spruce WB=White Birch WS=White Spruce BF=Balsam Fir Ce=Cedar La= Larch TA=Trembling Aspen

13. Stream Cover (%)

In Water	Overhanging branches	0%	%
	Bottom branch debris	0%.	%
	Undercut banks	2%	%
	Logs	5%	#/m
Overhead Cover	Canopy (vertical shading)	0%.	%
	Ground Vegetation	Shrubs 0%.	%
		Graminoid 5%	%

Notes:

14. Vegetation Composition (Macrophytes) – in-stream (%)

	Emergent	Submergent
Vegetation cover (%)	5%.	10%.
Dominant species (%)	Burr Reed : 45%.	Slender pond weed: 30%.
	Marsh Marigold: 5%.	Lemna : 30%.
	Marshy spikerush: 40%	Myriophyllum 40%.
	Bead Arroweed.: 10%	

15. Current velocity m/s: 0.02 m/s.

Notes:

Bank stability: Left bank Poor - Moderate Right bank Poor - Moderate

Notes:

CREEK PROFILE SHEETS

1. Creek/Reach Name: Cla - 2. Field Dates: July 23, 2011.

GPS Start: 0428087 5409317. Weather: overcast / showers.

End: 0428079 5409293. Time Start: 16:03.

Field Crew: ~~BB~~ BM / SA / PM. End:

2. Reach Length: Valley Line 28.0 m Channel Line 40.0 m

Surrounding Land Use: Forested ; Agriculture? (may be some distance away).

Surrounding Pollution:

3. Channel Features:

Sinuosity	m/m	Gradient Low. / medium.	m/m
Meander Length ~~28.0~~ 28.0	m	Meander amplitude 5.7	m
Entrenchment 1:1 to 2:1 (moderate)	m		

Notes:

4. Channel Type:

Stream/River	Stream.	Intermittent	
Channelized	✓	Ephemeral	
Permanent	✓		

Notes:

5. Channel Dimensions:

Floodplain width (m) 30	Channel depth (bank full) (m) 1.06.
Channel width (wetted) (m) 2.1.	Top of Bank (m) 148.5
Channel width (bank full) (m) 3.1	Average thaleg depth (m) 0.68.

Notes:

Photos: 0075 u/s
0076 D/S
0077 Across.
} Retess Camera.

6. Channel Morphology (%)

Pools	70 %	Flats	20. %	Runs	[redacted] %
Riffles	10 %	Braided/diffuse	0. %	Beaver ponds	0. %

Notes: * Old large beaver dam observed ~ 50 m u/s.

7. Other Channel Features:

Undercut banks Amount (m):	5 %	Beaver dams Number Observed:	% 0. (see note above).
Eroding banks	15. %	Woody structure	5. %
Organic debris	5. %		

Notes:

8. Summer Temperature/Dissolved Oxygen

Summer Temperature	-water	15.6	°C
	-air	18.0	°C
Dissolved oxygen			mg/l
pH			
Conductivity			v/s

9. Key Water Quality Parameters (units, mg/l)

pH	8.03.	Turbidity	
Conductivity	528 µs/cm.	Phosphorus	
Alkalinity			
TDS	263. ppm.		

Cla-2 July 23.

10. Substrates (%)

Boulder	Cobble	Gravel	Sand	Silt/Muck	Clay	Detritus
A) 0.	0.	10%	15%	35%	40%	0
B) 5%	10%	25%	40%	10%	10%	
C)						

Notes:

11. Upwellings/Seeps

Upwellings confirmed	m
Upwellings suspected	m
Supra water level seeps	#/m

Notes: None Observed.

12. Vegetation Composition – Supralittoral/Eulittoral (%)

Supralittoral

JP	BS	WS	BF	Ce	La	TA	BP	WB
	50%.					5%.	30%.	15%

Notes:

Eulittoral

Alder	Willow	Dogwood	Ericaceous	Graminoid	Width (m)
10%.	20%.	0	25%	45%	≈ 30m.

Notes:

Vegetation Key

JP=Jack Pine BP=Bolar Poplar BS=Black Spruce WB=White Birch WS=White Spruce BF=Balsam Fir Ce=Cedar La= Larch TA=Trembling Aspen

13. Stream Cover (%)

In Water	Overhanging branches		0 %.	%
	Bottom branch debris		0 %.	%
	Undercut banks		15 %.	%
	Logs		5 %.	#/m
Overhead Cover	Canopy (vertical shading)		0 %.	%
	Ground Vegetation	Shrubs	2 %.	%
		Graminoid	40 %.	%

Notes:

14. Vegetation Composition (Macrophytes) – in-stream (%)

	Emergent	Submergent
Vegetation cover (%)	5 %.	5 %.
Dominant species (%)	~~Slender~~ Narrow Arrowweed. 30%	Broad ~~Flat~~ leaf Pondweed 100%.
	Broad Arrowweed. 30%	
	Marsh Marigold. 40%	

15. Current velocity m/s: 0.01 m/s.

Notes:

Bank stability: Left bank Good. Right bank Moderate. → Good.

Notes:

CREEK PROFILE SHEETS

1. Creek/Reach Name: Cla-3 Field Dates: 25 July, 2011

GPS Start: 0426688 5408752. Weather: Sunny w cloudy Periods.

End: 0426681 5408753. Time Start: 14:30

Field Crew: BM/SA/DM. End: ~~14:30~~ 15:15

2. Reach Length: Valley Line 8.7 m Channel Line 10.0 m

Surrounding Land Use: Agriculture (Pasture & Hay)

Surrounding Pollution: Agri-run-off. (Cows observed in Pasture)

3. Channel Features:

Sinuosity	m/m	Gradient low (little to no flow)	m/m
Meander Length 8.7m	m	Meander amplitude 1,7 m.	m
Entrenchment 2:1	m		

Notes:

Stream is between 2 Fields, one used for Hay, the other for Agriculture.

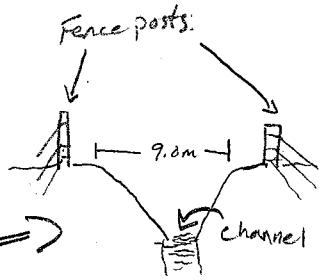
4. Channel Type:

Stream/River	X	Intermittent	
Channelized	X	Ephemeral	
Permanent	X		

Notes:

5. Channel Dimensions:

Floodplain width (m) 30 m. (Fields)	Channel depth (bank full) (m) 0.88
Channel width (wetted) (m) 1.6 m.	Top of Bank (m) 9.0 m. (watercourse is in a steep small valley)
Channel width (bank full) (m) 2.2 m	Average thaleg depth (m) 0.38 m.



Notes:

Photos: 0101 U/S
0102 D/S
0103 Across. (left bank)
} Pete's Camera.

6. Channel Morphology (%)

Pools *	15 %	%	Flats	85 %	%	Runs	0	%
Riffles	0.	%	Braided/diffuse	0	%	Beaver ponds	0.	%

Notes:
* Deeper Areas ie on crest and trough of meander.

7. Other Channel Features:

Undercut banks Amount (m): 10 %.	%	Beaver dams Number Observed: 0	%
Eroding banks 5 %.	%	Woody structure 10 %.	%
Organic debris 5 %.	%		

Notes:

8. Summer Temperature/Dissolved Oxygen

Summer Temperature	-water	19.97 °C.	°C
	-air	28 °C	°C
Dissolved oxygen	10.32 mg/L ; 113.6 %.		mg/l
pH	7.74		
Conductivity	0.599 ms/cm³ ; 541 µs/cm.		v/s

9. Key Water Quality Parameters (units, mg/l)

pH		Turbidity	
Conductivity		Phosphorus	
Alkalinity			
TDS	0.389.		

C1a-3

10. Substrates (%)

Boulder	Cobble	Gravel	Sand	Silt/Muck	Clay	Detritus
A) 0%	0%	10%	30%	40%	15%	5%
B) 0%	0%	25%	[redacted] 40%	20%	10%	5%
C)						

Notes: More gravel and sand present at this site compared to others before July 25

11. Upwellings/Seeps None observed.

Upwellings confirmed	m
Upwellings suspected	m
Supra water level seeps	#/m

Notes:

12. Vegetation Composition – Supralittoral/Eulittoral (%)

Supralittoral

JP	BS	WS	BF	Ce	La	TA	BP	WB

Notes: No trees; Just field :. Ericaceous ! 40%. Graminoid ! 60%

Eulittoral

Alder	Willow	Dogwood	Ericaceous	Graminoid	Width (m)
10%	30%		30%	30%	[redacted] ~10m

Notes:

Vegetation Key

JP=Jack Pine BP=Bolar Poplar BS=Black Spruce WB=White Birch WS=White Spruce BF=Balsam Fir Ce=Cedar La= Larch TA=Trembling Aspen

13. Stream Cover (%)

In Water	Overhanging branches	* 80%	%	(willows)
	Bottom branch debris	50%.	%	
	Undercut banks	10%.	%	
	Logs	5%.	#/m	
Overhead Cover	Canopy (vertical shading)	85%.	%	
	Ground Vegetation	Shrubs * ———	%	
		Graminoid 10%.	%	

Notes:
* Willows overhanging ~80% of reach.

14. Vegetation Composition (Macrophytes) – in-stream (%)

	Emergent	Submergent
Vegetation cover (%)	10%.	0%.
Dominant species (%)	Marshy Spike rush. 2%.	
	Carex. 8%	

15. Current velocity m/s: 0.01 m/s.

Notes:

Bank stability: Left bank Good. Right bank Good.

Notes:

CREEK PROFILE SHEETS

BLA-1

1. Creek/Reach Name: Blackhawk Creek Field Dates: July 22/11

GPS Start: see book Weather: Hot

End: Time Start: 14:00

Field Crew: Jay, Alison, Steve End:

2. Reach Length: Valley Line 40 m Channel Line 49 m

Surrounding Land Use: agriculture, logging

Surrounding Pollution: agriculture,

3. Channel Features: low in this area.

Sinuosity		m/m	Gradient	0.01	m/m
Meander Length	NA.	m	Meander amplitude	NA.	m
Entrenchment	Ø	m			

Notes:

4. Channel Type:

Stream/River Stream	Intermittent
Channelized	Ephemeral
Permanent	

Notes:

near culvert, increased depth due to beaver activity downstream.

5. Channel Dimensions:

Floodplain width (m) 60 m.	Channel depth (bank full) (m) 2.1 m
Channel width (wetted) (m) 2.3	Top of Bank (m) 2.3
Channel width (bank full) (m) 4.5	Average thaleg depth (m) 1.5

Notes:

6. Channel Morphology (%)

Pools	%	Flats	%	Runs 100	%
Riffles	%	Braided/diffuse	%	Beaver ponds	%

Notes: NA - slow moving run section

~~Dot-n~~

7. Other Channel Features:

Undercut banks 10 %		Beaver dams	%
Amount (m): 0.25 m		Number Observed: 0	
Eroding banks 0	%	Woody structure 20	%
Organic debris 10	%		

Notes:

8. Summer Temperature/Dissolved Oxygen

Summer Temperature	-water	29.55 °C	
	-air	29 °C	
Dissolved oxygen	57.8 %	/ 4.99 mg/L	mg/l
pH	6.88		
Conductivity	0.252 mS/cm³	/ 240 µS/cm	v/s

TDS = 0.163 g/L

ORP = -37.5

9. Key Water Quality Parameters (units, mg/l)

pH		Turbidity	
Conductivity		Phosphorus	
Alkalinity			
TDS			

Pics 35-36 - Steve camera

BLA-1

10. Substrates (%)

Boulder	Cobble	Gravel	Sand	Silt/Muck	Clay	Detritus
A) 20	Ø	10	Ø	30	30	10
B) 10	Ø	Ø	Ø	30	40	20
C)						

Notes:

11. Upwellings/Seeps N/A

Upwellings confirmed	m
Upwellings suspected	m
Supra water level seeps	#/m

Notes:

12. Vegetation Composition – Supralittoral/Eulittoral (%)

Supralittoral

JP	BS	WS	BF	Ce	La	TA	BP	WB	Alder	willow
							20	20	30	30

Notes:

Eulittoral

Alder	Willow	Dogwood	Ericaceous	Graminoid	Width (m)
Ø	40			60	

Notes:

Vegetation Key

JP=Jack Pine BP=Bolar Poplar BS=Black Spruce WB=White Birch WS=White Spruce BF=Balsam Fir Ce=Cedar La= Larch TA=Trembling Aspen

13. Stream Cover (%)

In Water	Overhanging branches	5	%
	Bottom branch debris	10	%
	Undercut banks	10	%
	Logs	0.3	#/m
Overhead Cover	Canopy (vertical shading)	25	%
	Ground Vegetation — Shrubs	12.5	%
	Ground Vegetation — Graminoid	12.5	%

Notes:

14. Vegetation Composition (Macrophytes) – in-stream (%)

	Emergent	Submergent
Vegetation cover (%)	5%	2%
Dominant species (%)	Sedge 5%	Duckweed

15. Current velocity m/s: <0.01 m/s (non detectable)

Notes:

Bank stability: Left bank high Right bank high

Notes:

APPENDIX F

BENTHIC INVERTEBRATE COMMUNITY DATA

AMEC: Rainy River Resources, Pinewood River tributaries (TC111504.2003): Baseline MMER, Invertebrate Identifications 2011: Calculated totals

Station	Cla-2	Pin-3	Los-1	Bla-1	Los-T2	Los-2	Tait-T2-1	Pin-6	Cla-3	Pin-4	Upp-T5-1	Wes-3	Mar-Up	Cla-1	Mar-1	Wes-1	Wes-2-Pon	Wes-2	Wes-4	Pin-7	Pin-2	Pin-1	Mar-5	Mar-3	Mar-4	Mar-2
DATE	11.09.28	11.09.29	11.10.01	11.09.30	11.10.01	11.10.01	11.10.02	11.10.01	11.10.02	11.10.02	11.10.02	11.10.02	11.09.28	11.09.28	11.09.28	11.09.29	11.09.29	11.09.29	11.09.29	11.09.30	11.09.30	11.09.30	11.09.27	11.09.27	11.09.27	11.09.28
Original % Subsampled	100	100	100	100	100	100	50	100	100	50	100	100	50	100	100	100	100	100	25	100	100/20	100	100	100	100	100
TAXA LIST																	pond				c/f					
ANNELIDA:HIRUDINEA:																										
ERPOBDELLIDAE:																										
Erpobdella punctata												2		1							2				1	11
Nephelopsis obscura					2					10								1	4	1				2		
GLOSSIPHONIIDAE:																										
Glossiphonia complanata										2				1					4	1						
Helobdella stagnalis					1									1		3										
Placobdella ornata																						1				
HAEMOPIDAE:																										
Haemopis grandis							2												4							
Haemopis poss. Terrestris																									1	
ANNELIDA:OLIGOCHAETA																										
ENCHYTRAEIDAE:														1												
LUMBRICIDAE:																										
Eiseniella tetraedra																1										
LIMBRICULIDAE:																										
Lumbriculus variegatus																									37	
NAIDIDAE:																										
Dero digitata			2							2											173					
Slavinia appendiculata																					20					
TUBIFICIDAE:																										
Immatures with hairs		2	25	1		2				6	1						2								7	
Immatures without hairs	2	31	2		1	37	4	3	1	132	1	132		6		3		3	4	3		7	14		135	2
Limnodrilus clarapedianus						2																				
Limnodrilus hoffmeisteri	4	2																								
ACARINA:																										
ARRENURIDAE:																										
Arrenurus																							1			
HYDROBATIDAE:																										
Hygrobates																					30					
LEBERTIIDAE:																										
Lebertia																1										
SPERCHONTIDAE:																										
Sperchon										2																
UNIONICOLIDAE:																										
Neumania																					10					
Unionicola																					30					
CRUSTACEA:AMPHIPODA:																										
HYALELLIDAE:																										
Hyalella azteca					31		18	4		36				98		1		8	16	14			1			
INSECTA:																										
COLEOPTERA:																										
CHRYSOMELIDAE:																										
Donacia								2																		
DYTISCIDAE:																										

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2012.01.26

AMEC: Rainy River Resources, Pinewood River tributaries (TC111504.2003): Baseline MMER, Invertebrate Identifications 2011: Calculated totals

Station	Cla-2	Pin-3	Los-1	Bla-1	Los-T2	Los-2	Tait-T2-1	Pin-6	Cla-3	Pin-4	Upp-T5-1	Wes-3	Mar-Up	Cla-1	Mar-1	Wes-1	Wes-2-Pon	Wes-2	Wes-4	Pin-7	Pin-2	Pin-1	Mar-5	Mar-3	Mar-4	Mar-2
DATE	11.09.28	11.09.29	11.10.01	11.09.30	11.10.01	11.10.01	11.10.02	11.10.01	11.10.02	11.10.02	11.10.02	11.10.02	11.09.28	11.09.28	11.09.28	11.09.29	11.09.29	11.09.29	11.09.29	11.09.30	11.09.30	11.09.30	11.09.27	11.09.27	11.09.27	11.09.28
Original % Subsampled	100	100	100	100	100	100	50	100	100	50	100	100	50	100	100	100	100	100	25	100	100/20	100	100	100	100	100
TAXA LIST																	pond				c/f					
Agabus																				1						
ELMIDAE:																										
Dubiraphia	20	10						5	2			5				31		14		77	66		1			
Dubiraphia vittata																1					3					
HALIPLIDAE:																										
Haliplus										2																1
												.														
INSECTA:																										
DIPTERA:																										
CERATOPOGONIDAE:	1	3	36		2	16	16	35		4	17	12		12	1	20	1	29	8	3	5	4	2			
CHAOBORIDAE:																										
Chaoborus punctipennis			9			32	2	11							34											
CHIRONOMIDAE:																										
CHIRONOMINAE:																										
Chironomus		20	95	1		323			15	2		1			1									10		
Cladopelma		4	11			12	4			8	12						2									
Cladotanytarsus											1					13										
Cyptochironomus	1	4	9		1	4	2			4	15				1	3	3					11	6			
Cryptotendipes																								1		
Dicrotendipes	7	22				8	18			34	2	14		6			27				452	33	13	2		
Einfeldia natchitocheae			277			25		1					2										5	2		
Endochironomus					4			1		16	1												3			
Glyptotendipes		4		1	3	4	22			38																
Lauterbourniella							6																			
Microtendipes	1	1			1		46	1		10				6					20		12					
Nolithauma																					6					
Paratanytarsus																					47					
Paratendipes																									5	
Phaenopsectra																									1	
Polypedilum	1	6					14			10	36					21	30		4	10	1	7			6	
Pseudochironomus										2																
Stictochironomus														2				1		1			1		1	
Tanytarsus							110			34	2					9					25					
Tribelos	11	28																								
Zavreliella										8																
ORTHOCLADIINAE:																										
Cricoropus										2																
Epoicocladius								3	1											4						
Nanocladius							2																			
Parakiefferiella																									2	
Parametriocnemus																									1	
Psectrocladius										4											1					
TANYPODINAE:																										
Ablabesmyia				1	1		22	2		18										4	1	3				
Clinotanypus					4						1	2								1		1				
Helopelopia																95									5	
Paramerina	2													4		11										
Procladius	16	8	183		14	33	152	15	11	48	70	5		10	15	1	17		4	2	20	10	1	6	6	
EMPIDIDAE:																										
Hemerodromia																1										

AMEC: Rainy River Resources, Pinewood River tributaries (TC111504.2003): Baseline MMER, Invertebrate Identifications 2011: Calculated totals

Station	Cla-2	Pin-3	Los-1	Bla-1	Los-T2	Los-2	Tait-T2-1	Pin-6	Cla-3	Pin-4	Upp-T5-1	Wes-3	Mar-Up	Cla-1	Mar-1	Wes-1	Wes-2-Pon	Wes-2	Wes-4	Pin-7	Pin-2	Pin-1	Mar-5	Mar-3	Mar-4	Mar-2
DATE	11.09.28	11.09.29	11.10.01	11.09.30	11.10.01	11.10.01	11.10.02	11.10.01	11.10.02	11.10.02	11.10.02	11.10.02	11.09.28	11.09.28	11.09.28	11.09.29	11.09.29	11.09.29	11.09.29	11.09.30	11.09.30	11.09.30	11.09.27	11.09.27	11.09.27	11.09.28
Original % Subsampled	100	100	100	100	100	100	50	100	100	50	100	100	50	100	100	100	100	100	25	100	100/20	100	100	100	100	100
TAXA LIST																	pond				c/f					
TABANIDAE:																										
Chrysops	2						2	1		6	1	2				18		9		2			1		2	
TIPULIDAE:																										
Psuedolimnophila												1				1		1				1			1	
Rhabdomastix												2	2	2					4							
EPHEMEROPTERA:																										
BAETIDAE:																										
Acerpenna macdunnoughi																14										
Baetis brunneicolor																5										
CAENIDAE:																										
Caenis youngi	6				1		14			8	2			2		2	2	7		8	331	5	1			
EPHEMERELLIDAE:																										
Eurylophella																					4					
EPHEMERIDAE:																										
Hexagenia limbata								6	1											7		3				
HEPTAGENIIDAE:																										
Stenacron interpunctatum																				1						
Stenonema femoratum																4										
LEPTOPHLEBIIDAE:																										
Leptophlebia																122	1	4		4	3					
HEMIPTERA:																										
CORIXIDAE:																										
Hesperocorixa								3						1												
Sigara		2				3					1			12								2	1			
PLEIDAE:																										
Neoplea striola							4																			
MEGALOPTERA:																										
SIALIDAE:																										
Sialis																				8						
LEPIDOPTERA:																										
CRAMBIDAE:																										
Acentria ephemerella										2									4							
Paraponyx										2																
ODONATA:																										
AESHNIDAE:																										
Aeshna														1				1								
COENAGRIONIDAE:																										
Enallagma					1		2			26										3						
CORDULIIDAE:																										
Somatochlora walshii									1												2					
Tetragoneuria canis										2	1	2									1					
GOMPHIDAE:																										
Gomphus					1							1														
LIBELLULIDAE:																										
Libellula					2												1									

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2012.01.26

AMEC: Rainy River Resources, Pinewood River tributaries (TC111504.2003): Baseline MMER, Invertebrate Identifications 2011: Calculated totals

Station	Cla-2	Pin-3	Los-1	Bla-1	Los-T2	Los-2	Tait-T2-1	Pin-6	Cla-3	Pin-4	Upp-T5-1	Wes-3	Mar-Up	Cla-1	Mar-1	Wes-1	Wes-2-Pon	Wes-2	Wes-4	Pin-7	Pin-2	Pin-1	Mar-5	Mar-3	Mar-4	Mar-2
DATE	11.09.28	11.09.29	11.10.01	11.09.30	11.10.01	11.10.01	11.10.02	11.10.01	11.10.02	11.10.02	11.10.02	11.10.02	11.09.28	11.09.28	11.09.28	11.09.29	11.09.29	11.09.29	11.09.29	11.09.30	11.09.30	11.09.30	11.09.27	11.09.27	11.09.27	11.09.28
Original % Subsampled	100	100	100	100	100	100	50	100	100	50	100	100	50	100	100	100	100	100	25	100	100/20	100	100	100	100	100
TAXA LIST																	pond				c/f					
TRICHOPTERA:																										
DIPSEUDOPSIDAE:																										
Phylocentropus	6						2														2	1				
HYDROPSYCHIDAE:																										
Cheumatopsyche																1										
Hydropsyche																1										
HYDROPTILIDAE:																										
Hydroptila																					1					
Oxyethira										2	1															
LEPIDOSTOMATIDAE:																										
Lepidostoma																1										
LIMNEPHILIDAE:														8												
PHILOPOTAMIDAE:																										
Dolophilodes																1										
PHRYGANAEIDAE:																										
Banksiola										2																
Phryganea											2															
Ptilostomis										2						12		1					1		2	
POLYCENTROPODIDAE:																										
Polycentropus																					3					
MOLLUSCA:BIVALVIA:																										
SPHAERIIDAE:																										
Musculium							2				4															
Pisidium	13	1	7		17	6	18			8	17	3		28	1	38		41	48				5		20	2
Sphaerium rhomboideum	1				9																					
Sphaerium simile				1					4	2				1				8		2	5					
Sphaerium striatinum																					2		2			
UNIONIDAE:																										
Pyganodon grandis								1																		
MOLLUSCA:GASTROPODA:																										
ANCYLIDAE:																										
Ferrissia paralella						1	8									3					26		1			
HYDROBIIDAE:																										
Amnicola limosa		2						22		50										71			84			
LYMNAEIDAE:																										
Fossaria					1																					
PHYSIDAE:																										
Physella gyrina								1		4				1						2			1			2
PLANORBIDAE:																										
Gyraulus circumstriatus					1		38			50							1						3		1	5
Helisoma anceps							4																4			
VALVATIDAE:																										
Valvata lewisi							14																			24
TOTAL NUMBERS	94	150	656	5	98	508	548	117	36	600	188	184	4	204	53	438	87	128	124	230	1284	89	152	23	234	47
TOTAL TAXA	16	17	11	5	20	15	27	18	8	38	20	14	2	21	6	30	11	14	12	23	29	14	22	6	18	7

WIlliam B. Morton
2012.01.26

APPENDIX G

FISHERIES RESOURCES CAPTURE AND SAMPLING EFFORT DATA SUMMARY

Waterbody Name	Date (dd/mm/yy)	Gear Used	Location Description	Sample Location ID	Species Name	Fish ID #	Fork Length (mm)	Total Length (mm)	Round Weight (g)	Age Structures	Tissue	Pres. For Analy. (Y/N)	Notes
Pinewood River	22/07/11	Seine Net	PIN-1	Pin-1	Brook Stickleback	1	-	27	-	-	-	N	
Pinewood River	22/07/11	Seine Net	PIN-1	Pin-1	Brook Stickleback	2	-	28	-	-	-	N	
Pinewood River	22/07/11	Seine Net	PIN-1	Pin-1	Brook Stickleback	3	-	27	-	-	-	N	
Pinewood River	22/07/11	Seine Net	PIN-1	Pin-1	Central Mud Minnow	4	-	32	-	-	-	N	
Pinewood River	22/07/11	Seine Net	PIN-1	Pin-1	Brook Stickleback	5	-	25	-	-	-	N	
Pinewood River	22/07/11	Seine Net	PIN-1	Pin-1	Brook Stickleback	6	-	24	-	-	-	N	
Pinewood River	22/07/11	Seine Net	PIN-1	Pin-1	Brook Stickleback	7	-	29	-	-	-	N	
Pinewood River	22/07/11	Seine Net	PIN-1	Pin-1	Brook Stickleback	8	-	30	-	-	-	N	
Pinewood River	22/07/11	Seine Net	PIN-1	Pin-1	Common Shiner	9	63	69	-	-	A	Y	
Pinewood River	22/07/11	Seine Net	PIN-1	Pin-1	Brook Stickleback	10	-	35	-	-	-	N	
Pinewood River	22/07/11	Seine Net	PIN-1	Pin-1	Brook Stickleback	11	-	23	-	-	-	N	
Pinewood River	22/07/11	Seine Net	PIN-1	Pin-1	Brook Stickleback	12	-	25	-	-	-	N	
Pinewood River	22/07/11	Seine Net	PIN-1	Pin-1	Brook Stickleback	13	-	20	-	-	-	N	
Pinewood River	22/07/11	Seine Net	PIN-1	Pin-1	Common Shiner	14	82	90	-	-	A	Y	
Pinewood River	22/07/11	Seine Net	PIN-1	Pin-1	Common Shiner	15	89	97	-	-	A	Y	
Pinewood River	22/07/11	Seine Net	PIN-1	Pin-1	Common Shiner	16	47	52	-	-	A	Y	
Pinewood River	22/07/11	Seine Net	PIN-1	Pin-1	Common Shiner	17	45	49	-	-	A	Y	
Pinewood River	22/07/11	Seine Net	PIN-1	Pin-1	Common Shiner	18	75	82	-	-	A	Y	
Pinewood River	22/07/11	Seine Net	PIN-1	Pin-1	Brook Stickleback	19	-	26	-	-	-	N	
Pinewood River	22/07/11	Seine Net	PIN-1	Pin-1	Brook Stickleback	20	-	28	-	-	-	N	
Pinewood River	22/07/11	Seine Net	PIN-1	Pin-1	Brook Stickleback	21	-	28	-	-	-	N	
Pinewood River	22/07/11	Seine Net	PIN-1	Pin-1	Brook Stickleback	22	-	25	-	-	-	N	
Pinewood River	22/07/11	Seine Net	PIN-1	Pin-1	Common Shiner	23	110	121	-	-	A	Y	Picture
Pinewood River	22/07/11	Seine Net	PIN-1	Pin-1	Brook Stickleback	24	-	29	-	-	-	N	
Pinewood River	22/07/11	Seine Net	PIN-1	Pin-1	Common Shiner	25	123	134	-	-	A	Y	
Pinewood River	22/07/11	Seine Net	PIN-1	Pin-1	Common Shiner	26	84	92	-	-	A	Y	
Pinewood River	22/07/11	Seine Net	PIN-1	Pin-1	Common Shiner	27	80	87	-	-	A	Y	
Pinewood River	22/07/11	Seine Net	PIN-1	Pin-1	Common Shiner	28	-	17	-	-	-	N	
Pinewood River	22/07/11	Seine Net	PIN-1	Pin-1	Brook Stickleback	29	-	30	-	-	-	N	
Pinewood River	22/07/11	Seine Net	PIN-1	Pin-1	Common Shiner	30	95	104	-	-	A	Y	
Pinewood River	22/07/11	Seine Net	PIN-1	Pin-1	Common Shiner	31	82	91	-	-	A	Y	Black spot
Pinewood River	22/07/11	Seine Net	PIN-1	Pin-1	Common Shiner	32	92	100	-	-	A	Y	
Pinewood River	22/07/11	Seine Net	PIN-1	Pin-1	Johnny Darter	33	-	51	-	-	-	N	
Pinewood River	22/07/11	Seine Net	PIN-1	Pin-1	Brook Stickleback	34	-	33	-	-	-	N	
Pinewood River	22/07/11	Seine Net	PIN-1	Pin-1	Common Shiner	35	51	56	-	-	A	Y	
Pinewood River	22/07/11	Seine Net	PIN-1	Pin-1	Common Shiner	36	85	95	-	-	A	Y	
Pinewood River	22/07/11	Seine Net	PIN-1	Pin-1	Common Shiner	37	106	117	-	-	A	Y	
Pinewood River	22/07/11	Seine Net	PIN-1	Pin-1	Common Shiner	38	75	83	-	-	A	Y	
Pinewood River	22/07/11	Seine Net	PIN-1	Pin-1	White Sucker	39	120	129	-	-	-	N	
Pinewood River	22/07/11	Seine Net	PIN-1	Pin-1	Common Shiner	40	102	111	-	-	A	Y	
Pinewood River	22/07/11	Seine Net	PIN-1	Pin-1	Common Shiner	41	104	113	-	-	A	Y	
Pinewood River	22/07/11	Seine Net	PIN-1	Pin-1	White Sucker	42	132	142	-	-	-	N	
Pinewood River	22/07/11	Seine Net	PIN-1	Pin-1	Common Shiner	43	87	96	-	-	A	Y	
Pinewood River	22/07/11	Seine Net	PIN-1	Pin-1	Central Mud Minnow	44	-	98	-	-	-	N	
Pinewood River	22/07/11	Seine Net	PIN-1	Pin-1	White Sucker	45	115	124	-	-	-	N	
Pinewood River	22/07/11	Seine Net	PIN-1	Pin-1	Common Shiner	46	111	122	-	-	-	N	
Pinewood River	22/07/11	Seine Net	PIN-1	Pin-1	White Sucker	47	120	126	-	-	-	N	
Pinewood River	22/07/11	Seine Net	PIN-1	Pin-1	White Sucker	48	127	135	-	-	-	N	
Pinewood River	22/07/11	Seine Net	PIN-1	Pin-1	White Sucker	49	125	134	-	-	-	N	
Pinewood River	22/07/11	Seine Net	PIN-1	Pin-1	Common Shiner	50	98	106	-	-	-	N	
Pinewood River	22/07/11	Seine Net	PIN-1	Pin-1	Blackside Darter	51	-	77	-	-	A	Y	
Pinewood River	22/07/11	Seine Net	PIN-1	Pin-1	Central Mud Minnow	52	-	51	-	-	-	N	
Pinewood River	22/07/11	Seine Net	PIN-1	Pin-1	White Sucker	53	108	115	-	-	-	N	
Pinewood River	22/07/11	Seine Net	PIN-1	Pin-1	Common Shiner	54	112	125	-	-	-	N	
Pinewood River	22/07/11	Seine Net	PIN-1	Pin-1	White Sucker	55	129	134	-	-	-	N	
Pinewood River	22/07/11	Seine Net	PIN-1	Pin-1	Johnny Darter	56	-	58	-	-	-	N	
Pinewood River	22/07/11	Seine Net	PIN-1	Pin-1	White Sucker	57	122	130	-	-	-	N	

Pinewood River	22/07/11	Seine Net	PIN-1	Pin-1	White Sucker	58	116	123	-	-	-	N	
Pinewood River	22/07/11	Seine Net	PIN-1	Pin-1	Creek Chub	59	150	160	-	-	-	N	
Pinewood River	22/07/11	Seine Net	PIN-1	Pin-1	Johnny Darter	60	-	59	-	-	-	N	
Pinewood River	22/07/11	Seine Net	PIN-1	Pin-1	Johnny Darter	61	-	51	-	-	-	N	
Pinewood River	22/07/11	Seine Net	PIN-1	Pin-1	Johnny Darter	62	-	66	-	-	-	N	
Pinewood River	22/07/11	Seine Net	PIN-1	Pin-1	Johnny Darter	63	-	61	-	-	-	N	
Pinewood River	22/07/11	Seine Net	PIN-1	Pin-1	White Sucker	64	185	194	-	-	-	N	
Pinewood River	22/07/11	Seine Net	PIN-1	Pin-1	Johnny Darter	65	-	65	-	-	-	N	
Pinewood River	22/07/11	Seine Net	PIN-1	Pin-1	Johnny Darter	66	-	54	-	-	-	N	
Pinewood River	22/07/11	Seine Net	PIN-1	Pin-1	Johnny Darter	67	-	52	-	-	-	N	
Pinewood River	22/07/11	Seine Net	PIN-1	Pin-1	Johnny Darter	68	-	66	-	-	-	N	
Pinewood River	22/07/11	Seine Net	PIN-1	Pin-1	White Sucker	69	135	144	-	-	-	N	
Pinewood River	22/07/11	Seine Net	PIN-1	Pin-1	Johnny Darter	70	-	53	-	-	-	N	
Pinewood River	22/07/11	Seine Net	PIN-1	Pin-1	Johnny Darter	71	-	49	-	-	-	N	
Pinewood River	22/07/11	Seine Net	PIN-1	Pin-1	Johnny Darter	72	-	65	-	-	-	N	
Pinewood River	22/07/11	Gillnet	PIN-1	Pin-1	Creek Chub	1	159	168	-	-	-	N	
Pinewood River	22/07/11	Gillnet	PIN-1	Pin-1	Creek Chub	2	165	174	-	-	-	N	
Pinewood River	22/07/11	Gillnet	PIN-1	Pin-1	Creek Chub	3	180	194	-	-	-	N	
Pinewood River	22/07/11	Gillnet	PIN-1	Pin-1	Creek Chub	4	175	182	-	-	-	N	
Pinewood River	22/07/11	Gillnet	PIN-1	Pin-1	Creek Chub	5	166	175	-	-	-	N	
Pinewood River	21/07/11	Minnow Trap	Pin-2	Pin-2	Common Shiner	1	90	99	-	-	A	Y	Batch wt. = 106.4g
Pinewood River	21/07/11	Minnow Trap	Pin-2	Pin-2	Common Shiner	2	68	75	-	-	A	Y	Batch wt. = 106.4g
Pinewood River	21/07/11	Minnow Trap	Pin-2	Pin-2	Common Shiner	3	88	94	-	-	A	Y	Batch wt. = 106.4g
Pinewood River	21/07/11	Minnow Trap	Pin-2	Pin-2	Spottail Shiner	4	58	60	-	-	-	N	
Pinewood River	21/07/11	Minnow Trap	Pin-2	Pin-2	Spottail Shiner	5	60	64	-	-	-	N	
Pinewood River	21/07/11	Minnow Trap	Pin-2	Pin-2	Common Shiner	6	82	90	-	-	A	Y	Batch wt. = 106.4g
Pinewood River	21/07/11	Minnow Trap	Pin-2	Pin-2	Spottail Shiner	7	64	67	-	-	-	N	
Pinewood River	21/07/11	Minnow Trap	Pin-2	Pin-2	Spottail Shiner	8	54	57	-	-	-	N	
Pinewood River	21/07/11	Minnow Trap	Pin-2	Pin-2	Common Shiner	9	78	84	-	-	A	Y	Batch wt. = 106.4g
Pinewood River	21/07/11	Minnow Trap	Pin-2	Pin-2	Common Shiner	10	76	82	-	-	A	Y	Batch wt. = 106.4g
Pinewood River	21/07/11	Minnow Trap	Pin-2	Pin-2	Common Shiner	11	85	90	-	-	A	Y	Batch wt. = 106.4g
Pinewood River	21/07/11	Minnow Trap	Pin-2	Pin-2	Common Shiner	12	73	79	-	-	A	Y	Batch wt. = 106.4g
Pinewood River	21/07/11	Minnow Trap	Pin-2	Pin-2	Creek Chub	13	115	120	-	-	-	N	
Pinewood River	21/07/11	Minnow Trap	Pin-2	Pin-2	Pearl Dace	14	74	79	-	-	-	N	
Pinewood River	21/07/11	Minnow Trap	Pin-2	Pin-2	Common Shiner	15	77	83	-	-	A	Y	Batch wt. = 106.4g
Pinewood River	21/07/11	Minnow Trap	Pin-2	Pin-2	Common Shiner	16	77	84	-	-	A	Y	Batch wt. = 106.4g
Pinewood River	21/07/11	Minnow Trap	Pin-2	Pin-2	Creek Chub	17	110	115	-	-	-	N	
Pinewood River	21/07/11	Minnow Trap	Pin-2	Pin-2	Creek Chub	18	140	145	-	-	-	N	
Pinewood River	21/07/11	Minnow Trap	Pin-2	Pin-2	Common Shiner	19	85	91	-	-	A	Y	Batch wt. = 106.4g
Pinewood River	21/07/11	Minnow Trap	Pin-2	Pin-2	Common Shiner	20	77	82	-	-	A	Y	Batch wt. = 106.4g
Pinewood River	21/07/11	Minnow Trap	Pin-2	Pin-2	Common Shiner	21	75	81	-	-	-	N	
Pinewood River	21/07/11	Minnow Trap	Pin-2	Pin-2	Common Shiner	22	81	90	-	-	A	Y	Batch wt. = 106.4g
Pinewood River	21/07/11	Minnow Trap	Pin-2	Pin-2	Common Shiner	23	78	86	-	-	A	Y	Batch wt. = 106.4g
Pinewood River	21/07/11	Minnow Trap	Pin-2	Pin-2	Common Shiner	24	87	91	-	-	A	Y	Batch wt. = 106.4g
Pinewood River	21/07/11	Minnow Trap	Pin-2	Pin-2	Common Shiner	25	77	82	-	-	A	Y	Batch wt. = 106.4g
Pinewood River	21/07/11	Minnow Trap	Pin-2	Pin-2	Common Shiner	26	133	144	-	-	-	N	
Pinewood River	21/07/11	Minnow Trap	Pin-2	Pin-2	Common Shiner	27	84	87	-	-	A	Y	Batch wt. = 106.4g
Pinewood River	21/07/11	Minnow Trap	Pin-2	Pin-2	Creek Chub	28	121	130	-	-	-	N	
Pinewood River	21/07/11	Minnow Trap	Pin-2	Pin-2	Creek Chub	29	135	144	-	-	-	N	
Pinewood River	21/07/11	Minnow Trap	Pin-2	Pin-2	Spottail Shiner	30	112	120	-	-	-	N	
Pinewood River	21/07/11	Minnow Trap	Pin-2	Pin-2	Creek Chub	31	140	150	-	-	-	N	
Pinewood River	21/07/11	Minnow Trap	Pin-2	Pin-2	Common Shiner	32	80	85	-	-	A	Y	Batch wt. = 106.4g
Pinewood River	21/07/11	Minnow Trap	Pin-2	Pin-2	Common Shiner	33	90	98	-	-	A	Y	Batch wt. = 106.4g
Pinewood River	21/07/11	Minnow Trap	Pin-2	Pin-2	Common Shiner	34	80	85	-	-	A	Y	Batch wt. = 106.4g
Pinewood River	21/07/11	Minnow Trap	Pin-2	Pin-2	Common Shiner	35	65	70	-	-	-	N	
Pinewood River	21/07/11	Minnow Trap	Pin-2	Pin-2	Creek Chub	36	145	152	-	-	-	N	
Pinewood River	21/07/11	Minnow Trap	Pin-2	Pin-2	Common Shiner	37	86	94	-	-	-	N	
Pinewood River	21/07/11	Minnow Trap	Pin-2	Pin-2	Common Shiner	38	92	99	-	-	-	N	
Pinewood River	21/07/11	Minnow Trap	Pin-2	Pin-2	Common Shiner	39	85	93	-	-	-	N	

Pinewood River	21/07/11	Minnow Trap	Pin-2	Pin-2	Common Shiner	40	79	84	-	-	-	N	
Pinewood River	21/07/11	Minnow Trap	Pin-2	Pin-2	Common Shiner	41	71	83	-	-	-	N	
Pinewood River	21/07/11	Minnow Trap	Pin-2	Pin-2	Common Shiner	42	80	87	-	-	-	N	
Pinewood River	21/07/11	Minnow Trap	Pin-2	Pin-2	Common Shiner	43	85	91	-	-	-	N	
Pinewood River	21/07/11	Minnow Trap	Pin-2	Pin-2	Common Shiner	44	77	83	-	-	-	N	
Pinewood River	21/07/11	Minnow Trap	Pin-2	Pin-2	Nothern Redbellly Dace	45	95	100	-	-	-	N	
Pinewood River	21/07/11	Minnow Trap	Pin-2	Pin-2	Spottail Shiner	46	54	57	-	-	-	N	
Pinewood River	21/07/11	Minnow Trap	Pin-2	Pin-2	Spottail Shiner	47	58	62	-	-	-	N	
Pinewood River	21/07/11	Minnow Trap	Pin-2	Pin-2	Spottail Shiner	48	55	59	-	-	-	N	
Pinewood River	21/07/11	Minnow Trap	Pin-2	Pin-2	Spottail Shiner	49	55	59	-	-	-	N	
Pinewood River	21/07/11	Minnow Trap	Pin-2	Pin-2	Creek Chub	50	100	110	-	-	-	N	
Pinewood River	21/07/11	Minnow Trap	Pin-2	Pin-2	Creek Chub	51	115	121	-	-	-	N	
Pinewood River	21/07/11	Minnow Trap	Pin-2	Pin-2	Spottail Shiner	52	65	69	-	-	-	N	
Pinewood River	21/07/11	Minnow Trap	Pin-2	Pin-2	Spottail Shiner	53	57	60	-	-	-	N	
Pinewood River	21/07/11	Minnow Trap	Pin-2	Pin-2	Finescale Dace	54	59	64	-	-	-	N	
Pinewood River	21/07/11	Minnow Trap	Pin-2	Pin-2	Finescale Dace	55	57	59	-	-	-	N	
Pinewood River	21/07/11	Minnow Trap	Pin-2	Pin-2	Finescale Dace	56	54	56	-	-	-	N	
Pinewood River	21/07/11	Minnow Trap	Pin-2	Pin-2	Spottail Shiner	57	57	60	-	-	-	N	
Pinewood River	21/07/11	Minnow Trap	Pin-2	Pin-2	Finescale Dace	58	53	56	-	-	-	N	
Pinewood River	21/07/11	Minnow Trap	Pin-2	Pin-2	Spottail Shiner	59	54	58	-	-	-	N	
Pinewood River	21/07/11	Minnow Trap	Pin-2	Pin-2	Finescale Dace	60	57	60	-	-	-	N	
Pinewood River	21/07/11	Minnow Trap	Pin-2	Pin-2	Spottail Shiner	61	53	55	-	-	-	N	
Pinewood River	21/07/11	Minnow Trap	Pin-2	Pin-2	Spottail Shiner	62	44	50	-	-	-	N	
Pinewood River	21/07/11	Minnow Trap	Pin-2	Pin-2	Spottail Shiner	63	72	75	-	-	-	N	
Pinewood River	21/07/11	Minnow Trap	Pin-2	Pin-2	Spottail Shiner	64	60	64	-	-	-	N	
Pinewood River	21/07/11	Minnow Trap	Pin-2	Pin-2	Spottail Shiner	65	55	59	-	-	-	N	
Pinewood River	21/07/11	Minnow Trap	Pin-2	Pin-2	Spottail Shiner	66	53	56	-	-	-	N	
Pinewood River	21/07/11	Minnow Trap	Pin-2	Pin-2	Spottail Shiner	67	50	53	-	-	-	N	
Pinewood River	21/07/11	Minnow Trap	Pin-2	Pin-2	Spottail Shiner	68	65	69	-	-	-	N	
Pinewood River	21/07/11	Minnow Trap	Pin-2	Pin-2	Spottail Shiner	69	54	57	-	-	-	N	
Pinewood River	21/07/11	Minnow Trap	Pin-2	Pin-2	Finescale Dace	70	60	64	-	-	-	N	
Pinewood River	21/07/11	Minnow Trap	Pin-2	Pin-2	Spottail Shiner	71	54	59	-	-	-	N	
Pinewood River	21/07/11	Minnow Trap	Pin-2	Pin-2	Finescale Dace	72	53	56	-	-	-	N	
Pinewood River	21/07/11	Minnow Trap	Pin-2	Pin-2	Spottail Shiner	73	49	53	-	-	-	N	
Pinewood River	21/07/11	Minnow Trap	Pin-2	Pin-2	Finescale Dace	74	55	60	-	-	-	N	
Pinewood River	21/07/11	Minnow Trap	Pin-2	Pin-2	Spottail Shiner	75	60	65	-	-	-	N	
Pinewood River	21/07/11	Minnow Trap	Pin-2	Pin-2	Spottail Shiner	76	59	65	-	-	-	N	
Pinewood River	21/07/11	Minnow Trap	Pin-2	Pin-2	Spottail Shiner	77	57	60	-	-	-	N	
Pinewood River	21/07/11	Minnow Trap	Pin-2	Pin-2	Spottail Shiner	78	45	50	-	-	-	N	
Pinewood River	21/07/11	Minnow Trap	Pin-2	Pin-2	Spottail Shiner	79	53	55	-	-	-	N	
Pinewood River	21/07/11	Minnow Trap	Pin-2	Pin-2	Spottail Shiner	80	61	65	-	-	-	N	
Pinewood River	21/07/11	Minnow Trap	Pin-2	Pin-2	Spottail Shiner	81	55	58	-	-	-	N	
Pinewood River	21/07/11	Minnow Trap	Pin-2	Pin-2	White Sucker	82	110	120	-	-	-	N	
Pinewood River	21/07/11	Minnow Trap	Pin-2	Pin-2	White Sucker	83	120	125	-	-	-	N	
Pinewood River	21/07/11	Minnow Trap	Pin-2	Pin-2	Spottail Shiner	84	90	94	-	-	-	N	
Pinewood River	21/07/11	Minnow Trap	Pin-2	Pin-2	Finescale Dace	85	60	63	-	-	-	N	
Pinewood River	21/07/11	Minnow Trap	Pin-2	Pin-2	Spottail Shiner	86	69	74	-	-	-	N	
Pinewood River	21/07/11	Minnow Trap	Pin-2	Pin-2	Spottail Shiner	87	69	73	-	-	-	N	
Pinewood River	21/07/11	Minnow Trap	Pin-2	Pin-2	Darter	88	-	71	-	-	A	Y	
Pinewood River	21/07/11	Minnow Trap	Pin-2	Pin-2	Spottail Shiner	89	50	53	-	-	-	N	
Pinewood River	21/07/11	Minnow Trap	Pin-2	Pin-2	White Sucker	90	124	133	-	-	-	N	
Pinewood River	21/07/11	Minnow Trap	Pin-2	Pin-2	Darter	91	-	63	-	-	-	N	
Pinewood River	21/07/11	Minnow Trap	Pin-2	Pin-2	Darter	92	62	63	-	-	A	Y	
Pinewood River	21/07/11	Minnow Trap	Pin-2	Pin-2	Darter	93	65	68	-	-	-	N	
Pinewood River	21/07/11	Minnow Trap	Pin-2	Pin-2	Finescale Dace	94	95	100	-	-	-	N	
Pinewood River	22/07/11	Seine Net	Alternate site used, @ confluence of Pine R. + Clark C. (right shore)	Pin-3	Brook Stickleback	1	-	47	-	-	-	N	
Pinewood River	22/07/11	Seine Net	Alternate site used, @ confluence of Pine R. + Clark C. (right shore)	Pin-3	Spottail Shiner	2	-	45	-	-	-	N	
Pinewood River	22/07/11	Seine Net	Alternate site used, @ confluence of Pine R. + Clark C. (right shore)	Pin-3	Finescale Dace	3	42	45	-	-	-	N	
Pinewood River	22/07/11	Seine Net	Alternate site used, @ confluence of Pine R. + Clark C. (right shore)	Pin-3	Central Mud Minnow	4	-	46	-	-	-	N	

Pinewood River	22/07/11	Seine Net	Alternate site used, @ confluence of Pine R. + Clark C. (right shore)	Pin-3	Brook Stickleback	5	-	27	-	-	-	N	
Pinewood River	22/07/11	Seine Net	Alternate site used, @ confluence of Pine R. + Clark C. (right shore)	Pin-3	Brook Stickleback	6	-	43	-	-	-	N	
Pinewood River	22/07/11	Seine Net	Alternate site used, @ confluence of Pine R. + Clark C. (right shore)	Pin-3	Brook Stickleback	7	-	39	-	-	-	N	
Pinewood River	22/07/11	Seine Net	Alternate site used, @ confluence of Pine R. + Clark C. (right shore)	Pin-3	Brook Stickleback	8	-	46	-	-	-	N	
Pinewood River	22/07/11	Seine Net	Alternate site used, @ confluence of Pine R. + Clark C. (right shore)	Pin-3	Brook Stickleback	9	-	43	-	-	-	N	
Pinewood River	22/07/11	Seine Net	Alternate site used, @ confluence of Pine R. + Clark C. (right shore)	Pin-3	Spottail Shiner	10	40	43	-	-	-	N	
Pinewood River	22/07/11	Seine Net	Alternate site used, @ confluence of Pine R. + Clark C. (right shore)	Pin-3	Brook Stickleback	11	-	44	-	-	-	N	
Pinewood River	22/07/11	Seine Net	Alternate site used, @ confluence of Pine R. + Clark C. (right shore)	Pin-3	Brook Stickleback	12	-	33	-	-	-	N	
Pinewood River	22/07/11	Seine Net	Alternate site used, @ confluence of Pine R. + Clark C. (right shore)	Pin-3	Brook Stickleback	13	-	48	-	-	-	N	
Pinewood River	22/07/11	Seine Net	Alternate site used, @ confluence of Pine R. + Clark C. (right shore)	Pin-3	Brook Stickleback	14	-	43	-	-	-	N	
Pinewood River	22/07/11	Seine Net	Alternate site used, @ confluence of Pine R. + Clark C. (right shore)	Pin-3	Brook Stickleback	15	-	32	-	-	-	N	
Pinewood River	22/07/11	Seine Net	Alternate site used, @ confluence of Pine R. + Clark C. (right shore)	Pin-3	Brook Stickleback	16	-	48	-	-	-	N	
Pinewood River	22/07/11	Seine Net	Alternate site used, @ confluence of Pine R. + Clark C. (right shore)	Pin-3	Blacknose Dace	17	-	28	-	-	-	N	
Pinewood River	22/07/11	Seine Net	Alternate site used, @ confluence of Pine R. + Clark C. (right shore)	Pin-3	Common Shiner	18	-	34	-	-	-	N	
Pinewood River	22/07/11	Seine Net	Alternate site used, @ confluence of Pine R. + Clark C. (right shore)	Pin-3	Common Shiner	19	-	36	-	-	-	N	
Pinewood River	22/07/11	Seine Net	Alternate site used, @ confluence of Pine R. + Clark C. (right shore)	Pin-3	Central Mud Minnow	20	-	51	-	-	-	N	
Pinewood River	22/07/11	Seine Net	Alternate site used, @ confluence of Pine R. + Clark C. (right shore)	Pin-3	Brook Stickleback	21	-	21	-	-	-	N	
Pinewood River	22/07/11	Seine Net	Alternate site used, @ confluence of Pine R. + Clark C. (right shore)	Pin-3	Blacknose Dace	22	-	33	-	-	-	N	
Pinewood River	22/07/11	Seine Net	Alternate site used, @ confluence of Pine R. + Clark C. (right shore)	Pin-3	Brook Stickleback	23	-	21	-	-	-	N	
Pinewood River	22/07/11	Seine Net	Alternate site used, @ confluence of Pine R. + Clark C. (right shore)	Pin-3	Common Shiner	24	-	35	-	-	-	N	
Pinewood River	22/07/11	Seine Net	Alternate site used, @ confluence of Pine R. + Clark C. (right shore)	Pin-3	Common Shiner	25	-	38	-	-	-	N	
Pinewood River	22/07/11	Seine Net	Alternate site used, @ confluence of Pine R. + Clark C. (right shore)	Pin-3	Brook Stickleback	26	-	39	-	-	-	N	
Pinewood River	22/07/11	Seine Net	Alternate site used, @ confluence of Pine R. + Clark C. (right shore)	Pin-3	Brook Stickleback	27	-	41	-	-	-	N	
Pinewood River	22/07/11	Seine Net	Alternate site used, @ confluence of Pine R. + Clark C. (right shore)	Pin-3	Brook Stickleback	28	-	28	-	-	-	N	
Pinewood River	22/07/11	Seine Net	Alternate site used, @ confluence of Pine R. + Clark C. (right shore)	Pin-3	Brook Stickleback	29	-	42	-	-	-	N	
Pinewood River	22/07/11	Seine Net	Alternate site used, @ confluence of Pine R. + Clark C. (right shore)	Pin-3	Brook Stickleback	30	-	44	-	-	-	N	
Pinewood River	22/07/11	Seine Net	Alternate site used, @ confluence of Pine R. + Clark C. (right shore)	Pin-3	Brook Stickleback	31	-	41	-	-	-	N	
Pinewood River	22/07/11	Seine Net	Alternate site used, @ confluence of Pine R. + Clark C. (right shore)	Pin-3	Central Mud Minnow	32	-	42	-	-	-	N	
Pinewood River	22/07/11	Seine Net	Alternate site used, @ confluence of Pine R. + Clark C. (right shore)	Pin-3	Central Mud Minnow	33	-	38	-	-	-	N	
Pinewood River	22/07/11	Seine Net	Alternate site used, @ confluence of Pine R. + Clark C. (right shore)	Pin-3	Brook Stickleback	34	-	46	-	-	-	N	
Pinewood River	22/07/11	Seine Net	Alternate site used, @ confluence of Pine R. + Clark C. (right shore)	Pin-3	Brook Stickleback	35	-	46	-	-	-	N	
Pinewood River	22/07/11	Seine Net	Alternate site used, @ confluence of Pine R. + Clark C. (right shore)	Pin-3	Central Mud Minnow	36	-	51	-	-	-	N	
Pinewood River	22/07/11	Seine Net	Alternate site used, @ confluence of Pine R. + Clark C. (right shore)	Pin-3	Brook Stickleback	37	-	36	-	-	-	N	
Pinewood River	22/07/11	Seine Net	Alternate site used, @ confluence of Pine R. + Clark C. (right shore)	Pin-3	Brook Stickleback	38	-	39	-	-	-	N	
Pinewood River	22/07/11	Seine Net	Alternate site used, @ confluence of Pine R. + Clark C. (right shore)	Pin-3	Blacknose Dace	39	-	22	-	-	-	N	
Pinewood River	22/07/11	Seine Net	Alternate site used, @ confluence of Pine R. + Clark C. (right shore)	Pin-3	Brook Stickleback	40	-	22	-	-	-	N	
Pinewood River	22/07/11	Seine Net	Alternate site used, @ confluence of Pine R. + Clark C. (right shore)	Pin-3	Brook Stickleback	41	-	30	-	-	-	N	
Pinewood River	22/07/11	Seine Net	Alternate site used, @ confluence of Pine R. + Clark C. (right shore)	Pin-3	Brook Stickleback	42	-	40	-	-	-	N	
Pinewood River	22/07/11	Seine Net	Alternate site used, @ confluence of Pine R. + Clark C. (right shore)	Pin-3	Brook Stickleback	43	-	48	-	-	-	N	
Pinewood River	22/07/11	Seine Net	Alternate site used, @ confluence of Pine R. + Clark C. (right shore)	Pin-3	Central Mud Minnow	44	-	50	-	-	-	N	
Pinewood River	22/07/11	Seine Net	Alternate site used, @ confluence of Pine R. + Clark C. (right shore)	Pin-3	Brook Stickleback	45	-	47	-	-	-	N	
Pinewood River	22/07/11	Seine Net	Alternate site used, @ confluence of Pine R. + Clark C. (right shore)	Pin-3	Brook Stickleback	46	-	36	-	-	-	N	
Pinewood River	22/07/11	Seine Net	Alternate site used, @ confluence of Pine R. + Clark C. (right shore)	Pin-3	Brook Stickleback	47	-	40	-	-	-	N	
Pinewood River	22/07/11	Seine Net	Alternate site used, @ confluence of Pine R. + Clark C. (right shore)	Pin-3	Central Mud Minnow	48	-	47	-	-	-	N	
Pinewood River	22/07/11	Seine Net	Alternate site used, @ confluence of Pine R. + Clark C. (right shore)	Pin-3	Brook Stickleback	49	-	39	-	-	-	N	
Pinewood River	22/07/11	Seine Net	Alternate site used, @ confluence of Pine R. + Clark C. (right shore)	Pin-3	Brook Stickleback	50	-	44	-	-	-	N	
Pinewood River	22/07/11	Seine Net	Alternate site used, @ confluence of Pine R. + Clark C. (right shore)	Pin-3	Brook Stickleback	51	-	30	-	-	-	N	
Pinewood River	22/07/11	Seine Net	Alternate site used, @ confluence of Pine R. + Clark C. (right shore)	Pin-3	Finescale Dace	52	-	29	-	-	-	N	
Pinewood River	22/07/11	Seine Net	Alternate site used, @ confluence of Pine R. + Clark C. (right shore)	Pin-3	Finescale Dace	53	-	41	-	-	-	N	
Pinewood River	22/07/11	Seine Net	Alternate site used, @ confluence of Pine R. + Clark C. (right shore)	Pin-3	Central Mud Minnow	54	-	45	-	-	-	N	
Pinewood River	22/07/11	Seine Net	Alternate site used, @ confluence of Pine R. + Clark C. (right shore)	Pin-3	Common Shiner	55	38	41	-	-	-	N	
Pinewood River	22/07/11	Seine Net	Alternate site used, @ confluence of Pine R. + Clark C. (right shore)	Pin-3	Common Shiner	56	42	46	-	-	-	N	
Pinewood River	22/07/11	Seine Net	Alternate site used, @ confluence of Pine R. + Clark C. (right shore)	Pin-3	Common Shiner	57	40	44	-	-	-	N	
Pinewood River	22/07/11	Seine Net	Alternate site used, @ confluence of Pine R. + Clark C. (right shore)	Pin-3	Common Shiner	58	45	49	-	-	-	N	
Pinewood River	22/07/11	Seine Net	Alternate site used, @ confluence of Pine R. + Clark C. (right shore)	Pin-3	Common Shiner	59	42	44	-	-	-	N	
Pinewood River	22/07/11	Seine Net	Alternate site used, @ confluence of Pine R. + Clark C. (right shore)	Pin-3	Blacknose Dace	60	39	42	-	-	-	N	
Pinewood River	22/07/11	Seine Net	Alternate site used, @ confluence of Pine R. + Clark C. (right shore)	Pin-3	Central Mud Minnow	61	-	45	-	-	-	N	
Pinewood River	22/07/11	Seine Net	Alternate site used, @ confluence of Pine R. + Clark C. (right shore)	Pin-3	Central Mud Minnow	62	-	36	-	-	-	N	
Pinewood River	22/07/11	Seine Net	Alternate site used, @ confluence of Pine R. + Clark C. (right shore)	Pin-3	Pearl Dace	63	42	44	-	-	-	N	

Pinewood River	22/07/11	Seine Net	Alternate site used, @ confluence of Pine R. + Clark C. (right shore)	Pin-3	Common Shiner	64	34	36	-	-	-	N	
Pinewood River	22/07/11	Seine Net	Alternate site used, @ confluence of Pine R. + Clark C. (right shore)	Pin-3	Common Shiner	65	38	41	-	-	-	N	
Pinewood River	22/07/11	Seine Net	Alternate site used, @ confluence of Pine R. + Clark C. (right shore)	Pin-3	Common Shiner	66	36	40	-	-	-	N	
Pinewood River	22/07/11	Seine Net	Alternate site used, @ confluence of Pine R. + Clark C. (right shore)	Pin-3	Common Shiner	67	33	36	-	-	-	N	
Pinewood River	22/07/11	Seine Net	Alternate site used, @ confluence of Pine R. + Clark C. (right shore)	Pin-3	Central Mud Minnow	68	-	72	-	-	-	N	
Pinewood River	22/07/11	Seine Net	Alternate site used, @ confluence of Pine R. + Clark C. (right shore)	Pin-3	Central Mud Minnow	69	-	55	-	-	-	N	
Pinewood River	22/07/11	Seine Net	Alternate site used, @ confluence of Pine R. + Clark C. (right shore)	Pin-3	Central Mud Minnow	70	-	40	-	-	-	N	
Pinewood River	22/07/11	Seine Net	Alternate site used, @ confluence of Pine R. + Clark C. (right shore)	Pin-3	Brassy Minnow	71	60	64	-	-	-	N	
Pinewood River	22/07/11	Seine Net	Alternate site used, @ confluence of Pine R. + Clark C. (right shore)	Pin-3	Blackside Darter	72	-	63	-	-	-	N	
Pinewood River	22/07/11	Seine Net	Alternate site used, @ confluence of Pine R. + Clark C. (right shore)	Pin-3	Brassy Minnow	73	54	56	-	-	-	N	
Pinewood River	22/07/11	Seine Net	Alternate site used, @ confluence of Pine R. + Clark C. (right shore)	Pin-3	Brassy Minnow	74	79	84	-	-	-	N	
Pinewood River	22/07/11	Seine Net	Alternate site used, @ confluence of Pine R. + Clark C. (right shore)	Pin-3	Common Shiner	75	-	-	-	-	-	N	
Pinewood River	22/07/11	Seine Net	Alternate site used, @ confluence of Pine R. + Clark C. (right shore)	Pin-3	Common Shiner	76	-	43	-	-	-	N	
Pinewood River	22/07/11	Seine Net	Alternate site used, @ confluence of Pine R. + Clark C. (right shore)	Pin-3	Central Mud Minnow	77	-	46	-	-	-	N	
Pinewood River	22/07/11	Seine Net	Alternate site used, @ confluence of Pine R. + Clark C. (right shore)	Pin-3	Central Mud Minnow	78	-	96	-	-	-	N	
Pinewood River	22/07/11	Seine Net	Alternate site used, @ confluence of Pine R. + Clark C. (right shore)	Pin-3	Brassy Minnow	79	104	112	-	-	-	N	
Pinewood River	22/07/11	Seine Net	Alternate site used, @ confluence of Pine R. + Clark C. (right shore)	Pin-3	Nothern Redbellly Dace	80	59	62	-	-	-	N	
Pinewood River	22/07/11	Seine Net	Alternate site used, @ confluence of Pine R. + Clark C. (right shore)	Pin-3	Blackside Darter	81	-	56	-	-	-	N	
Pinewood River	22/07/11	Seine Net	Alternate site used, @ confluence of Pine R. + Clark C. (right shore)	Pin-3	Central Mud Minnow	82	-	50	-	-	-	N	
Pinewood River	22/07/11	Seine Net	Alternate site used, @ confluence of Pine R. + Clark C. (right shore)	Pin-3	Central Mud Minnow	83	-	46	-	-	-	N	
Pinewood River	22/07/11	Seine Net	Alternate site used, @ confluence of Pine R. + Clark C. (right shore)	Pin-3	Central Mud Minnow	84	-	45	-	-	-	N	
Pinewood River	22/07/11	Seine Net	Alternate site used, @ confluence of Pine R. + Clark C. (right shore)	Pin-3	Central Mud Minnow	85	-	54	-	-	-	N	
Pinewood River	22/07/11	Seine Net	Alternate site used, @ confluence of Pine R. + Clark C. (right shore)	Pin-3	Central Mud Minnow	86	-	50	-	-	-	N	
Pinewood River	22/07/11	Seine Net	Alternate site used, @ confluence of Pine R. + Clark C. (right shore)	Pin-3	Central Mud Minnow	87	-	49	-	-	-	N	
Pinewood River	22/07/11	Seine Net	Alternate site used, @ confluence of Pine R. + Clark C. (right shore)	Pin-3	Central Mud Minnow	88	-	54	-	-	-	N	
Pinewood River	22/07/11	Seine Net	Alternate site used, @ confluence of Pine R. + Clark C. (right shore)	Pin-3	Central Mud Minnow	89	-	44	-	-	-	N	
Pinewood River	22/07/11	Seine Net	Alternate site used, @ confluence of Pine R. + Clark C. (right shore)	Pin-3	Central Mud Minnow	90	-	45	-	-	-	N	
Pinewood River	22/07/11	Seine Net	Alternate site used, @ confluence of Pine R. + Clark C. (right shore)	Pin-3	Central Mud Minnow	91	-	47	-	-	-	N	
Pinewood River	22/07/11	Seine Net	Alternate site used, @ confluence of Pine R. + Clark C. (right shore)	Pin-3	Pearl Dace	92	46	49	-	-	-	N	
Pinewood River	22/07/11	Seine Net	Alternate site used, @ confluence of Pine R. + Clark C. (right shore)	Pin-3	Blackside Darter	93	-	60	-	-	-	N	
Pinewood River	22/07/11	Seine Net	Alternate site used, @ confluence of Pine R. + Clark C. (right shore)	Pin-3	Brassy Minnow	94	90	96	-	-	-	N	
Pinewood River	22/07/11	Minnow Trap	Alternate site used, @ confluence of Pine R. + Clark C. (right shore)	Pin-3	Finescale Dace	95	45	46	-	-	-	N	
Pinewood River	22/07/11	Minnow Trap	Alternate site used, @ confluence of Pine R. + Clark C. (right shore)	Pin-3	Common Shiner	96	46	51	-	-	-	N	
Pinewood River	22/07/11	Minnow Trap	Alternate site used, @ confluence of Pine R. + Clark C. (right shore)	Pin-3	Common Shiner	97	43	46	-	-	-	N	
Pinewood River	22/07/11	Minnow Trap	Alternate site used, @ confluence of Pine R. + Clark C. (right shore)	Pin-3	Common Shiner	98	50	55	-	-	-	N	
Pinewood River	22/07/11	Minnow Trap	Alternate site used, @ confluence of Pine R. + Clark C. (right shore)	Pin-3	Common Shiner	99	39	43	-	-	-	N	
Pinewood River	22/07/11	Minnow Trap	Alternate site used, @ confluence of Pine R. + Clark C. (right shore)	Pin-3	Finescale Dace	100	43	45	-	-	-	N	
Pinewood River	22/07/11	Minnow Trap	Alternate site used, @ confluence of Pine R. + Clark C. (right shore)	Pin-3	Common Shiner	101	39	40	-	-	-	N	
Pinewood River	22/07/11	Minnow Trap	Alternate site used, @ confluence of Pine R. + Clark C. (right shore)	Pin-3	Brassy Minnow	102	92	98	-	-	-	N	
Pinewood River	22/07/11	Minnow Trap	Alternate site used, @ confluence of Pine R. + Clark C. (right shore)	Pin-3	Finescale Dace	103	45	47	-	-	-	N	
Pinewood River	22/07/11	Minnow Trap	Alternate site used, @ confluence of Pine R. + Clark C. (right shore)	Pin-3	Common Shiner	104	57	60	-	-	-	N	
Pinewood River	22/07/11	Minnow Trap	Alternate site used, @ confluence of Pine R. + Clark C. (right shore)	Pin-3	Brassy Minnow	105	62	65	-	-	-	N	
Pinewood River	22/07/11	Minnow Trap	Alternate site used, @ confluence of Pine R. + Clark C. (right shore)	Pin-3	Brassy Minnow	106	73	78	-	-	-	N	
Pinewood River	22/07/11	Minnow Trap	Alternate site used, @ confluence of Pine R. + Clark C. (right shore)	Pin-3	Common Shiner	107	48	54	-	-	-	N	
Pinewood River	22/07/11	Minnow Trap	Alternate site used, @ confluence of Pine R. + Clark C. (right shore)	Pin-3	Brassy Minnow	108	85	91	-	-	-	N	
Pinewood River	22/07/11	Minnow Trap	Alternate site used, @ confluence of Pine R. + Clark C. (right shore)	Pin-3	Brassy Minnow	109	68	71	-	-	-	N	
Pinewood River	22/07/11	Minnow Trap	Alternate site used, @ confluence of Pine R. + Clark C. (right shore)	Pin-3	Spottail Shiner	110	56	60	-	-	-	N	
Pinewood River	22/07/11	Minnow Trap	Alternate site used, @ confluence of Pine R. + Clark C. (right shore)	Pin-3	Spottail Shiner	111	68	72	-	-	-	N	
Pinewood River	22/07/11	Minnow Trap	Alternate site used, @ confluence of Pine R. + Clark C. (right shore)	Pin-3	Common Shiner	112	45	48	-	-	-	N	
Pinewood River	22/07/11	Minnow Trap	Alternate site used, @ confluence of Pine R. + Clark C. (right shore)	Pin-3	Common Shiner	113	50	55	-	-	-	N	
Pinewood River	22/07/11	Minnow Trap	Alternate site used, @ confluence of Pine R. + Clark C. (right shore)	Pin-3	Finescale Dace	114	46	49	-	-	-	N	
Pinewood River	22/07/11	Minnow Trap	Alternate site used, @ confluence of Pine R. + Clark C. (right shore)	Pin-3	Spottail Shiner	115	55	57	-	-	-	N	
Pinewood River	22/07/11	Minnow Trap	Alternate site used, @ confluence of Pine R. + Clark C. (right shore)	Pin-3	UNKNOWN Darter	116	-	62	-	-	-	N	
Pinewood River	22/07/11	Minnow Trap	Alternate site used, @ confluence of Pine R. + Clark C. (right shore)	Pin-3	Spottail Shiner	117	68	73	-	-	-	N	
Pinewood River	22/07/11	Minnow Trap	Alternate site used, @ confluence of Pine R. + Clark C. (right shore)	Pin-3	Spottail Shiner	118	55	59	-	-	-	N	
Pinewood River	22/07/11	Minnow Trap	Alternate site used, @ confluence of Pine R. + Clark C. (right shore)	Pin-3	White Sucker	119	114	118	-	-	-	N	
Pinewood River	22/07/11	Minnow Trap	Alternate site used, @ confluence of Pine R. + Clark C. (right shore)	Pin-3	Brassy Minnow	120	66	72	-	-	-	N	
Pinewood River	22/07/11	Minnow Trap	Alternate site used, @ confluence of Pine R. + Clark C. (right shore)	Pin-3	Creek Chub	121	124	129	-	-	-	N	
Pinewood River	22/07/11	Minnow Trap	Alternate site used, @ confluence of Pine R. + Clark C. (right shore)	Pin-3	Brassy Minnow	122	132	140	-	-	-	N	

Pinewood River	22/07/11	Minnow Trap	Alternate site used, @ confluence of Pine R. + Clark C. (right shore)	Pin-3	Brook Stickleback	123	-	47	-	-	-	N	
Pinewood River	22/07/11	Minnow Trap	Alternate site used, @ confluence of Pine R. + Clark C. (right shore)	Pin-3	Spottail Shiner	124	58	62	-	-	-	N	
Pinewood River	22/07/11	Minnow Trap	Alternate site used, @ confluence of Pine R. + Clark C. (right shore)	Pin-3	Common Shiner	125	45	47	-	-	-	N	
Pinewood River	22/07/11	Minnow Trap	Alternate site used, @ confluence of Pine R. + Clark C. (right shore)	Pin-3	Brassy Minnow	126	62	65	-	-	-	N	
Pinewood River	22/07/11	Minnow Trap	Alternate site used, @ confluence of Pine R. + Clark C. (right shore)	Pin-3	Common Shiner	127	48	51	-	-	-	N	
Pinewood River	22/07/11	Minnow Trap	Alternate site used, @ confluence of Pine R. + Clark C. (right shore)	Pin-3	White Sucker	128	71	80	-	-	-	N	
Pinewood River	22/07/11	Minnow Trap	Alternate site used, @ confluence of Pine R. + Clark C. (right shore)	Pin-3	Common Shiner	129	45	49	-	-	-	N	
Pinewood River	22/07/11	Minnow Trap	Alternate site used, @ confluence of Pine R. + Clark C. (right shore)	Pin-3	Common Shiner	130	58	64	-	-	-	N	
Pinewood River	22/07/11	Minnow Trap	Alternate site used, @ confluence of Pine R. + Clark C. (right shore)	Pin-3	Brassy Minnow	131	64	66	-	-	-	N	
Pinewood River	22/07/11	Minnow Trap	Alternate site used, @ confluence of Pine R. + Clark C. (right shore)	Pin-3	Brassy Minnow	132	72	77	-	-	-	N	
Pinewood River	22/07/11	Minnow Trap	Alternate site used, @ confluence of Pine R. + Clark C. (right shore)	Pin-3	Spottail Shiner	133	42	45	-	-	-	N	
Pinewood River	22/07/11	Minnow Trap	Alternate site used, @ confluence of Pine R. + Clark C. (right shore)	Pin-3	Common Shiner	134	44	47	-	-	-	N	
Pinewood River	22/07/11	Minnow Trap	Alternate site used, @ confluence of Pine R. + Clark C. (right shore)	Pin-3	Spottail Shiner	135	65	66	-	-	-	N	
Pinewood River	22/07/11	Minnow Trap	Alternate site used, @ confluence of Pine R. + Clark C. (right shore)	Pin-3	Spottail Shiner	136	60	64	-	-	-	N	
Pinewood River	22/07/11	Minnow Trap	Alternate site used, @ confluence of Pine R. + Clark C. (right shore)	Pin-3	Common Shiner	137	69	75	-	-	-	N	
Pinewood River	22/07/11	Minnow Trap	Alternate site used, @ confluence of Pine R. + Clark C. (right shore)	Pin-3	Common Shiner	138	45	50	-	-	-	N	
Pinewood River	22/07/11	Minnow Trap	Alternate site used, @ confluence of Pine R. + Clark C. (right shore)	Pin-3	Spottail Shiner	139	70	75	-	-	-	N	
Pinewood River	22/07/11	Minnow Trap	Alternate site used, @ confluence of Pine R. + Clark C. (right shore)	Pin-3	Spottail Shiner	140	67	72	-	-	-	N	
Pinewood River	22/07/11	Minnow Trap	Alternate site used, @ confluence of Pine R. + Clark C. (right shore)	Pin-3	Brassy Minnow	141	60	63	-	-	-	N	
Pinewood River	22/07/11	Minnow Trap	Alternate site used, @ confluence of Pine R. + Clark C. (right shore)	Pin-3	Brook Stickleback	142	-	54	-	-	-	N	
Pinewood River	22/07/11	Minnow Trap	Alternate site used, @ confluence of Pine R. + Clark C. (right shore)	Pin-3	Common Shiner	143	45	49	-	-	-	N	
Pinewood River	22/07/11	Minnow Trap	Alternate site used, @ confluence of Pine R. + Clark C. (right shore)	Pin-3	Spottail Shiner	144	59	61	-	-	-	N	
Pinewood River	22/07/11	Minnow Trap	Alternate site used, @ confluence of Pine R. + Clark C. (right shore)	Pin-3	Spottail Shiner	145	65	69	-	-	-	N	
Pinewood River	22/07/11	Minnow Trap	Alternate site used, @ confluence of Pine R. + Clark C. (right shore)	Pin-3	Spottail Shiner	146	66	68	-	-	-	N	
Pinewood River	22/07/11	Minnow Trap	Alternate site used, @ confluence of Pine R. + Clark C. (right shore)	Pin-3	Spottail Shiner	147	85	89	-	-	-	N	
Pinewood River	22/07/11	Minnow Trap	Alternate site used, @ confluence of Pine R. + Clark C. (right shore)	Pin-3	Spottail Shiner	148	62	65	-	-	-	N	
Pinewood River	22/07/11	Minnow Trap	Alternate site used, @ confluence of Pine R. + Clark C. (right shore)	Pin-3	Brassy Minnow	149	74	78	-	-	-	N	
Pinewood River	22/07/11	Minnow Trap	Alternate site used, @ confluence of Pine R. + Clark C. (right shore)	Pin-3	Spottail Shiner	150	113	119	-	-	-	N	
Pinewood River	22/07/11	Minnow Trap	Alternate site used, @ confluence of Pine R. + Clark C. (right shore)	Pin-3	Brook Stickleback	151	-	50	-	-	-	N	
Pinewood River	22/07/11	Minnow Trap	Alternate site used, @ confluence of Pine R. + Clark C. (right shore)	Pin-3	Finescale Dace	152	70	74	-	-	-	N	
Pinewood River	22/07/11	Minnow Trap	Alternate site used, @ confluence of Pine R. + Clark C. (right shore)	Pin-3	Spottail Shiner	153	54	57	-	-	-	N	
Pinewood River	22/07/11	Minnow Trap	Alternate site used, @ confluence of Pine R. + Clark C. (right shore)	Pin-3	White Sucker	154	79	84	-	-	-	N	
Pinewood River	22/07/11	Minnow Trap	Alternate site used, @ confluence of Pine R. + Clark C. (right shore)	Pin-3	Brook Stickleback	155	-	42	-	-	-	N	
Pinewood River	22/07/11	Minnow Trap	Alternate site used, @ confluence of Pine R. + Clark C. (right shore)	Pin-3	Common Shiner	156	44	47	-	-	-	N	
Pinewood River	22/07/11	Minnow Trap	Alternate site used, @ confluence of Pine R. + Clark C. (right shore)	Pin-3	Brassy Minnow	157	70	75	-	-	-	N	
Pinewood River	22/07/11	Minnow Trap	Alternate site used, @ confluence of Pine R. + Clark C. (right shore)	Pin-3	Brook Stickleback	158	-	58	-	-	-	N	
Pinewood River	22/07/11	Minnow Trap	Alternate site used, @ confluence of Pine R. + Clark C. (right shore)	Pin-3	Spottail Shiner	159	54	57	-	-	-	N	
Pinewood River	22/07/11	Minnow Trap	Alternate site used, @ confluence of Pine R. + Clark C. (right shore)	Pin-3	Spottail Shiner	160	66	70	-	-	-	N	
Pinewood River	22/07/11	Minnow Trap	Alternate site used, @ confluence of Pine R. + Clark C. (right shore)	Pin-3	Finescale Dace	161	-	45	-	-	-	N	
Pinewood River	22/07/11	Minnow Trap	Alternate site used, @ confluence of Pine R. + Clark C. (right shore)	Pin-3	Brook Stickleback	162	-	48	-	-	-	N	
Pinewood River	22/07/11	Minnow Trap	Alternate site used, @ confluence of Pine R. + Clark C. (right shore)	Pin-3	Brook Stickleback	163	-	45	-	-	-	N	
Pinewood River	22/07/11	Minnow Trap	Alternate site used, @ confluence of Pine R. + Clark C. (right shore)	Pin-3	Brassy Minnow	164	70	74	-	-	-	N	
Pinewood River	22/07/11	Minnow Trap	Alternate site used, @ confluence of Pine R. + Clark C. (right shore)	Pin-3	Common Shiner	165	42	45	-	-	-	N	
Pinewood River	22/07/11	Minnow Trap	Alternate site used, @ confluence of Pine R. + Clark C. (right shore)	Pin-3	Brassy Minnow	166	60	64	-	-	-	N	
Pinewood River	22/07/11	Minnow Trap	Alternate site used, @ confluence of Pine R. + Clark C. (right shore)	Pin-3	Brassy Minnow	167	66	60	-	-	-	N	
Pinewood River	22/07/11	Minnow Trap	Alternate site used, @ confluence of Pine R. + Clark C. (right shore)	Pin-3	Brassy Minnow	168	70	73	-	-	-	N	
Pinewood River	22/07/11	Minnow Trap	Alternate site used, @ confluence of Pine R. + Clark C. (right shore)	Pin-3	Brook Stickleback	169	-	44	-	-	-	N	
Pinewood River	22/07/11	Gillnet	Alternate site used, @ confluence of Pine R. + Clark C. (right shore)	Pin-3	White Sucker	1	175	185	-	-	-	N	
Pinewood River	22/07/11	Gillnet	Alternate site used, @ confluence of Pine R. + Clark C. (right shore)	Pin-3	Spottail Shiner	2	159	166	-	-	-	N	
Pinewood River	22/07/11	Gillnet	Alternate site used, @ confluence of Pine R. + Clark C. (right shore)	Pin-3	Golden Shiner	3	140	148	-	-	-	N	
Pinewood River	22/07/11	Gillnet	Alternate site used, @ confluence of Pine R. + Clark C. (right shore)	Pin-3	Spottail Shiner	4	155	163	-	-	-	N	
Pinewood River	22/07/11	Gillnet	Alternate site used, @ confluence of Pine R. + Clark C. (right shore)	Pin-3	White Sucker	5	160	169	-	-	-	N	
Pinewood River	23/07/11	Seine Net	Pin-4	Pin-4	Central Mud Minnow	1	-	59	-	-	-	N	
Pinewood River	23/07/11	Seine Net	Pin-4	Pin-4	Central Mud Minnow	2	-	71	-	-	-	N	
Pinewood River	23/07/11	Seine Net	Pin-4	Pin-4	Brook Stickleback	3	-	37	-	-	-	N	
Pinewood River	23/07/11	Seine Net	Pin-4	Pin-4	Brook Stickleback	4	-	32	-	-	-	N	
Pinewood River	23/07/11	Seine Net	Pin-4	Pin-4	Brook Stickleback	5	-	39	-	-	-	N	
Pinewood River	23/07/11	Seine Net	Pin-4	Pin-4	Brook Stickleback	6	-	32	-	-	-	N	
Pinewood River	23/07/11	Seine Net	Pin-4	Pin-4	Brook Stickleback	7	-	25	-	-	-	N	

Pinewood River	23/07/11	Seine Net	Pin-4	Pin-4	Blacknose Dace	8	30	32	-	-	-	N	
Pinewood River	23/07/11	Seine Net	Pin-4	Pin-4	Brook Stickleback	9	-	27	-	-	-	N	
Pinewood River	23/07/11	Seine Net	Pin-4	Pin-4	Brook Stickleback	10	-	28	-	-	-	N	
Pinewood River	23/07/11	Seine Net	Pin-4	Pin-4	Central Mud Minnow	11	-	73	-	-	-	N	
Pinewood River	23/07/11	Seine Net	Pin-4	Pin-4	Spottail Shiner	12	-	35	-	-	-	N	
Pinewood River	23/07/11	Seine Net	Pin-4	Pin-4	Blacknose Dace	13	27	30	-	-	-	N	
Pinewood River	23/07/11	Seine Net	Pin-4	Pin-4	Brook Stickleback	14	-	25	-	-	-	N	
Pinewood River	23/07/11	Seine Net	Pin-4	Pin-4	Brook Stickleback	15	-	22	-	-	-	N	
Pinewood River	23/07/11	Seine Net	Pin-4	Pin-4	Brook Stickleback	16	-	23	-	-	-	N	
Pinewood River	23/07/11	Seine Net	Pin-4	Pin-4	Brook Stickleback	17	-	22	-	-	-	N	
Pinewood River	23/07/11	Seine Net	Pin-4	Pin-4	Brook Stickleback	18	-	23	-	-	-	N	
Pinewood River	23/07/11	Seine Net	Pin-4	Pin-4	Brook Stickleback	19	-	29	-	-	-	N	
Pinewood River	23/07/11	Gillnet	Pin-4	Pin-4	Nothern Pike	1	375	402	280.00	2,D	1	Y	66.3g
Pinewood River	23/07/11	Gillnet	Pin-4	Pin-4	Nothern Pike	2	396	424	660.00	2,D	1	Y	111g
Pinewood River	19/07/11	Seine Net	Pin-5	Pin-5	Spottail Shiner	1	45	49	-	-	-	N	
Pinewood River	19/07/11	Seine Net	Pin-5	Pin-5	Spottail Shiner	2	47	52	-	-	-	N	
Pinewood River	19/07/11	Seine Net	Pin-5	Pin-5	Spottail Shiner	3	17	18	-	-	-	N	
Pinewood River	19/07/11	Seine Net	Pin-5	Pin-5	Spottail Shiner	4	21	22	-	-	-	N	
Pinewood River	19/07/11	Seine Net	Pin-5	Pin-5	Creek Chub	5	21	23	-	-	-	N	
Pinewood River	19/07/11	Seine Net	Pin-5	Pin-5	Spottail Shiner	6	51	56	-	-	-	N	
Pinewood River	19/07/11	Seine Net	Pin-5	Pin-5	Common Shiner	7	53	57	-	-	-	N	
Pinewood River	19/07/11	Seine Net	Pin-5	Pin-5	Spottail Shiner	8	47	52	-	-	-	N	
Pinewood River	19/07/11	Seine Net	Pin-5	Pin-5	Blackchin Shiner	9	45	49	-	-	-	N	
Pinewood River	19/07/11	Seine Net	Pin-5	Pin-5	Blackchin Shiner	10	48	53	-	-	-	N	
Pinewood River	19/07/11	Seine Net	Pin-5	Pin-5	Brook Stickleback	11	-	51	-	-	-	N	
Pinewood River	19/07/11	Seine Net	Pin-5	Pin-5	Finescale Dace	12	45	48	-	-	-	N	
Pinewood River	19/07/11	Seine Net	Pin-5	Pin-5	Blackchin Shiner	13	22	23	-	-	-	N	
Pinewood River	19/07/11	Seine Net	Pin-5	Pin-5	Blackchin Shiner	14	51	56	-	-	-	N	
Pinewood River	19/07/11	Seine Net	Pin-5	Pin-5	Brook Stickleback	15	-	25	-	-	-	N	
Pinewood River	19/07/11	Seine Net	Pin-5	Pin-5	Blackchin Shiner	16	49	53	-	-	-	N	
Pinewood River	19/07/11	Seine Net	Pin-5	Pin-5	Brook Stickleback	15	-	25	-	-	-	N	
Pinewood River	19/07/11	Seine Net	Pin-5	Pin-5	Blackchin Shiner	16	49	53	-	-	-	N	
Pinewood River	19/07/11	Seine Net	Pin-5	Pin-5	Finescale Dace	17	52	57	-	-	-	N	
Pinewood River	19/07/11	Seine Net	Pin-5	Pin-5	Brook Stickleback	18	-	33	-	-	-	N	
Pinewood River	19/07/11	Minnow Trap	Pin-5	Pin-5	Brook Stickleback	19	-	65	-	-	-	N	
Pinewood River	25/07/11	Seine Net	Pin-6	Pin-6	Nothern Pike	1	86	91	-	-	-	N	Picture #0096 Pete's camera
Pinewood River	25/07/11	Minnow Trap	Pin-6	Pin-6	Black Bullhead	2	-	97	-	-	-	N	Picture #0097-0099 Pete's camera
Pinewood River	25/07/11	Gillnet	Pin-6	Pin-6	Nothern Pike	1	330	382	330.00	-	-	N	
Pinewood River	25/07/11	Gillnet	Pin-6	Pin-6	Nothern Pike	2	339	334	360.00	2,D	1	Y	64.2g
Pinewood River	25/07/11	Gillnet	Pin-6	Pin-6	Nothern Pike	3	302	321	180.00	2,D	1	Y	32.5g
Pinewood River	25/07/11	Gillnet	Pin-6	Pin-6	Nothern Pike	4	307	325	170.00	-	-	N	
Pinewood River	25/07/11	Gillnet	Pin-6	Pin-6	Nothern Pike	5	401	427	560.00	-	-	N	
Pinewood River	30/09/11	Seine Net	Pin-7	Route 600	Nothern Pike	1	139	145	-	-	-	N	
Pinewood River	30/09/11	Seine Net	Pin-7	Route 600	Nothern Pike	2	113	121	-	-	-	N	
Pinewood River	30/09/11	Seine Net	Pin-7	Route 600	Golden Shiner	3	101	113	-	-	-	N	
Pinewood River	30/09/11	Seine Net	Pin-7	Route 600	Golden Shiner	4	81	89	-	-	-	N	
Pinewood River	30/09/11	Seine Net	Pin-7	Route 600	Golden Shiner	5	44	48	-	-	-	N	
Pinewood River	30/09/11	Seine Net	Pin-7	Route 600	Golden Shiner	6	36	40	-	-	-	N	
Pinewood River	30/09/11	Seine Net	Pin-7	Route 600	Golden Shiner	7	44	47	-	-	-	N	
Pinewood River	30/09/11	Seine Net	Pin-7	Route 600	Pearl Dace	8	40	43	-	-	-	N	
Pinewood River	30/09/11	Seine Net	Pin-7	Route 600	Golden Shiner	9	42	46	-	-	-	N	
Pinewood River	30/09/11	Seine Net	Pin-7	Route 600	Golden Shiner	10	46	51	-	-	-	N	
Pinewood River	30/09/11	Seine Net	Pin-7	Route 600	Golden Shiner	11	32	35	-	-	-	N	
Pinewood River	30/09/11	Seine Net	Pin-7	Route 600	Golden Shiner	12	34	37	-	-	-	N	
Pinewood River	30/09/11	Seine Net	Pin-7	Route 600	Golden Shiner	13	44	48	-	-	-	N	
Pinewood River	30/09/11	Seine Net	Pin-7	Route 600	Golden Shiner	14	36	42	-	-	-	N	
Pinewood River	30/09/11	Seine Net	Pin-7	Route 600	Golden Shiner	15	36	40	-	-	-	N	
Pinewood River	30/09/11	Gillnet	Pin-7	Route 600	Nothern Pike	1	390	415	-	-	-	N	Fish was in good shape and released
Pinewood River	30/09/11	Gillnet	Pin-7	Route 600	Nothern Pike	2	295	315	-	2,D	-	Y	Dead
Tait Creek trib.2	26/07/11	Dip Netting	Trib. 2, Beaver pond	Tait-T2-1	Brassy Minnow	1	31	33	-	-	-	N	
Tait Creek trib.2	26/07/11	Dip Netting	Trib. 2, Beaver pond	Tait-T2-1	Brassy Minnow	2	21	23	-	-	-	N	

Tait Creek trib.2	26/07/11	Dip Netting	Trib. 2, Beaver pond	Tait-T2-1	Brassy Minnow	3	24	26	-	-	-	N	
Tait Creek trib.2	26/07/11	Dip Netting	Trib. 2, Beaver pond	Tait-T2-1	Brassy Minnow	4	19	21	-	-	-	N	
Tait Creek trib.2	26/07/11	Dip Netting	Trib. 2, Beaver pond	Tait-T2-1	Brassy Minnow	5	23	25	-	-	-	N	
Tait Creek trib.2	26/07/11	Dip Netting	Trib. 2, Beaver pond	Tait-T2-1	Brassy Minnow	6	25	27	-	-	-	N	
Tait Creek trib.2	26/07/11	Dip Netting	Trib. 2, Beaver pond	Tait-T2-1	Brassy Minnow	7	24	25	-	-	-	N	
Tait Creek trib.2	26/07/11	Dip Netting	Trib. 2, Beaver pond	Tait-T2-1	Pearl Dace	8	26	28	-	-	-	N	
Tait Creek trib.2	26/07/11	Dip Netting	Trib. 2, Beaver pond	Tait-T2-1	Pearl Dace	9	22	24	-	-	-	N	
Tait Creek trib.2	26/07/11	Dip Netting	Trib. 2, Beaver pond	Tait-T2-1	Pearl Dace	10	33	35	-	-	-	N	
Tait Creek trib.2	26/07/11	Dip Netting	Trib. 2, Beaver pond	Tait-T2-1	Brassy Minnow	11	22	24	-	-	-	N	
Tait Creek trib.2	26/07/11	Dip Netting	Trib. 2, Beaver pond	Tait-T2-1	Brassy Minnow	12	25	26	-	-	-	N	
Tait Creek trib.2	26/07/11	Dip Netting	Trib. 2, Beaver pond	Tait-T2-1	Brassy Minnow	13	34	36	-	-	-	N	
Tait Creek trib.2	26/07/11	Dip Netting	Trib. 2, Beaver pond	Tait-T2-1	Brassy Minnow	14	22	23	-	-	-	N	
Tait Creek trib.2	26/07/11	Dip Netting	Trib. 2, Beaver pond	Tait-T2-1	Brassy Minnow	15	27	29	-	-	-	N	
Tait Creek trib.2	26/07/11	Dip Netting	Trib. 2, Beaver pond	Tait-T2-1	Brassy Minnow	16	29	32	-	-	-	N	
Tait Creek trib.2	26/07/11	Dip Netting	Trib. 2, Beaver pond	Tait-T2-1	Pearl Dace	17	25	27	-	-	-	N	
Tait Creek trib.2	26/07/11	Dip Netting	Trib. 2, Beaver pond	Tait-T2-1	Pearl Dace	18	30	32	-	-	-	N	
Tait Creek trib.2	26/07/11	Dip Netting	Trib. 2, Beaver pond	Tait-T2-1	Pearl Dace	19	31	34	-	-	-	N	
Tait Creek trib.2	26/07/11	Dip Netting	Trib. 2, Beaver pond	Tait-T2-1	Brassy Minnow	20	19	20	-	-	-	N	
Tait Creek trib.2	26/07/11	Dip Netting	Trib. 2, Beaver pond	Tait-T2-1	Pearl Dace	21	31	34	-	-	-	N	
Tait Creek trib.2	26/07/11	Dip Netting	Trib. 2, Beaver pond	Tait-T2-1	Brassy Minnow	22	22	24	-	-	-	N	
Tait Creek trib.2	26/07/11	Dip Netting	Trib. 2, Beaver pond	Tait-T2-1	Brassy Minnow	23	24	26	-	-	-	N	
Tait Creek trib.2	26/07/11	Dip Netting	Trib. 2, Beaver pond	Tait-T2-1	Brassy Minnow	24	19	20	-	-	-	N	
Tait Creek trib.2	26/07/11	Dip Netting	Trib. 2, Beaver pond	Tait-T2-1	Brassy Minnow	25	21	23	-	-	-	N	
Tait Creek trib.2	26/07/11	Dip Netting	Trib. 2, Beaver pond	Tait-T2-1	Brook Stickleback	26	-	15	-	-	-	N	
Tait Creek trib.2	26/07/11	Dip Netting	Trib. 2, Beaver pond	Tait-T2-1	Brook Stickleback	27	-	33	-	-	-	N	
Tait Creek trib.2	26/07/11	Dip Netting	Trib. 2, Beaver pond	Tait-T2-1	Brook Stickleback	28	-	14	-	-	-	N	
Tait Creek trib.2	26/07/11	Dip Netting	Trib. 2, Beaver pond	Tait-T2-1	Brook Stickleback	29	-	28	-	-	-	N	
Tait Creek trib.2	26/07/11	Dip Netting	Trib. 2, Beaver pond	Tait-T2-1	Pearl Dace	30	33	35	-	-	-	N	
Tait Creek trib.2	26/07/11	Dip Netting	Trib. 2, Beaver pond	Tait-T2-1	Brassy Minnow	31	22	24	-	-	-	N	
Tait Creek trib.2	26/07/11	Dip Netting	Trib. 2, Beaver pond	Tait-T2-1	Pearl Dace	32	25	27	-	-	-	N	
Tait Creek trib.2	26/07/11	Dip Netting	Trib. 2, Beaver pond	Tait-T2-1	Brassy Minnow	33	30	31	-	-	-	N	
Tait Creek trib.2	26/07/11	Dip Netting	Trib. 2, Beaver pond	Tait-T2-1	Brassy Minnow	34	30	32	-	-	-	N	
Tait Creek trib.2	26/07/11	Dip Netting	Trib. 2, Beaver pond	Tait-T2-1	Brassy Minnow	35	28	30	-	-	-	N	
Tait Creek trib.2	26/07/11	Dip Netting	Trib. 2, Beaver pond	Tait-T2-1	Brook Stickleback	36	-	17	-	-	-	N	
Tait Creek trib.2	26/07/11	Dip Netting	Trib. 2, Beaver pond	Tait-T2-1	Brook Stickleback	37	-	25	-	-	-	N	
Tait Creek trib.2	26/07/11	Dip Netting	Trib. 2, Beaver pond	Tait-T2-1	Pearl Dace	38	25	27	-	-	-	N	
Tait Creek trib.2	26/07/11	Minnow Trap	Trib. 2, Beaver pond	Tait-T2-1	Brook Stickleback	39	-	60	-	-	-	N	
Tait Creek trib.2	26/07/11	Minnow Trap	Trib. 2, Beaver pond	Tait-T2-1	Brassy Minnow	40	28	31	-	-	-	N	
Loslo Creek	24/07/11	Seine Net	Downstream from Los-T-2	Los-1	Brassy Minnow	1	50	54	-	-	A	Y	Batch wt. = 25.7g
Loslo Creek	24/07/11	Seine Net	Downstream from Los-T-2	Los-1	Finescale Dace	2	62	64	-	-	-	N	
Loslo Creek	24/07/11	Seine Net	Downstream from Los-T-2	Los-1	Brassy Minnow	3	19	20	-	-	-	N	
Loslo Creek	24/07/11	Seine Net	Downstream from Los-T-2	Los-1	Central Mud Minnow	4	-	79	-	-	-	N	
Loslo Creek	24/07/11	Seine Net	Downstream from Los-T-2	Los-1	Finescale Dace	5	75	79	-	-	-	N	
Loslo Creek	24/07/11	Seine Net	Downstream from Los-T-2	Los-1	Brassy Minnow	6	58	61	-	-	A	Y	Batch wt. = 25.7g
Loslo Creek	24/07/11	Seine Net	Downstream from Los-T-2	Los-1	Brook Stickleback	7	-	48	-	-	-	N	
Loslo Creek	24/07/11	Seine Net	Downstream from Los-T-2	Los-1	Central Mud Minnow	8	-	98	-	-	-	N	
Loslo Creek	24/07/11	Seine Net	Downstream from Los-T-2	Los-1	Brassy Minnow	9	66	70	-	-	A	Y	Batch wt. = 25.7g
Loslo Creek	24/07/11	Seine Net	Downstream from Los-T-2	Los-1	Central Mud Minnow	10	-	72	-	-	-	N	
Loslo Creek	24/07/11	Seine Net	Downstream from Los-T-2	Los-1	Brassy Minnow	11	25	27	-	-	A	Y	Batch wt. = 25.7g
Loslo Creek	24/07/11	Seine Net	Downstream from Los-T-2	Los-1	Brassy Minnow	12	53	56	-	-	A	Y	Batch wt. = 25.7g
Loslo Creek	24/07/11	Seine Net	Downstream from Los-T-2	Los-1	Central Mud Minnow	13	-	80	-	-	-	N	
Loslo Creek	24/07/11	Seine Net	Downstream from Los-T-2	Los-1	Brassy Minnow	14	57	60	-	-	-	Y	Batch wt. = 25.7g
Loslo Creek	24/07/11	Seine Net	Downstream from Los-T-2	Los-1	Brassy Minnow	15	55	58	-	-	A	Y	Batch wt. = 25.7g
Loslo Creek	24/07/11	Seine Net	Downstream from Los-T-2	Los-1	Brassy Minnow	16	57	60	-	-	A	Y	Batch wt. = 25.7g
Loslo Creek	24/07/11	Seine Net	Downstream from Los-T-2	Los-1	Central Mud Minnow	17	-	64	-	-	-	N	
Loslo Creek	24/07/11	Seine Net	Downstream from Los-T-2	Los-1	Nothern Redbellly Dace	18	53	55	-	-	-	N	
Loslo Creek	24/07/11	Seine Net	Downstream from Los-T-2	Los-1	Brassy Minnow	19	51	54	-	-	A	Y	Batch wt. = 25.7g
Loslo Creek	24/07/11	Seine Net	Downstream from Los-T-2	Los-1	Brook Stickleback	20	-	47	-	-	-	N	
Loslo Creek	24/07/11	Seine Net	Downstream from Los-T-2	Los-1	Nothern Redbellly Dace	21	70	74	-	-	-	N	

Loslo Creek	24/07/11	Seine Net	Downstream from Los-T-2	Los-1	Nothern Redbellly Dace	22	64	68	-	-	-	N	
Loslo Creek	24/07/11	Seine Net	Downstream from Los-T-2	Los-1	Brassy Minnow	23	53	56	-	-	A	Y	Batch wt. = 25.7g
Loslo Creek	24/07/11	Seine Net	Downstream from Los-T-2	Los-1	Central Mud Minnow	24	-	82	-	-	-	N	
Loslo Creek	24/07/11	Seine Net	Downstream from Los-T-2	Los-1	Brassy Minnow	25	27	29	-	-	A	Y	Batch wt. = 25.7g
Loslo Creek	24/07/11	Seine Net	Downstream from Los-T-2	Los-1	Central Mud Minnow	26	-	59	-	-	-	N	
Loslo Creek	24/07/11	Seine Net	Downstream from Los-T-2	Los-1	Brook Stickleback	27	-	47	-	-	-	N	
Loslo Creek	24/07/11	Seine Net	Downstream from Los-T-2	Los-1	Central Mud Minnow	28	-	95	-	-	-	N	
Loslo Creek	24/07/11	Seine Net	Downstream from Los-T-2	Los-1	Brassy Minnow	29	57	60	-	-	A	Y	Batch wt. = 25.7g
Loslo Creek	24/07/11	Seine Net	Downstream from Los-T-2	Los-1	Central Mud Minnow	30	-	68	-	-	-	N	
Loslo Creek	24/07/11	Seine Net	Downstream from Los-T-2	Los-1	Brook Stickleback	31	-	45	-	-	-	N	
Loslo Creek	24/07/11	Seine Net	Downstream from Los-T-2	Los-1	Brook Stickleback	32	-	44	-	-	-	N	
Loslo Creek	24/07/11	Minnow Trap	Downstream from Los-T-2 between two beaver dams	Los-1	Central Mud Minnow	33	-	50	-	-	-	N	
Loslo Creek (small eastern trib.)	25/07/11	Seine Net	Moved d/s from location on map	Los-2	Brook Stickleback	1	-	52	-	-	-	N	
Loslo Creek (small eastern trib.)	25/07/11	Seine Net	Moved d/s from location on map	Los-2	White Sucker	2	168	172	-	-	-	N	
Loslo Creek (small eastern trib.)	25/07/11	Dip Netting	Moved d/s from location on map	Los-2	Brook Stickleback	3	-	16	-	-	-	N	
Loslo Creek (small eastern trib.)	25/07/11	Dip Netting	Moved d/s from location on map	Los-2	Brook Stickleback	4	-	-	-	-	-	N	Escaped
Loslo Creek (small eastern trib.)	25/07/11	Dip Netting	Moved d/s from location on map	Los-2	Brook Stickleback	5	-	-	-	-	-	N	Escaped
Loslo Creek (small eastern trib.)	25/07/11	Minnow Trap	Moved d/s from location on map	Los-2	Brook Stickleback	6	-	49	-	-	-	N	
Loslo Creek Trib.2	24/07/11	Dip Netting	Trib.2 Pond created by beaver activity downstream from actual site	Los-T-2	Brassy Minnow	1	25	27	-	-	-	N	
Loslo Creek Trib.2	24/07/11	Dip Netting	Trib.2 Pond created by beaver activity downstream from actual site	Los-T-2	Brassy Minnow	2	17	19	-	-	-	N	
Loslo Creek Trib.2	24/07/11	Dip Netting	Trib.2 Pond created by beaver activity downstream from actual site	Los-T-2	Brassy Minnow	3	19	21	-	-	-	N	
Loslo Creek Trib.2	24/07/11	Dip Netting	Trib.2 Pond created by beaver activity downstream from actual site	Los-T-2	Brassy Minnow	4	15	16	-	-	-	N	
Loslo Creek Trib.2	24/07/11	Dip Netting	Trib.2 Pond created by beaver activity downstream from actual site	Los-T-2	Brassy Minnow	5	19	21	-	-	-	N	
Loslo Creek Trib.2	24/07/11	Dip Netting	Trib.2 Pond created by beaver activity downstream from actual site	Los-T-2	Brassy Minnow	6	18	19	-	-	-	N	
Loslo Creek Trib.2	24/07/11	Dip Netting	Trib.2 Pond created by beaver activity downstream from actual site	Los-T-2	Brassy Minnow	7	17	18	-	-	-	N	
Loslo Creek Trib.2	24/07/11	Dip Netting	Trib.2 Pond created by beaver activity downstream from actual site	Los-T-2	Brassy Minnow	8	17	18	-	-	-	N	
Loslo Creek Trib.2	24/07/11	Dip Netting	Trib.2 Pond created by beaver activity downstream from actual site	Los-T-2	Brassy Minnow	9	15	16	-	-	-	N	
Loslo Creek Trib.2	24/07/11	Dip Netting	Trib.2 Pond created by beaver activity downstream from actual site	Los-T-2	Brassy Minnow	10	19	20	-	-	-	N	
Loslo Creek Trib.2	24/07/11	Dip Netting	Trib.2 Pond created by beaver activity downstream from actual site	Los-T-2	Brassy Minnow	11	19	20	-	-	-	N	
Loslo Creek Trib.2	24/07/11	Dip Netting	Trib.2 Pond created by beaver activity downstream from actual site	Los-T-2	Brassy Minnow	12	21	22	-	-	-	N	
Loslo Creek Trib.2	24/07/11	Dip Netting	Trib.2 Pond created by beaver activity downstream from actual site	Los-T-2	Brassy Minnow	11	19	20	-	-	-	N	
Loslo Creek Trib.2	24/07/11	Dip Netting	Trib.2 Pond created by beaver activity downstream from actual site	Los-T-2	Brassy Minnow	12	21	22	-	-	-	N	
Loslo Creek Trib.2	24/07/11	Dip Netting	Trib.2 Pond created by beaver activity downstream from actual site	Los-T-2	Brassy Minnow	13	19	20	-	-	-	N	
Loslo Creek Trib.2	24/07/11	Dip Netting	Trib.2 Pond created by beaver activity downstream from actual site	Los-T-2	Brassy Minnow	14	18	19	-	-	-	N	
Loslo Creek Trib.2	24/07/11	Dip Netting	Trib.2 Pond created by beaver activity downstream from actual site	Los-T-2	Brassy Minnow	15	18	19	-	-	-	N	
Loslo Creek Trib.2	24/07/11	Dip Netting	Trib.2 Pond created by beaver activity downstream from actual site	Los-T-2	Brassy Minnow	16	15	16	-	-	-	N	
Loslo Creek Trib.2	24/07/11	Dip Netting	Trib.2 Pond created by beaver activity downstream from actual site	Los-T-2	Brassy Minnow	17	17	18	-	-	-	N	
Loslo Creek Trib.2	24/07/11	Dip Netting	Trib.2 Pond created by beaver activity downstream from actual site	Los-T-2	Brassy Minnow	18	16	17	-	-	-	N	
Loslo Creek Trib.2	24/07/11	Dip Netting	Trib.2 Pond created by beaver activity downstream from actual site	Los-T-2	Brassy Minnow	19	19	20	-	-	-	N	
Loslo Creek Trib.2	24/07/11	Dip Netting	Trib.2 Pond created by beaver activity downstream from actual site	Los-T-2	Brassy Minnow	20	19	20	-	-	-	N	
Loslo Creek Trib.2	24/07/11	Dip Netting	Trib.2 Pond created by beaver activity downstream from actual site	Los-T-2	Brassy Minnow	21	16	17	-	-	-	N	
Loslo Creek Trib.2	24/07/11	Dip Netting	Trib.2 Pond created by beaver activity downstream from actual site	Los-T-2	Brassy Minnow	22	17	18	-	-	-	N	
Loslo Creek Trib.2	24/07/11	Dip Netting	Trib.2 Pond created by beaver activity downstream from actual site	Los-T-2	Brassy Minnow	23	19	20	-	-	-	N	
Loslo Creek Trib.2	24/07/11	Dip Netting	Trib.2 Pond created by beaver activity downstream from actual site	Los-T-2	Brassy Minnow	24	20	21	-	-	-	N	
Loslo Creek Trib.2	24/07/11	Dip Netting	Trib.2 Pond created by beaver activity downstream from actual site	Los-T-2	Brassy Minnow	25	18	19	-	-	-	N	
Loslo Creek Trib.2	24/07/11	Dip Netting	Trib.2 Pond created by beaver activity downstream from actual site	Los-T-2	Brassy Minnow	26	21	22	-	-	-	N	
Loslo Creek Trib.2	24/07/11	Dip Netting	Trib.2 Pond created by beaver activity downstream from actual site	Los-T-2	Brassy Minnow	27	20	21	-	-	-	N	
Loslo Creek Trib.2	24/07/11	Dip Netting	Trib.2 Pond created by beaver activity downstream from actual site	Los-T-2	Brassy Minnow	28	29	30	-	-	-	N	
Loslo Creek Trib.2	24/07/11	Dip Netting	Trib.2 Pond created by beaver activity downstream from actual site	Los-T-2	Brassy Minnow	29	15	16	-	-	-	N	
Loslo Creek Trib.2	24/07/11	Dip Netting	Trib.2 Pond created by beaver activity downstream from actual site	Los-T-2	Brassy Minnow	30	19	20	-	-	-	N	
Loslo Creek Trib.2	24/07/11	Dip Netting	Trib.2 Pond created by beaver activity downstream from actual site	Los-T-2	Brassy Minnow	31	25	26	-	-	-	N	
Loslo Creek Trib.2	24/07/11	Dip Netting	Trib.2 Pond created by beaver activity downstream from actual site	Los-T-2	Brook Stickleback	32	-	21	-	-	-	N	
Loslo Creek Trib.2	24/07/11	Dip Netting	Trib.2 Pond created by beaver activity downstream from actual site	Los-T-2	Brassy Minnow	33	19	20	-	-	-	N	
Loslo Creek Trib.2	24/07/11	Dip Netting	Trib.2 Pond created by beaver activity downstream from actual site	Los-T-2	Brassy Minnow	34	18	19	-	-	-	N	
Loslo Creek Trib.2	24/07/11	Dip Netting	Trib.2 Pond created by beaver activity downstream from actual site	Los-T-2	Brassy Minnow	35	19	20	-	-	-	N	
Loslo Creek Trib.2	24/07/11	Dip Netting	Trib.2 Pond created by beaver activity downstream from actual site	Los-T-2	Brassy Minnow	36	17	18	-	-	-	N	
Loslo Creek Trib.2	24/07/11	Dip Netting	Trib.2 Pond created by beaver activity downstream from actual site	Los-T-2	Brassy Minnow	37	20	21	-	-	-	N	
Loslo Creek Trib.2	24/07/11	Dip Netting	Trib.2 Pond created by beaver activity downstream from actual site	Los-T-2	Brassy Minnow	38	20	21	-	-	-	N	
Loslo Creek Trib.2	24/07/11	Dip Netting	Trib.2 Pond created by beaver activity downstream from actual site	Los-T-2	Brook Stickleback	39	-	37	-	-	-	N	
Loslo Creek Trib.2	24/07/11	Dip Netting	Trib.2 Pond created by beaver activity downstream from actual site	Los-T-2	Brook Stickleback	40	-	21	-	-	-	N	
Loslo Creek Trib.2	24/07/11	Dip Netting	Trib.2 Pond created by beaver activity downstream from actual site	Los-T-2	Brook Stickleback	41	-	26	-	-	-	N	

Loslo Creek Trib.2	24/07/11	Dip Netting	Trib.2 Pond created by beaver activity downstream from actual site	Los-T-2	Brook Stickleback	42	-	25	-	-	-	N	
Loslo Creek Trib.2	24/07/11	Dip Netting	Trib.2 Pond created by beaver activity downstream from actual site	Los-T-2	Brook Stickleback	43	-	22	-	-	-	N	
Loslo Creek Trib.2	24/07/11	Minnow Trap	Trib.2 Pond created by beaver activity downstream from actual site	Los-T-2	Central Mud Minnow	44	-	58	-	-	-	N	
Upper Trib. 5	26/07/11	Electrofisher	Beaver dam	UPP-T5-1	Brook Stickleback	1	-	37	-	-	-	N	
Upper Trib. 5	26/07/11	Electrofisher	Beaver dam	UPP-T5-1	Brook Stickleback	2	-	29	-	-	-	N	
Upper Trib. 5	26/07/11	Electrofisher	Beaver dam	UPP-T5-1	Central Mud Minnow	3	-	56	-	-	-	N	
Upper Trib. 5	26/07/11	Electrofisher	Beaver dam	UPP-T5-1	Central Mud Minnow	4	-	45	-	-	-	N	Full of parasites
Upper Trib. 5	26/07/11	Electrofisher	Beaver dam	UPP-T5-1	Brook Stickleback	5	-	32	-	-	-	N	
Upper Trib. 5	26/07/11	Electrofisher	Beaver dam	UPP-T5-1	Brook Stickleback	6	-	39	-	-	-	N	
Upper Trib. 5	26/07/11	Electrofisher	Beaver dam	UPP-T5-1	Central Mud Minnow	7	-	60	-	-	-	N	
Upper Trib. 5	26/07/11	Electrofisher	Beaver dam	UPP-T5-1	Central Mud Minnow	8	-	60	-	-	-	N	
Upper Trib. 5	26/07/11	Electrofisher	Beaver dam	UPP-T5-1	Brook Stickleback	9	-	56	-	-	-	N	
Marr Creek	20/07/11	Seine Net	Beaver pond	Marr-1(Beaver Pond)	Central Mud Minnow	1	-	68	-	-	-	N	
Marr Creek	20/07/11	Seine Net	Beaver pond	Marr-1(Beaver Pond)	Central Mud Minnow	2	-	46	-	-	-	N	
Marr Creek	20/07/11	Seine Net	Beaver pond	Marr-1(Beaver Pond)	Central Mud Minnow	3	-	44	-	-	-	N	
Marr Creek	20/07/11	Seine Net	Beaver pond	Marr-1(Beaver Pond)	Brook Stickleback	4	-	41	-	-	-	N	
Marr Creek	21/07/11	Dip Netting	Marr-2	Marr-2	Brook Stickleback	1	-	52	-	-	-	N	
Marr Creek	21/07/11	Dip Netting	Marr-2	Marr-2	Brook Stickleback	2	-	26	-	-	-	N	
Marr Creek	21/07/11	Dip Netting	Marr-2	Marr-2	Brook Stickleback	3	-	22	-	-	-	N	
Marr Creek	21/07/11	Dip Netting	Marr-2	Marr-2	Central Mud Minnow	4	-	24	-	-	-	N	
Marr Creek	21/07/11	Dip Netting	Marr-2	Marr-2	Brook Stickleback	5	-	25	-	-	-	N	
Marr Creek	21/07/11	Dip Netting	Marr-2	Marr-2	Brook Stickleback	6	-	51	-	-	-	N	
Marr Creek	21/07/11	Dip Netting	Marr-2	Marr-2	Brook Stickleback	7	-	24	-	-	-	N	
Marr Creek	21/07/11	Dip Netting	Marr-2	Marr-2	Brook Stickleback	8	-	30	-	-	-	N	
Marr Creek	21/07/11	Dip Netting	Marr-2	Marr-2	Brook Stickleback	9	-	32	-	-	-	N	
Marr Creek	21/07/11	Dip Netting	Marr-2	Marr-2	Brook Stickleback	10	-	36	-	-	-	N	
Marr Creek	21/07/11	Dip Netting	Marr-2	Marr-2	Brook Stickleback	11	-	33	-	-	-	N	
Marr Creek	21/07/11	Dip Netting	Marr-2	Marr-2	Brook Stickleback	12	-	30	-	-	-	N	
Marr Creek	21/07/11	Dip Netting	Marr-2	Marr-2	Brook Stickleback	13	-	36	-	-	-	N	
Marr Creek	21/07/11	Dip Netting	Marr-2	Marr-2	Brook Stickleback	14	-	21	-	-	-	N	
Marr Creek	21/07/11	Dip Netting	Marr-2	Marr-2	Brook Stickleback	15	-	19	-	-	-	N	
Marr Creek	21/07/11	Dip Netting	Marr-2	Marr-2	Brook Stickleback	16	-	20	-	-	-	N	
Marr Creek	21/07/11	Dip Netting	Marr-2	Marr-2	Brook Stickleback	17	-	29	-	-	-	N	
Marr Creek	21/07/11	Dip Netting	Marr-2	Marr-2	Brook Stickleback	18	-	18	-	-	-	N	
Marr Creek	21/07/11	Dip Netting	Marr-2	Marr-2	Brook Stickleback	19	-	28	-	-	-	N	
Marr Creek	21/07/11	Dip Netting	Marr-2	Marr-2	Brook Stickleback	20	-	16	-	-	-	N	
Marr Creek	21/07/11	Dip Netting	Marr-2	Marr-2	Brook Stickleback	21	-	26	-	-	-	N	
Marr Creek	20/07/11	Seine Net	Western side of culvert	Marr-3	Central Mud Minnow	1	-	58	-	-	-	N	
Marr Creek	20/07/11	Seine Net	Western side of culvert	Marr-3	Common Shiner	2	59	62	-	-	-	N	
Marr Creek	20/07/11	Seine Net	Western side of culvert	Marr-3	Brook Stickleback	3	-	60	-	-	-	N	
Marr Creek	20/07/11	Seine Net	Western side of culvert	Marr-3	Brook Stickleback	4	-	50	-	-	-	N	
Marr Creek	20/07/11	Seine Net	Western side of culvert	Marr-3	Brook Stickleback	5	-	49	-	-	-	N	
Marr Creek	20/07/11	Seine Net	Western side of culvert	Marr-3	Brook Stickleback	6	-	55	-	-	-	N	
Marr Creek	20/07/11	Seine Net	Western side of culvert	Marr-3	Brook Stickleback	7	-	50	-	-	-	N	
Marr Creek	20/07/11	Seine Net	Western side of culvert	Marr-3	Brook Stickleback	8	-	55	-	-	-	N	
Marr Creek	20/07/11	Seine Net	Western side of culvert	Marr-3	Brook Stickleback	9	-	53	-	-	-	N	
Marr Creek	20/07/11	Seine Net	Western side of culvert	Marr-3	Brook Stickleback	10	-	57	-	-	-	N	
Marr Creek	20/07/11	Seine Net	Western side of culvert	Marr-3	Brook Stickleback	11	-	59	-	-	-	N	
Marr Creek	20/07/11	Seine Net	Western side of culvert	Marr-3	Brook Stickleback	12	-	54	-	-	-	N	
Marr Creek	20/07/11	Seine Net	Western side of culvert	Marr-3	Brook Stickleback	13	-	49	-	-	-	N	
Marr Creek	20/07/11	Seine Net	Western side of culvert	Marr-3	Brook Stickleback	14	-	52	-	-	-	N	
Marr Creek	20/07/11	Seine Net	Western side of culvert	Marr-3	Brook Stickleback	15	-	55	-	-	-	N	
Marr Creek	20/07/11	Seine Net	Western side of culvert	Marr-3	Brook Stickleback	16	-	50	-	-	-	N	
Marr Creek	20/07/11	Seine Net	Western side of culvert	Marr-3	Brook Stickleback	17	-	51	-	-	-	N	
Marr Creek	20/07/11	Seine Net	Western side of culvert	Marr-3	Brook Stickleback	18	-	48	-	-	-	N	
Marr Creek	20/07/11	Seine Net	Western side of culvert	Marr-3	Brook Stickleback	19	-	50	-	-	-	N	
Marr Creek	20/07/11	Seine Net	Western side of culvert	Marr-3	Brook Stickleback	20	-	53	-	-	-	N	
Marr Creek	20/07/11	Seine Net	Western side of culvert	Marr-3	Brook Stickleback	21	-	55	-	-	-	N	
Marr Creek	20/07/11	Seine Net	Western side of culvert	Marr-3	Brook Stickleback	22	-	52	-	-	-	N	

Marr Creek	20/07/11	Seine Net	Western side of culvert	Marr-3	Brook Stickleback	23	-	52	-	-	-	N	
Marr Creek	20/07/11	Seine Net	Western side of culvert	Marr-3	Brook Stickleback	24	-	56	-	-	-	N	
Marr Creek	20/07/11	Seine Net	Western side of culvert	Marr-3	Brook Stickleback	25	-	59	-	-	-	N	
Marr Creek	20/07/11	Seine Net	Western side of culvert	Marr-3	Brook Stickleback	26	-	56	-	-	-	N	
Marr Creek	20/07/11	Seine Net	Western side of culvert	Marr-3	Brook Stickleback	27	-	62	-	-	-	N	
Marr Creek	20/07/11	Seine Net	Western side of culvert	Marr-3	Brook Stickleback	28	-	56	-	-	-	N	
Marr Creek	20/07/11	Seine Net	Western side of culvert	Marr-3	Brook Stickleback	29	-	55	-	-	-	N	
Marr Creek	20/07/11	Seine Net	Western side of culvert	Marr-3	Brook Stickleback	30	-	48	-	-	-	N	
Marr Creek	20/07/11	Seine Net	Western side of culvert	Marr-3	Brook Stickleback	31	-	57	-	-	-	N	
Marr Creek	20/07/11	Seine Net	Western side of culvert	Marr-3	Brook Stickleback	32	-	57	-	-	-	N	
Marr Creek	20/07/11	Seine Net	Western side of culvert	Marr-3	Brook Stickleback	33	-	54	-	-	-	N	
Marr Creek	20/07/11	Seine Net	Western side of culvert	Marr-3	Brook Stickleback	34	-	52	-	-	-	N	
Marr Creek	20/07/11	Seine Net	Western side of culvert	Marr-3	Brook Stickleback	35	-	52	-	-	-	N	
Marr Creek	20/07/11	Seine Net	Western side of culvert	Marr-3	Brook Stickleback	36	-	58	-	-	-	N	
Marr Creek	20/07/11	Seine Net	Western side of culvert	Marr-3	Brook Stickleback	37	-	52	-	-	-	N	
Marr Creek	20/07/11	Seine Net	Western side of culvert	Marr-3	Brook Stickleback	38	-	50	-	-	-	N	
Marr Creek	20/07/11	Seine Net	Western side of culvert	Marr-3	Brook Stickleback	39	-	54	-	-	-	N	
Marr Creek	20/07/11	Seine Net	Western side of culvert	Marr-3	Pearl Dace	40	64	66	-	-	A	Y	Batch wt. = 56.3g
Marr Creek	20/07/11	Seine Net	Western side of culvert	Marr-3	Common Shiner	41	66	70	-	-	-	N	
Marr Creek	20/07/11	Seine Net	Western side of culvert	Marr-3	Pearl Dace	42	103	108	-	-	A	Y	Batch wt. = 56.3g
Marr Creek	20/07/11	Seine Net	Western side of culvert	Marr-3	Pearl Dace	43	62	64	-	-	A	Y	Batch wt. = 56.3g
Marr Creek	20/07/11	Seine Net	Western side of culvert	Marr-3	Brook Stickleback	44	-	58	-	-	-	N	
Marr Creek	20/07/11	Seine Net	Western side of culvert	Marr-3	Brook Stickleback	45	-	54	-	-	-	N	
Marr Creek	20/07/11	Seine Net	Western side of culvert	Marr-3	Brook Stickleback	46	-	55	-	-	-	N	
Marr Creek	20/07/11	Seine Net	Western side of culvert	Marr-3	Brook Stickleback	47	-	48	-	-	-	N	
Marr Creek	20/07/11	Seine Net	Western side of culvert	Marr-3	Spottail Shiner	48	47	50	-	-	-	N	
Marr Creek	20/07/11	Seine Net	Western side of culvert	Marr-3	Common Shiner	49	55	58	-	-	-	N	
Marr Creek	20/07/11	Seine Net	Western side of culvert	Marr-3	Brook Stickleback	50	-	52	-	-	-	N	
Marr Creek	20/07/11	Seine Net	Western side of culvert	Marr-3	Brook Stickleback	51	-	47	-	-	-	N	
Marr Creek	20/07/11	Seine Net	Western side of culvert	Marr-3	Pearl Dace	52	86	90	-	-	A	Y	Batch wt. = 56.3g
Marr Creek	20/07/11	Seine Net	Western side of culvert	Marr-3	Spottail Shiner	53	54	58	-	-	-	N	
Marr Creek	20/07/11	Seine Net	Western side of culvert	Marr-3	Brook Stickleback	54	-	47	-	-	-	N	
Marr Creek	20/07/11	Seine Net	Western side of culvert	Marr-3	Brook Stickleback	55	-	56	-	-	-	N	
Marr Creek	20/07/11	Seine Net	Western side of culvert	Marr-3	Brook Stickleback	56	-	54	-	-	-	N	
Marr Creek	20/07/11	Seine Net	Western side of culvert	Marr-3	Brook Stickleback	57	-	50	-	-	-	N	
Marr Creek	20/07/11	Seine Net	Western side of culvert	Marr-3	Brook Stickleback	58	-	32	-	-	-	N	
Marr Creek	20/07/11	Seine Net	Western side of culvert	Marr-3	Brook Stickleback	59	-	57	-	-	-	N	
Marr Creek	20/07/11	Seine Net	Western side of culvert	Marr-3	Brook Stickleback	60	-	54	-	-	-	N	
Marr Creek	20/07/11	Seine Net	Western side of culvert	Marr-3	Brook Stickleback	61	-	49	-	-	-	N	
Marr Creek	20/07/11	Seine Net	Western side of culvert	Marr-3	Finescale Dace	62	61	65	-	-	-	N	
Marr Creek	20/07/11	Seine Net	Western side of culvert	Marr-3	Brook Stickleback	63	-	50	-	-	-	N	
Marr Creek	20/07/11	Seine Net	Western side of culvert	Marr-3	Brook Stickleback	64	-	55	-	-	-	N	
Marr Creek	20/07/11	Seine Net	Western side of culvert	Marr-3	Brook Stickleback	65	-	50	-	-	-	N	
Marr Creek	20/07/11	Seine Net	Western side of culvert	Marr-3	Brook Stickleback	66	-	57	-	-	-	N	
Marr Creek	20/07/11	Seine Net	Western side of culvert	Marr-3	Brook Stickleback	67	-	46	-	-	-	N	
Marr Creek	20/07/11	Seine Net	Western side of culvert	Marr-3	Brook Stickleback	68	-	49	-	-	-	N	
Marr Creek	20/07/11	Seine Net	Western side of culvert	Marr-3	Brook Stickleback	69	-	50	-	-	-	N	
Marr Creek	20/07/11	Seine Net	Western side of culvert	Marr-3	Brook Stickleback	70	-	57	-	-	-	N	
Marr Creek	20/07/11	Seine Net	Western side of culvert	Marr-3	Brook Stickleback	71	-	54	-	-	-	N	
Marr Creek	20/07/11	Seine Net	Western side of culvert	Marr-3	Brook Stickleback	72	-	53	-	-	-	N	
Marr Creek	20/07/11	Seine Net	Western side of culvert	Marr-3	Spottail Shiner	73	57	59	-	-	-	N	
Marr Creek	20/07/11	Seine Net	Western side of culvert	Marr-3	Brook Stickleback	74	-	55	-	-	-	N	
Marr Creek	20/07/11	Seine Net	Western side of culvert	Marr-3	Brook Stickleback	75	-	51	-	-	-	N	
Marr Creek	20/07/11	Seine Net	Western side of culvert	Marr-3	Brook Stickleback	76	-	53	-	-	-	N	
Marr Creek	20/07/11	Seine Net	Western side of culvert	Marr-3	Brook Stickleback	77	-	54	-	-	-	N	
Marr Creek	20/07/11	Seine Net	Western side of culvert	Marr-3	Brook Stickleback	78	-	56	-	-	-	N	
Marr Creek	20/07/11	Seine Net	Western side of culvert	Marr-3	Brook Stickleback	79	-	56	-	-	-	N	
Marr Creek	20/07/11	Seine Net	Western side of culvert	Marr-3	Brook Stickleback	80	-	54	-	-	-	N	
Marr Creek	20/07/11	Seine Net	Western side of culvert	Marr-3	Brook Stickleback	81	-	50	-	-	-	N	

Marr Creek	20/07/11	Seine Net	Western side of culvert	Marr-3	Brook Stickleback	82	-	60	-	-	-	N	
Marr Creek	20/07/11	Seine Net	Western side of culvert	Marr-3	Pearl Dace	83	67	71	-	-	A	Y	Batch wt. = 56.3g
Marr Creek	20/07/11	Seine Net	Western side of culvert	Marr-3	Brook Stickleback	84	-	50	-	-	-	N	
Marr Creek	20/07/11	Seine Net	Western side of culvert	Marr-3	Brook Stickleback	85	-	52	-	-	-	N	
Marr Creek	20/07/11	Seine Net	Western side of culvert	Marr-3	Brook Stickleback	86	-	50	-	-	-	N	
Marr Creek	20/07/11	Seine Net	Western side of culvert	Marr-3	Central Mud Minnow	87	-	66	-	-	-	N	
Marr Creek	20/07/11	Seine Net	Western side of culvert	Marr-3	Brook Stickleback	88	-	57	-	-	-	N	
Marr Creek	20/07/11	Seine Net	Western side of culvert	Marr-3	Brook Stickleback	89	-	54	-	-	-	N	
Marr Creek	20/07/11	Seine Net	Western side of culvert	Marr-3	Brook Stickleback	90	-	50	-	-	-	N	
Marr Creek	20/07/11	Seine Net	Western side of culvert	Marr-3	Brook Stickleback	91	-	55	-	-	-	N	
Marr Creek	20/07/11	Seine Net	Western side of culvert	Marr-3	Brook Stickleback	92	-	52	-	-	-	N	
Marr Creek	20/07/11	Seine Net	Western side of culvert	Marr-3	Common Shiner	93	80	84	-	-	-	N	
Marr Creek	20/07/11	Seine Net	Western side of culvert	Marr-3	Pearl Dace	94	72	75	-	-	A	Y	Batch wt. = 56.3g
Marr Creek	20/07/11	Seine Net	Western side of culvert	Marr-3	Brook Stickleback	95	-	53	-	-	-	N	
Marr Creek	20/07/11	Seine Net	Western side of culvert	Marr-3	Brook Stickleback	96	-	60	-	-	-	N	
Marr Creek	20/07/11	Seine Net	Western side of culvert	Marr-3	Brook Stickleback	97	-	50	-	-	-	N	
Marr Creek	20/07/11	Seine Net	Western side of culvert	Marr-3	Fathead Minnow	98	71	73	-	-	-	N	
Marr Creek	20/07/11	Seine Net	Western side of culvert	Marr-3	Brook Stickleback	99	-	53	-	-	-	N	
Marr Creek	20/07/11	Seine Net	Western side of culvert	Marr-3	Brook Stickleback	100	-	55	-	-	-	N	
Marr Creek	20/07/11	Seine Net	Western side of culvert	Marr-3	Common Shiner	101	46	49	-	-	-	N	
Marr Creek	20/07/11	Seine Net	Western side of culvert	Marr-3	Brook Stickleback	102	-	52	-	-	-	N	
Marr Creek	20/07/11	Seine Net	Western side of culvert	Marr-3	Brook Stickleback	103	-	53	-	-	-	N	
Marr Creek	20/07/11	Seine Net	Western side of culvert	Marr-3	Brook Stickleback	104	-	57	-	-	-	N	
Marr Creek	20/07/11	Seine Net	Western side of culvert	Marr-3	Brook Stickleback	105	-	62	-	-	-	N	
Marr Creek	20/07/11	Seine Net	Western side of culvert	Marr-3	Pearl Dace	106	68	70	-	-	A	Y	Batch wt. = 56.3g
Marr Creek	20/07/11	Seine Net	Western side of culvert	Marr-3	Brook Stickleback	107	-	53	-	-	-	N	
Marr Creek	20/07/11	Seine Net	Western side of culvert	Marr-3	Brook Stickleback	108	-	55	-	-	-	N	
Marr Creek	20/07/11	Seine Net	Western side of culvert	Marr-3	Brook Stickleback	109	-	61	-	-	-	N	
Marr Creek	20/07/11	Seine Net	Western side of culvert	Marr-3	Brook Stickleback	110	-	51	-	-	-	N	
Marr Creek	20/07/11	Seine Net	Western side of culvert	Marr-3	Brook Stickleback	111	-	48	-	-	-	N	
Marr Creek	20/07/11	Seine Net	Western side of culvert	Marr-3	Brook Stickleback	112	-	59	-	-	-	N	
Marr Creek	20/07/11	Seine Net	Western side of culvert	Marr-3	Brook Stickleback	113	-	55	-	-	-	N	
Marr Creek	20/07/11	Seine Net	Western side of culvert	Marr-3	Brook Stickleback	114	-	56	-	-	-	N	
Marr Creek	20/07/11	Seine Net	Western side of culvert	Marr-3	Brook Stickleback	115	-	46	-	-	-	N	
Marr Creek	20/07/11	Seine Net	Western side of culvert	Marr-3	Finescale Dace	116	83	87	-	-	-	N	Photo 0031
Marr Creek	20/07/11	Seine Net	Western side of culvert	Marr-3	Brook Stickleback	117	-	55	-	-	-	N	
Marr Creek	20/07/11	Seine Net	Western side of culvert	Marr-3	Creek Chub	118	76	80	-	-	-	N	
Marr Creek	20/07/11	Seine Net	Western side of culvert	Marr-3	Brook Stickleback	119	-	58	-	-	-	N	
Marr Creek	20/07/11	Seine Net	Western side of culvert	Marr-3	Pearl Dace	120	51	54	-	-	A	Y	Batch wt. = 56.3g
Marr Creek	20/07/11	Seine Net	Western side of culvert	Marr-3	Pearl Dace	121	50	55	-	-	A	Y	Batch wt. = 56.3g
Marr Creek	20/07/11	Minnow Trap	Set at each side of road and at GPS location	Marr-3	Brook Stickleback	122	-	48	-	-	-	N	
Marr Creek	20/07/11	Minnow Trap	Set at each side of road and at GPS location	Marr-3	Central Mud Minnow	123	-	60	-	-	-	N	
Marr Creek	20/07/11	Minnow Trap	Set at each side of road and at GPS location	Marr-3	Pearl Dace	124	106	111	-	-	-	N	
Marr Creek	20/07/11	Minnow Trap	Set at each side of road and at GPS location	Marr-3	Pearl Dace	125	75	79	-	-	A	Y	Bag wt. = 35.7g
Marr Creek	20/07/11	Minnow Trap	Set at each side of road and at GPS location	Marr-3	Pearl Dace	126	95	100	-	-	A	Y	Bag wt. = 35.7g
Marr Creek	20/07/11	Minnow Trap	Set at each side of road and at GPS location	Marr-3	Pearl Dace	127	96	100	-	-	A	Y	Bag wt. = 35.7g
Marr Creek	20/07/11	Minnow Trap	Set at each side of road and at GPS location	Marr-3	Spottail Shiner	128	80	83	-	-	-	N	
Marr Creek	20/07/11	Minnow Trap	Set at each side of road and at GPS location	Marr-3	Spottail Shiner	129	74	77	-	-	-	N	
Marr Creek	20/07/11	Minnow Trap	Set at each side of road and at GPS location	Marr-3	Spottail Shiner	130	91	96	-	-	-	N	
Marr Creek	20/07/11	Minnow Trap	Set at each side of road and at GPS location	Marr-3	Brook Stickleback	131	-	57	-	-	-	N	
Marr Creek	20/07/11	Minnow Trap	Set at each side of road and at GPS location	Marr-3	Brook Stickleback	132	-	49	-	-	-	N	
Marr Creek	19/07/11	Minnow Trap	Lower end of pool, small beaver dam (+1.5m)	Marr-4	Brook Stickleback	1	-	43	-	-	-	N	Dead
Marr Creek	19/07/11	Minnow Trap	Lower end of pool, small beaver dam (+1.5m)	Marr-4	Brook Stickleback	2	-	41	-	-	-	N	
Marr Creek	19/07/11	Minnow Trap	Lower end of pool, small beaver dam (+1.5m)	Marr-4	Brook Stickleback	3	-	39	-	-	-	N	
Marr Creek	19/07/11	Dip Netting	Upper end of pool (fence + twin culvert)	Marr-4	Brook Stickleback	1	-	19	-	-	-	N	
Marr Creek	19/07/11	Dip Netting	Upper end of pool (fence + twin culvert)	Marr-4	Brook Stickleback	2	-	26	-	-	-	N	
Marr Creek	19/07/11	Dip Netting	Upper end of pool (fence + twin culvert)	Marr-4	Brook Stickleback	3	-	20	-	-	-	N	
Marr Creek	19/07/11	Dip Netting	Upper end of pool (fence + twin culvert)	Marr-4	Brook Stickleback	4	-	29	-	-	-	N	
Marr Creek	19/07/11	Dip Netting	Upper end of pool (fence + twin culvert)	Marr-4	Brook Stickleback	5	-	12	-	-	-	N	

Marr Creek	19/07/11	Dip Netting	Upper end of pool (fence + twin culvert)	Marr-4	Brook Stickleback	6	-	13	-	-	-	N	
Marr Creek	19/07/11	Dip Netting	Upper end of pool (fence + twin culvert)	Marr-4	Brook Stickleback	7	-	12	-	-	-	N	
Marr Creek	19/07/11	Dip Netting	Upper end of pool (fence + twin culvert)	Marr-4	Brook Stickleback	8	-	13	-	-	-	N	
Marr Creek	19/07/11	Dip Netting	Upper end of pool (fence + twin culvert)	Marr-4	Brook Stickleback	9	-	20	-	-	-	N	
Marr Creek	19/07/11	Dip Netting	Upper end of pool (fence + twin culvert)	Marr-4	Brook Stickleback	10	-	19	-	-	-	N	
Marr Creek	19/07/11	Dip Netting	Upper end of pool (fence + twin culvert)	Marr-4	Central Mud Minnow	11	-	35	1.00	-	-	N	
Marr Creek	19/07/11	Dip Netting	Upper end of pool (fence + twin culvert)	Marr-4	Brook Stickleback	12	-	42	0.60	-	-	N	
Marr Creek	19/07/11	Dip Netting	Upper end of pool (fence + twin culvert)	Marr-4	Brook Stickleback	13	-	23	-	-	-	N	
Marr Creek	19/07/11	Dip Netting	Upper end of pool (fence + twin culvert)	Marr-4	Brook Stickleback	14	-	22	-	-	-	N	
Marr Creek	19/07/11	Dip Netting	Upper end of pool (fence + twin culvert)	Marr-4	Brook Stickleback	15	-	20	-	-	-	N	
Marr Creek	19/07/11	Dip Netting	Upper end of pool (fence + twin culvert)	Marr-4	Brook Stickleback	16	-	36	0.40	-	-	N	
Marr Creek	19/07/11	Dip Netting	Upper end of pool (fence + twin culvert)	Marr-4	Brook Stickleback	17	-	34	0.40	-	-	N	
Marr Creek	19/07/11	Dip Netting	Upper end of pool (fence + twin culvert)	Marr-4	Brook Stickleback	18	-	40	0.70	-	-	N	
Marr Creek	19/07/11	Dip Netting	Upper end of pool (fence + twin culvert)	Marr-4	Brook Stickleback	19	-	20	-	-	-	N	
Marr Creek	19/07/11	Dip Netting	Downstream ~ 800m from road crossing (cattle crossing)	Marr-4A	Brook Stickleback	1	-	49	-	-	-	N	
Marr Creek	19/07/11	Dip Netting	Downstream ~ 800m from road crossing (cattle crossing)	Marr-4A	Brook Stickleback	2	-	30	-	-	-	N	
Marr Creek	19/07/11	Dip Netting	Downstream ~ 800m from road crossing (cattle crossing)	Marr-4A	Brook Stickleback	3	-	20	-	-	-	N	
Marr Creek	19/07/11	Dip Netting	Downstream ~ 800m from road crossing (cattle crossing)	Marr-4A	Brook Stickleback	4	-	45	-	-	-	N	
Marr Creek	19/07/11	Dip Netting	Downstream ~ 800m from road crossing (cattle crossing)	Marr-4A	Brook Stickleback	5	-	20	-	-	-	N	
Marr Creek	19/07/11	Dip Netting	Downstream ~ 800m from road crossing (cattle crossing)	Marr-4A	Brook Stickleback	6	-	22	-	-	-	N	
Marr Creek	19/07/11	Dip Netting	Downstream ~ 800m from road crossing (cattle crossing)	Marr-4A	Brook Stickleback	7	-	19	-	-	-	N	
Marr Creek	19/07/11	Dip Netting	Downstream ~ 800m from road crossing (cattle crossing)	Marr-4A	Brook Stickleback	8	-	20	-	-	-	N	
Marr Creek	19/07/11	Dip Netting	Downstream ~ 800m from road crossing (cattle crossing)	Marr-4A	Brook Stickleback	9	-	25	-	-	-	N	
Marr Creek	19/07/11	-	~12m from confluence of Pinewood R. & Marr Cr.	Marr-5	Brook Stickleback	1	-	23	-	-	-	N	
Marr Creek	19/07/11	-	~12m from confluence of Pinewood R. & Marr Cr.	Marr-5	Brook Stickleback	2	-	18	-	-	-	N	
Marr Creek	19/07/11	-	~12m from confluence of Pinewood R. & Marr Cr.	Marr-5	Brook Stickleback	3	-	20	-	-	-	N	
Marr Creek	19/07/11	-	~12m from confluence of Pinewood R. & Marr Cr.	Marr-5	Brook Stickleback	4	-	18	-	-	-	N	
Marr Creek	19/07/11	-	~12m from confluence of Pinewood R. & Marr Cr.	Marr-5	Brook Stickleback	5	-	16	-	-	-	N	
Marr Creek	21/07/11	Minnow Trap	Marr-Upper-Pond	Marr-Upper-Pond	Central Mud Minnow	1	-	81	-	-	-	N	
Marr Creek	21/07/11	Minnow Trap	Marr-Upper-Pond	Marr-Upper-Pond	Central Mud Minnow	2	-	74	-	-	-	N	
Marr Creek	21/07/11	Minnow Trap	Marr-Upper-Pond	Marr-Upper-Pond	Central Mud Minnow	3	-	61	-	-	-	N	
Marr Creek	21/07/11	Minnow Trap	Marr-Upper-Pond	Marr-Upper-Pond	Nothern Redbellly Dace	4	91	97	-	-	-	N	
Marr Creek	21/07/11	Minnow Trap	Marr-Upper-Pond	Marr-Upper-Pond	Nothern Redbellly Dace	5	78	82	-	-	-	N	
Marr Creek	21/07/11	Minnow Trap	Marr-Upper-Pond	Marr-Upper-Pond	Central Mud Minnow	6	-	86	-	-	-	N	
Marr Creek	21/07/11	Minnow Trap	Marr-Upper-Pond	Marr-Upper-Pond	Central Mud Minnow	7	-	97	-	-	-	N	
Marr Creek	21/07/11	Minnow Trap	Marr-Upper-Pond	Marr-Upper-Pond	Finescale Dace	8	68	72	-	-	-	N	
Marr Creek	21/07/11	Minnow Trap	Marr-Upper-Pond	Marr-Upper-Pond	Central Mud Minnow	9	-	94	-	-	-	N	
Marr Creek	21/07/11	Minnow Trap	Marr-Upper-Pond	Marr-Upper-Pond	Finescale Dace	10	76	80	-	-	-	N	
Marr Creek	21/07/11	Minnow Trap	Marr-Upper-Pond	Marr-Upper-Pond	Central Mud Minnow	11	-	82	-	-	-	N	
Marr Creek	21/07/11	Minnow Trap	Marr-Upper-Pond	Marr-Upper-Pond	Finescale Dace	12	87	91	-	-	-	N	
Marr Creek	21/07/11	Minnow Trap	Marr-Upper-Pond	Marr-Upper-Pond	Central Mud Minnow	13	-	81	-	-	-	N	
Marr Creek	21/07/11	Minnow Trap	Marr-Upper-Pond	Marr-Upper-Pond	Central Mud Minnow	14	-	79	-	-	-	N	
Marr Creek	21/07/11	Minnow Trap	Marr-Upper-Pond	Marr-Upper-Pond	Central Mud Minnow	15	-	100	-	-	-	N	
Marr Creek	21/07/11	Minnow Trap	Marr-Upper-Pond	Marr-Upper-Pond	Central Mud Minnow	16	-	75	-	-	-	N	
Marr Creek	21/07/11	Minnow Trap	Marr-Upper-Pond	Marr-Upper-Pond	Finescale Dace	17	89	94	-	-	-	N	
Marr Creek	21/07/11	Minnow Trap	Marr-Upper-Pond	Marr-Upper-Pond	Central Mud Minnow	18	-	57	-	-	-	N	
Marr Creek	21/07/11	Minnow Trap	Marr-Upper-Pond	Marr-Upper-Pond	Pearl Dace	19	99	105	-	-	-	N	
Marr Creek	21/07/11	Minnow Trap	Marr-Upper-Pond	Marr-Upper-Pond	Pearl Dace	20	101	105	-	-	-	N	
Marr Creek	21/07/11	Minnow Trap	Marr-Upper-Pond	Marr-Upper-Pond	Central Mud Minnow	21	-	74	-	-	-	N	
Marr Creek	21/07/11	Minnow Trap	Marr-Upper-Pond	Marr-Upper-Pond	Finescale Dace	22	80	85	-	-	-	N	
Marr Creek	21/07/11	Minnow Trap	Marr-Upper-Pond	Marr-Upper-Pond	Finescale Dace	23	91	95	-	-	-	N	
Marr Creek	21/07/11	Minnow Trap	Marr-Upper-Pond	Marr-Upper-Pond	Pearl Dace	24	65	70	-	-	-	N	
Marr Creek	21/07/11	Minnow Trap	Marr-Upper-Pond	Marr-Upper-Pond	Nothern Redbellly Dace	25	71	74	-	-	-	N	
Marr Creek	21/07/11	Minnow Trap	Marr-Upper-Pond	Marr-Upper-Pond	Nothern Redbellly Dace	26	82	89	-	-	-	N	
Marr Creek	21/07/11	Seine Net	Marr-Upper-Pond	Marr-Upper-Pond	Brook Stickleback	1	-	18	-	-	-	N	
Marr Creek	21/07/11	Seine Net	Marr-Upper-Pond	Marr-Upper-Pond	Brook Stickleback	2	-	30	-	-	-	N	
Marr Creek	21/07/11	Seine Net	Marr-Upper-Pond	Marr-Upper-Pond	Central Mud Minnow	3	-	85	-	-	-	N	
Marr Creek	21/07/11	Dip Netting	Marr-Upper-Pond	Marr-Upper-Pond	Brook Stickleback	4	-	25	-	-	-	N	
Marr Creek	21/07/11	Dip Netting	Marr-Upper-Pond	Marr-Upper-Pond	Brook Stickleback	5	-	26	-	-	-	N	

Marr Creek	21/07/11	Dip Netting	Marr-Upper-Pond	Marr-Upper-Pond	Brook Stickleback	6	-	26	-	-	-	N	
Marr Creek	21/07/11	Dip Netting	Marr-Upper-Pond	Marr-Upper-Pond	Brook Stickleback	7	-	25	-	-	-	N	
West Creek Trib. 4	21/07/11	Electrofisher	Wes-1	Wes-1	Pearl Dace	1	29	32	-	-	-	N	yoy
West Creek Trib. 4	21/07/11	Electrofisher	Wes-1	Wes-1	Finescale Dace	2	24	25	-	-	-	N	
West Creek Trib. 4	21/07/11	Electrofisher	Wes-1	Wes-1	Pearl Dace	3	25	26	-	-	-	N	
West Creek Trib. 4	21/07/11	Electrofisher	Wes-1	Wes-1	Nothern Redbellly Dace	4	34	36	-	-	-	N	
West Creek Trib. 4	21/07/11	Electrofisher	Wes-1	Wes-1	Pearl Dace	5	81	87	-	-	-	N	
West Creek Trib. 4	21/07/11	Electrofisher	Wes-1	Wes-1	Brook Stickleback	6	-	47	-	-	-	N	
West Creek Trib. 4	21/07/11	Electrofisher	Wes-1	Wes-1	Central Mud Minnow	7	-	84	-	-	-	N	
West Creek Trib. 4	21/07/11	Electrofisher	Wes-1	Wes-1	Finescale Dace	8	49	53	-	-	-	N	
West Creek Trib. 4	21/07/11	Electrofisher	Wes-1	Wes-1	Central Mud Minnow	9	-	65	-	-	-	N	
West Creek Trib. 4	21/07/11	Electrofisher	Wes-1	Wes-1	Central Mud Minnow	10	-	33	-	-	-	N	
West Creek Trib. 4	21/07/11	Electrofisher	Wes-1	Wes-1	Finescale Dace	11	75	80	-	-	-	N	
West Creek Trib. 4	21/07/11	Electrofisher	Wes-1	Wes-1	Central Mud Minnow	12	-	82	-	-	-	N	
West Creek Trib. 4	21/07/11	Minnow Trap	Wes-1	Wes-1	Pearl Dace	1	150	155	-	-	-	N	Picture
West Creek Trib. 4	21/07/11	Minnow Trap	Wes-1	Wes-1	Nothern Redbellly Dace	2	24	25	-	-	-	N	
West Creek Trib. 4	21/07/11	Minnow Trap	Wes-1	Wes-1	Nothern Redbellly Dace	3	44	46	-	-	-	N	
West Creek Trib. 4	21/07/11	Minnow Trap	Wes-1	Wes-1	Nothern Redbellly Dace	4	49	52	-	-	-	N	
West Creek Trib. 4	21/07/11	Minnow Trap	Wes-1	Wes-1	Pearl Dace	5	72	77	-	-	-	N	
West Creek Trib. 4	21/07/11	Minnow Trap	Wes-1	Wes-1	Finescale Dace	6	72	75	-	-	-	N	
West Creek Trib. 4	21/07/11	Minnow Trap	Wes-1	Wes-1	Nothern Redbellly Dace	7	49	52	-	-	-	N	
West Creek Trib. 4	21/07/11	Minnow Trap	Wes-1	Wes-1	Finescale Dace	8	41	44	-	-	-	N	
West Creek Trib. 4	21/07/11	Minnow Trap	Wes-1	Wes-1	Pearl Dace	9	49	53	-	-	-	N	
West Creek Trib. 4	21/07/11	Minnow Trap	Wes-1	Wes-1	Nothern Redbellly Dace	10	47	51	-	-	-	N	
West Creek Trib. 4	21/07/11	Minnow Trap	Wes-1	Wes-1	Pearl Dace	11	73	79	-	-	-	N	
West Creek Trib. 4	21/07/11	Minnow Trap	Wes-1	Wes-1	Pearl Dace	12	64	68	-	-	-	N	
West Creek Trib. 4	21/07/11	Minnow Trap	Wes-1	Wes-1	Finescale Dace	13	65	69	-	-	-	N	
West Creek Trib. 4	21/07/11	Minnow Trap	Wes-1	Wes-1	Brook Stickleback	14	-	52	-	-	-	N	
West Creek Trib. 4	21/07/11	Minnow Trap	Wes-1	Wes-1	Brook Stickleback	15	-	59	-	-	-	N	
West Creek Trib. 4	21/07/11	Minnow Trap	Wes-1	Wes-1	Brook Stickleback	16	-	48	-	-	-	N	
West Creek	20/07/11	Electrofisher	WES-2	Wes-2	Finescale Dace	1	39	43	-	-	A	Y	
West Creek	20/07/11	Electrofisher	WES-2	Wes-2	Finescale Dace	2	56	60	-	-	A	Y	
West Creek	20/07/11	Electrofisher	WES-2	Wes-2	Blackchin Shiner	3	27	29	-	-	-	N	
West Creek	20/07/11	Electrofisher	WES-2	Wes-2	Blackchin Shiner	4	25	26	-	-	-	N	
West Creek	20/07/11	Electrofisher	WES-2	Wes-2	Blackchin Shiner	5	21	22	-	-	-	N	
West Creek	20/07/11	Electrofisher	WES-2	Wes-2	Blackchin Shiner	6	23	25	-	-	-	N	
West Creek	20/07/11	Electrofisher	WES-2	Wes-2	Blackchin Shiner	7	24	25	-	-	-	N	
West Creek	20/07/11	Electrofisher	WES-2	Wes-2	Blackchin Shiner	8	19	20	-	-	-	N	
West Creek	20/07/11	Electrofisher	WES-2	Wes-2	Blackchin Shiner	9	22	23	-	-	-	N	
West Creek	20/07/11	Electrofisher	WES-2	Wes-2	Blackchin Shiner	10	19	20	-	-	-	N	
West Creek	20/07/11	Electrofisher	WES-2	Wes-2	Blackchin Shiner	11	19	20	-	-	-	N	
West Creek	20/07/11	Electrofisher	WES-2	Wes-2	Blackchin Shiner	12	19	20	-	-	-	N	
West Creek	20/07/11	Electrofisher	WES-2	Wes-2	Blackchin Shiner	13	19	20	-	-	-	N	
West Creek	20/07/11	Electrofisher	WES-2	Wes-2	Pearl Dace	14	69	73	-	-	A	Y	
West Creek	20/07/11	Electrofisher	WES-2	Wes-2	Common Shiner	15	51	54	-	-	A	Y	
West Creek	20/07/11	Electrofisher	WES-2	Wes-2	Pearl Dace	16	56	61	-	-	A	Y	
West Creek	20/07/11	Electrofisher	WES-2	Wes-2	Nothern Redbelly Dace	17	54	59	-	-	A	Y	
West Creek	20/07/11	Electrofisher	WES-2	Wes-2	Finescale Dace	18	84	90	-	-	A	Y	
West Creek	20/07/11	Electrofisher	WES-2	Wes-2	Finescale Dace	19	56	61	-	-	A	Y	
West Creek	20/07/11	Electrofisher	WES-2	Wes-2	Finescale Dace	20	19	20	-	-	-	N	
West Creek	20/07/11	Electrofisher	WES-2	Wes-2	Nothern Redbelly Dace	21	50	53	-	-	A	Y	
West Creek	20/07/11	Electrofisher	WES-2	Wes-2	White Sucker	22	48	51	-	-	-	N	
West Creek	20/07/11	Electrofisher	WES-2	Wes-2	Blackchin Shiner	23	24	25	-	-	-	N	
West Creek	20/07/11	Electrofisher	WES-2	Wes-2	Blackchin Shiner	24	24	25	-	-	-	N	
West Creek	20/07/11	Electrofisher	WES-2	Wes-2	Blackchin Shiner	25	24	25	-	-	-	N	
West Creek	20/07/11	Electrofisher	WES-2	Wes-2	Nothern Redbelly Dace	26	49	52	-	-	A	Y	
West Creek	20/07/11	Electrofisher	WES-2	Wes-2	Pearl Dace	27	90	95	-	-	A	Y	
West Creek	20/07/11	Electrofisher	WES-2	Wes-2	Nothern Redbelly Dace	28	53	57	-	-	A	Y	
West Creek	20/07/11	Electrofisher	WES-2	Wes-2	Pearl Dace	29	49	52	-	-	A	Y	

West Creek	20/07/11	Electrofisher	WES-2	Wes-2	Nothern Redbelly Dace	30	55	60	-	-	A	Y	
West Creek	20/07/11	Electrofisher	WES-2	Wes-2	Nothern Redbelly Dace	31	54	58	-	-	A	Y	
West Creek	20/07/11	Electrofisher	WES-2	Wes-2	Nothern Redbelly Dace	32	55	59	-	-	A	Y	
West Creek	20/07/11	Electrofisher	WES-2	Wes-2	White Sucker	33	43	46	-	-	-	N	
West Creek	20/07/11	Electrofisher	WES-2	Wes-2	Pearl Dace	34	60	64	-	-	A	Y	
West Creek	20/07/11	Electrofisher	WES-2	Wes-2	Finescale Dace	35	89	96	-	-	-	N	
West Creek	20/07/11	Electrofisher	WES-2	Wes-2	White Sucker	36	45	50	-	-	-	N	
West Creek	20/07/11	Electrofisher	WES-2	Wes-2	Nothern Redbelly Dace	37	41	44	-	-	A	Y	
West Creek	20/07/11	Electrofisher	WES-2	Wes-2	Pearl Dace	38	75	80	-	-	A	Y	
West Creek	20/07/11	Electrofisher	WES-2	Wes-2	Nothern Redbelly Dace	39	39	42	-	-	A	Y	
West Creek	20/07/11	Minnow Trap	Pond	Wes-2-Pond	Nothern Redbelly Dace	1	52	56	-	-	A	Y	Batch wt. = 112.4g
West Creek	20/07/11	Minnow Trap	Pond	Wes-2-Pond	Nothern Redbelly Dace	2	51	55	-	-	A	Y	Batch wt. = 112.4g
West Creek	20/07/11	Minnow Trap	Pond	Wes-2-Pond	Nothern Redbelly Dace	3	52	55	-	-	A	Y	Batch wt. = 112.4g
West Creek	20/07/11	Minnow Trap	Pond	Wes-2-Pond	Nothern Redbelly Dace	4	55	58	-	-	A	Y	Batch wt. = 112.4g
West Creek	20/07/11	Minnow Trap	Pond	Wes-2-Pond	Nothern Redbelly Dace	5	50	54	-	-	A	Y	Batch wt. = 112.4g
West Creek	20/07/11	Minnow Trap	Pond	Wes-2-Pond	Nothern Redbelly Dace	6	52	57	-	-	A	Y	Batch wt. = 112.4g
West Creek	20/07/11	Minnow Trap	Pond	Wes-2-Pond	Nothern Redbelly Dace	7	52	56	-	-	A	Y	Batch wt. = 112.4g
West Creek	20/07/11	Minnow Trap	Pond	Wes-2-Pond	Nothern Redbelly Dace	8	53	56	-	-	A	Y	Batch wt. = 112.4g
West Creek	20/07/11	Minnow Trap	Pond	Wes-2-Pond	Nothern Redbelly Dace	9	57	60	-	-	A	Y	Batch wt. = 112.4g
West Creek	20/07/11	Minnow Trap	Pond	Wes-2-Pond	Nothern Redbelly Dace	10	54	57	-	-	A	Y	Batch wt. = 112.4g
West Creek	20/07/11	Minnow Trap	Pond	Wes-2-Pond	Nothern Redbelly Dace	11	52	55	-	-	A	Y	Batch wt. = 112.4g
West Creek	20/07/11	Minnow Trap	Pond	Wes-2-Pond	Nothern Redbelly Dace	12	50	54	-	-	A	Y	Batch wt. = 112.4g
West Creek	20/07/11	Minnow Trap	Pond	Wes-2-Pond	Nothern Redbelly Dace	13	54	58	-	-	A	Y	Batch wt. = 112.4g
West Creek	20/07/11	Minnow Trap	Pond	Wes-2-Pond	Nothern Redbelly Dace	14	50	54	-	-	A	Y	Batch wt. = 112.4g
West Creek	20/07/11	Minnow Trap	Pond	Wes-2-Pond	Nothern Redbelly Dace	15	51	55	-	-	A	Y	Batch wt. = 112.4g
West Creek	20/07/11	Minnow Trap	Pond	Wes-2-Pond	Nothern Redbelly Dace	16	59	63	-	-	A	Y	Batch wt. = 112.4g
West Creek	20/07/11	Minnow Trap	Pond	Wes-2-Pond	Nothern Redbelly Dace	17	50	53	-	-	A	Y	Batch wt. = 112.4g
West Creek	20/07/11	Minnow Trap	Pond	Wes-2-Pond	Nothern Redbelly Dace	18	55	59	-	-	A	Y	Batch wt. = 112.4g
West Creek	20/07/11	Minnow Trap	Pond	Wes-2-Pond	Nothern Redbelly Dace	19	52	55	-	-	A	Y	Batch wt. = 112.4g
West Creek	20/07/11	Minnow Trap	Pond	Wes-2-Pond	Nothern Redbelly Dace	20	52	54	-	-	A	Y	Batch wt. = 112.4g
West Creek	20/07/11	Minnow Trap	Pond	Wes-2-Pond	Nothern Redbelly Dace	21	56	60	-	-	A	Y	Batch wt. = 112.4g
West Creek	20/07/11	Minnow Trap	Pond	Wes-2-Pond	Nothern Redbelly Dace	22	55	58	-	-	A	Y	Batch wt. = 112.4g
West Creek	20/07/11	Minnow Trap	Pond	Wes-2-Pond	Nothern Redbelly Dace	23	49	53	-	-	A	Y	Batch wt. = 112.4g
West Creek	20/07/11	Minnow Trap	Pond	Wes-2-Pond	Nothern Redbelly Dace	24	51	54	-	-	A	Y	Batch wt. = 112.4g
West Creek	20/07/11	Minnow Trap	Pond	Wes-2-Pond	Nothern Redbelly Dace	25	49	52	-	-	A	Y	Batch wt. = 112.4g
West Creek	20/07/11	Minnow Trap	Pond	Wes-2-Pond	Nothern Redbelly Dace	26	53	56	-	-	A	Y	Batch wt. = 112.4g
West Creek	20/07/11	Minnow Trap	Pond	Wes-2-Pond	Nothern Redbelly Dace	27	55	60	-	-	A	Y	Batch wt. = 112.4g
West Creek	20/07/11	Minnow Trap	Pond	Wes-2-Pond	Nothern Redbelly Dace	28	55	59	-	-	A	Y	Batch wt. = 112.4g
West Creek	20/07/11	Minnow Trap	Pond	Wes-2-Pond	Nothern Redbelly Dace	29	52	55	-	-	A	Y	Batch wt. = 112.4g
West Creek	20/07/11	Minnow Trap	Pond	Wes-2-Pond	Nothern Redbelly Dace	30	51	54	-	-	A	Y	Batch wt. = 112.4g
West Creek	20/07/11	Minnow Trap	Pond	Wes-2-Pond	Nothern Redbelly Dace	31	51	54	-	-	A	Y	Batch wt. = 112.4g
West Creek	20/07/11	Minnow Trap	Pond	Wes-2-Pond	Nothern Redbelly Dace	32	52	55	-	-	A	Y	Batch wt. = 112.4g
West Creek	20/07/11	Minnow Trap	Pond	Wes-2-Pond	Nothern Redbelly Dace	33	51	54	-	-	A	Y	Batch wt. = 112.4g
West Creek	20/07/11	Minnow Trap	Pond	Wes-2-Pond	Pearl Dace	34	104	111	-	-	A	Y	Batch wt. = 112.4g
West Creek	20/07/11	Minnow Trap	Pond	Wes-2-Pond	Blackchin Shiner	35	23	25	-	-	A	Y	Batch wt. = 112.4g
West Creek	20/07/11	Minnow Trap	Pond	Wes-2-Pond	Blackchin Shiner	36	53	57	-	-	A	Y	Batch wt. = 112.4g
West Creek	20/07/11	Minnow Trap	Pond	Wes-2-Pond	Brook Stickleback	37	-	48	-	-	A	Y	Batch wt. = 112.4g
West Creek	23/07/11	Dip Netting	Wes-4	Wes-4	Brook Stickleback	1	-	42	-	-	-	N	
West Creek	23/07/11	Dip Netting	Wes-4	Wes-4	Brook Stickleback	2	-	42	-	-	-	N	
West Creek	23/07/11	Dip Netting	Wes-4	Wes-4	Creek Chub	3	27	29	-	-	-	N	
West Creek	23/07/11	Dip Netting	Wes-4	Wes-4	Creek Chub	4	32	34	-	-	-	N	
West Creek	23/07/11	Dip Netting	Wes-4	Wes-4	Brassy Minnow	5	46	52	-	-	-	N	
West Creek	23/07/11	Dip Netting	Wes-4	Wes-4	Brassy Minnow	6	34	36	-	-	-	N	
West Creek	23/07/11	Dip Netting	Wes-4	Wes-4	Creek Chub	7	41	44	-	-	-	N	
West Creek	23/07/11	Dip Netting	Wes-4	Wes-4	Brook Stickleback	8	-	36	-	-	-	N	
West Creek	23/07/11	Dip Netting	Wes-4	Wes-4	Creek Chub	9	39	42	-	-	-	N	
West Creek	23/07/11	Dip Netting	Wes-4	Wes-4	Brassy Minnow	10	49	53	-	-	-	N	
West Creek	23/07/11	Dip Netting	Wes-4	Wes-4	Brook Stickleback	11	-	30	-	-	-	N	
West Creek	23/07/11	Dip Netting	Wes-4	Wes-4	Brassy Minnow	12	43	47	-	-	-	N	

West Creek	23/07/11	Dip Netting	Wes-4	Wes-4	Creek Chub	13	30	32	-	-	-	N	
West Creek	23/07/11	Dip Netting	Wes-4	Wes-4	Brassy Minnow	14	50	54	-	-	-	N	
West Creek	23/07/11	Dip Netting	Wes-4	Wes-4	Brook Stickleback	15	-	44	-	-	-	N	
West Creek	23/07/11	Dip Netting	Wes-4	Wes-4	Brassy Minnow	16	50	54	-	-	-	N	
West Creek	23/07/11	Dip Netting	Wes-4	Wes-4	Brassy Minnow	17	57	62	-	-	-	N	
West Creek	23/07/11	Dip Netting	Wes-4	Wes-4	Brassy Minnow	18	52	56	-	-	-	N	
West Creek	23/07/11	Dip Netting	Wes-4	Wes-4	Brook Stickleback	19	-	36	-	-	-	N	
West Creek	23/07/11	Dip Netting	Wes-4	Wes-4	Brassy Minnow	20	35	50	-	-	-	N	
West Creek	23/07/11	Dip Netting	Wes-4	Wes-4	Brook Stickleback	21	-	35	-	-	-	N	
West Creek	23/07/11	Dip Netting	Wes-4	Wes-4	Creek Chub	22	34	36	-	-	-	N	
West Creek	23/07/11	Dip Netting	Wes-4	Wes-4	Brook Stickleback	23	-	33	-	-	-	N	
West Creek	23/07/11	Dip Netting	Wes-4	Wes-4	Creek Chub	24	29	31	-	-	-	N	
West Creek	23/07/11	Dip Netting	Wes-4	Wes-4	Brook Stickleback	25	-	20	-	-	-	N	
West Creek	23/07/11	Dip Netting	Wes-4	Wes-4	Finescale Dace	26	37	40	-	-	-	N	
West Creek	23/07/11	Dip Netting	Wes-4	Wes-4	Brook Stickleback	27	-	46	-	-	-	N	
West Creek	23/07/11	Dip Netting	Wes-4	Wes-4	Creek Chub	28	36	39	-	-	-	N	
West Creek	23/07/11	Dip Netting	Wes-4	Wes-4	Brook Stickleback	29	-	45	-	-	-	N	
West Creek	23/07/11	Minnow Trap	Wes-4	Wes-4	Brassy Minnow	30	59	62	-	-	-	N	
West Creek	23/07/11	Minnow Trap	Wes-4	Wes-4	Brassy Minnow	31	54	58	-	-	-	N	
West Creek	23/07/11	Minnow Trap	Wes-4	Wes-4	Brook Stickleback	32	-	57	-	-	-	N	
West Creek	23/07/11	Minnow Trap	Wes-4	Wes-4	Brassy Minnow	33	50	54	-	-	-	N	
West Creek	23/07/11	Minnow Trap	Wes-4	Wes-4	Brassy Minnow	34	51	54	-	-	-	N	
West Creek	23/07/11	Minnow Trap	Wes-4	Wes-4	Brassy Minnow	35	70	76	-	-	-	N	
West Creek	23/07/11	Minnow Trap	Wes-4	Wes-4	Creek Chub	36	65	71	-	-	-	N	
West Creek	23/07/11	Minnow Trap	Wes-4	Wes-4	Brassy Minnow	37	57	60	-	-	-	N	
West Creek	23/07/11	Minnow Trap	Wes-4	Wes-4	Brook Stickleback	38	-	50	-	-	-	N	
West Creek	23/07/11	Minnow Trap	Wes-4	Wes-4	Brook Stickleback	39	-	45	-	-	-	N	
West Creek	23/07/11	Minnow Trap	Wes-4	Wes-4	Brook Stickleback	40	-	39	-	-	-	N	
West Creek	23/07/11	Minnow Trap	Wes-4	Wes-4	Blackside Darter	41	-	71	-	-	-	N	
West Creek	23/07/11	Minnow Trap	Wes-4	Wes-4	Brassy Minnow	42	54	59	-	-	-	N	
West Creek	23/07/11	Minnow Trap	Wes-4	Wes-4	Brook Stickleback	43	-	46	-	-	-	N	
West Creek	23/07/11	Minnow Trap	Wes-4	Wes-4	Brook Stickleback	44	-	46	-	-	-	N	
West Creek	23/07/11	Minnow Trap	Wes-4	Wes-4	Brook Stickleback	45	-	34	-	-	-	N	
West Creek	23/07/11	Minnow Trap	Wes-4	Wes-4	Brook Stickleback	46	-	42	-	-	-	N	
West Creek	23/07/11	Minnow Trap	Wes-4	Wes-4	Brook Stickleback	47	-	39	-	-	-	N	
West Creek	23/07/11	Minnow Trap	Wes-4	Wes-4	Brook Stickleback	48	-	40	-	-	-	N	
West Creek	23/07/11	Minnow Trap	Wes-4	Wes-4	Brook Stickleback	49	-	53	-	-	-	N	
West Creek	23/07/11	Minnow Trap	Wes-4	Wes-4	Brook Stickleback	50	-	39	-	-	-	N	
West Creek	23/07/11	Minnow Trap	Wes-4	Wes-4	Central Mud Minnow	51	-	96	-	-	-	N	
West Creek	23/07/11	Minnow Trap	Wes-4	Wes-4	Central Mud Minnow	52	-	87	-	-	-	N	
West Creek	23/07/11	Minnow Trap	Wes-4	Wes-4	Brook Stickleback	53	-	41	-	-	-	N	
West Creek Trib. 3	21/07/11	Minnow Trap	West Side of Roen Rd. drainage/culvert/pool	West Trib. 3	Brook Stickleback	1	-	52	-	-	-	N	
West Creek Trib. 3	21/07/11	Minnow Trap	West Side of Roen Rd. drainage/culvert/pool	West Trib. 3	Brassy Minnow	2	42	45	-	-	-	N	
West Creek Trib. 3	21/07/11	Minnow Trap	West Side of Roen Rd. drainage/culvert/pool	West Trib. 3	Finescale Dace	3	43	46	-	-	-	N	
West Creek Trib. 3	21/07/11	Minnow Trap	West Side of Roen Rd. drainage/culvert/pool	West Trib. 3	Finescale Dace	4	54	57	-	-	-	N	
West Creek Trib. 3	21/07/11	Minnow Trap	West Side of Roen Rd. drainage/culvert/pool	West Trib. 3	Brook Stickleback	5	-	54	-	-	-	N	
West Creek Trib. 3	21/07/11	Minnow Trap	West Side of Roen Rd. drainage/culvert/pool	West Trib. 3	Brook Stickleback	6	-	45	-	-	-	N	
West Creek Trib. 3	21/07/11	Minnow Trap	West Side of Roen Rd. drainage/culvert/pool	West Trib. 3	Finescale Dace	7	51	54	-	-	-	N	
West Creek Trib. 3	21/07/11	Minnow Trap	West Side of Roen Rd. drainage/culvert/pool	West Trib. 3	Nothern Redbelly Dace	8	52	56	-	-	-	N	
West Creek Trib. 3	21/07/11	Minnow Trap	West Side of Roen Rd. drainage/culvert/pool	West Trib. 3	Creek Chub	9	41	45	-	-	-	N	
West Creek Trib. 3	21/07/11	Minnow Trap	West Side of Roen Rd. drainage/culvert/pool	West Trib. 3	Brook Stickleback	10	45	48	-	-	-	N	
West Creek Trib. 3	21/07/11	Minnow Trap	West Side of Roen Rd. drainage/culvert/pool	West Trib. 3	Creek Chub	11	47	51	-	-	-	N	
West Creek Trib. 3	21/07/11	Minnow Trap	West Side of Roen Rd. drainage/culvert/pool	West Trib. 3	Brook Stickleback	12	-	50	-	-	-	N	
West Creek Trib. 3	21/07/11	Minnow Trap	West Side of Roen Rd. drainage/culvert/pool	West Trib. 3	Brook Stickleback	13	-	50	-	-	-	N	
West Creek Trib. 3	21/07/11	Minnow Trap	West Side of Roen Rd. drainage/culvert/pool	West Trib. 3	Brassy Minnow	14	45	48	-	-	-	N	
West Creek Trib. 3	21/07/11	Minnow Trap	West Side of Roen Rd. drainage/culvert/pool	West Trib. 3	Creek Chub	15	54	57	-	-	-	N	
West Creek Trib. 3	21/07/11	Minnow Trap	West Side of Roen Rd. drainage/culvert/pool	West Trib. 3	Finescale Dace	16	51	54	-	-	-	N	
West Creek Trib. 3	21/07/11	Minnow Trap	West Side of Roen Rd. drainage/culvert/pool	West Trib. 3	Brook Stickleback	17	-	59	-	-	-	N	
West Creek Trib. 3	21/07/11	Minnow Trap	West Side of Roen Rd. drainage/culvert/pool	West Trib. 3	Brook Stickleback	18	-	62	-	-	-	N	

West Creek Trib. 3	21/07/11	Minnow Trap	West Side of Roen Rd. drainage/culvert/pool	West Trib. 3	Brook Stickleback	19	-	58	-	-	-	N	
West Creek Trib. 3	21/07/11	Minnow Trap	West Side of Roen Rd. drainage/culvert/pool	West Trib. 3	Brook Stickleback	20	-	43	-	-	-	N	
West Creek Trib. 3	21/07/11	Minnow Trap	West Side of Roen Rd. drainage/culvert/pool	West Trib. 3	Brassy Minnow	21	43	45	-	-	-	N	
West Creek Trib. 3	21/07/11	Minnow Trap	West Side of Roen Rd. drainage/culvert/pool	West Trib. 3	Brook Stickleback	22	-	54	-	-	-	N	
West Creek Trib. 3	21/07/11	Minnow Trap	West Side of Roen Rd. drainage/culvert/pool	West Trib. 3	Brook Stickleback	23	-	51	-	-	-	N	
West Creek Trib. 3	21/07/11	Minnow Trap	West Side of Roen Rd. drainage/culvert/pool	West Trib. 3	Brook Stickleback	24	-	42	-	-	-	N	
West Creek Trib. 3	21/07/11	Minnow Trap	West Side of Roen Rd. drainage/culvert/pool	West Trib. 3	Brook Stickleback	25	-	50	-	-	-	N	
West Creek Trib. 3	21/07/11	Minnow Trap	West Side of Roen Rd. drainage/culvert/pool	West Trib. 3	Brassy Minnow	26	45	47	-	-	-	N	
West Creek Trib. 3	21/07/11	Minnow Trap	West Side of Roen Rd. drainage/culvert/pool	West Trib. 3	Finescale Dace	27	43	46	-	-	-	N	
West Creek Trib. 3	21/07/11	Minnow Trap	West Side of Roen Rd. drainage/culvert/pool	West Trib. 3	Brassy Minnow	28	51	54	-	-	-	N	
West Creek Trib. 3	21/07/11	Minnow Trap	West Side of Roen Rd. drainage/culvert/pool	West Trib. 3	Creek Chub	29	50	52	-	-	-	N	
West Creek Trib. 3	21/07/11	Minnow Trap	West Side of Roen Rd. drainage/culvert/pool	West Trib. 3	Brook Stickleback	30	-	50	-	-	-	N	
West Creek Trib. 3	21/07/11	Minnow Trap	West Side of Roen Rd. drainage/culvert/pool	West Trib. 3	Brassy Minnow	31	55	59	-	-	-	N	
West Creek Trib. 3	21/07/11	Minnow Trap	West Side of Roen Rd. drainage/culvert/pool	West Trib. 3	Brassy Minnow	32	45	48	-	-	-	N	
West Creek Trib. 3	21/07/11	Minnow Trap	West Side of Roen Rd. drainage/culvert/pool	West Trib. 3	Brassy Minnow	33	46	49	-	-	-	N	
West Creek Trib. 3	21/07/11	Minnow Trap	West Side of Roen Rd. drainage/culvert/pool	West Trib. 3	Brook Stickleback	34	-	55	-	-	-	N	
West Creek Trib. 3	21/07/11	Minnow Trap	West Side of Roen Rd. drainage/culvert/pool	West Trib. 3	Brook Stickleback	35	-	57	-	-	-	N	
West Creek Trib. 3	21/07/11	Minnow Trap	West Side of Roen Rd. drainage/culvert/pool	West Trib. 3	Brassy Minnow	36	54	58	-	-	-	N	
West Creek Trib. 3	21/07/11	Minnow Trap	West Side of Roen Rd. drainage/culvert/pool	West Trib. 3	Brassy Minnow	37	51	55	-	-	-	N	
West Creek Trib. 3	21/07/11	Minnow Trap	West Side of Roen Rd. drainage/culvert/pool	West Trib. 3	Brassy Minnow	38	55	58	-	-	-	N	
West Creek Trib.3	21/07/11	Minnow Trap	Beaver pond, surrounding area being drilled, used drilling access road	West Trib.3	Creek Chub	-	-	-	-	-	-	N	
West Creek Trib.3	21/07/11	Minnow Trap	Beaver pond, surrounding area being drilled, used drilling access road	West Trib.3	Common Shiner	-	-	-	-	-	-	N	
West Creek Trib.3	21/07/11	Minnow Trap	Beaver pond, surrounding area being drilled, used drilling access road	West Trib.3	Nothern Redbellly Dace	-	-	-	-	-	-	N	
West Creek Trib.3	21/07/11	Minnow Trap	Beaver pond, surrounding area being drilled, used drilling access road	West Trib.3	Brassy Minnow	-	-	-	-	-	-	N	
West Creek Trib.3	21/07/11	Minnow Trap	Beaver pond, surrounding area being drilled, used drilling access road	West Trib.3	Emerald Shiner	-	-	-	-	-	-	N	
West Creek Trib.3	21/07/11	Minnow Trap	Beaver pond, surrounding area being drilled, used drilling access road	West Trib.3	White Sucker	-	-	-	-	-	-	N	
West Creek Trib.3	21/07/11	Minnow Trap	Beaver pond, surrounding area being drilled, used drilling access road	West Trib.3	Brook Stickleback	-	-	-	-	-	-	N	
Clark Creek	24/07/11	Dip Netting	Site moved ~100m d/s from road crossing	Cla-1	Finescale Dace	1	40	43	-	-	-	N	
Clark Creek	24/07/11	Dip Netting	Site moved ~100m d/s from road crossing	Cla-1	Finescale Dace	2	18	19	-	-	-	N	
Clark Creek	24/07/11	Dip Netting	Site moved ~100m d/s from road crossing	Cla-1	Finescale Dace	3	40	43	-	-	-	N	
Clark Creek	24/07/11	Dip Netting	Site moved ~100m d/s from road crossing	Cla-1	Brassy Minnow	4	38	40	-	-	-	N	
Clark Creek	24/07/11	Dip Netting	Site moved ~100m d/s from road crossing	Cla-1	Brook Stickleback	5	-	23	-	-	-	N	
Clark Creek	24/07/11	Dip Netting	Site moved ~100m d/s from road crossing	Cla-1	Finescale Dace	6	18	19	-	-	-	N	
Clark Creek	24/07/11	Dip Netting	Site moved ~100m d/s from road crossing	Cla-1	Brook Stickleback	7	-	23	-	-	-	N	
Clark Creek	24/07/11	Dip Netting	Site moved ~100m d/s from road crossing	Cla-1	Finescale Dace	8	17	18	-	-	-	N	
Clark Creek	24/07/11	Dip Netting	Site moved ~100m d/s from road crossing	Cla-1	Finescale Dace	9	18	19	-	-	-	N	
Clark Creek	24/07/11	Dip Netting	Site moved ~100m d/s from road crossing	Cla-1	Finescale Dace	10	16	17	-	-	-	N	
Clark Creek	24/07/11	Dip Netting	Site moved ~100m d/s from road crossing	Cla-1	Finescale Dace	11	17	18	-	-	-	N	
Clark Creek	24/07/11	Dip Netting	Site moved ~100m d/s from road crossing	Cla-1	Finescale Dace	12	16	17	-	-	-	N	
Clark Creek	24/07/11	Dip Netting	Site moved ~100m d/s from road crossing	Cla-1	Finescale Dace	13	17	18	-	-	-	N	
Clark Creek	24/07/11	Dip Netting	Site moved ~100m d/s from road crossing	Cla-1	Finescale Dace	14	36	37	-	-	-	N	
Clark Creek	24/07/11	Dip Netting	Site moved ~100m d/s from road crossing	Cla-1	Finescale Dace	15	17	18	-	-	-	N	
Clark Creek	24/07/11	Dip Netting	Site moved ~100m d/s from road crossing	Cla-1	Finescale Dace	16	14	15	-	-	-	N	
Clark Creek	24/07/11	Dip Netting	Site moved ~100m d/s from road crossing	Cla-1	Finescale Dace	17	35	37	-	-	-	N	
Clark Creek	24/07/11	Dip Netting	Site moved ~100m d/s from road crossing	Cla-1	Brook Stickleback	18	-	40	-	-	-	N	
Clark Creek	24/07/11	Dip Netting	Site moved ~100m d/s from road crossing	Cla-1	Brook Stickleback	19	-	27	-	-	-	N	
Clark Creek	24/07/11	Dip Netting	Site moved ~100m d/s from road crossing	Cla-1	Finescale Dace	20	33	35	-	-	-	N	
Clark Creek	24/07/11	Dip Netting	Site moved ~100m d/s from road crossing	Cla-1	Brook Stickleback	21	-	21	-	-	-	N	
Clark Creek	24/07/11	Dip Netting	Site moved ~100m d/s from road crossing	Cla-1	Brook Stickleback	22	-	21	-	-	-	N	
Clark Creek	24/07/11	Dip Netting	Site moved ~100m d/s from road crossing	Cla-1	Finescale Dace	23	17	18	-	-	-	N	
Clark Creek	24/07/11	Dip Netting	Site moved ~100m d/s from road crossing	Cla-1	Finescale Dace	24	19	20	-	-	-	N	
Clark Creek	24/07/11	Dip Netting	Site moved ~100m d/s from road crossing	Cla-1	Finescale Dace	25	15	16	-	-	-	N	
Clark Creek	24/07/11	Dip Netting	Site moved ~100m d/s from road crossing	Cla-1	Finescale Dace	26	20	21	-	-	-	N	
Clark Creek	24/07/11	Dip Netting	Site moved ~100m d/s from road crossing	Cla-1	Finescale Dace	27	17	18	-	-	-	N	
Clark Creek	24/07/11	Dip Netting	Site moved ~100m d/s from road crossing	Cla-1	Finescale Dace	28	19	20	-	-	-	N	
Clark Creek	24/07/11	Dip Netting	Site moved ~100m d/s from road crossing	Cla-1	Finescale Dace	29	17	18	-	-	-	N	
Clark Creek	24/07/11	Dip Netting	Site moved ~100m d/s from road crossing	Cla-1	Brook Stickleback	30	-	27	-	-	-	N	
Clark Creek	24/07/11	Dip Netting	Site moved ~100m d/s from road crossing	Cla-1	Brook Stickleback	31	-	28	-	-	-	N	
Clark Creek	24/07/11	Dip Netting	Site moved ~100m d/s from road crossing	Cla-1	Brook Stickleback	32	-	25	-	-	-	N	

Clark Creek	24/07/11	Dip Netting	Site moved ~100m d/s from road crossing	Cla-1	Brassy Minnow	33	45	47	-	-	-	N	
Clark Creek	24/07/11	Dip Netting	Site moved ~100m d/s from road crossing	Cla-1	Brook Stickleback	34	-	21	-	-	-	N	
Clark Creek	24/07/11	Dip Netting	Site moved ~100m d/s from road crossing	Cla-1	Finescale Dace	35	18	19	-	-	-	N	
Clark Creek	24/07/11	Dip Netting	Site moved ~100m d/s from road crossing	Cla-1	Finescale Dace	36	18	19	-	-	-	N	
Clark Creek	24/07/11	Dip Netting	Site moved ~100m d/s from road crossing	Cla-1	Brook Stickleback	37	-	24	-	-	-	N	
Clark Creek	24/07/11	Dip Netting	Site moved ~100m d/s from road crossing	Cla-1	Brook Stickleback	38	-	19	-	-	-	N	
Clark Creek	24/07/11	Dip Netting	Site moved ~100m d/s from road crossing	Cla-1	Brook Stickleback	39	-	16	-	-	-	N	
Clark Creek	24/07/11	Dip Netting	Site moved ~100m d/s from road crossing	Cla-1	Brook Stickleback	40	-	22	-	-	-	N	
Clark Creek	24/07/11	Dip Netting	Site moved ~100m d/s from road crossing	Cla-1	Finescale Dace	41	18	19	-	-	-	N	
Clark Creek	24/07/11	Dip Netting	Site moved ~100m d/s from road crossing	Cla-1	Finescale Dace	42	18	19	-	-	-	N	
Clark Creek	24/07/11	Dip Netting	Site moved ~100m d/s from road crossing	Cla-1	Finescale Dace	43	18	19	-	-	-	N	
Clark Creek	24/07/11	Dip Netting	Site moved ~100m d/s from road crossing	Cla-1	Brook Stickleback	44	-	24	-	-	-	N	
Clark Creek	24/07/11	Dip Netting	Site moved ~100m d/s from road crossing	Cla-1	Brook Stickleback	45	17	18	-	-	-	N	
Clark Creek	24/07/11	Dip Netting	Site moved ~100m d/s from road crossing	Cla-1	Brook Stickleback	46	-	25	-	-	-	N	
Clark Creek	24/07/11	Dip Netting	Site moved ~100m d/s from road crossing	Cla-1	Finescale Dace	47	17	18	-	-	-	N	
Clark Creek	24/07/11	Dip Netting	Site moved ~100m d/s from road crossing	Cla-1	Finescale Dace	48	18	19	-	-	-	N	
Clark Creek	24/07/11	Minnow Trap	Site moved ~100m d/s from road crossing	Cla-1	Finescale Dace	48	18	19	-	-	-	N	
Clark Creek	24/07/11	Minnow Trap	Site moved ~100m d/s from road crossing	Cla-1	Brook Stickleback	49	-	42	-	-	-	N	
Clark Creek	24/07/11	Minnow Trap	Site moved ~100m d/s from road crossing	Cla-1	Brook Stickleback	50	-	46	-	-	-	N	
Clark Creek	24/07/11	Minnow Trap	Site moved ~100m d/s from road crossing	Cla-1	Brook Stickleback	51	-	50	-	-	-	N	
Clark Creek	24/07/11	Minnow Trap	Site moved ~100m d/s from road crossing	Cla-1	Brook Stickleback	52	-	45	-	-	-	N	
Clark Creek	24/07/11	Minnow Trap	Site moved ~100m d/s from road crossing	Cla-1	Brook Stickleback	53	-	47	-	-	-	N	
Clark Creek	24/07/11	Minnow Trap	Site moved ~100m d/s from road crossing	Cla-1	Brook Stickleback	54	-	51	-	-	-	N	
Clark Creek	23/07/11	Dip Netting	Old large beaver dam with water flowing through a gap in the dam	Cla-2	Nothern Redbellly Dace	1	54	57	-	-	-	N	
Clark Creek	23/07/11	Dip Netting	Old large beaver dam with water flowing through a gap in the dam	Cla-2	Blacknose Dace	2	21	24	-	-	-	N	
Clark Creek	23/07/11	Dip Netting	Old large beaver dam with water flowing through a gap in the dam	Cla-2	Blacknose Dace	3	17	18	-	-	-	N	
Clark Creek	23/07/11	Dip Netting	Old large beaver dam with water flowing through a gap in the dam	Cla-2	Blacknose Dace	4	17	18	-	-	-	N	
Clark Creek	23/07/11	Dip Netting	Old large beaver dam with water flowing through a gap in the dam	Cla-2	Blacknose Dace	5	23	23	-	-	-	N	
Clark Creek	23/07/11	Dip Netting	Old large beaver dam with water flowing through a gap in the dam	Cla-2	Blacknose Dace	6	22	23	-	-	-	N	
Clark Creek	23/07/11	Dip Netting	Old large beaver dam with water flowing through a gap in the dam	Cla-2	Blacknose Dace	7	26	28	-	-	-	N	
Clark Creek	23/07/11	Dip Netting	Old large beaver dam with water flowing through a gap in the dam	Cla-2	Blacknose Dace	8	15	16	-	-	-	N	
Clark Creek	23/07/11	Dip Netting	Old large beaver dam with water flowing through a gap in the dam	Cla-2	Blacknose Dace	9	24	25	-	-	-	N	
Clark Creek	23/07/11	Dip Netting	Old large beaver dam with water flowing through a gap in the dam	Cla-2	Brook Stickleback	10	-	38	-	-	-	N	
Clark Creek	23/07/11	Dip Netting	Old large beaver dam with water flowing through a gap in the dam	Cla-2	Blacknose Dace	11	25	27	-	-	-	N	
Clark Creek	23/07/11	Dip Netting	Old large beaver dam with water flowing through a gap in the dam	Cla-2	Blacknose Dace	12	18	19	-	-	-	N	
Clark Creek	23/07/11	Dip Netting	Old large beaver dam with water flowing through a gap in the dam	Cla-2	Nothern Redbellly Dace	13	51	55	-	-	-	N	
Clark Creek	23/07/11	Dip Netting	Old large beaver dam with water flowing through a gap in the dam	Cla-2	Brook Stickleback	14	-	43	-	-	-	N	
Clark Creek	23/07/11	Dip Netting	Old large beaver dam with water flowing through a gap in the dam	Cla-2	Blacknose Dace	15	22	25	-	-	-	N	
Clark Creek	23/07/11	Dip Netting	Old large beaver dam with water flowing through a gap in the dam	Cla-2	Blacknose Dace	16	21	23	-	-	-	N	
Clark Creek	23/07/11	Dip Netting	Old large beaver dam with water flowing through a gap in the dam	Cla-2	Blacknose Dace	17	24	25	-	-	-	N	
Clark Creek	23/07/11	Minnow Trap	Old large beaver dam with water flowing through a gap in the dam	Cla-2	Common Shiner	18	90	98	-	-	-	N	
Clark Creek	23/07/11	Minnow Trap	Old large beaver dam with water flowing through a gap in the dam	Cla-2	Brassy Minnow	19	101	105	-	-	A	Y	Batch wt. = 205.2g (Brassy Minnows kep
Clark Creek	23/07/11	Minnow Trap	Old large beaver dam with water flowing through a gap in the dam	Cla-2	Common Shiner	20	101	111	-	-	-	N	
Clark Creek	23/07/11	Minnow Trap	Old large beaver dam with water flowing through a gap in the dam	Cla-2	Brassy Minnow	21	101	110	-	-	A	Y	Batch wt. = 205.2g (Brassy Minnows kep
Clark Creek	23/07/11	Minnow Trap	Old large beaver dam with water flowing through a gap in the dam	Cla-2	Brassy Minnow	22	105	112	-	-	A	Y	Batch wt. = 205.2g (Brassy Minnows kep
Clark Creek	23/07/11	Minnow Trap	Old large beaver dam with water flowing through a gap in the dam	Cla-2	Spottail Shiner	23	59	62	-	-	-	N	
Clark Creek	23/07/11	Minnow Trap	Old large beaver dam with water flowing through a gap in the dam	Cla-2	Brassy Minnow	24	100	111	-	-	A	Y	Batch wt. = 205.2g (Brassy Minnows kep
Clark Creek	23/07/11	Minnow Trap	Old large beaver dam with water flowing through a gap in the dam	Cla-2	Common Shiner	25	99	108	-	-	-	N	
Clark Creek	23/07/11	Minnow Trap	Old large beaver dam with water flowing through a gap in the dam	Cla-2	Common Shiner	26	112	121	-	-	-	N	
Clark Creek	23/07/11	Minnow Trap	Old large beaver dam with water flowing through a gap in the dam	Cla-2	Brassy Minnow	27	98	104	-	-	A	Y	Batch wt. = 205.2g (Brassy Minnows kep
Clark Creek	23/07/11	Minnow Trap	Old large beaver dam with water flowing through a gap in the dam	Cla-2	Brassy Minnow	28	139	147	-	-	A	Y	Batch wt. = 205.2g (Brassy Minnows kep
Clark Creek	23/07/11	Minnow Trap	Old large beaver dam with water flowing through a gap in the dam	Cla-2	Brassy Minnow	29	140	148	-	-	A	Y	Batch wt. = 205.2g (Brassy Minnows kep
Clark Creek	23/07/11	Minnow Trap	Old large beaver dam with water flowing through a gap in the dam	Cla-2	Brassy Minnow	30	150	156	-	-	A	Y	Batch wt. = 205.2g (Brassy Minnows kep
Clark Creek	23/07/11	Minnow Trap	Old large beaver dam with water flowing through a gap in the dam	Cla-2	Common Shiner	31	90	97	-	-	-	N	
Clark Creek	23/07/11	Minnow Trap	Old large beaver dam with water flowing through a gap in the dam	Cla-2	Brassy Minnow	32	139	146	-	-	A	Y	Batch wt. = 205.2g (Brassy Minnows kep
Clark Creek	23/07/11	Minnow Trap	Old large beaver dam with water flowing through a gap in the dam	Cla-2	Brassy Minnow	33	135	141	-	-	A	Y	Batch wt. = 205.2g (Brassy Minnows kep
Clark Creek	23/07/11	Minnow Trap	Old large beaver dam with water flowing through a gap in the dam	Cla-2	Brassy Minnow	34	57	60	-	-	-	N	
Clark Creek	23/07/11	Minnow Trap	Old large beaver dam with water flowing through a gap in the dam	Cla-2	Brassy Minnow	35	120	128	-	-	-	N	
Clark Creek	23/07/11	Minnow Trap	Old large beaver dam with water flowing through a gap in the dam	Cla-2	Brassy Minnow	36	114	118	-	-	-	N	

Clark Creek	23/07/11	Minnow Trap	Old large beaver dam with water flowing through a gap in the dam	Cla-2	Common Shiner	37	112	120	-	-	-	N	
Clark Creek	23/07/11	Minnow Trap	Old large beaver dam with water flowing through a gap in the dam	Cla-2	Brassy Minnow	38	95	100	-	-	-	N	
Clark Creek	23/07/11	Minnow Trap	Old large beaver dam with water flowing through a gap in the dam	Cla-2	Spottail Shiner	39	50	54	-	-	-	N	
Clark Creek	23/07/11	Minnow Trap	Old large beaver dam with water flowing through a gap in the dam	Cla-2	Brassy Minnow	40	135	142	-	-	-	N	
Clark Creek	23/07/11	Minnow Trap	Old large beaver dam with water flowing through a gap in the dam	Cla-2	Brassy Minnow	41	96	101	-	-	-	N	
Clark Creek	23/07/11	Minnow Trap	Old large beaver dam with water flowing through a gap in the dam	Cla-2	Common Shiner	42	98	105	-	-	-	N	
Clark Creek	23/07/11	Minnow Trap	Old large beaver dam with water flowing through a gap in the dam	Cla-2	Brassy Minnow	43	83	85	-	-	-	N	
Clark Creek	23/07/11	Minnow Trap	Old large beaver dam with water flowing through a gap in the dam	Cla-2	Brassy Minnow	44	104	110	-	-	-	N	
Clark Creek	23/07/11	Minnow Trap	Old large beaver dam with water flowing through a gap in the dam	Cla-2	Brassy Minnow	45	79	83	-	-	-	N	
Clark Creek	23/07/11	Minnow Trap	Old large beaver dam with water flowing through a gap in the dam	Cla-2	Brassy Minnow	46	102	109	-	-	-	N	
Clark Creek	23/07/11	Minnow Trap	Old large beaver dam with water flowing through a gap in the dam	Cla-2	Brassy Minnow	47	99	105	-	-	-	N	
Clark Creek	23/07/11	Minnow Trap	Old large beaver dam with water flowing through a gap in the dam	Cla-2	Brassy Minnow	48	118	124	-	-	-	N	
Clark Creek	23/07/11	Minnow Trap	Old large beaver dam with water flowing through a gap in the dam	Cla-2	Brassy Minnow	49	136	142	-	-	-	N	
Clark Creek	23/07/11	Minnow Trap	Old large beaver dam with water flowing through a gap in the dam	Cla-2	Brassy Minnow	50	65	69	-	-	-	N	
Clark Creek	23/07/11	Minnow Trap	Old large beaver dam with water flowing through a gap in the dam	Cla-2	Brassy Minnow	51	60	64	-	-	-	N	
Clark Creek	23/07/11	Minnow Trap	Old large beaver dam with water flowing through a gap in the dam	Cla-2	Brassy Minnow	52	122	130	-	-	-	N	
Clark Creek	23/07/11	Minnow Trap	Old large beaver dam with water flowing through a gap in the dam	Cla-2	Brassy Minnow	53	90	94	-	-	-	N	
Clark Creek	23/07/11	Minnow Trap	Old large beaver dam with water flowing through a gap in the dam	Cla-2	Brassy Minnow	54	92	96	-	-	-	N	
Clark Creek	23/07/11	Minnow Trap	Old large beaver dam with water flowing through a gap in the dam	Cla-2	Brassy Minnow	55	101	107	-	-	-	N	
Clark Creek	23/07/11	Minnow Trap	Old large beaver dam with water flowing through a gap in the dam	Cla-2	Brassy Minnow	56	97	103	-	-	-	N	
Clark Creek	23/07/11	Minnow Trap	Old large beaver dam with water flowing through a gap in the dam	Cla-2	Brassy Minnow	57	78	83	-	-	-	N	
Clark Creek	23/07/11	Minnow Trap	Old large beaver dam with water flowing through a gap in the dam	Cla-2	Brook Stickleback	58	-	56	-	-	-	N	
Clark Creek	23/07/11	Minnow Trap	Old large beaver dam with water flowing through a gap in the dam	Cla-2	Spottail Shiner	59	54	56	-	-	-	N	
Clark Creek	23/07/11	Minnow Trap	Old large beaver dam with water flowing through a gap in the dam	Cla-2	Spottail Shiner	60	54	57	-	-	-	N	
Clark Creek	23/07/11	Minnow Trap	Old large beaver dam with water flowing through a gap in the dam	Cla-2	Brook Stickleback	61	-	46	-	-	-	N	
Clark Creek	23/07/11	Minnow Trap	Old large beaver dam with water flowing through a gap in the dam	Cla-2	White Sucker	62	76	87	-	-	-	N	
Clark Creek	23/07/11	Minnow Trap	Old large beaver dam with water flowing through a gap in the dam	Cla-2	Finescale Dace	63	53	56	-	-	-	N	
Clark Creek	23/07/11	Minnow Trap	Old large beaver dam with water flowing through a gap in the dam	Cla-2	Spottail Shiner	64	54	57	-	-	-	N	
Clark Creek	23/07/11	Minnow Trap	Old large beaver dam with water flowing through a gap in the dam	Cla-2	Brook Stickleback	65	-	50	-	-	-	N	
Clark Creek	23/07/11	Minnow Trap	Old large beaver dam with water flowing through a gap in the dam	Cla-2	Nothern Redbellly Dace	66	56	60	-	-	-	N	
Clark Creek	23/07/11	Minnow Trap	Old large beaver dam with water flowing through a gap in the dam	Cla-2	Creek Chub	67	100	105	-	-	-	N	Needs positive I.D.
Clark Creek	23/07/11	Minnow Trap	Old large beaver dam with water flowing through a gap in the dam	Cla-2	Spottail Shiner	68	54	57	-	-	-	N	
Clark Creek	23/07/11	Minnow Trap	Old large beaver dam with water flowing through a gap in the dam	Cla-2	Brook Stickleback	69	-	59	-	-	-	N	
Clark Creek	23/07/11	Minnow Trap	Old large beaver dam with water flowing through a gap in the dam	Cla-2	Spottail Shiner	70	54	56	-	-	-	N	
Clark Creek	23/07/11	Minnow Trap	Old large beaver dam with water flowing through a gap in the dam	Cla-2	Spottail Shiner	71	59	62	-	-	-	N	
Clark Creek	23/07/11	Minnow Trap	Old large beaver dam with water flowing through a gap in the dam	Cla-2	Finescale Dace	72	61	65	-	-	-	N	
Clark Creek	23/07/11	Minnow Trap	Old large beaver dam with water flowing through a gap in the dam	Cla-2	Finescale Dace	73	48	52	-	-	-	N	
Clark Creek	23/07/11	Minnow Trap	Old large beaver dam with water flowing through a gap in the dam	Cla-2	Nothern Redbellly Dace	74	56	59	-	-	-	N	
Clark Creek	23/07/11	Minnow Trap	Old large beaver dam with water flowing through a gap in the dam	Cla-2	Nothern Redbellly Dace	75	52	55	-	-	-	N	
Clark Creek	23/07/11	Minnow Trap	Old large beaver dam with water flowing through a gap in the dam	Cla-2	Brook Stickleback	76	-	56	-	-	-	N	
Clark Creek	23/07/11	Minnow Trap	Old large beaver dam with water flowing through a gap in the dam	Cla-2	Spottail Shiner	77	50	54	-	-	-	N	
Clark Creek	23/07/11	Minnow Trap	Old large beaver dam with water flowing through a gap in the dam	Cla-2	Brook Stickleback	78	-	56	-	-	-	N	
Clark Creek	23/07/11	Minnow Trap	Old large beaver dam with water flowing through a gap in the dam	Cla-2	Spottail Shiner	79	60	64	-	-	-	N	
Clark Creek	23/07/11	Minnow Trap	Old large beaver dam with water flowing through a gap in the dam	Cla-2	Finescale Dace	80	56	58	-	-	-	N	
Clark Creek	23/07/11	Minnow Trap	Old large beaver dam with water flowing through a gap in the dam	Cla-2	Brook Stickleback	81	-	59	-	-	-	N	
Clark Creek	23/07/11	Minnow Trap	Old large beaver dam with water flowing through a gap in the dam	Cla-2	Nothern Redbellly Dace	82	50	54	-	-	-	N	
Clark Creek	23/07/11	Minnow Trap	Old large beaver dam with water flowing through a gap in the dam	Cla-2	Spottail Shiner	83	50	53	-	-	-	N	
Clark Creek	23/07/11	Minnow Trap	Old large beaver dam with water flowing through a gap in the dam	Cla-2	Spottail Shiner	84	59	63	-	-	-	N	
Clark Creek	23/07/11	Minnow Trap	Old large beaver dam with water flowing through a gap in the dam	Cla-2	Spottail Shiner	85	54	56	-	-	-	N	
Clark Creek	23/07/11	Minnow Trap	Old large beaver dam with water flowing through a gap in the dam	Cla-2	Finescale Dace	86	52	55	-	-	-	N	
Clark Creek	23/07/11	Minnow Trap	Old large beaver dam with water flowing through a gap in the dam	Cla-2	Finescale Dace	87	55	58	-	-	-	N	
Clark Creek	23/07/11	Minnow Trap	Old large beaver dam with water flowing through a gap in the dam	Cla-2	Finescale Dace	88	47	49	-	-	-	N	
Clark Creek	23/07/11	Minnow Trap	Old large beaver dam with water flowing through a gap in the dam	Cla-2	Finescale Dace	89	52	56	-	-	-	N	
Clark Creek	23/07/11	Minnow Trap	Old large beaver dam with water flowing through a gap in the dam	Cla-2	Finescale Dace	90	55	58	-	-	-	N	
Clark Creek	23/07/11	Minnow Trap	Old large beaver dam with water flowing through a gap in the dam	Cla-2	Nothern Redbellly Dace	91	59	63	-	-	-	N	
Clark Creek	23/07/11	Minnow Trap	Old large beaver dam with water flowing through a gap in the dam	Cla-2	Spottail Shiner	92	50	54	-	-	-	N	
Clark Creek	23/07/11	Minnow Trap	Old large beaver dam with water flowing through a gap in the dam	Cla-2	Finescale Dace	93	49	52	-	-	-	N	
Clark Creek	23/07/11	Minnow Trap	Old large beaver dam with water flowing through a gap in the dam	Cla-2	Brook Stickleback	94	-	45	-	-	-	N	
Clark Creek	25/07/11	Minnow Trap	Watercourse in small deep valley between two fields lined with fences	Cla-3	Pearl Dace	1	41	45	-	-	-	N	

Clark Creek	25/07/11	Minnow Trap	Watercourse in small deep valley between two fields lined with fences	Cla-3	Pearl Dace	2	54	56	-	-	-	N	
Clark Creek	25/07/11	Minnow Trap	Watercourse in small deep valley between two fields lined with fences	Cla-3	Brassy Minnow	3	48	51	-	-	-	N	
Clark Creek	25/07/11	Minnow Trap	Watercourse in small deep valley between two fields lined with fences	Cla-3	Pearl Dace	4	46	51	-	-	-	N	
Clark Creek	25/07/11	Minnow Trap	Watercourse in small deep valley between two fields lined with fences	Cla-3	Brook Stickleback	5	-	39	-	-	-	N	
Clark Creek	25/07/11	Minnow Trap	Watercourse in small deep valley between two fields lined with fences	Cla-3	Pearl Dace	6	50	53	-	-	-	N	
Clark Creek	25/07/11	Minnow Trap	Watercourse in small deep valley between two fields lined with fences	Cla-3	Brook Stickleback	7	-	50	-	-	-	N	
Clark Creek	25/07/11	Minnow Trap	Watercourse in small deep valley between two fields lined with fences	Cla-3	Common Shiner	8	40	44	-	-	-	N	
Clark Creek	25/07/11	Minnow Trap	Watercourse in small deep valley between two fields lined with fences	Cla-3	Brook Stickleback	9	-	44	-	-	-	N	
Clark Creek	25/07/11	Minnow Trap	Watercourse in small deep valley between two fields lined with fences	Cla-3	Pearl Dace	10	60	63	-	-	-	N	
Clark Creek	25/07/11	Minnow Trap	Watercourse in small deep valley between two fields lined with fences	Cla-3	Pearl Dace	11	43	46	-	-	-	N	
Clark Creek	25/07/11	Minnow Trap	Watercourse in small deep valley between two fields lined with fences	Cla-3	Common Shiner	12	75	81	-	-	-	N	
Clark Creek	25/07/11	Minnow Trap	Watercourse in small deep valley between two fields lined with fences	Cla-3	Pearl Dace	13	55	61	-	-	-	N	
Clark Creek	25/07/11	Minnow Trap	Watercourse in small deep valley between two fields lined with fences	Cla-3	Creek Chub	14	60	64	-	-	-	N	
Clark Creek	25/07/11	Minnow Trap	Watercourse in small deep valley between two fields lined with fences	Cla-3	Brassy Minnow	15	54	59	-	-	-	N	
Clark Creek	25/07/11	Minnow Trap	Watercourse in small deep valley between two fields lined with fences	Cla-3	Brook Stickleback	16	-	46	-	-	-	N	
Clark Creek	25/07/11	Minnow Trap	Watercourse in small deep valley between two fields lined with fences	Cla-3	Common Shiner	17	40	44	-	-	-	N	
Clark Creek	25/07/11	Minnow Trap	Watercourse in small deep valley between two fields lined with fences	Cla-3	Pearl Dace	18	54	57	-	-	-	N	
Clark Creek	25/07/11	Minnow Trap	Watercourse in small deep valley between two fields lined with fences	Cla-3	Common Shiner	19	47	51	-	-	-	N	
Clark Creek	25/07/11	Minnow Trap	Watercourse in small deep valley between two fields lined with fences	Cla-3	White Sucker	20	79	83	-	-	-	N	
Clark Creek	25/07/11	Minnow Trap	Watercourse in small deep valley between two fields lined with fences	Cla-3	Pearl Dace	21	68	71	-	-	-	N	
Clark Creek	25/07/11	Minnow Trap	Watercourse in small deep valley between two fields lined with fences	Cla-3	Pearl Dace	22	50	54	-	-	-	N	
Clark Creek	25/07/11	Minnow Trap	Watercourse in small deep valley between two fields lined with fences	Cla-3	Common Shiner	23	72	78	-	-	-	N	
Clark Creek	25/07/11	Minnow Trap	Watercourse in small deep valley between two fields lined with fences	Cla-3	Pearl Dace	24	47	52	-	-	-	N	
Clark Creek	25/07/11	Minnow Trap	Watercourse in small deep valley between two fields lined with fences	Cla-3	Brassy Minnow	25	105	110	-	-	-	N	
Clark Creek	25/07/11	Minnow Trap	Watercourse in small deep valley between two fields lined with fences	Cla-3	Brassy Minnow	26	55	59	-	-	-	N	
Clark Creek	25/07/11	Minnow Trap	Watercourse in small deep valley between two fields lined with fences	Cla-3	Brassy Minnow	27	50	55	-	-	-	N	
Clark Creek	25/07/11	Minnow Trap	Watercourse in small deep valley between two fields lined with fences	Cla-3	White Sucker	28	101	106	-	-	-	N	
Clark Creek	25/07/11	Minnow Trap	Watercourse in small deep valley between two fields lined with fences	Cla-3	Common Shiner	29	71	78	-	-	-	N	
Clark Creek	25/07/11	Minnow Trap	Watercourse in small deep valley between two fields lined with fences	Cla-3	Common Shiner	30	81	90	-	-	-	N	
Clark Creek	25/07/11	Minnow Trap	Watercourse in small deep valley between two fields lined with fences	Cla-3	Brassy Minnow	31	73	76	-	-	-	N	
Clark Creek	25/07/11	Minnow Trap	Watercourse in small deep valley between two fields lined with fences	Cla-3	Common Shiner	32	71	77	-	-	-	N	
Clark Creek	25/07/11	Minnow Trap	Watercourse in small deep valley between two fields lined with fences	Cla-3	Brook Stickleback	33	-	45	-	-	-	N	
Clark Creek	25/07/11	Minnow Trap	Watercourse in small deep valley between two fields lined with fences	Cla-3	Brassy Minnow	34	54	64	-	-	-	N	
Clark Creek	25/07/11	Minnow Trap	Watercourse in small deep valley between two fields lined with fences	Cla-3	Brook Stickleback	35	-	49	-	-	-	N	
Clark Creek	25/07/11	Minnow Trap	Watercourse in small deep valley between two fields lined with fences	Cla-3	Brook Stickleback	36	-	45	-	-	-	N	
Clark Creek	25/07/11	Minnow Trap	Watercourse in small deep valley between two fields lined with fences	Cla-3	Common Shiner	37	70	75	-	-	-	N	
Clark Creek	25/07/11	Minnow Trap	Watercourse in small deep valley between two fields lined with fences	Cla-3	Pearl Dace	38	43	46	-	-	-	N	
Clark Creek	25/07/11	Minnow Trap	Watercourse in small deep valley between two fields lined with fences	Cla-3	Brassy Minnow	39	79	83	-	-	-	N	
Clark Creek	25/07/11	Minnow Trap	Watercourse in small deep valley between two fields lined with fences	Cla-3	Brook Stickleback	40	-	51	-	-	-	N	
Clark Creek	25/07/11	Minnow Trap	Watercourse in small deep valley between two fields lined with fences	Cla-3	Brook Stickleback	41	-	45	-	-	-	N	
Clark Creek	25/07/11	Minnow Trap	Watercourse in small deep valley between two fields lined with fences	Cla-3	Brassy Minnow	42	57	60	-	-	-	N	
Clark Creek	25/07/11	Minnow Trap	Watercourse in small deep valley between two fields lined with fences	Cla-3	Brassy Minnow	43	58	62	-	-	-	N	
Clark Creek	25/07/11	Electrofisher	Watercourse in small deep valley between two fields lined with fences	Cla-3	Pearl Dace	1	39	43	-	-	-	N	
Clark Creek	25/07/11	Electrofisher	Watercourse in small deep valley between two fields lined with fences	Cla-3	Pearl Dace	2	59	63	-	-	-	N	
Clark Creek	25/07/11	Electrofisher	Watercourse in small deep valley between two fields lined with fences	Cla-3	Brassy Minnow	3	135	142	-	-	-	N	
Clark Creek	25/07/11	Electrofisher	Watercourse in small deep valley between two fields lined with fences	Cla-3	Central Mud Minnow	4	-	64	-	-	-	N	
Clark Creek	25/07/11	Electrofisher	Watercourse in small deep valley between two fields lined with fences	Cla-3	Common Shiner	5	81	88	-	-	-	N	
Clark Creek	25/07/11	Electrofisher	Watercourse in small deep valley between two fields lined with fences	Cla-3	Common Shiner	6	70	77	-	-	-	N	
Clark Creek	25/07/11	Electrofisher	Watercourse in small deep valley between two fields lined with fences	Cla-3	Pearl Dace	7	48	51	-	-	-	N	
Clark Creek	25/07/11	Electrofisher	Watercourse in small deep valley between two fields lined with fences	Cla-3	Pearl Dace	8	39	43	-	-	-	N	
Clark Creek	25/07/11	Electrofisher	Watercourse in small deep valley between two fields lined with fences	Cla-3	Common Shiner	9	102	110	-	-	-	N	
Clark Creek	25/07/11	Electrofisher	Watercourse in small deep valley between two fields lined with fences	Cla-3	Creek Chub	10	11	114	-	-	-	N	
Clark Creek	25/07/11	Electrofisher	Watercourse in small deep valley between two fields lined with fences	Cla-3	Pearl Dace	11	51	55	-	-	-	N	
Clark Creek	25/07/11	Electrofisher	Watercourse in small deep valley between two fields lined with fences	Cla-3	Brassy Minnow	12	104	109	-	-	-	N	
Clark Creek	25/07/11	Electrofisher	Watercourse in small deep valley between two fields lined with fences	Cla-3	Common Shiner	13	90	99	-	-	-	N	
Clark Creek	25/07/11	Electrofisher	Watercourse in small deep valley between two fields lined with fences	Cla-3	Brassy Minnow	14	71	76	-	-	-	N	
Clark Creek	25/07/11	Electrofisher	Watercourse in small deep valley between two fields lined with fences	Cla-3	Pearl Dace	15	72	77	-	-	-	N	
Clark Creek	25/07/11	Electrofisher	Watercourse in small deep valley between two fields lined with fences	Cla-3	Central Mud Minnow	16	-	55	-	-	-	N	
Clark Creek	25/07/11	Electrofisher	Watercourse in small deep valley between two fields lined with fences	Cla-3	Creek Chub	17	11	118	-	-	-	N	

Clark Creek	25/07/11	Electrofisher	Watercourse in small deep valley between two fields lined with fences	Cla-3	Central Mud Minnow	18	-	52	-	-	-	N	
Clark Creek	25/07/11	Electrofisher	Watercourse in small deep valley between two fields lined with fences	Cla-3	Central Mud Minnow	19	-	108	-	-	-	N	
Clark Creek	25/07/11	Electrofisher	Watercourse in small deep valley between two fields lined with fences	Cla-3	Creek Chub	20	68	74	-	-	-	N	
Clark Creek	25/07/11	Electrofisher	Watercourse in small deep valley between two fields lined with fences	Cla-3	Common Shiner	21	97	104	-	-	-	N	
Clark Creek	25/07/11	Electrofisher	Watercourse in small deep valley between two fields lined with fences	Cla-3	Central Mud Minnow	22	-	73	-	-	-	N	
Clark Creek	25/07/11	Electrofisher	Watercourse in small deep valley between two fields lined with fences	Cla-3	Spottail Shiner	23	58	61	-	-	-	N	
Clark Creek	25/07/11	Electrofisher	Watercourse in small deep valley between two fields lined with fences	Cla-3	White Sucker	24	95	101	-	-	-	N	
Clark Creek	25/07/11	Electrofisher	Watercourse in small deep valley between two fields lined with fences	Cla-3	Central Mud Minnow	25	-	69	-	-	-	N	
Clark Creek	25/07/11	Electrofisher	Watercourse in small deep valley between two fields lined with fences	Cla-3	Creek Chub	26	106	112	-	-	-	N	
Clark Creek	25/07/11	Electrofisher	Watercourse in small deep valley between two fields lined with fences	Cla-3	Central Mud Minnow	27	-	47	-	-	-	N	
Clark Creek	25/07/11	Electrofisher	Watercourse in small deep valley between two fields lined with fences	Cla-3	Brook Stickleback	28	-	40	-	-	-	N	
Clark Creek	25/07/11	Electrofisher	Watercourse in small deep valley between two fields lined with fences	Cla-3	Central Mud Minnow	29	-	64	-	-	-	N	
Clark Creek	25/07/11	Electrofisher	Watercourse in small deep valley between two fields lined with fences	Cla-3	Brook Stickleback	30	-	47	-	-	-	N	
Clark Creek	25/07/11	Electrofisher	Watercourse in small deep valley between two fields lined with fences	Cla-3	Pearl Dace	31	73	76	-	-	-	N	
Clark Creek	25/07/11	Electrofisher	Watercourse in small deep valley between two fields lined with fences	Cla-3	Central Mud Minnow	32	-	80	-	-	-	N	
Clark Creek	25/07/11	Electrofisher	Watercourse in small deep valley between two fields lined with fences	Cla-3	Brook Stickleback	33	-	47	-	-	-	N	
Clark Creek	25/07/11	Electrofisher	Watercourse in small deep valley between two fields lined with fences	Cla-3	Brook Stickleback	34	-	40	-	-	-	N	
Clark Creek	25/07/11	Electrofisher	Watercourse in small deep valley between two fields lined with fences	Cla-3	Brook Stickleback	35	-	43	-	-	-	N	
Blackhawk Creek	22/07/11	Seine Net	BLA-1	Bla-1	Creek Chub	1	130	137	-	-	-	N	
Blackhawk Creek	22/07/11	Seine Net	BLA-1	Bla-1	Finescale Dace	2	82	87	-	-	-	N	
Blackhawk Creek	22/07/11	Seine Net	BLA-1	Bla-1	Creek Chub	3	114	120	-	-	-	N	
Blackhawk Creek	22/07/11	Seine Net	BLA-1	Bla-1	Finescale Dace	4	95	102	-	-	-	N	
Blackhawk Creek	22/07/11	Seine Net	BLA-1	Bla-1	Creek Chub	5	127	133	-	-	-	N	
Blackhawk Creek	22/07/11	Seine Net	BLA-1	Bla-1	Creek Chub	6	77	83	-	-	-	N	
Blackhawk Creek	22/07/11	Seine Net	BLA-1	Bla-1	Finescale Dace	7	97	105	-	-	-	N	
Blackhawk Creek	22/07/11	Seine Net	BLA-1	Bla-1	Creek Chub	8	115	125	-	-	-	N	
Blackhawk Creek	22/07/11	Seine Net	BLA-1	Bla-1	Common Shiner	9	116	121	-	-	A	Y	Batch wt. = 152.1g
Blackhawk Creek	22/07/11	Seine Net	BLA-1	Bla-1	Common Shiner	10	90	96	-	-	A	Y	Batch wt. = 152.1g
Blackhawk Creek	22/07/11	Seine Net	BLA-1	Bla-1	Common Shiner	11	105	114	-	-	A	Y	Batch wt. = 152.1g
Blackhawk Creek	22/07/11	Seine Net	BLA-1	Bla-1	Common Shiner	12	105	114	-	-	A	Y	Batch wt. = 152.1g
Blackhawk Creek	22/07/11	Seine Net	BLA-1	Bla-1	Common Shiner	13	96	105	-	-	A	Y	Batch wt. = 152.1g
Blackhawk Creek	22/07/11	Seine Net	BLA-1	Bla-1	Common Shiner	14	85	92	-	-	A	Y	Batch wt. = 152.1g
Blackhawk Creek	22/07/11	Seine Net	BLA-1	Bla-1	Common Shiner	15	85	92	-	-	A	Y	Batch wt. = 152.1g
Blackhawk Creek	22/07/11	Seine Net	BLA-1	Bla-1	Common Shiner	16	92	100	-	-	A	Y	Batch wt. = 152.1g
Blackhawk Creek	22/07/11	Seine Net	BLA-1	Bla-1	Common Shiner	17	95	103	-	-	A	Y	Batch wt. = 152.1g
Blackhawk Creek	22/07/11	Seine Net	BLA-1	Bla-1	Common Shiner	18	84	90	-	-	A	Y	Batch wt. = 152.1g
Blackhawk Creek	22/07/11	Seine Net	BLA-1	Bla-1	Common Shiner	19	90	98	-	-	A	Y	Batch wt. = 152.1g
Blackhawk Creek	22/07/11	Seine Net	BLA-1	Bla-1	Common Shiner	20	115	126	-	-	A	Y	Batch wt. = 152.1g

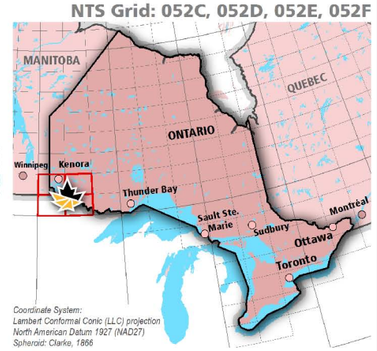
APPENDIX H

RRR WATER QUALITY DATA

RAINY RIVER PROJECT
Rainy River Resources Ltd.

SURFACE WATER SAMPLING LOCATIONS

NTS Grid: 052C, 052D, 052E, 052F



Coordinate System:
Lambert Conformal Conic (LLC) projection
North American Datum 1927 (NAD27)
Spheroid: Clarke, 1866

400000 410000 420000 430000 440000

5410000 5400000 5390000

ARBOR VITAE
CRANBERRY LAKE PROVINCIAL NATURE RESERVE
Pratt
Sutherland
Kishkakoesis River
NORTH BRANCH
Sifton
Richardson
Rock River East Branch
Mud Lake
Little Pine Lake
Boundary Lake
Tina Lake
Off Lake
Potts
Muskrat Lake
FINLAND
GAMELAND
Cranberry Lake
SUTHERLAND 2 ROAD
BLUE 7 ROAD
DEARLOCK
Pinewood River
SPRUCE ISLANDS PROVINCIAL PARK
Nelles
Blue
BLUE 4 ROAD
BLUE 3 ROAD
BLUE 2 ROAD
NEILSON ROAD
BROWN ROAD
Pattullo
Tait
Mather
Sturgeon Creek
Bunting Creek
Dilke
MORLEY PATTULLO ROAD WEST
MOSHER ROAD
MATHER ROAD
Chapple
Mather Creek
WOOD
SLEEMAN
Worthington
COLONIZATION ROAD
Sleeman Creek
Cemetery Creek
PINEWOOD
ADVENT ROAD
WEIR ROAD
FEHER ROAD
SHENSTON
TAYLOR ROAD
PENNEY ROAD
BALL ROAD
DEVELOPMENT ROAD
Morley
Shenston
Dobie
CAMERON ROAD
Cameron Creek
STRATTON
WOOLSEY ROAD
MCCULLOCH ROAD
STEINER ROAD
ANDERSON ROAD
MANDERS
Morley Additional
Roseberry
LONG SAULT 12
LONGSAULT RAPIDS
RIVER ROAD
HIGHWAY 11
BARWICK
Barwick
MANITOU RAPIDS 11
MANITOU RAPIDS
Manitou Creek
Everett Creek
Couchie Creek
EMO
Rainy River (rivière à la Pluie)
SW 1A
SW 2
SW 3
SW 4
SW 7A
SW 10
SW 11
SW 12 A
SW 13
SW 14
SW 15
SW 16
SW 17
SW 18
OFF LAKE CORNER
BLACK HAWK
TEEPLE ROAD
WESTRA ROAD
WHITE ROAD
KORPI ROAD
LAMPI ROAD
MAKI ROAD
ROEN ROAD
CLARK ROAD
GALLINGER ROAD
HEATWOLE ROAD
ATKINSON ROAD
MOULTON ROAD
HUNSPERGER ROAD
EMO ROAD
PINE RIVER ROAD
RICHARDSON ROAD
PHANTOM ROAD
BOUNDARY LAKE ROAD
MARR ROAD
SMITH ROAD
JOHNSTON ROAD
MORLEY DILKE ROAD
WORTHINGTON DILKE ROAD
GRAHAM ROAD
SCHRAM ROAD
ELSTAD ROAD
MORLEY CHAPPLE ROAD
OLSON ROAD
BOLEN ROAD NORTH
BARWICK ROAD
ANGUS ROAD
VANHEST ROAD
CATES ROAD
OFF LAKE ROAD
HAYES ROAD
HELE ROAD
HUZLAK ROAD
SHAW ROAD
BOUCHERVILLE ROAD
OTT ROAD
CAVE ROAD
SIMDWALL ROAD
CLEMENT CREEK
Sims Creek
Mathers Creek
Highway 621
Highway 619
Highway 617
Highway 600
Highway 615
Highway 71
Highway 602
MN 11

SURFACE WATER SAMPLING LOCATION

TRANSPORTATION & OTHER FEATURES
- HIGHWAY
- ARTERIAL ROAD
- LOCAL ROAD, STREET
- RESOURCE, RECREATION ROAD
- OTHER ROAD SEGMENT (MNR)
- DIGITIZED ROAD SEGMENT
- ELEVATION CONTOUR (5M INTERVAL)
- BUILDING LOCATION

HYDROLOGY FEATURES
- BEAVER DAM (ALTERED)
- LARGE WATERBODY
- WATERCOURSE
- VIRTUAL FLOW SEGMENT ALTERED
- WETLAND
- QUATERNARY WATERSHED BOUNDARY

326 Metres (m) a.s.l. 426

0 2 4 6 8
Kilometers

Coordinate System:
North American Datum (NAD) 1983
Universal Transverse Mercator (UTM) Zone 15N

Natural Resources Canada, ©2010
National Topographic Data Base

RAINY RIVER

F:\MAP DOCUMENTS\RAINY RIVER PROJECT\2011-08-31 HYDROLOGY, WATER SAMPLING (ALYSON)\SURFACE WATER SAMPLING LOCATIONS (DYNAMIC LABELS) 11X17_NEW.MXD

Appendix H:
2011-2012 Surface Water Analytical Results

		pH	Conductivity	Hardness as $CaCO_3$	Dissolved Organic Carbon	TSS	Total Ammonia-N	Fluoride	Nitrate	Nitrite	Cyanide-Total	Aluminum-Dissolved	Aluminum-Total	Antimony-Total	Arsenic-Total	Boron-Total	Cadmium-Total	Chromium-Total	Cobalt-Total	Copper-Total	Iron-Total	Lead-Total	Mercury	Molybdenum-Total	Nickel-Total	Phosphorus-Total	Selenium-Total	Thallium-Total	Uranium-Total	Vanadium-Total	Zinc-Total
PWQO		6.5-8.5	-	-	-	-	-	-	-	-	0.005[A]	-	0.075[LB]	0.02[I]	0.1(0.005[I])	0.2[I]	0.0002	0.001 / 0.0089[E]	0.0009	0.005 (0.005)[IC]	0.3	0.020/0.025 (0.003/0.005)[H]	0.0002	0.04[I]	0.025	0.03[I]	0.1	0.0003[I]	0.005[I]	0.006[I]	0.03(0.02[I])
CEQG		6.5-9.0	-	-	-	-	-	0.12	2.935	0.06	0.005[A]	-	0.1[C]	-	0.005	1.5	0.000015-0.000088[D]	0.001 / 0.0089[E]	-	0.002-0.00622[G]	0.3	0.00102-0.01343[J]	0.000026	0.073[I]	0.025[J]	-	0.001	0.0008	0.015	-	0.03
RDL		-	1	1	0.2	1*	0.05*	0.1*	0.1*	0.01*	0.005*	0.005*	0.005	0.0005*	0.001	0.01	0.0001*	0.005*	0.0005	0.001*	0.1	0.0005*	0.0001	0.001*	0.001	0.002	0.002*	0.00005*	0.0001	0.001	0.005*
		pH units	uS/cm	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
SW1/1A	28-Dec-10	7.70	296	150	23.8	8	0.06	<0.1	<0.1	<0.01	<0.005	0.02	0.17	<0.0005	<0.001	<0.01	<0.0001	<0.005	<0.0005	<0.001	0.77	<0.0005	<0.0001	<0.001	<0.001	0.048	<0.002	<0.00005	0.0007	0.001	<0.005
	26-Jan-11	7.65	292	150	20.8	7	0.07	<0.1	<0.1	<0.01	<0.005	0.014	0.23	<0.0005	<0.001	0.011	<0.0001	<0.005	<0.0005	0.001	0.84	<0.0005	<0.0001	<0.001	0.001	0.057	<0.002	<0.00005	0.0006	0.001	<0.005
	22-Feb-11	7.74	295	160	19.3	5	<0.05	<0.1	<0.1	<0.01	<0.005	0.011	0.32	<0.0005	<0.001	0.012	<0.0001	<0.005	<0.0005	<0.001	0.9	0.0036	<0.0001	<0.001	0.001	0.049	<0.002	<0.00005	0.0007	0.001	<0.005
	29-Mar-11	7.6	361	180	17.9	5	<0.05	<0.1	<0.1	<0.01	<0.005	0.015	0.27	<0.0005	<0.001	0.012	<0.0001	<0.005	<0.0005	0.001	0.6	<0.0005	<0.0001	<0.001	0.001	0.076	<0.002	<0.00005	0.0017	0.001	<0.005
	2-May-11	7.17	180	88	15.6	9	<0.05	<0.1	<0.1	<0.01	<0.005	0.029	0.38	<0.0005	<0.001	0.014	<0.0001	<0.005	<0.0005	0.002	0.49	<0.0005	<0.0001	<0.001	0.002	0.060	<0.002	<0.00005	0.0005	0.002	<0.005
	1-Jun-11	8.83	249	130	24.4	43	<0.05	<0.1	<0.1	<0.01	<0.005	0.012	0.4	<0.0005	0.001	0.02	<0.0001	<0.005	<0.0005	0.001	0.72	<0.0005	0.0001	<0.001	0.002	0.073	<0.002	<0.00005	0.0006	0.002	0.001
	13-Jul-11	7.79	296	150	29.3	74	<0.05	<0.1	<0.1	<0.01	<0.005	0.01	0.22	<0.0005	0.003	0.02	<0.0001	<0.005	0.0006	<0.001	0.63	<0.0005	<0.0001	<0.001	0.003	0.13	<0.002	<0.00005	0.0004	0.002	<0.005
	4-Aug-11	7.69	329	170	24.5	6	<0.05	0.1	<0.1	<0.01	<0.005	0.008	0.042	<0.0005	0.003	0.02	<0.0001	<0.005	<0.0005	<0.001	0.36	<0.0005	<0.0001	<0.001	0.002	0.09	<0.002	<0.00005	0.0003	0.0006	<0.005
	15-Sep-11	7.7	361	204	24.3	23.7	0.033	0.072	<0.030	<0.020	<0.0020	0.0062	0.506	0.000091	0.00262	0.0268	0.0000109	0.00119	0.000544	0.00120	0.925	0.000416	<0.000010	0.000578	0.00233	0.09620	<0.00020	0.0000091	0.00116	0.00203	0.0040
	12-Oct-2011	7.74	360	198	21.1	19.9	<0.020	0.107	<0.030	<0.020	<0.0020	0.0071	0.345	0.000084	0.00255	0.0221	0.0000143	<0.00090	0.000516	0.00125	0.685	0.000449	-	0.000840	0.0026	0.0986	<0.0020	0.0000060	0.00156	0.00155	0.0079
	16-Nov-2011	7.93	389	248	19.7	7.9	<0.020	0.093	<0.030	<0.020	<0.0020	0.0026	0.286	0.000080	0.00127	0.0258	0.0000219	<0.00090	0.000295	0.00096	0.395	0.000307	-	0.000894	0.0020	0.0808	<0.0020	0.0000119	0.00192	0.00115	0.0318
	14-Dec-2011	7.55	574	301	21.7	4.7	0.033	0.081	0.038	<0.020	<0.0020	0.0025	0.194	0.000098	0.00139	0.0276	0.0000122	<0.00090	0.000372	0.00117	0.556	0.000197	-	0.000605	0.0025	0.0596	<0.0020	0.0000078	0.00245	0.000902	0.0068
	10-Jan-2012	7.51	524	300	24.2	12.8	0.060	0.076	<0.030	<0.020	<0.0020	0.0053	0.278	<0.00010	0.00125	0.0228	0.000013	<0.00050	0.000469	0.00093	0.942	0.00025	-	0.00035	0.0022	0.0634	<0.00050	<0.000030	0.00137	0.00081	0.0032
	15-Feb-2012	7.58	383	206	17.8	18.2	0.134	0.037	0.046	<0.020	<0.0020	0.0041	0.410	<0.00010	0.00101	0.0236	0.000012	0.00068	0.000414	0.00095	0.929	0.00036	-	0.00030	0.0016	0.0657	<0.00050	<0.000030	0.000571	0.00123	0.0232
	20-Mar-2012	7.38	188	79.0	11.1	25.1	0.085	<0.030	0.795	<0.020	<0.0020	0.0104	0.241	<0.00010	0.00068	0.0131	0.000021	0.00070	0.000500	0.00129	0.595	0.00029	-	0.00062	0.0013	0.0990	<0.00050	<0.000030	0.000412	0.00130	0.0039
	19-Apr-2012	7.75	245	116	18.9	8.3	<0.020	0.046	<0.030	<0.020	<0.0020	0.0151	0.215	<0.00010	0.00091	0.0138	0.000010	0.00064	0.000226	0.00151	0.427	0.00019	-	0.00049	0.0016	0.0279	<0.00050	<0.000030	0.000458	0.00113	0.0030
	Min	7.17	180	79	11.1	4.7	0.020	0.030	0.030	0.010	0.0020	0.0025	0.0420	0.00008	0.00068	0.0100	0.0000010	0.00050	0.000226	0.00093	0.360	0.00019	0.0000010	0.00030	0.00100	0.02790	0.00020	0.0000006	0.00030	0.00060	0.0010
	Max	8.83	574	301	29.3	74.0	0.134	0.107	0.795	0.020	0.0050	0.0290	0.5060	0.00050	0.00300	0.0276	0.00010	0.00500	0.000600	0.00200	0.942	0.00360	0.0001	0.00100	0.00300	0.13000	0.00200	0.0000050	0.00245	0.00203	0.0318
	Median	7.70	313	165	21.0	8.7	0.050	0.100	0.100	0.015	0.0035	0.0102	0.2740	0.00030	0.00101	0.0200	0.00006	0.00310	0.000500	0.00100	0.658	0.00047	0.0001	0.00095	0.00200	0.06935	0.00200	0.0000040	0.00065	0.00114	0.0050
	St Dev.	0.35	106	65	4.3	18.3	0.028	0.025	0.185	0.005	0.0015	0.0069	0.1114	0.00021	0.00081	0.0061	0.00004	0.00217	0.000095	0.00028	0.198	0.00081	-	0.00026	0.00064	0.02511	7.500E-04	0.000018	0.00065	0.00047	0.0081
	N	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	9	16	16	16	16	16	16	16	16
	75th %	7.74	367	205	24.2	20.9	0.060	0.100	0.100	0.020	0.0050	0.0143	0.3538	0.0005	0.00168	0.0230	0.00010	0.00500	0.000500	0.001213	0.855	0.00050	0.0001	0.00100	0.00223	0.09155	0.00200	0.0000500	0.001418	0.00166	0.0055
SW2	28-Dec-10	7.81	232	130	20.4	3	<0.05	<0.1	<0.1	<0.01	<0.005	0.021	0.13	<0.0005	<0.001	<0.01	<0.0001	<0.005	<0.0005	<0.001	0.76	<0.0005	<0.0001	<0.001	<0.001	0.028	<0.002	<0.00005	0.0003	<0.001	<0.005
	26-Jan-11	7.84	244	130	19.9	3	0.08	<0.1	<0.1	<0.01	<0.005	0.019	0.14	<0.0005	<0.001	<0.01	<0.0001	<0.005	<0.0005	0.004	0.91	<0.0005	<0.0001	<0.001	0.002	0.037	<0.002	<0.00005	0.0003	0.001	<0.005
	22-Feb-11	7.91	261	160	20.1	2	<0.05	<0.1	<0.1	0.01	<0.005	0.019	0.14	<0.0005	<0.001	<0.01	<0.0001	<0.005	<0.0005	<0.001	1	<0.0005	<0.0001	<0.001	0.001	0.036	<0.002	<0.00005	0.0003	<0.001	<0.005
	29-Mar-11	7.76	255	150	18.5	11	<0.05	<0.1	<0.1	<0.01	<0.005	0.022	0.3	<0.0005	<0.001	<0.01	<0.0001	<0.005	<0.0005	0.001	0.86	<0.0005	<0.0001	<0.001	0.002	0.037	<0.002	<0.00005	0.0006	0.001	<0.005
	2-May-11	7.3	136	74	17.2	35	<0.05	<0.1	<0.1	<0.01	<0.005	0.02	0.34	<0.0005	<0.001	<0.01	<0.0001	<0.005	<0.0005	0.002	0.47	<0.0005	<0.0001	<0.001	0.001	0.039	<0.002	<0.00005	0.0003	0.001	<0.005
	1-Jun-11	9.38	204	110	16.7	26	<0.05	<0.1	<0.1	<0.01	<0.005	0.007	0.38	<0.0005	<0.001	0.011	<0.0001	<0.005	<0.0005	0.002	0.65	<0.0005	0.0001	<0.001	0.002	0.044	<0.002	<0.00005	0.0004	0.002	<0.005
	13-Jul-11	7.97	265	140	20.7	4	<0.05	<0.1	<0.1	<0.01	<0.005	0.008	0.075	<0.0005	0.002	0.015	<0.0001	<0.005	<0.0005	<0.001	0.55	<0.0005	<0.0001	<0.001	0.002	0.06	<0.002	<0.00005	0.0003	0.001	<0.005
	4-Aug-11	8	304	170	21.2	20	<0.05	<0.1	<0.1	<0.01	<0.005	0.005	0.16	<0.0005	0.002	0.014	<0.0001	<0.005	<0.0005	0.001	0.5	<0.0005	<0.0001	0.0008	0.002	0.06	<0.002	<0.00005	0.0005	0.0018	<0.005
	15-Sep-11	7.79	447	256	8.9	18.1	0.024	0.114	0.107	<0.020	<0.0020	<0.0030	0.0193	0.000048	0.00100	0.0126	<0.0000050	<0.00050	0.000197	0.00070	0.288	<0.000050	<0.000010	0.000635	0.00106	0.06660	<0.00020	0.0000025	0.00131	0.00078	<0.0030
	12-Oct-2011	7.75	418	251	15.0	6.9	<0.020	0.092	<0.030	<0.020	<0.0020	0.0023	0.0441	0.000055	0.00217	0.0173	0.0000212	<0.00090	0.000209	0.00113	0.315	0.000093	-	0.000614	0.0018	0.105	<0.0020	<0.0000040	0.000835	0.000576	0.0043
	16-Nov-2011	7.98	320	206	13.3	5.2	<0.020	0.06	<0.030	<0.020	<0.0020	0.0021	0.0649	0.000065	0.000736	0.0142	0.000012	<0.00090	0.000073	0.00085	0.195	0.000077	-	0.000572	0.0013	0.0158	<0.0020	<0.0000040	0.000985	0.00071	0.0039
	14-Dec-2011	7.57	403	239	19.8	<2.0	0.027	0.056	<0.030	<0.020	<0.0020	0.0037	0.123	0.000075	0.00115	0.0135	0.0000151	<0.00090	0.00023	0.00145	0.669	0.000231	-	0.00051	0.0023	0.0354	<0.0020	<0.0000040	0.00112	0.00114	0.0506
	10-Jan-2012	7.53	314	194	22.2	6.1	0.054	0.044	0.031	<0.020	<0.0020	0.0083	0.215	<0.00010	0.00123	0.0091	0.000019	<0.00050	0.000375	0.00132	0.935	0.00028	-	0.00032	0.0019	0.0350	<0.00050	<0.000030	0.000651	0.00115	0.0033
	20-Mar-2012	7.61	146	72.1	10.2	142	0.088	<0.030	0.383	<0.020	<0.0020	0.0152	0.610	<0.00010	0.00075	0.0088	0.000038	0.00135	0.000998	0.00289	1.03	0.00123	-	0.00036	0.0023	0.126	<0.00050	<0.000030	0.000392	0.0032	0.0083
	19-Apr-2012	7.82	170	89.1	18.6	4.6	<0.020	0.048	<0.030	<0.020	<0.0020	0.0206	0.124	<0.00010	0.00053	0.0077	<0.000010	<0.00050	0.000154	0.00113	0.333	0.00012	-	0.00031	0.0012	0.0128	<0.00050	<0.000030	0.000298	0.00089	0.0022
	Min	7.30	136	72	8.9	2.0	0.020	0.030	0.030	0.010	0.0020	0.0021	0.0193	0.00005	0.00053	0.0077	0.000005	0.00050	0.000073	0.00070	0.195	0.00005	0.0000	0.00031	0.00100	0.01280	0.00020	0.000003	0.00030	0.00058	0.0022
	Max	9.38	447	256	22.2	142.0	0.088	0.114	0.383	0.020	0.0050	0.0220	0.6100	0.00050	0.00217	0.0173	0.00010	0.00500	0.000998	0.00400	1.030	0.00123	0.0001	0.00100	0.00230	0.12600	0.00200	0.0000050	0.00131	0.00320	0.0506
	Median	7.81	261	150	18.6	6.1	0.050	0.100	0.100	0.010	0.0050	0.0083	0.1400	0.00050	0.00100	0.0100	0.00010	0.00500	0.000500	0.00113	0.650	0.00050	0.0001	0.00080	0.00190	0.03700	0.00200	0.0000500	0.00040	0.00100	0.0050
	St Dev.	0.46	95	61	4.0	35.4	0.021	0.027	0.086	0.005	0.0015	0.0079	0.1571	0.00022	0.00049	0.0027	0.00004	0.00218	0.000225	0.00090	0.278	0.00029	0.000030	0.00028	0.00050	0.03098	0.00072	0.000020	0.00034	0.00066	0.0119
	N	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	9	15	15	15	15	15	15	15	15
	75th %	7.94	317	200	20.3	19.1	0.050	0.100	0.100	0.020	0.0050	0.0195	0.2575	0.0005	0.00119	0.0138	0.00010	0.00500	0.000500	0.001725	0.885	0.00050	0.0001	0.00100	0.00200	0.06000	0.00200	0.0000500	0.000743	0.00115	0.0050
SW3	28-Dec-10	7.67	334	180	20.8	7	<0.05	<0.1	<0.1	<0.01	<0.005	0.013	0.16	<0.0005	<0.001	<0.01	<0.0001	<0.005	<0.0005	<0.001	0.69	<0.0005	<0.0001	<0.001	0.001	0.047	<0.002	<0.00005	0.0007	0.001	<0.005
	26-Jan-11	7.69	348	170	19.6	9	<0.05	<0.1	<0.1	<0.01	<0.005	0.011	0.34	<0.0005	<0.001	<0.01	<0.0001	<0.005	<0.0005	0.001	0.83	<0.0005	<0.0001	<0.001	0.001	0.064	<0.002	<0.00005	0.0008	0.001	<0.005
	22-Feb-11	7.8	369	210	17.9	9	<0.05	<0.1	<0.1	<0.01	<0.005	0.008	0.28	<0.0005	<0.001	0.012	<0.0001	<0.005	<0.0005	<0.001	0.92	<0.0005	<0.0001	<0.001	0.002	0.065	<0.002	<0.00005	0.0009	0.001	<0.005
	29-Mar-11	7.66	366	200	16.2	9	<0.05	<0.1	<0.1	<0.01	<0.005	0.011	0.21	<0.0005	<0.001	<0.01	<0.0001	<0.005	<0.0005	0.002	0.49	<0.0005	<0.0001	<0.001	0.001	0.05	<0.002	<0.00005	0.0015	<0.001	<0.005
	2-May-11	7.62	195	100	16.6	10	<0.05	<0.1	<0.1	<0.01	<0.005	0.016	0.32	<0.0005	<0.001	0.011	<0.0001	<0.005	<0.0005	0.002	0.38	<0.0005	<0.0001	<0.001	0.001	0.051	<0.002	<0.00005	0.0005	0.001	<0.005
	1-Jun-11	8.61	268	140	21.3	23	<0.05	<0.1	<0.1	<0.01	<0.005	0.01	0.25	<0.0005	0.001	0.015	<0.0001	<0.005	<0.0005	0.001	0.47	<0.0005	0.0001	<0.001	0.002	0.086	<0.002	<0.00005	0.0006	<0.001	<0.005
	13-Jul-11	7.87	320	170	25.3	31	<0.05	<0.1	<0.1	<0.01	<0.005	0.009	0.29	<0.0005	0.003	0.02	<0.0001	<0.005	0.0006	0.001	0.82	<0.0005	<0.0001	<0.001	0.003	0.1	<0.002	<0.00005	0.0004	0.002	0.01
	4-Aug-11	7.99	339	180	9	40	<0.05	0.1	<0.1	<0.01	<0.005	0.007	0.3	<0.0005	0.004	0.02	<0.0001	<0.005	0.0006	0.003	0.81	0.001	<0.0001	0.0005	0.003	0.11	<0.002	<0.00005	0.001	0.003	0.005
	15-Sep-11	8.01	362	206	21.1	32	0.041	0.087	0.153	<0.020	<0.0020	0.0267	2.77	0.000203	0.00372	0.0332	0.0000301	0.00407	0.001370	0.00377	2.700	0.001690	<0.000010	0.001410	0.00497	0.194	0.00031	0.0000397	0.00196	0.00839	0.0101
	12-Oct-2011	7.89	376	213	19.1	17.1	<0.020	0.136	<0.030	<0.020	<0.0020	0.0043	0.748	0.000124	0.00261	0.0188	0.0000221	0.00113	0.000601	0.00226	0.913	0.000577	-	0.000803	0.0038	0.0926	<0.0020	0.0000113	0.00172	0.00256	0.0054
	16-Nov-2011	7.69	337	203	18.5	10.6	<0.020	0.063	<0.030	<0.020	<0.0020	0.0042	0.399	0.000140	0.00167	0.0181	0.0000189	<0.00090	0.000568	0.00119	0.829	0.000391	-	0.000509	0.0025	0.0576	<0.0020	0.0000107	0.00103	0.00145	<0.0030
	14-Dec-2011	7.5	549	303	21.8	14.5	0.037	0.132	<0.030	<0.020	<0.0020	0.0029	0.299	0.000079	0.00186	0.0231	0.0000227	<0.00090	0.0015	0.00148	0.949	0.000387	-	0.000498	0.0036	0.0762	<0.0020	<0.0000040	0.00137	0.00141	0.0043
	10-Jan-2012	7.27	567	322	25.4	26	0.069	0.093	<0.030	<0.020	<0.0020	0.0039	0.584	<0.00010	0.0037	0.0198	0.000034	<0.00050	0.00471	0.00119	3.72	0.00054	-	0.00043	0.0038	0.183	<0.00050	<0.000030	0.00105	0.0021	0.0099
	15-Feb-2012	7.67	780	450	27.1	11.6	0.467	0.103	<0.030	<0.020	<0.0020	<0.0030	0.0821	<0.00010	0.00321	0.0248	0.000011	<0.00050	0.00426	<0.00070	1.76	0.00014	-	0.00041	0.0034	0.142	<0.00050	<0.000030	0.00104	0.00071	0.0061
	20-Mar-2012	7.4	181	83.0	10.8	35.9	0.047	<0.030	0.381	<0.020	<0.0020	0.0101	0.456	<0.00010	0.00074	0.0147	0.000024	0.00109	0.000568	0.00151	0.843	0.0004	-	0.00068	0.0016	0.114	<0.00050	<0.000030	0.000422	0.00193	0.0034
	19-Apr-2012	7.3	250	115	17.7	14.5	<0.020	0.061	<0.030	<0.020	<0.0020	0.0143	0.176	<0.00010	0.00088	0.0123	0.000012	0.00054	0.000218	0.00138	0.366	0.00018	-	0.00053	0.0015	0.0292	<0.00050	<0.000030	0.00062	0.00108	0.0030
	Min	7.27	181	83	9.0	7.0	0.020	0.030	0.030	0.010	0.0020	0.0029	0.0821	0.00008	0.00074	0.0100	0.000011	0.00050	0.000218	0.00070	0.366	0.00014	0.0000	0.00041	0.00100	0.02920	0.00031	0.000004	0.00040	0.00071	0.0030
	Max	8.61	780	450	27.1	40.0	0.467	0.136	0.381	0.020	0.0050	0.0267	2.7700	0.00050	0.00400	0.0332	0.00010	0.00500	0.004710	0.00377	3.720	0.00169	0.0001	0.00141	0.00497	0.19400	0.00200	0.0000500	0.00196	0.00839	0.0101
	Median	7.68	344	190	19.4	14.5	0.050	0.100	0.100	0.015	0.0035	0.0095	0.2995	0.00035	0.00134	0.0166	0.00007	0.00454	0.000568	0.00129	0.830	0.00050	0.0001	0.00090	0.00225	0.08110	0.00200	0.000045	0.00095	0.00125	0.0050
	St Dev.	0.32	150	91	4.8	10.9	0.107	0.026	0.086	0.005	0.0015	0.0061	0.6324	0.00020	0.00120	0.0065	0.00004	0.00212	0.001354	0.00083	0.906	0.00036	0.000030	0.00029	0.00125	0.04792	0.00074	0.000017	0.00046	0.00185	0.0023
	N	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	9	16	16	16	16	16	16	16	16
	75th %	7.88	371	211	21.4	27.3	0.050	0.100	0.100	0.020	0.0050	0.0115	0.4133	0.0005	0.00305	0.0200	0.00010	0.00500	0.000793	0.002000	0.92725	0.00051	0.0001	0.00100	0.00345	0.11100	0.00200	0.0000500	0.001130	0.00203	0.0056
SW4	28-Dec-10	7.05	130	61	29	4	0.09	<0.1	<0.1	<0.01	<0.005	0.02	0.042	<0.0005	<0.001	<0.01	<0.0001	<0.005	<0.0005	<0.001	0.35	<0.0005	<0.0001	<0.001	<0.001	0.018	<0.002	<0.00005	<0.005	<0.001	<0.005
	26-Jan-11	6.95	129	61	29.8	4	0.16	<0.1	<0.1	<0.01	<0.005	0.018	0.046	<0.0005	<0.001	<0.01	<0.0001	<0.005	0.0007	<0.001	0.84	<0.0005	<0.0001	<0.001	<0.001	0.025	<0.002	<0.00005	<0.005	<0.001	<0.005
	22-Feb-11	6.83	136	72	31.2	4	0.19	<0.1	<0.1	<0.01	<0.005	0.018	0.041	<0.0005	<0.001	<0.01	<0.0001	<0.005	0.0006	<0.001	1.1	<0.0005	<0.0001	<0.001	<0.001	0.032	<0.002	<0.00005	<0.005	<0.001	<0.005
	29-Mar-11	6.75	155	81	32.7	2	0.18	<0.1	<0.1	<0.01	<0.005	0.022	0.039	<0.0005	<0.001	<0.01	<0.0001	<0.005	0.0006	<0.001	1.2	<0.0005	<0.0001	<0.001	<0.001	0.037	<0.002	<0.00005	<0.005	<0.001	0.007
	2-May-11	6.91	74	35	13.9	12	<0.05	<0.1	<0.1	<0.01	<0.005	0.012	0.021	<0.0005	<0.001	<0.01	<0.0001	<0.005	<0.0005	<0.001	0.14	<0.0005	<0.0001	<0.001	<0.001	0.018	<0.002	<0.00005	<0.005	<0.001	<0.005
	1-Jun-11	8.32	133	56	16.6	3	<0.05	<0.1	<0.1	<0.01	<0.005	0.012	0.04	<0.0005	<0.001	<0.01	<0.0001	<0.005	<0.0005	<0.001	0.29	<0.0005	0.0001	<0.001	<0.001	0.023	<0.002	<0.00005	<0.005	<0.001	<0.005
	13-Jul-11	7.07	154	62	19.3	2	<0.05	<0.1	<0.1	<0.01	<0.005	0.012	0.025	<0.0005	<0.001	<0.01	<0.0001	<0.005	<0.0005	<0.001	0.54	<0.0005	<0.0001	<0.001	<0.001	0.035	<0.002	<0.00005	<0.005	<0.001	<0.005
	4-Aug-11	7.12	151	67	7.9	2	<0.05	<0.1	<0.1	<0.01	<0.005	0.008	0.026	<0.0005	<0.001	0.01	0.0001	<0.005	<0.0005	<0.001	0.42	<0.0005	<0.0001	0.0005	<0.001	0.024	<0.002	0.00013	0.0005	0.0006	<0.005
	15-Sep-11	6.99	164	70.7	18.4	4.1	0.024	<0.030	0.035	<0.020	<0.0020	0.0077	0.0496	0.000036	0.00057	0.0128	<0.0000050	<0.00050	0.000123	<0.00050	0.289	0.000092	<0.000010	0.000053	0.00042	0.0179	<0.00020	0.0000030	0.00003	0.00024	0.0129
	12-Oct-2011	7	139	61.8	15.6	6.5	<0.020	<0.030	<0.030	<0.020	<0.0020	0.0085	0.0842	0.000083	0.000624	0.00774	<0.0000090	<0.00090	0.000136	<0.00070	0.32	0.000144	-	<0.000090	<0.0010	0.0282	<0.0020	<0.0000040	0.0000294	0.000302	0.0036
	16-Nov-2011	6.87	122	60.2	15.8	13	0.024	<0.030	<0.030	<0.020	<0.0020

Appendix H:
2011-2012 Surface Water Analytical Results

		pH	Conductivity	Hardness as $CaCO_3$	Dissolved Organic Carbon	TSS	Total Ammonia-N	Fluoride	Nitrate	Nitrite	Cyanide-Total	Aluminum-Dissolved	Aluminum-Total	Antimony-Total	Arsenic-Total	Boron-Total	Cadmium-Total	Chromium-Total	Cobalt-Total	Copper-Total	Iron-Total	Lead-Total	Mercury	Molybdenum-Total	Nickel-Total	Phosphorus-Total	Selenium-Total	Thallium-Total	Uranium-Total	Vanadium-Total	Zinc-Total
PWQO		6.5-8.5	-	-	-	-	-	-	-	-	0.005[A]	-	0.075[LB]	0.02[I]	0.1(0.005[I])	0.2[I]	0.0002	0.001 / 0.0089[E]	0.0009	0.005 (0.005)[IC]	0.3	0.020/0.025 (0.003/0.005)[IH]	0.0002	0.04[I]	0.025	0.03[I]	0.1	0.0003[I]	0.005[I]	0.006[I]	0.03(0.02[I])
CEQG		6.5-9.0	-	-	-	-	-	0.12	2.935	0.06	0.005[A]	-	0.1[C]	-	0.005	1.5	0.000015-0.000088[D]	0.001 / 0.0089[E]	-	0.002-0.00622[G]	0.3	0.00102-0.01343[I]	0.000026	0.073[I]	0.025[J]	-	0.001	0.0008	0.015	-	0.03
RDL		-	1	1	0.2	1*	0.05*	0.1*	0.1*	0.01*	0.005*	0.005*	0.005	0.0005*	0.001	0.01	0.0001*	0.005*	0.0005	0.001*	0.1	0.0005*	0.0001	0.001*	0.001	0.002	0.002*	0.00005*	0.0001	0.001	0.005*
		pH units	uS/cm	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
SW6	28-Dec-10	7.04	125	63	29.1	2	0.09	<0.1	<0.1	<0.01	<0.005	0.022	0.038	<0.0005	<0.001	<0.01	<0.0001	<0.005	<0.0005	<0.001	0.32	<0.0005	<0.0001	<0.001	<0.001	0.016	<0.002	<0.00005	<0.005	<0.001	<0.005
	26-Jan-11	7.86	180	74	22.5	1	0.08	<0.1	0.3	0.02	<0.005	0.022	0.054	<0.0005	<0.001	0.011	<0.0001	<0.005	<0.0005	0.002	0.2	<0.0005	<0.0001	<0.001	0.001	0.033	<0.002	<0.00005	0.0002	<0.001	<0.005
	22-Feb-11	7.3	156	90	26.7	<1	0.1	<0.1	<0.1	<0.01	<0.005	0.038	0.046	<0.0005	<0.001	<0.01	<0.0001	<0.005	0.0005	0.001	0.74	<0.0005	<0.0001	<0.001	<0.001	0.019	<0.002	<0.00005	<0.005	<0.001	<0.005
	29-Mar-11	7.78	379	220	15	4	<0.05	<0.1	<0.1	<0.01	<0.005	0.014	0.2	<0.0005	<0.001	<0.01	<0.0001	<0.005	<0.0005	0.001	0.56	<0.0005	<0.0001	<0.001	0.001	0.043	<0.002	<0.00005	0.0011	<0.001	<0.005
	2-May-11	7.74	181	97	15.2	2	<0.05	<0.1	<0.1	<0.01	<0.005	0.008	0.073	<0.0005	<0.001	0.012	<0.0001	<0.005	<0.0005	<0.001	0.13	<0.0005	<0.0001	<0.001	<0.001	0.024	<0.002	<0.00005	0.0003	<0.001	<0.005
	1-Jun-11	8.65	249	130	24.4	19	<0.05	<0.1	<0.1	<0.01	<0.005	0.009	0.44	<0.0005	0.001	0.018	<0.0001	<0.005	<0.0005	0.001	0.82	<0.0005	0.0001	<0.001	0.003	0.079	<0.002	<0.00005	0.0006	0.002	<0.005
	13-Jul-11	7.97	265	140	20.7	8	<0.05	<0.1	<0.1	<0.01	<0.005	0.009	0.11	<0.0005	0.002	0.014	<0.0001	<0.005	<0.0005	<0.001	0.56	<0.0005	<0.0001	<0.001	0.002	0.06	<0.002	<0.00005	0.0003	0.001	<0.005
	4-Aug-11	7.98	340	190	25.7	42	<0.05	0.0001	<0.1	<0.01	<0.005	0.005	0.38	<0.0005	0.004	0.021	<0.0001	<0.005	0.0008	0.003	0.92	0.0011	<0.0001	0.0006	0.004	0.13	<0.002	<0.00005	0.001	0.0033	0.005
	15-Sep-11	7.79	365	209	25.1	22.2	0.036	0.101	0.105	<0.020	<0.0020	0.0054	0.531	0.000111	0.00263	0.0251	0.0000092	0.00125	0.000584	0.00115	0.987	0.000440	<0.000010	0.000529	0.00235	0.097	<0.00020	0.0000991	0.00114	0.00207	0.0035
	12-Oct-2011	7.82	431	243	13.9	8.2	<0.020	<0.030	<0.030	<0.020	<0.0020	0.0023	0.0449	0.000074	0.00197	0.0166	0.0000161	<0.00090	0.000177	0.00083	0.317	0.00009	-	0.000627	0.0017	0.106	<0.0020	<0.0000040	0.000829	0.000562	<0.0030
	16-Nov-2011	7.69	336	213	20.1	9	0.036	0.068	<0.030	<0.020	<0.0020	0.0027	0.381	0.000069	0.00167	0.0177	0.0000179	<0.00090	0.000562	0.00121	0.779	0.000358	-	0.000454	0.0023	0.0629	<0.0020	0.000007	0.000985	0.00145	<0.0030
	14-Dec-2011	6.87	145	63.7	20.1	9.3	0.057	0.035	<0.030	<0.020	<0.0020	0.0094	0.120	0.00004	0.000643	0.00885	<0.0000090	<0.00090	0.000335	0.00085	0.429	0.00023	-	<0.000090	<0.0010	0.0353	<0.0020	<0.0000040	0.000023	0.000434	0.0041
	10-Jan-2012	7.56	427	244	22.5	20.6	0.058	0.065	<0.030	<0.020	<0.0020	0.0082	0.316	<0.00010	0.00131	0.023	0.000017	<0.00050	0.000662	0.00086	1.19	0.00035	-	0.0003	0.0019	0.0808	<0.00050	<0.000030	0.000938	0.00102	0.0042
	15-Feb-2012	6.87	238	121	41.0	109	0.768	<0.030	0.054	<0.020	<0.0020	0.0321	1.44	<0.00010	0.00209	0.0087	0.000054	0.00194	0.00317	0.00407	6.74	0.00098	-	<0.00020	0.0034	0.208	<0.00050	<0.000030	0.000147	0.00315	0.0456
	20-Mar-2012	7.58	240	115	12.2	238	0.092	<0.030	0.267	<0.020	<0.0020	0.0111	1.01	<0.00010	0.00094	0.0153	0.000038	0.00228	0.000880	0.00263	1.58	0.00083	-	0.00113	0.0025	0.198	<0.00050	0.000051	0.000734	0.00389	0.008
	19-Apr-2012	7.56	225	103	22.5	10.9	<0.020	0.048	<0.030	<0.020	<0.0020	0.0211	0.150	<0.00010	0.00084	0.0144	<0.0000010	0.00108	0.000223	0.00131	0.367	0.00014	-	0.00049	0.0019	0.0265	<0.00050	<0.000030	0.000419	0.00099	0.0029
	Min	6.87	125	63	12.2	1.0	0.020	0.000	0.030	0.010	0.0020	0.0023	0.0380	0.00004	0.00064	0.0087	0.000009	0.00050	0.000177	0.00083	0.130	0.00009	0.0000	0.00009	0.00100	0.01600	0.00020	0.000004	0.00002	0.00043	0.0029
	Max	8.65	431	244	41.0	238.0	0.768	0.101	0.300	0.020	0.0050	0.0380	1.4400	0.00050	0.00400	0.0251	0.00010	0.00500	0.003170	0.00407	6.740	0.00110	0.0001	0.00113	0.00400	0.20800	0.00200	0.0000051	0.00500	0.00389	0.0456
	Median	7.72	245	126	22.5	9.2	0.050	0.084	0.100	0.020	0.0035	0.0092	0.1750	0.00031	0.00100	0.0142	0.00008	0.00364	0.000500	0.00100	0.650	0.00050	0.0001	0.00081	0.00190	0.06145	0.00200	0.000050	0.00078	0.00100	0.0050
	St Dev.	0.45	100	65	7.0	61.1	0.180	0.035	0.079	0.005	0.0015	0.0105	0.3902	0.00021	0.00087	0.0052	0.00004	0.00199	0.000687	0.00095	1.568	0.00027	0.000030	0.00034	0.00095	0.05979	0.00075	0.000019	0.00154	0.00104	0.0103
	N	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	9	16	16	16	16	16	16	16	16
	75th %	7.83	346	210	25.3	21.0	0.083	0.100	0.100	0.020	0.0050	0.0213	0.3958	0.0005	0.0019775	0.0178	0.00010	0.00500	0.000604	0.001483	0.93675	0.00050	0.0001	0.00100	0.00239	0.09925	0.00200	0.0000500	0.001025	0.00202	0.0050
SW7/7A	28-Dec-10	7.92	382	200	15.5	2	0.06	<0.1	<0.1	<0.01	<0.005	0.01	0.09	<0.0005	<0.001	<0.01	<0.0001	<0.005	<0.0005	<0.001	0.66	<0.0005	<0.0001	<0.001	<0.001	0.032	<0.002	<0.00005	0.0008	<0.001	<0.005
	26-Jan-11	7.93	389	210	14.7	18	0.2	<0.1	<0.1	0.01	<0.005	0.01	0.31	<0.0005	<0.001	<0.01	<0.0001	<0.005	<0.0005	0.001	1.1	<0.0005	<0.0001	<0.001	0.001	0.098	<0.002	<0.00005	0.0009	0.001	<0.005
	22-Feb-11	7.98	482	260	14.6	5	0.18	<0.1	<0.1	<0.01	<0.005	0.012	0.12	<0.0005	<0.001	0.015	<0.0001	<0.005	<0.0005	0.018	0.84	<0.0005	<0.0001	<0.001	<0.001	0.069	<0.002	<0.00005	0.0012	<0.001	<0.005
	29-Mar-11	7.8	370	210	14.7	3	<0.05	<0.1	<0.1	<0.01	<0.005	0.013	0.2	<0.0005	<0.001	<0.01	<0.0001	<0.005	<0.0005	0.001	0.55	<0.0005	<0.0001	<0.001	0.001	0.043	<0.002	<0.00005	0.001	<0.001	<0.005
	2-May-11	7.63	202	110	11.9	18	<0.05	<0.1	<0.1	<0.01	<0.005	0.016	0.35	<0.0005	<0.001	0.01	<0.0001	<0.005	<0.0005	0.002	0.42	<0.0005	<0.0001	<0.001	0.001	0.037	<0.002	<0.00005	0.0004	0.002	<0.005
	1-Jun-11	10.1	292	150	15.8	23	<0.05	<0.1	<0.1	<0.01	<0.005	0.007	0.42	<0.0005	<0.001	0.013	<0.0001	<0.005	<0.0005	0.001	0.58	<0.0005	0.0001	<0.001	0.002	0.038	<0.002	<0.00005	0.0006	0.001	<0.005
	13-Jul-11	8.18	378	210	17.2	6	<0.05	0.1	<0.1	<0.01	<0.005	0.009	0.084	<0.0005	0.002	0.02	<0.0001	<0.005	<0.0005	<0.001	0.7	<0.0005	<0.0001	<0.001	0.002	0.073	<0.002	<0.00005	0.0006	0.001	<0.005
	4-Aug-11	7.99	327	170	20.4	21	<0.05	0.1	<0.1	<0.01	<0.005	0.007	0.3	<0.0005	0.002	0.017	<0.0001	<0.005	<0.0005	0.001	0.95	<0.0005	<0.0001	<0.001	0.002	0.11	<0.002	<0.00005	0.0008	0.0025	<0.005
	15-Sep-11	7.71	576	312	8.6	25.9	0.108	0.102	0.155	<0.020	<0.0020	<0.0030	0.123	0.000044	0.00170	0.0366	<0.0000050	<0.00050	0.000402	0.00052	1.890	0.000156	<0.000010	0.000917	0.00072	0.458	<0.00020	0.0000031	0.00214	0.00084	0.0042
	12-Oct-2011	7.88	537	296	14.8	3.6	0.029	0.097	<0.030	<0.020	<0.0020	0.0035	0.0181	0.000078	0.00127	0.0307	0.0000219	<0.00090	0.000315	0.00117	0.409	0.000072	-	0.002460	0.0018	0.0579	<0.0020	<0.0000040	0.002	0.000575	<0.0030
	16-Nov-2011	8.14	530	304	12.0	4.2	<0.020	0.065	<0.030	<0.020	<0.0020	0.0023	0.0267	0.000088	0.000713	0.0245	0.0000198	<0.00090	0.000076	0.00074	0.291	0.000088	-	0.00144	<0.0010	0.0209	<0.0020	<0.0000040	0.00169	0.000555	0.0042
	10-Jan-2012	7.78	829	462	22.1	21.6	1.36	0.1	<0.030	<0.020	<0.0020	<0.030	0.214	<0.00010	0.00215	0.023	0.000018	<0.00050	0.00116	0.00099	1.54	0.00017	-	0.00179	0.0022	0.139	<0.00050	<0.000030	0.00406	0.00082	0.0043
	20-Mar-2012	7.58	239	113	12.1	34.6	0.087	<0.03	0.262	<0.020	<0.0020	0.0081	0.71	<0.00010	0.00082	0.016	0.000031	0.00165	0.000654	0.00218	1.12	0.00057	-	0.00118	0.002	0.106	<0.00050	0.000046	0.000698	0.00291	0.0051
	19-Apr-2012	7.89	293	134	15.8	19.6	<0.020	0.065	<0.030	<0.020	<0.0020	0.0104	0.344	<0.00010	0.00085	0.0117	0.000015	0.00079	0.000313	0.00183	0.593	0.00029	-	0.00086	0.0017	0.0196	<0.00050	<0.000030	0.000925	0.00164	0.0043
	Min	7.58	202	110	8.6	2.0	0.020	0.030	0.030	0.010	0.0020	0.0023	0.0181	0.00004	0.00071	0.0100	0.000005	0.00050	0.000076	0.00052	0.291	0.00007	0.0000	0.00086	0.00072	0.01960	0.00020	0.000003	0.00040	0.00056	0.0030
	Max	10.10	829	462	22.1	34.6	1.360	0.102	0.262	0.020	0.0050	0.0300	0.7100	0.00050	0.00215	0.0366	0.00010	0.00500	0.001160	0.01800	1.890	0.00057	0.0001	0.00246	0.00220	0.45800	0.00200	0.000050	0.00406	0.00291	0.0051
	Median	7.91	380	210	14.8	18.0	0.050	0.100	0.100	0.010	0.0050	0.0095	0.2070	0.00050	0.00100	0.0155	0.00010	0.00500	0.000500	0.00100	0.680	0.00050	0.0001	0.00100	0.00135	0.06345	0.00200	0.000050	0.00091	0.00100	0.0050
	St Dev.	0.62	164	96	3.4	10.5	0.348	0.021	0.061	0.005	0.0015	0.0069	0.1874	0.00021	0.00049	0.0084	0.00004	0.00214	0.000248	0.00452	0.454	0.00018	0.000030	0.00044	0.00053	0.11129	0.00074	0.000019	0.00096	0.00072	0.0006
	N	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	9	14	14	14	14	14	14	14	14
	75th %	7.99	518	287	15.8	21.5	0.103	0.100	0.100	0.020	0.0050	0.0116	0.3355	0.0005	0.0015925	0.0223	0.00010	0.00500	0.000500	0.001665	1.0625	0.00050	0.0001	0.00114	0.00200	0.10400	0.00200	0.0000500	0.001568	0.00148	0.0050
SW10	28-Dec-10	7.69	280	140	24	2	<0.05	<0.1	<0.1	<0.01	<0.005	0.019	0.2	<0.0005	<0.001	<0.01	<0.0001	<0.005	<0.0005	<0.001	0.66	<0.0005	<0.0001	<0.001	0.001	0.039	<0.002	<0.00005	0.0006	<0.001	<0.005
	26-Jan-11	7.65	266	140	20	4	0.07	<0.1	<0.1	<0.01	<0.005	0.015	0.14	<0.0005	<0.001	<0.01	<0.0001	<0.005	<0.0005	<0.001	0.76	0.0005	<0.0001	<0.001	0.001	0.054	<0.002	<0.00005	0.0005	0.002	<0.005
	22-Feb-11	7.56	269	150	19.2	3	<0.05	<0.1	<0.1	<0.01	<0.005	0.025	0.12	<0.0005	<0.001	<0.01	<0.0001	<0.005	<0.0005	<0.001	0.65	<0.0005	<0.0001	<0.001	0.001	0.049	<0.002	<0.00005	0.0006	<0.001	<0.005
	29-Mar-11	7.69	358	170	19	4	<0.05	<0.1	<0.1	<0.01	<0.005	0.017	0.2	<0.0005	<0.001	0.01	<0.0001	<0.005	<0.0005	0.002	0.55	<0.0005	<0.0001	<0.001	0.007	0.06	<0.002	<0.00005	0.0014	<0.001	<0.005
	2-May-11	7.48	171	83	21.6	7	<0.05	<0.1	<0.1	<0.01	<0.005	0.035	0.32	<0.0005	<0.001	0.015	<0.0001	<0.005	<0.0005	0.002	0.43	0.001	<0.0001	<0.001	0.001	0.061	<0.002	<0.00005	0.0005	0.001	<0.005
	1-Jun-11	8.89	233	120	25.9	17	<0.05	<0.1	<0.1	<0.01	<0.005	0.01	0.24	<0.0005	0.001	0.016	<0.0001	<0.005	<0.0005	<0.001	0.53	<0.0005	0.0001	<0.001	0.003	0.06	<0.002	<0.00005	0.0005	0.001	<0.005
	13-Jul-11	7.95	275	130	31.8	7	<0.05	<0.1	<0.1	<0.01	<0.005	0.008	0.098	<0.0005	0.002	0.021	<0.0001	<0.005	<0.0005	<0.001	0.55	<0.0005	<0.0001	<0.001	0.002	0.097	<0.002	<0.00005	0.0004	0.002	<0.005
	4-Aug-11	8.01	370	180	29.2	6	<0.05	0.1	<0.1	<0.01	<0.005	0.006	0.2	<0.0005	0.003	0.023	<0.0001	<0.005	<0.0005	<0.001	0.58	<0.0005	<0.0001	0.0006	0.002	0.09	<0.002	<0.00005	0.0009	0.002	<0.005
	15-Sep-11	8.2	558	323	15.7	12.1	0.024	0.111	0.053	<0.020	<0.0020	<0.0030	0.239	0.000066	0.00169	0.0331	0.0000061	0.00077	0.000314	0.00097	0.506	0.000259	<0.000010	0.001260	0.00142	0.0614	<0.00020	0.0000062	0.00185	0.00139	0.0335
	12-Oct-2011	8.01	525	312	17.0	9.9	<0.020	0.101	<0.030	<0.020	<0.0020	0.0038	0.146	0.000124	0.00139	0.0297	0.0000131	<0.00090	0.000202	0.001	0.366	0.000169	-	0.000728	0.002	0.0372	<0.00200	<0.0000040	0.00134	0.000859	0.0308
	16-Nov-2011	7.89	397	233	20.6	7.3	<0.020	0.068	0.043	<0.020	<0.0020	0.0028	0.109	0.000066	0.000923	0.0292	0.000011	<0.00090	0.000198	<0.00070	0.314	0.000148	-	0.000536	0.0015	0.0329	<0.00200	<0.0000040	0.00122	0.0006	<0.0030
	15-Feb-2012	7.61	344	185	17.2	1340	0.219	<0.030	0.056	<0.020	<0.0020	0.0036	32.3	<0.00010	0.0129	0.0477	0.000741	0.0615	0.0216	0.0361	42.3	0.0232	-	0.00109	0.051	1.40	0.00282	0.000392	0.00302	0.0715	0.203
	14-Dec-2011	7.54	543	293	20.8	3.2	0.043	0.081	<0.030	<0.020	<0.0020	0.0034	0.0705	0.000067	0.00132	0.0273	0.0000113	<0.00090	0.000455	0.00073	0.568	0.000117	-	0.000492	0.0023	0.0465	<0.0020	<0.0000040	0.00237	0.000548	<0.0030
	10-Jan-2012	7.55	442	239	23.9	29.8	0.06	0.064	<0.030	<0.020	<0.0020	0.0056	0.778	<0.00010	0.00158	0.0263	0.000029	<0.00050	0.00116	0.00115	1.91	0.0006	-	0.00035	0.0027	0.0954	<0.00050	<0.000030	0.00107	0.00242	0.0065
	20-Mar-2012	7.29	167	71.1	12.7	23.9	0.098	<0.030	0.606	<0.020	<0.0020	0.017	0.295	<0.00010	0.00064	0.0144	0.000023	0.00081	0.000550	0.00116	0.675	0.0003	-	0.0005	0.0013	0.0838	<0.00050	0.000031	0.000323	0.00135	0.0038
	19-Apr-2012	7.61	224	101	23.2	9.3	0.037	0.056	<0.030	<0.020	<0.0020	0.0197	0.145	<0.00010	0.00086	0.0133	<0.000010	0.00055	0.000187	0.00141	0.361	0.00014	-	0.00046	0.0015	0.0243	<0.00050	<0.000030	0.000385	0.00095	0.0025
	Min	7.29	167	71	12.7	2.0	0.020	0.030	0.030	0.010	0.0020	0.0028	0.0705	0.00007	0.00064	0.0100	0.000006	0.00050	0.000187	0.00070	0.314	0.00012	0.0000	0.00035	0.00100	0.02430	0.00020	0.000004	0.00032	0.00055	0.0025
	Max	8.89	558	323	31.8	1340.0	0.219	0.111	0.606	0.020	0.0050	0.0350	32.3000	0.00050	0.01290	0.0477	0.00074	0.06150	0.021600	0.03610	42.300	0.02320	0.0001	0.00126	0.05100	1.40000	0.00282	0.000392	0.00302	0.07150	0.2030
	Median	7.67	312	160	20.7	7.2	0.050	0.100	0.100	0.015	0.0035	0.0090	0.2000	0.00031	0.00100	0.0185	0.00010	0.00500	0.000500	0.00100	0.559	0.00050	0.0001	0.00100	0.00175	0.06000	0.00200	0.000050	0.00075	0.00100	0.0050
	St Dev.	0.38	126	79	4.9	332.7	0.047	0.026	0.137	0.005	0.0015	0.0094	8.0217	0.00021	0.00296	0.0107	0.00018	0.01477	0.005287	0.00875	10.425	0.00570	0.000030	0.00028	0.01232	0.33588	0.00077	0.000092	0.00078	0.01757	0.0496
	N	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	9	16	16	16	16	16	16	16	16
	75th %	7.97	408	235	23.9	13.3	0.053	0.100	0.100	0.020	0.0050	0.0175	0.2538	0.0005	0.0016075	0.0278	0.00010	0.00500	0.000500	0.001223	0.66375	0.00050	0.0001	0.00100	0.00240	0.08535	0.00200	0.0000500	0.001355	0.00200	0.0054
SW11	28-Dec-10	7.36	185	100	33.4	1	0.06	<0.1	<0.1	<0.01	<0.005	0.042	0.14	<0.0005	<0.001	<0.01	<0.0001	<0.005	0.0011	<0.001	1.1	<0.0005	<0.0001	<0.001	<0.001	0.026	<0.002	<0.00005	<0.005	<0.001	<0.005
	26-Jan-11	7.13	170	91	37.8	4	0.11	<0.1	<0.1	<0.01	<0.005	0.042	0.078	<0.0005	0.001	<0.01	<0.0001	<0.005	0.0019	<0.001	1.9	<0.0005	<0.0001	<0.001	<0.001	0.035	<0.002	<0.00005	<0.005	<0.001	<0.005
	22-Feb-11	7.17	174	100	36	3	0.14	<0.1	<0.1	<0.01	<0.005	0.038	0.086	<0.0005	0.001	<0.01	<0.0001	<0.005	0.0016	<0.001	1.9	<0.0005	<0.0001	<0.001	<0.001	0.038	<0.002	<0.00005	<0.005	<0.001	<0.005
	29-Mar-11	7.17	183	110	36	5	0.1	<0.1	<0.1	<0.01	<0.005	0.046	0.11	<0.0005	0.002	<0.01	<0.0001	<0.005	0.0019	<0.001	1.9	<0.0005	<0.0001	<0.001	0.001	0.052	<0.002	<0.00005	<0.005	<0.001	0.006
	2-May-11	7.08	91	53	21.1	<1	<0.05	<0.1	<0.1	<0.01	<0.005	0.034	0.065	<0.0005	<0.001	<0.01	<0.0001	<0.005	<0.0005	0.001	0.19	<0.0005	<0.0001	<0.001	0.001	0.021	<0.002	<0.00005	<0.005	<0.001	<0.005
	1-Jun-11	7.64	138	76	25.3	4	<0.05	<0.1	<0.1	<0.01	<0.005	0.017	0.041	<0.0005	0.001	<0.01	<0.0001	<0.005	<0.0005	<0.001	0.44	<0.0005	<0.0001	<0.001	<0.001	0.03	<0.002	<0.00005	<0.005	<0.001	<0.005
	13-Jul-11	7.3	217	130	26.9	13	<0.05	<0.1	<0.1	<0.01	<0.005	0.018	0.032	<0.0005	0.002	0.011	<0.0001	<0.005	0.0031	<0.001	3.2	<0.0005	<0.0001	<0.001	0.002	0.065	<0.002	<0.00005	<0.005	<0.001	0.006
	4-Aug-11	7.34	264	150	28.3	21	<0.05	<0.1	<0.1	<0.01	<0.005	0.013	0.14	<0.0005	0.003	0.01	<0.0001	<0.005	0.0026	<0.001	3.5	<0.0005	<0.0001	<0.001	0.003	0.083	<0.002	<0.00005	0.0002	0.0007	<0.005
	15-Sep-11	7.18	249	146	19.3	29.9	0.034	0.056	0.348	<0.020	<0.0020	0.0128	1.05	0.000043	0.00119	0.0141	0.0000158	0.00208	0.001200	0.00096	2.100	0.000559	<0.000010	0.000107	0.00194	0.0642	<0.00020	0.0000201	0.00030	0.00255	0.0060
	12-Oct-2011	7.18	245	144	21.4	3.3	0.027	0.071	<0.030	<0.020	<0.0020	0.0116	0.0282	0.000263	0.000915	0.00837	<0.0000090	<0.00090	0.000636	<0.00070	0.917	<0.000060	-	<0.000090	0.0013	0.0377	<0.0020	<0.0000040	0.00011	0.000233	<0.0030
	16-Nov-2011	7.25	204	115	23.5	3	<0.020	<0.030	<0.030	<0.020	<0.0020	0.0064	0.08	0.000049	0.000635	0.00751	<0.0000090	<0.00090	0.000216	0.0032	0.255	0.000237	-	<0.000090	<0.0010	0.0204	<0.0020	<0.0000040	0.0000898	0.00035	0.0032
	14-Dec-2011	7.04	246	136	34.3	6.9	0.097	0.042	<0.030	<0.020	<0.0020	0.0216	0.0635	0.000056	0.00118

Appendix H:
2011-2012 Surface Water Analytical Results

		pH	Conductivity	Hardness as $CaCO_3$	Dissolved Organic Carbon	TSS	Total Ammonia-N	Fluoride	Nitrate	Nitrite	Cyanide-Total	Aluminum-Dissolved	Aluminum-Total	Antimony-Total	Arsenic-Total	Boron-Total	Cadmium-Total	Chromium-Total	Cobalt-Total	Copper-Total	Iron-Total	Lead-Total	Mercury	Molybdenum-Total	Nickel-Total	Phosphorus-Total	Selenium-Total	Thallium-Total	Uranium-Total	Vanadium-Total	Zinc-Total
PWQO		6.5-8.5	-	-	-	-	-	-	-	-	0.005[A]	-	0.075[LB]	0.02[I]	0.1(0.005[I])	0.2[I]	0.0002	0.001 / 0.0089[E]	0.0009	0.005 (0.005)[IC]	0.3	0.020/0.025 (0.003/0.005)[H]	0.0002	0.04[I]	0.025	0.03[I]	0.1	0.0003[I]	0.005[I]	0.006[I]	0.03(0.02[I])
CEQG		6.5-9.0	-	-	-	-	-	0.12	2.935	0.06	0.005[A]	-	0.1[C]	-	0.005	1.5	0.000015-0.000088[D]	0.001 / 0.0089[E]	-	0.002-0.00622[G]	0.3	0.00102-0.01343[I]	0.000026	0.073[I]	0.025[J]	-	0.001	0.0008	0.015	-	0.03
RDL		-	1	1	0.2	1*	0.05*	0.1*	0.1*	0.01*	0.005*	0.005*	0.005	0.0005*	0.001	0.01	0.0001*	0.005*	0.0005	0.001*	0.1	0.0005*	0.0001	0.001*	0.001	0.002	0.002*	0.00005*	0.0001	0.001	0.005*
		pH units	uS/cm	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
SW12/12A	28-Dec-10	6.89	103	49	24.3	17	0.22	<0.1	<0.1	<0.01	<0.005	0.084	0.57	<0.0005	0.001	<0.01	<0.0001	<0.005	0.0032	0.001	4.6	<0.0005	<0.0001	<0.001	0.001	0.05	<0.002	<0.00005	0.0001	0.003	<0.005
	26-Jan-11	7.35	174	88	41	7	0.32	<0.1	<0.1	0.01	<0.005	0.15	0.27	<0.0005	0.002	<0.01	<0.0001	<0.005	0.0046	0.002	5.3	<0.0005	<0.0001	<0.001	0.002	0.033	<0.002	<0.00005	0.0002	0.002	<0.005
	22-Feb-11	7.21	225	120	47.1	4	0.34	<0.1	<0.1	<0.01	<0.005	0.15	0.24	<0.0005	0.002	0.015	<0.0001	<0.005	0.0051	0.002	4.7	<0.0005	<0.0001	<0.001	0.003	0.035	<0.002	<0.00005	0.0002	0.001	0.001
	29-Mar-11	6.77	89	44	15.3	11	0.39	<0.1	0.2	0.01	<0.005	0.036	0.25	<0.0005	<0.001	<0.01	0.0001	<0.005	0.0018	0.001	1.8	<0.0005	<0.0001	<0.001	<0.001	0.036	<0.002	<0.00005	<0.005	<0.001	<0.005
	2-May-11	6.8	58	28	11.8	5	<0.05	<0.1	<0.1	<0.01	<0.005	0.061	0.13	<0.0005	<0.001	<0.01	<0.0001	<0.005	<0.0005	0.002	0.36	<0.0005	<0.0001	<0.001	<0.001	0.02	<0.002	<0.00005	<0.005	<0.001	<0.005
	1-Jun-11	7.23	68	37	15	6	<0.05	<0.1	<0.1	<0.01	<0.005	0.04	0.15	<0.0005	<0.001	<0.01	<0.0001	<0.005	<0.0005	<0.001	0.5	<0.0005	0.0001	<0.001	0.001	0.025	<0.002	<0.00005	<0.005	<0.001	<0.005
	13-Jul-11	7.05	88	46	17.1	13	<0.05	<0.1	<0.1	<0.01	<0.005	0.035	0.099	<0.0005	<0.001	<0.01	<0.0001	<0.005	<0.0005	<0.001	1	<0.0005	<0.0001	<0.001	0.001	0.04	<0.002	<0.00005	<0.005	<0.001	<0.005
	4-Aug-11	7.06	92	45	1.9	7	<0.05	<0.1	<0.1	<0.01	<0.005	0.025	0.063	<0.0005	0.001	<0.01	<0.0001	<0.005	0.0005	<0.001	1.2	<0.0005	<0.0001	<0.001	<0.001	0.028	<0.002	<0.00005	<0.005	0.0005	0.011
	15-Sep-11	6.95	98.5	54	16.9	6.7	0.024	<0.030	0.167	<0.020	<0.0020	0.0192	0.207	0.000078	0.00092	0.0096	0.0000055	0.00067	0.000404	0.00075	0.854	0.000193	<0.000010	<0.000050	0.00096	0.0208	<0.00	0.0000059	0.00006	0.00084	0.0034
	12-Oct-2011	6.99	96.6	50.3	14.9	21.2	<0.020	<0.030	<0.030	<0.020	<0.0020	0.0161	0.373	0.000044	0.00108	0.0068	<0.0000090	<0.00090	0.000512	0.00126	0.755	0.000354	-	<0.000090	0.0012	0.0345	<0.00	0.0000049	0.0000562	0.00119	0.0042
	16-Nov-2011	6.82	95.1	49.7	14.7	24.3	<0.020	<0.030	<0.030	<0.020	<0.0020	0.0109	0.285	0.000032	0.000681	0.00718	<0.0000090	<0.00090	0.000277	0.00113	0.448	0.000248	-	<0.000090	<0.0010	0.0330	<0.00	0.0000005	0.000059	0.000905	0.0063
	14-Dec-2011	6.62	151	73.0	19.9	41.9	0.144	0.032	<0.030	<0.020	<0.0020	0.0301	0.461	0.000031	0.0022	0.00852	0.0000132	0.00103	0.00278	0.0019	4.32	0.000421	-	<0.00018	0.002	0.115	<0.00	<0.0000040	0.00011	0.0016	0.0074
	10-Jan-2012	6.54	179	95.4	30.1	58.6	0.413	<0.030	<0.030	<0.020	<0.0020	0.0373	1.28	<0.00010	0.00254	0.0084	0.000029	<0.00050	0.0033	0.00272	5.9	0.0007	-	<0.00020	0.0031	0.135	<0.00	<0.000030	0.000168	0.00333	0.0094
	15-Feb-2012	6.57	238	123	37.6	108	0.744	<0.030	0.03	<0.020	<0.0020	0.029	1.85	<0.00010	0.00255	0.0109	0.000042	0.0027	0.00413	0.00395	8.09	0.00108	-	<0.00020	0.0041	0.205	<0.00	<0.000030	0.00021	0.00413	0.0173
	20-Mar-2012	6.63	57.1	23.1	13.1	40.9	0.024	<0.030	<0.030	<0.020	<0.0020	0.144	0.904	<0.00010	0.00058	0.0054	0.000023	0.00168	0.000673	0.00545	1.08	0.00062	-	<0.00020	0.0019	0.0685	<0.00	<0.000030	0.000094	0.00299	0.0047
	19-Apr-2012	6.94	70.9	32.2	14.7	8.6	0.021	<0.030	<0.030	<0.020	<0.0020	0.0617	0.194	<0.00010	0.00068	0.0063	<0.000010	<0.00050	0.000182	0.00153	0.367	0.00011	-	<0.00020	<0.0010	0.0186	0.00134	<0.000030	0.000105	0.00075	0.0024
	Min	6.54	57	23	1.9	4.0	0.020	0.030	0.030	0.010	0.0020	0.0109	0.0630	0.00003	0.00058	0.0054	0.000006	0.00050	0.000182	0.00075	0.360	0.00011	0.0000	0.00005	0.00096	0.01860	0.00020	0.000004	0.00006	0.00050	0.0010
	Max	7.35	238	123	47.1	108.0	0.744	0.100	0.200	0.020	0.0050	0.1500	1.8500	0.00050	0.00255	0.0150	0.00010	0.00500	0.005100	0.00545	8.090	0.00108	0.0001	0.00100	0.00410	0.20500	0.00200	0.000050	0.00500	0.00413	0.0173
	Median	6.92	96	49	16.1	12.0	0.050	0.066	0.100	0.015	0.0035	0.0367	0.2600	0.00030	0.00100	0.0100	0.00007	0.00385	0.000593	0.00140	1.140	0.00050	0.0001	0.00060	0.00100	0.03475	0.00200	0.000040	0.00018	0.00100	0.0050
	St Dev.	0.24	58	31	12.1	27.6	0.209	0.036	0.053	0.005	0.0015	0.0483	0.4905	0.00022	0.00068	0.0022	0.00004	0.00207	0.001749	0.00126	2.485	0.00022	0.000030	0.00044	0.00098	0.05190	0.00070	0.000019	0.00233	0.00111	0.0038
	N	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	9	16	16	16	16	16	16	16	16
	75th %	7.05	157	77	25.8	28.5	0.325	0.100	0.100	0.020	0.0050	0.0673	0.4883	0.0005	0.002	0.0100	0.00010	0.00500	0.003225	0.002000	4.625	0.00050	0.0001	0.00100	0.00200	0.05463	0.00200	0.0000500	0.005000	0.00225	0.0066
SW13	28-Dec-10	7.77	322	170	18	1	<0.05	<0.1	<0.1	<0.01	<0.005	0.006	0.069	<0.0005	<0.001	<0.01	<0.0001	<0.005	<0.0005	<0.001	0.35	<0.0005	<0.0001	<0.001	<0.001	0.027	<0.002	<0.00005	0.0006	<0.001	<0.005
	26-Jan-11	7.7	338	180	18.7	5	0.09	<0.1	<0.1	<0.01	<0.005	0.007	0.11	<0.0005	<0.001	<0.01	<0.0001	<0.005	<0.0005	<0.001	0.64	<0.0005	<0.0001	<0.001	<0.001	0.043	<0.002	<0.00005	0.0006	<0.001	<0.005
	22-Feb-11	7.9	358	200	16.5	9	0.07	<0.1	<0.1	<0.01	<0.005	0.006	0.25	<0.0005	<0.001	<0.01	<0.0001	<0.005	0.0006	<0.001	0.93	<0.0005	<0.0001	<0.001	0.001	0.042	<0.002	<0.00005	0.0008	<0.001	<0.005
	29-Mar-11	7.73	378	230	15.9	1	<0.05	<0.1	<0.1	<0.01	<0.005	0.006	0.034	<0.0005	<0.001	<0.01	<0.0001	<0.005	<0.0005	<0.001	0.28	<0.0005	<0.0001	<0.001	<0.001	0.035	<0.002	<0.00005	0.0013	<0.001	<0.005
	2-May-11	7.44	173	93	15.6	3	<0.05	<0.1	<0.1	<0.01	<0.005	0.009	0.066	<0.0005	<0.001	0.011	<0.0001	<0.005	<0.0005	0.001	0.11	<0.0005	<0.0001	<0.001	<0.001	0.026	<0.002	<0.00005	0.0003	<0.001	<0.005
	1-Jun-11	8.9	218	130	17.5	11	<0.05	<0.1	<0.1	<0.01	<0.005	<0.005	0.14	<0.0005	<0.001	0.012	<0.0001	<0.005	<0.0005	<0.001	0.29	<0.0005	0.0001	<0.001	0.001	0.031	<0.002	<0.00005	0.0003	<0.001	<0.005
	13-Jul-11	7.79	326	160	22.3	14	<0.05	<0.1	<0.1	<0.01	<0.005	<0.005	0.22	<0.0005	0.002	0.016	<0.0001	<0.005	0.0007	<0.001	0.56	<0.0005	<0.0001	<0.001	0.002	0.083	<0.002	<0.00005	0.0004	0.001	<0.005
	4-Aug-11	8.06	349	180	21.8	9	<0.05	0.1	<0.1	<0.01	<0.005	<0.005	0.19	<0.0005	0.002	0.016	<0.0001	<0.005	<0.0005	0.001	0.19	<0.0005	<0.0001	<0.001	0.002	0.044	<0.002	<0.00005	0.0013	0.0022	<0.005
	15-Sep-11	8.56	403	247	19	32.3	0.021	0.116	0.176	<0.020	<0.0020	0.0046	0.305	0.000145	0.00242	0.0200	0.0000103	0.00071	0.000351	0.00170	0.310	0.000278	<0.000010	0.000781	0.00204	0.0530	<0.00020	0.0000049	0.00415	0.00398	<0.0030
	12-Oct-2011	7.78	380	208	17.8	35.7	<0.020	0.116	<0.030	<0.020	<0.0020	0.0065	0.785	0.000148	0.00223	0.0194	0.0000237	0.00128	0.000774	0.0019	1.04	0.000606	-	0.000768	0.003	0.0905	<0.0020	0.0000122	0.00183	0.00318	0.0047
	16-Nov-2011	7.56	292	172	15.1	8.3	<0.020	0.049	<0.030	<0.020	<0.0020	0.002	0.224	0.000063	0.000684	0.0119	0.0000119	<0.00090	0.000251	<0.00070	0.361	0.000184	-	0.000318	0.0011	0.0257	<0.0020	<0.0000040	0.00087	0.00103	<0.0030
	14-Dec-2011	7.4	431	255	19.9	17.3	0.034	0.066	<0.030	<0.020	<0.0020	0.0018	0.164	0.000055	0.00138	0.011	0.000018	<0.00090	0.00149	<0.00070	1.14	0.000216	-	0.00029	0.002	0.0882	<0.0020	<0.0000040	0.00122	0.000898	0.0037
	10-Jan-2012	7.41	485	271	22.7	14	0.207	0.06	<0.030	<0.020	<0.0020	<0.0030	0.216	<0.00010	0.00217	0.011	0.000017	<0.00050	0.00229	<0.00070	2.29	0.00027	-	0.00025	0.0022	0.120	<0.00050	<0.000030	0.00105	0.00076	0.0054
	15-Feb-2012	7.45	662	409	37.2	30.5	0.714	<0.030	0.067	<0.020	<0.0020	<0.0030	0.198	<0.00010	0.00391	0.0137	0.000017	<0.00050	0.00476	<0.00070	4.77	0.00032	-	0.00028	0.0037	0.253	<0.00050	<0.000030	0.00111	0.00131	0.0068
	20-Mar-2012	7.35	172	83.3	10.7	22.6	0.128	<0.030	0.26	<0.020	<0.0020	0.0062	0.285	<0.00010	0.00064	0.011	0.0000116	0.00068	0.000445	0.00092	0.664	0.00028	-	0.00035	0.001	0.0787	<0.00050	<0.000030	0.000312	0.00133	0.0026
	19-Apr-2012	7.66	240	110	14.4	3.6	0.052	0.05	0.249	<0.020	<0.0020	0.0047	0.0210	<0.00010	0.00046	0.011	<0.000010	<0.00050	0.000062	0.00088	0.059	<0.00010	-	0.00042	<0.0010	0.0113	0.00101	<0.000030	0.000361	0.00051	<0.0020
	Min	7.35	172	83	10.7	1.0	0.020	0.030	0.030	0.010	0.0020	0.0018	0.0210	0.00006	0.00046	0.0100	0.0000010	0.00050	0.000062	0.00070	0.059	0.00010	0.0000	0.00025	0.00100	0.01130	0.00020	0.000004	0.00030	0.00051	0.0020
	Max	8.90	662	409	37.2	35.7	0.714	0.116	0.260	0.020	0.0050	0.0090	0.7850	0.00050	0.00391	0.0200	0.00010	0.00500	0.004760	0.00190	4.770	0.00061	0.0001	0.00100	0.00370	0.25300	0.00200	0.000050	0.00415	0.00398	0.0068
	Median	7.72	344	180	17.9	10.0	0.050	0.100	0.100	0.015	0.0035	0.0050	0.1940	0.00032	0.00100	0.0110	0.00006	0.00314	0.000500	0.00100	0.461	0.00050	0.0001	0.00089	0.00105	0.04350	0.00200	0.000040	0.00084	0.00100	0.0050
	St Dev.	0.43	122	80	5.8	11.3	0.169	0.030	0.070	0.005	0.0015	0.0019	0.1773	0.00021	0.00090	0.0033	0.00004	0.00220	0.001152	0.00033	1.176	0.00015	0.000030	0.00033	0.00084	0.05837	0.00071	0.000019	0.00095	0.00094	0.0012
	N	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	9	16	16	16	16	16	16	16	16
	75th %	7.82	386	234	20.4	18.6	0.075	0.100	0.100	0.020	0.0050	0.0061	0.2305	0.0005	0.0020425	0.0143	0.00010	0.00500	0.000719	0.001000	0.9575	0.00050	0.0001	0.00100	0.00201	0.08430	0.00200	0.0000500	0.001240	0.00132	0.0050
SW14	28-Dec-10	7.16	127	72	28.2	1	0.06	<0.1	<0.1	<0.01	<0.005	0.046	0.046	<0.0005	<0.001	<0.01	<0.0001	<0.005	<0.0005	<0.001	0.4	<0.0005	<0.0001	<0.001	<0.001	0.024	<0.002	<0.00005	<0.005	<0.001	<0.005
	26-Jan-11	7.26	150	78	26.7	<1	0.1	<0.1	<0.1	<0.01	<0.005	0.041	0.065	<0.0005	<0.001	<0.01	<0.0001	<0.005	0.0006	<0.001	0.73	<0.0005	<0.0001	<0.001	<0.001	0.017	<0.002	<0.00005	<0.005	<0.001	<0.005
	22-Feb-11	7.35	156	91	27.2	<1	0.12	<0.1	<0.1	<0.01	<0.005	0.037	0.051	<0.0005	<0.001	<0.01	<0.0001	<0.005	0.0005	<0.001	0.74	<0.0005	<0.0001	<0.001	<0.001	0.022	<0.002	<0.00005	<0.005	<0.001	<0.005
	29-Mar-11	7.19	175	100	24.1	1	0.07	<0.1	<0.1	<0.01	<0.005	0.042	0.18	<0.0005	<0.001	<0.01	<0.0001	<0.005	<0.0005	<0.001	0.6	<0.0005	<0.0001	<0.001	<0.001	0.027	<0.002	<0.00005	<0.005	<0.001	<0.005
	2-May-11	7.23	91	53	18.5	7	<0.05	<0.1	<0.1	<0.01	<0.005	0.027	0.096	<0.0005	<0.001	<0.01	<0.0001	<0.005	<0.0005	0.001	0.17	<0.0005	<0.0001	<0.001	<0.001	0.02	<0.002	<0.00005	<0.005	<0.001	<0.005
	1-Jun-11	9.38	116	68	20.1	5	<0.05	<0.1	<0.1	<0.01	<0.005	0.021	0.11	<0.0005	<0.001	<0.01	<0.0001	<0.005	<0.0005	<0.001	0.29	<0.0005	0.0001	<0.001	<0.001	0.02	<0.002	<0.00005	<0.005	<0.001	<0.005
	13-Jul-11	7.58	152	86	25	28	<0.05	<0.1	<0.1	<0.01	<0.005	0.017	0.086	<0.0005	0.001	<0.01	<0.0001	<0.005	<0.0005	<0.001	0.5	<0.0005	<0.0001	<0.001	<0.001	0.031	<0.002	<0.00005	<0.005	<0.001	<0.005
	4-Aug-11	7.7	175	91	25.6	2	<0.05	<0.1	<0.1	<0.01	<0.005	0.01	0.023	<0.0005	0.001	<0.01	<0.0001	<0.005	<0.0005	<0.001	0.4	<0.0005	<0.0001	<0.001	<0.001	0.022	<0.002	<0.00005	<0.005	<0.001	<0.005
	15-Sep-11	7.77	189	108	18	<2.0	0.029	<0.030	<0.020	0.906	<0.0020	0.008	0.0592	0.000067	0.00078	0.0106	<0.0000050	<0.00050	0.000129	<0.00050	0.300	0.000065	<0.000010	0.000108	0.00052	0.0104	<0.00020	0.0000021	0.00009	0.00030	<0.0030
	12-Oct-2011	7.59	169	96.0	20.3	6	<0.020	<0.030	<0.030	<0.020	<0.0020	0.0088	0.0263	0.000201	0.000671	0.00667	<0.0000090	<0.00090	0.000082	<0.00070	0.217	0.000075	-	<0.000090	<0.0010	0.0146	<0.0020	<0.0000040	0.000035	0.00159	0.0038
	16-Nov-2011	7.23	139	78.2	18.9	7.9	<0.020	<0.030	<0.030	<0.020	<0.0020	0.0077	0.126	0.000051	0.000437	0.00449	0.00001	<0.00090	0.000126	<0.00070	0.265	0.000113	-	<0.000090	<0.0010	0.0144	<0.0020	<0.0000040	0.0000491	0.000343	<0.0030
	14-Dec-2011	7.06	205	107	24.1	3	0.158	<0.030	<0.030	<0.020	<0.0020	0.0136	0.0424	0.000043	0.00068	0.0051	0.0000104	<0.00090	0.000702	<0.00070	0.761	0.000092	-	<0.000090	<0.0010	0.0247	<0.0020	<0.0000040	0.0000417	0.000185	0.0057
	10-Jan-2012	7.17	223	131	25.6	2.1	0.477	0.034	0.03	<0.020	<0.0020	0.0201	0.0903	<0.00010	0.00063	0.0043	0.000035	<0.00050	0.000683	<0.00070	1.09	0.00013	-	<0.00020	<0.0010	0.0199	<0.00050	<0.000030	0.000051	<0.00020	0.0039
	15-Feb-2012	6.99	297	169	28.4	10.9	1.23	<0.030	<0.030	<0.020	<0.0020	0.0164	0.325	<0.00010	0.00068	0.005	0.000015	0.0006	0.00177	0.00097	1.6	0.00024	-	<0.00020	0.001	0.0359	<0.00050	<0.000030	0.000075	0.00066	0.0084
	20-Mar-2012	7	102	48.2	11.7	9.3	0.162	<0.030	0.282	<0.020	<0.0020	0.0135	0.0997	<0.00010	0.00033	0.0063	0.000012	<0.00050	0.000186	<0.00070	0.26	0.00012	-	0.00021	<0.0010	0.0524	<0.00050	<0.000030	0.000057	0.00041	<0.0020
	19-Apr-2012	7.33	103	55.4	24.0	<2	<0.020	<0.030	<0.030	<0.020	<0.0020	0.0288	0.0553	<0.00010	0.00049	0.0059	<0.000010	<0.00050	0.000073	<0.00070	0.184	<0.00010	-	<0.00020	<0.0010	0.0068	0.00055	<0.000030	0.000039	0.00028	0.0025
	Min	6.99	91	48	11.7	1.0	0.020	0.030	0.020	0.010	0.0020	0.0077	0.0230	0.00004	0.00033	0.0043	0.000005	0.00050	0.000073	0.00050	0.170	0.00007	0.0000	0.00009	0.00052	0.00680	0.00020	0.000002	0.00004	0.00016	0.0020
	Max	9.38	297	169	28.4	28.0	1.230	0.100	0.282	0.906	0.0050	0.0460	0.3250	0.00050	0.00100	0.0106	0.00010	0.00500	0.001770	0.00100	1.600	0.00050	0.0001	0.00100	0.00100	0.05240	0.00200	0.000050	0.00500	0.00100	0.0084
	Median	7.25	154	89	24.1	2.6	0.055	0.067	0.100	0.015	0.0035	0.0186	0.0755	0.00035	0.00089	0.0100	0.00007	0.00295	0.000500	0.00099	0.400	0.00037	0.0001	0.00061	0.00100	0.02100	0.00200	0.000040	0.00254	0.00083	0.0050
	St Dev.	0.57	52	31	4.6	6.8	0.305	0.036	0.065	0.223	0.0015	0.0130	0.0740	0.00021	0.00024	0.0025	0.00005	0.00224	0.000402	0.00017	0.386	0.00020	0.000030	0.00044	0.00012	0.01078	0.00075	0.000020	0.00255	0.00037	0.0015
	N	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	9	16	16	16	16	16	16	16	16
	75th %	7.58	179	102	25.9	7.2	0.130	0.100	0.100	0.020	0.0050	0.0309	0.1023	0.0005	0.001	0.0100	0.00010	0.00500	0.000525	0.001000	0.7325	0.00050	0.0001	0.00100	0.00100	0.02528	0.00200	0.0000500	0.005000	0.00100	0.0050
SW15	28-Dec-10	7.57	251	130	27.4	13	0.08	<0.1	<0.1	<0.01	<0.005	0.042	0.53	<0.0005	<0.001	<0.01	0.0002	<0.005	<0.0005	<0.001	1.1	<0.0005	<0.0001	<0.001	0.001	0.044	<0.002	<0.00005	0.0006	0.002	<0.005
	26-Jan-11	7.64	267	140	9.8	10	0.1	<0.1	<0.1	0.01	<0.005	0.036	0.069	<0.0005	<0.001	<0.01	<0.0001	<0.005	<0.0005	0.001	0.16	<0.0005	<0.0001	<0.001	<0.001	0.06	<0.002	<0.00005	<0.005	0.001	<0.005
	22-Feb-11	7.72	299	170	26.1	12	0.06	<0.1	<0.1	0.02	<0.005	0.033	0.53	<0.0005	<0.001	0.011	<0.0001	<0.005	0.0006	0.001	1.4	0.0005	<0.0001	<0.001	0.002	0.059	<0.002	<0.00005	0.0009	0.002	0.001
	29-Mar-11	8.15	157	85	14.9	21	0.28	<0.1	0.4	<0.01	<0.005	<0.005	0.540	<0.0005	<0.001	<0.01	<0.0001	<0.005	<0.0005	0.002	1	<0.0005	<0.0001	<0.001	0.001	0.051	<0.002	<0.00005	0.0004	0.002	0.007
	2-May-11	7.43	159	85	27.9	33	<0.05	<0.1	<0.1	<0.01	<0.005	0.052	0.88	<0.0005	0.001	0.014	<0.0001	<0.005	0.9	0.003	1.2	0.0009	<0.0001	<0.001	0.002	0.077	<0.002	<0.00005	0.0008	0.003	0.008
	1-Jun-11	9.54	175	97	30.4	24	<0.05	<0.1	<0.1	<0.01	<0.005	0.065	0.7	<0.0005	0.001	0.012	<0.0001	<0.005	0.6	0.002	1.1	0.0006	0.0001	<0.001	0.003	0.066	<0.002	<0.00005	0.0006	0.002	0.001
	13-Jul-11	7.89	276	140	32.3	16	<0.05	<0.1	<0.1	<0.01	<0.005	0.02	0.28	<0.0005	0.002	0.019	<0.0001	<0.005	0.0007	0.003	0.77	0.0008	<0.0001	<0.001	0.003	0.15	<0.002	<0.00005	0.0007	0.002	0.006
	4-Aug-11	7.92	216	110	8.7	25	<0.05	<0.1	<0.1	<0.01	<0.005	0.011	0.28	<0.0005	0.003	0.015	<0.0001	<0.005	0.0006	0.003	0.75	0.001	<0.0001	<0.001	0.003	0.11	<0.002	<0.00005	0.0005	0.0028	0.011
	15-Sep-11	7.96	186	90.7	11.8	8.2	<0.020	<0.030	<0.030	<0.020	<0.0020	0.0353	0.393	0.000092	0.00162	0.0162	0.0000133	0.00098	0.000260	0.00245	0.488	0.000406	<0.000010	0.000458	0.00185	0.0494	<0.00020	0.0000095	0.00031	0.00207	0.0245
	12-Oct-2011	7.86	185	85.5	12.0	8.4	0.034	0.053	<0.030	<0.020	<0.0020	0.0287	0.360	0.000085	0.00115

Appendix H:
2011-2012 Surface Water Analytical Results

		pH	Conductivity	Hardness as $CaCO_3$	Dissolved Organic Carbon	TSS	Total Ammonia-N	Fluoride	Nitrate	Nitrite	Cyanide-Total	Aluminum-Dissolved	Aluminum-Total	Antimony-Total	Arsenic-Total	Boron-Total	Cadmium-Total	Chromium-Total	Cobalt-Total	Copper-Total	Iron-Total	Lead-Total	Mercury	Molybdenum-Total	Nickel-Total	Phosphorus-Total	Selenium-Total	Thallium-Total	Uranium-Total	Vanadium-Total	Zinc-Total
PWQO		6.5-8.5	-	-	-	-	-	-	-	-	0.005[A]	-	0.075[i,B]	0.02[i]	0.1(0.005[i])	0.2[i]	0.0002	0.001 / 0.0089[E]	0.0009	0.005 (0.005[i])[F]	0.3	0.020/0.025 (0.003/0.005[i])[H]	0.0002	0.04[i]	0.025	0.03[i]	0.1	0.0003[i]	0.005[i]	0.006[i]	0.03(0.02[i])
CEQG		6.5-9.0	-	-	-	-	-	0.12	2.935	0.06	0.005[A]	-	0.1[C]	-	0.005	1.5	0.000015-0.000088[D]	0.001 / 0.0089[E]	-	0.002-0.00622[G]	0.3	0.00102-0.01343[J]	0.000026	0.073[i]	0.025[J]	-	0.001	0.0008	0.015	-	0.03
RDL		-	1	1	0.2	1*	0.05*	0.1*	0.1*	0.01*	0.005*	0.005*	0.005	0.0005*	0.001	0.01	0.0001*	0.005*	0.0005	0.001*	0.1	0.0005*	0.0001	0.001*	0.001	0.002	0.002*	0.00005*	0.0001	0.001	0.005*
		pH units	uS/cm	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
SW16	28-Dec-10	7.32	68	26	10.2	2	<0.05	<0.1	<0.1	<0.01	<0.005	0.022	0.059	<0.0005	<0.001	<0.01	<0.0001	<0.005	<0.0005	<0.001	<0.1	<0.0005	<0.0001	<0.001	<0.001	0.023	<0.002	<0.00005	<0.005	<0.001	<0.005
	26-Jan-11	7.4	66	24	26.5	2	0.07	<0.1	<0.1	<0.01	<0.005	0.023	0.53	<0.0005	0.001	<0.01	<0.0001	<0.005	0.0006	0.002	1.2	<0.0005	<0.0001	<0.001	0.002	0.025	<0.002	<0.00005	0.0006	0.002	<0.005
	22-Feb-11	7.05	66	27	9.8	2	<0.05	<0.1	<0.1	<0.01	<0.005	0.023	0.055	<0.0005	<0.001	<0.01	<0.0001	<0.005	<0.0005	0.001	0.1	<0.0005	<0.0001	<0.001	<0.001	0.029	<0.002	<0.00005	<0.005	<0.001	<0.005
	29-Mar-11	7.17	115	47	11.3	4	<0.05	<0.1	<0.1	<0.01	<0.005	0.028	0.13	<0.0005	<0.001	<0.01	<0.0001	<0.005	<0.0005	0.002	0.23	<0.0005	<0.0001	<0.001	<0.001	0.045	<0.002	<0.00005	0.0003	<0.001	<0.005
	2-May-11	7.03	82	38	11.9	15	<0.05	<0.1	<0.1	<0.01	<0.005	0.038	0.41	<0.0005	<0.001	<0.01	<0.0001	<0.005	<0.0005	0.002	0.58	0.0005	<0.0001	<0.001	0.001	0.045	<0.002	<0.00005	0.0002	0.001	<0.005
	1-Jun-11	9.89	81	33	10.4	110	<0.05	<0.1	<0.1	<0.01	<0.005	0.025	0.8	<0.0005	<0.001	<0.01	<0.0001	<0.005	0.8	0.003	1.1	0.0009	0.0002	<0.001	0.003	0.073	<0.002	<0.00005	0.0002	0.002	<0.005
	13-Jul-11	7.5	74	29	10.6	9	<0.05	<0.1	<0.1	<0.01	<0.005	0.025	0.085	<0.0005	<0.001	<0.01	<0.0001	<0.005	<0.0005	0.001	0.19	<0.0005	<0.0001	<0.001	<0.001	0.04	<0.002	<0.00005	<0.005	<0.001	<0.005
	4-Aug-11	7.49	95	35	10.4	13	<0.05	<0.1	<0.1	<0.01	<0.005	0.02	0.13	0.0007	<0.001	<0.01	<0.0001	<0.005	<0.0005	0.002	0.2	<0.0005	<0.0001	<0.001	<0.001	0.033	<0.002	<0.00005	0.0001	0.0009	<0.005
	15-Sep-11	7.67	99	35.1	8.5	11.3	<0.020	<0.030	0.058	<0.020	<0.0020	0.0161	0.354	0.000166	0.00053	0.0115	0.0000134	0.00084	0.000199	0.00127	0.371	0.000226	<0.000010	0.000220	0.00103	0.0206	<0.00	0.0000091	0.00010	0.00144	0.0035
	12-Oct-2011	7.59	101	33.8	9.0	17.3	0.052	0.035	<0.030	<0.020	<0.0020	0.0118	0.348	0.000096	0.000555	0.0095	0.000018	<0.00090	0.000239	0.00147	0.415	0.000321	-	0.000143	0.0012	0.0357	<0.00	0.0000113	0.000104	0.0013	0.0038
	16-Nov-2011	6.95	95.7	37.1	8.2	17.6	0.046	<0.030	<0.030	<0.020	<0.0020	0.0087	0.319	0.000050	0.000489	0.0114	0.0000383	<0.00090	0.00022	0.0012	0.375	0.000271	-	0.000161	0.0010	0.0249	<0.00	0.000008	0.000106	0.00117	0.0034
	14-Dec-2011	7.35	80.5	25.7	8.1	2.4	0.042	<0.030	<0.030	<0.020	<0.0020	0.0133	0.0566	0.000059	0.000368	0.00888	0.00002	<0.00090	0.000054	0.00115	0.0988	0.000087	-	<0.00018	<0.0010	0.0149	<0.00	<0.0000040	0.0000657	0.000361	<0.0030
	10-Jan-2012	7.29	81.4	30.3	9.1	<2	<0.020	0.031	<0.030	<0.020	0.0057	0.0177	0.0660	<0.00010	0.0004	0.0065	<0.000010	<0.00050	<0.000050	0.00107	0.085	<0.00010	-	<0.00020	<0.0010	0.0170	<0.00	<0.000030	0.000081	<0.00020	0.0023
	15-Feb-2012	7.27	84.1	28.8	12.9	10.6	0.023	<0.030	0.099	<0.020	<0.0020	0.0129	0.0435	<0.00010	0.00039	0.0065	0.000012	<0.00050	0.000052	0.00163	0.064	0.00013	-	<0.00020	<0.0010	0.0185	<0.00	<0.000030	0.000057	0.0003	0.011
	20-Mar-2012	7.51	131	49.9	8.8	34.2	0.05	<0.030	0.43	<0.020	<0.0020	0.0141	0.414	<0.00010	0.00062	0.0118	0.000028	0.00111	0.000415	0.00164	0.686	0.00042	-	0.00035	0.0014	0.0751	<0.00	0.000032	0.00027	0.00159	0.0036
	19-Apr-2012	7.4	90.7	30.7	9.5	8.8	0.021	0.032	0.079	<0.020	<0.0020	0.0202	0.128	<0.00010	0.00039	0.0066	<0.000010	<0.00050	0.000094	0.00116	0.207	0.0001	-	<0.00020	<0.0010	0.0174	0.00064	<0.000030	0.0001	0.00056	0.0044
	Min	6.95	66	24	8.1	2.0	0.020	0.030	0.030	0.010	0.0020	0.0087	0.0435	0.00005	0.00037	0.0065	0.000010	0.00050	0.000050	0.00100	0.064	0.00009	0.0000	0.00014	0.00100	0.01490	0.00020	0.000004	0.00006	0.00020	0.0023
	Max	9.89	131	50	26.5	110.0	0.070	0.100	0.430	0.020	0.0057	0.0380	0.8000	0.00070	0.00100	0.0118	0.00010	0.00500	0.800000	0.00300	1.200	0.00090	0.0002	0.00100	0.00300	0.07510	0.00200	0.000050	0.00500	0.00200	0.0110
	Median	7.38	83	32	10.0	9.8	0.050	0.068	0.100	0.015	0.0050	0.0201	0.1300	0.00033	0.00081	0.0100	0.00007	0.00306	0.000458	0.00137	0.219	0.00046	0.0001	0.00068	0.00100	0.02700	0.00200	0.000041	0.00015	0.00100	0.0050
	St Dev.	0.67	18	7	4.4	26.4	0.014	0.036	0.093	0.005	0.0016	0.0073	0.2187	0.00023	0.00028	0.0017	0.00004	0.00219	0.199918	0.00055	0.353	0.00022	0.000048	0.00041	0.00054	0.01853	0.00074	0.000018	0.00195	0.00054	0.0019
	N	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	9	16	16	16	16	16	16	16	16
	75th %	7.50	97	36	10.8	15.6	0.050	0.100	0.100	0.020	0.0050	0.0235	0.3680	0.0005	0.001	0.0100	0.00010	0.00500	0.000500	0.002000	0.45625	0.00050	0.0001	0.00100	0.00107	0.04125	0.00200	0.0000500	0.000375	0.00134	0.0050
SW17	28-Dec-10	7.40	87	36	11.8	2	<0.05	<0.1	<0.1	<0.01	<0.005	0.021	0.086	<0.0005	<0.001	<0.01	<0.0001	<0.005	<0.0005	<0.001	0.14	<0.0005	<0.0001	<0.001	<0.001	0.021	<0.002	<0.00005	<0.005	<0.001	<0.005
	26-Jan-11	7.83	180	76	22.5	<1	0.08	<0.1	0.3	0.01	<0.005	0.025	0.062	<0.0005	<0.001	0.013	<0.0001	<0.005	<0.0005	0.003	0.22	<0.0005	<0.0001	<0.001	0.001	0.034	<0.002	<0.00005	0.0002	<0.001	<0.005
	22-Feb-11	7.08	86	35	10.8	2	<0.05	<0.1	0.1	<0.01	<0.005	0.024	0.075	<0.0005	<0.001	<0.01	<0.0001	<0.005	<0.0005	<0.001	0.15	<0.0005	<0.0001	<0.001	<0.001	0.027	<0.002	<0.00005	0.0001	<0.001	<0.005
	29-Mar-11	7.41	149	66	12.5	4	<0.05	<0.1	0.1	<0.01	<0.005	0.027	0.15	<0.0005	<0.001	<0.01	<0.0001	<0.005	<0.0005	0.001	0.34	<0.0005	<0.0001	<0.001	0.001	0.047	<0.002	<0.00005	0.0006	<0.001	<0.005
	2-May-11	7.25	115	59	13.3	11	<0.05	<0.1	<0.1	<0.01	<0.005	0.036	0.31	<0.0005	<0.001	<0.01	<0.0001	<0.005	<0.0005	0.002	0.92	<0.0005	<0.0001	<0.001	0.001	0.04	<0.002	<0.00005	0.0004	0.001	<0.005
	1-Jun-11	9.73	92	41	12.4	74	<0.05	<0.1	<0.1	<0.01	<0.005	0.024	0.38	<0.0005	<0.001	<0.01	<0.0001	<0.005	<0.0005	0.002	0.66	0.0005	0.0001	<0.001	0.001	0.06	<0.002	<0.00005	0.0002	<0.001	<0.005
	13-Jul-11	7.58	88	36	14.1	4	<0.05	<0.1	<0.1	<0.01	<0.005	0.025	0.14	<0.0005	<0.001	<0.01	<0.0001	<0.005	<0.0005	0.001	0.29	<0.0005	<0.0001	<0.001	<0.001	0.041	<0.002	<0.00005	0.0001	<0.001	<0.005
	4-Aug-11	7.47	103	41	10.9	3	<0.05	<0.1	<0.1	<0.01	<0.005	0.02	0.069	<0.0005	<0.001	<0.01	<0.0001	<0.005	<0.0005	<0.001	0.12	<0.0005	<0.0001	<0.001	<0.001	0.024	<0.002	<0.00005	0.0001	0.0006	0.007
	15-Sep-11	7.75	112	42.3	7.9	5.3	<0.020	<0.030	<0.030	<0.020	<0.0020	0.0172	0.182	0.000076	0.00059	0.0127	0.0000116	0.00076	0.000115	0.00123	0.208	0.000152	<0.000010	0.000242	0.00086	0.017	<0.00020	0.0000066	0.00011	0.00088	0.0003
	12-Oct-2011	7.68	110	39.7	8.8	12.6	0.024	<0.030	<0.030	<0.020	<0.0020	0.0134	0.117	0.000087	0.000529	0.0108	0.0000122	<0.00090	0.0001	0.00115	0.166	0.000149	-	0.000165	<0.0010	0.0447	<0.0020	0.0000049	0.000088	0.000615	0.003
	16-Nov-2011	7.04	111	47.7	9.2	19.8	0.048	0.032	<0.030	<0.020	<0.0020	0.0113	0.293	0.000090	0.000507	0.0115	0.0000305	<0.00090	0.000222	0.00145	0.422	0.000319	-	0.000173	<0.0010	0.0624	<0.0020	0.000006	0.000107	0.000965	0.0036
	14-Dec-2011	7.49	108	37.7	9.1	<2	<0.020	0.033	<0.030	<0.020	<0.0020	0.0116	0.0475	0.000055	0.000423	0.00892	0.0000641	<0.00090	0.000052	0.00102	0.092	0.000075	-	<0.00018	<0.0010	0.0168	<0.0020	<0.0000040	0.0000937	0.000337	<0.0030
	10-Jan-2012	7.3	105	42.3	10.0	<2	<0.020	0.039	0.039	<0.020	<0.0020	0.015	0.0592	<0.00010	0.00042	0.0074	<0.000010	<0.00050	<0.000050	0.00109	0.099	<0.00010	-	<0.00020	<0.0010	0.0196	<0.00050	<0.000030	0.000095	<0.00020	0.0159
	15-Feb-2012	7.38	112	41.4	11.4	<2	<0.020	0.034	0.114	<0.020	<0.0020	0.0141	0.0517	<0.00010	0.00042	0.0077	<0.000010	<0.00050	<0.000050	0.00129	0.089	<0.00010	-	<0.00020	<0.0010	0.0216	<0.00050	<0.000030	0.000088	0.00034	0.003
	20-Mar-2012	7.51	136	52.4	8.8	19.9	0.065	<0.030	0.17	<0.020	<0.0020	0.0137	0.236	<0.00010	0.00056	0.0107	0.000149	0.00084	0.000360	0.00154	0.561	0.00033	-	0.00041	0.0011	0.0620	<0.00050	<0.000030	0.000231	0.00107	0.0031
	19-Apr-2012	7.59	110	42.1	13.0	22.5	<0.020	0.034	0.064	<0.020	<0.0020	0.0313	0.288	<0.00010	0.00058	0.0084	0.000018	0.00075	0.000231	0.00151	0.456	0.00028	-	0.00023	<0.0010	0.0278	<0.00050	<0.000030	0.000161	0.00109	0.0044
	Min	7.04	86	35	7.9	1.0	0.020	0.030	0.030	0.010	0.0020	0.0113	0.0475	0.00006	0.00042	0.0074	0.000010	0.00050	0.000050	0.00100	0.089	0.00008	0.0000	0.00017	0.00086	0.01680	0.00020	0.000004	0.00009	0.00020	0.0003
	Max	9.73	180	76	22.5	74.0	0.080	0.100	0.300	0.020	0.0050	0.0360	0.3800	0.00050	0.00100	0.0130	0.00015	0.00500	0.000500	0.00300	0.920	0.00050	0.0001	0.00100	0.00110	0.06240	0.00200	0.000050	0.00500	0.00109	0.0159
	Median	7.48	110	42	11.2	4.0	0.050	0.070	0.100	0.015	0.0035	0.0205	0.1285	0.00030	0.00079	0.0100	0.00010	0.00295	0.000430	0.00119	0.214	0.00042	0.0001	0.00071	0.00100	0.03090	0.00200	0.000040	0.00011	0.00100	0.0050
	St Dev.	0.61	24	12	3.4	18.2	0.019	0.035	0.068	0.005	0.0015	0.0073	0.1091	0.00021	0.00026	0.0015	0.00005	0.00219	0.000198	0.00055	0.240	0.00018	0.000030	0.00040	0.00004	0.01614	0.00075	0.000019	0.00121	0.00030	0.0033
	N	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	9	16	16	16	16	16	16	16	16
	75th %	7.61	113	49	13	14.4	0.050	0.100	0.100	0.020	0.0050	0.0250	0.2490	0.0005	0.001	0.0107	0.00010	0.00500	0.000500	0.001518	0.4305	0.00050	0.0001	0.00100	0.00100	0.04528	0.00200	0.0000500	0.000208	0.00100	0.0050
SW18	28-Dec-10	7.65	349	190	21.3	<1	<0.05	<0.1	<0.1	<0.01	<0.005	0.01	0.036	<0.0005	<0.001	<0.01	<0.0001	<0.005	<0.0005	<0.001	0.16	<0.0005	<0.0001	<0.001	0.001	0.023	<0.002	<0.00005	0.0004	<0.001	<0.005
	26-Jan-11	7.53	381	200	20	2	<0.05	<0.1	<0.1	<0.01	<0.005	0.013	0.033	<0.0005	<0.001	<0.01	<0.0001	<0.005	0.0006	<0.001	0.41	<0.0005	<0.0001	<0.001	0.002	0.04	<0.002	<0.00005	0.0004	<0.001	<0.005
	22-Feb-11	7.69	527	290	19.1	6	0.3	<0.1	<0.1	<0.01	<0.005	<0.005	0.100	<0.0005	0.001	<0.01	<0.0001	<0.005	0.0044	<0.001	11	<0.0005	<0.0001	<0.001	0.002	0.14	<0.002	<0.00005	0.0004	<0.001	<0.005
	29-Mar-11	7.63	372	210	18.2	5	<0.05	<0.1	<0.1	<0.01	<0.005	0.013	0.35	<0.0005	<0.001	0.011	<0.0001	<0.005	<0.0005	0.003	0.68	<0.0005	<0.0001	<0.001	0.002	0.082	<0.002	<0.00005	0.0024	0.001	0.009
	2-May-11	7.72	188	100	19.5	<1	<0.05	<0.1	<0.1	<0.01	<0.005	0.018	0.22	<0.0005	<0.001	0.011	<0.0001	<0.005	<0.0005	0.002	0.19	<0.0005	<0.0001	<0.001	0.001	0.028	<0.002	<0.00005	0.0005	<0.001	<0.005
	1-Jun-11	7.91	236	120	22.4	<1	<0.05	<0.1	<0.1	<0.01	<0.005	0.006	0.027	<0.0005	<0.001	0.013	<0.0001	<0.005	<0.0005	<0.001	0.11	<0.0005	0.0001	<0.001	0.002	0.031	<0.002	<0.00005	0.0002	<0.001	<0.005
	13-Jul-11	7.73	385	200	23	11	<0.05	<0.1	<0.1	<0.01	<0.005	0.007	0.016	<0.0005	0.003	0.017	<0.0001	<0.005	0.0036	<0.001	2.9	<0.0005	<0.0001	<0.001	0.002	0.17	<0.002	<0.00005	0.0001	<0.001	<0.005
	4-Aug-11	7.61	405	200	9.3	8	<0.05	0.1	<0.1	<0.01	<0.005	<0.005	0.055	<0.0005	0.002	0.017	<0.0001	<0.005	0.0026	<0.001	2.4	<0.0005	<0.0001	<0.001	0.002	0.12	<0.002	<0.00005	0.0001	<0.001	<0.005
	15-Sep-11	7.93	530	309	18.8	5.2	0.033	0.105	<0.030	<0.020	<0.0020	<0.0030	0.0820	0.000097	0.00190	0.0242	<0.0000050	0.00054	0.000569	0.00068	1.340	0.000145	<0.000010	0.001600	0.00265	0.0683	<0.00020	0.0000026	0.00118	0.00089	<0.0030
	12-Oct-2011	7.66	533	302	14.7	7.2	0.021	0.053	<0.030	<0.020	<0.0020	0.0028	0.121	0.000118	0.00137	0.0173	<0.0000090	<0.00090	0.000775	<0.00070	1.04	0.000146	-	0.000662	0.0022	0.0705	<0.0020	<0.0000040	0.000934	0.000736	<0.0030
	16-Nov-2011	7.53	461	257	14.1	10	0.04	0.058	<0.030	<0.020	<0.0020	<0.0010	0.100	0.000054	0.000843	0.0127	0.0000129	<0.00090	0.00107	<0.00070	1.26	0.000105	-	0.000321	0.0014	0.112	<0.0020	<0.0000040	0.00133	0.000634	<0.0030
	14-Dec-2011	7.12	639	370	13.6	87.8	0.123	0.13	<0.030	<0.020	<0.0020	0.0014	0.939	0.000063	0.00332	0.0185	0.0000248	0.00225	0.00403	0.00166	14.9	0.000656	-	0.000425	0.005	0.445	<0.0020	0.0000086	0.000588	0.0035	0.0106
	10-Jan-2012	7.44	673	404	17.7	87.2	0.338	<0.030	<0.030	<0.020	<0.0020	<0.030	0.252	<0.00010	0.00335	0.0205	<0.000010	<0.00050	0.00311	<0.00070	35.6	0.0002	-	0.00049	0.0027	0.921	<0.00050	<0.000030	0.000269	0.00186	0.0045
	15-Feb-2012	7.39	1030	653	25.6	225	3.81	<0.030	<0.030	<0.020	<0.0020	<0.030	1.47	<0.00010	0.00544	0.0275	0.000023	0.00268	0.00543	0.00233	56.6	0.00085	-	0.00071	0.0054	1.23	<0.00050	<0.000030	0.000475	0.00464	0.0121
	20-Mar-2012	7.27	167	72.3	14.6	3.2	<0.020	<0.030	0.301	<0.020	<0.0020	0.016	0.0327	<0.00010	0.00051	0.0175	0.000018	<0.00050	0.000096	0.00119	0.125	<0.00010	-	0.00073	<0.0010	0.0853	<0.00050	<0.000030	0.00015	0.00075	0.0021
	19-Apr-2012	7.44	218	109	19.4	3.3	<0.020	0.045	<0.030	<0.020	<0.0020	0.01	0.0251	<0.00010	0.00055	0.0128	<0.000010	<0.00050	0.000075	0.00122	0.078	<0.00010	-	0.00054	0.0014	0.0133	<0.00050	<0.000030	0.000191	0.00065	0.0029
	Min	7.12	167	72	9.3	1.0	0.020	0.030	0.030	0.010	0.0020	0.0010	0.0160	0.00005	0.00051	0.0100	0.000005	0.00050	0.000075	0.00068	0.078	0.00010	0.0000	0.00032	0.00100	0.01330	0.00020	0.000003	0.00010	0.00063	0.0021
	Max	7.93	1030	653	25.6	225.0	3.810	0.130	0.301	0.020	0.0050	0.0300	1.4700	0.00050	0.00544	0.0275	0.00010	0.00500	0.005430	0.00300	56.600	0.00085	0.0001	0.00160	0.00540	1.23000	0.00200	0.000050	0.00240	0.00464	0.0121
	Median	7.62	395	205	19.0	5.6	0.050	0.100	0.100	0.015	0.0035	0.0085	0.0910	0.00031	0.00100	0.0150	0.00006	0.00384	0.000688	0.00100	1.150	0.00050	0.0001	0.00100	0.00200	0.08365	0.00200	0.000040	0.00040	0.00100	0.0050
	St Dev.	0.21	219	144	4.1	59.4	0.937	0.033	0.068	0.005	0.0015	0.0091	0.3997	0.00021	0.00136	0.0053	0.00004	0.00210	0.001783	0.00066	15.909	0.00023	0.000030	0.00032	0.00127	0.35228	0.00075	0.000019	0.00061	0.00111	0.0028
	N	16	16	16	16.0	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	9	16	16	16	16	16	16	16	16
	75th %	7.70	531	304	20.3	10.3	0.068	0.100	0.100	0.020	0.0050	0.0138	0.2280	0.0005	0.00225	0.0178	0.00010	0.00500	0.003233	0.001330	4.925	0.00050	0.0001	0.00100	0.00231	0.14750	0.00200	0.0000500	0.000675	0.00100	0.0050

Notes:

PWQO Provincial Water Quality Objectives, taken from "Policies, Guidelines, Provincial Water Quality Objectives ("PWQO") of the Ministry of Environment and Energy," July, 1994; Table 2; Table of PWQOs and Interim PWQOs ("IPWQO"). IPWQOs denoted by superscript "i". Station locations shown in Appendix H.

CEQG Canadian Environmental Quality Guidelines ("CEQG") from the Canadian Council of Ministers of the Environment, Summary Table: "Canadian Water Quality Guidelines for the Protection of Aquatic Life" Summary Table Accessed Online @ http://st-ts.ccme.ca/, November 15, 2011.

100 indicates exceedance of an interim PWQO.

100 indicates exceedance of the PWQO.

100 indicates exceedance of the CEQG.

100 indicates exceedance of both the PWQO and CEQG.

Others RDL - Reportable Detection Limit; Min - minimum; Max - maximum; St Dev. - Standard Deviation; N - number of samples; 75th % - 75th percentile

* indicates more than one RDL value.

i indicates values is an Interim PWQO.

A PWQO/CCME for free cyanide is 0.005 mg/L.

B PWQO is for total aluminum measured in a clay-free sample; analyzed samples are not clay-free.

C CCME for aluminum where pH is ≥6.5.

D CCME for cadmium = $10^{0.86[\log10(\text{hardness})]-3.2}$ µg/L.

E PWQO/CCME for hexavalent chromium is 1 µg/L. PWQO/CCME for trivalent chromium is 8.9 µg/L; total chromium reported.

F PWQO for copper is 5 µg/L; IPWQO is 5 µg/L where hardness is >20 mg/L.

G CCME for copper = $e^{0.8545[\ln(\text{hardness})]-1.465}$ + 0.2µg/L; Minimum of 2 µg/L.

H PWQO for lead is 20 µg/L where alkalinity is 40-80 mg/L and 25 µg/L where alkalinity is >80 mg/L; IPWQO is 3 µg/L where alkalinity is 30-80 mg/L and 5 µg/L where alkalinity is >80 mg/L.

I CCME for lead = $e^{1.273[\ln(\text{hardness})]-4.705}$; Minimum of 1 µg/L.

J CCME for nickel is a minimum of 25 µg/L regardless of water hardness.