newgold™ Rainy River Project

RAINY RIVER PROJECT

ENVIRONMENTAL ASSESSMENT COMPLIANCE REPORT FOR 2015

PER FEDERAL ENVIRONMENTAL ASSESSMENT
DECISION STATEMENT CONDITION 2.3

VERSION 1
Revision 2

Date	Revision #	Revision(s)	Originator
March 31, 2016	Version 1	Issued to NG	SD, AMEC Foster Wheeler
August 18, 2016	Revision 1 Draft	Issued to EC	DM, New Gold
August 30, 2016	Revision 2	Issued to EC	DM, New Gold

newgold™ Rainy River Project

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newgold™ Rainy River Project

August 30, 2016

Magali Francoeur
Canadian Environmental Assessment Agency
160 Elgin St., 22nd Floor
Ottawa, ON
K1A 0H3

Subject: Re: Annual Reporting Review New Gold Rainy River Project

Dear Ms. Francoeur,

In response to your letter dated July 19, 2016, regarding Annual Reporting Review, a copy of the revised 2015 Annual Report is attached for your review.

The Guidance to Proponent Decision Statement Reporting and Notification Requirements for the Rainy River Project was followed in the preparation of this report. We acknowledge the omissions cited in the 2015 Annual Report as per your letter and hope that the revised information provided will meet the CEAA Annual Reporting requirements.

Please review and forward any comments to Cailey Anderson (Cailey.Anderson@newgold.com) and Stacey Jack (Stacey.Jack@newgold.com).

Regards,
<Original signed by>

Darrell Martindale
Environmental Manager

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1.0 PROJECT UPDATE

New Gold Inc. (New Gold) is currently constructing the Rainy River Project (RRP), and plans to operate and eventually reclaim this new open pit and underground gold mine. Physical works related to the RRP will consist primarily of:

- Open pit;
- Underground mine;
- Overburden, mine rock and low grade ore stockpiles;
- Primary crusher and process plant;
- Tailings management area;
- 230 kilovolt transmission line;
- Relocation of a portion of gravel-surfaced Highway 600; and
- Associated buildings, facilities and infrastructure, supported by related piping and power infrastructure as needed.

Construction of the RRP began in late spring 2015 after the Environmental Assessment (EA) process was complete, the Closure Plan was filed and environmental approvals necessary for the work proposed were obtained.

The subsections that follow provide an overview of the activities conducted onsite during 2015. Photographs are provided in Appendix A.

1.1 Construction

- Overall construction progress was 21%.

- Site earthworks (New Gold work package CC003) progressed to 86% complete by year end.

- Concrete placement was on target at 42% complete versus a plan of 43%. Lean mix placed to date is 5,273 m^3 and structural concrete placed to date is 8,648 m^3. Approximately one-third (22 of 72) of the precast footings have now been placed in the process building.

- Structural steel erection was completed to Gridline 23 with one truss and the end wall remaining to complete the main structural shell of the building. Cladding commenced on the north east side of the grinding building at year end. Overall completion was 13%.

- Pinewood River pipeline progressed to 18%. Fusing of pipe was substantially complete by year end. Started digging trench to bury pipeline on the Highway 600 right of way.

- Earthworks progressed on various elements of the permanent water management infrastructure at the RRP site during 2015, with Berm 2 of the Water Management Pond nearing completion at year end. The status of the Earthworks Packages was as follows:

    - CC116-1 east earthworks 30% complete (Clark Creek Dam, Teeple Road Dam, Interim Mine Rock Pond and Mine Rock Pond);
    - CC116-2 north earthworks 67% complete (West Creek Pond Dam, West Creek Diversion Channel); and
    - CC116-3 west earthworks phase 1 and 2, 47% complete (Water Management Pond Dam and West Tailings Management Area).

- Highway 600 and the East Access Road were both opened to traffic in late December. Final surfacing, drainage works and site clean-up to be completed in 2016.

1.2 Operations

- Assembly of initial mine fleet largely complete.

- Exceeded target for mine development material movement by 15% in the fourth quarter of 2015.

- Employee transportation plan developed.

- Temporary assay lab established.

- Warehouse established.

1.3 Health and Safety

- No Lost Time Incidents in 2015.

- 1,265,699 hours worked on the project in 2015.

- Provided Site Health, Safety and Environmental Orientation for more than 2,500 people.

- Initiated Joint Health and Safety Committees for RRP Construction and RRP Operations.

- Began forming and developing the Emergency Response Site Team including regular training and drills.

- Ongoing proactive health and safety measures include: crew talks, field level risk assessments, and safe act observations and interactions.

- Developed critical task procedures (such as for: confined space, working at heights and working under power lines).

1.4 Community

- Extensive community engagement activities with neighbors, Aboriginal partners, municipalities and various interested members of the public.
- 17 career fairs held in Aboriginal and non-Aboriginal communities.
- Public presentations at various venues including: Women in Mining Symposium in Fort Frances, the Fort Frances Chamber of Commerce and Rainy River District Municipal Association.
- Spring, Summer and Fall newsletters distributed throughout the entire Rainy River District and parts of the Kenora District.
- Neighbours visits, tour and meeting.
- Numerous visits to Aboriginal Communities.
- Site tours provided to the Elders and community members of Naicatchewenin, Rainy River and Big Grassy First Nations.
- New Gold is proud to have graduated 11 surface miners from our first training program; Surface Miner Aboriginal Trainee. These graduates come from three local aboriginal communities and had no previous experience in mining.
- Four on-site public ceremonies held in Spring, before clearing activities commenced, before first blast at site and Fall.
- Ground-breaking ceremony and reception with invited guests.
- Mining Matters Program delivered in three local schools in Naotkamegwanning First Nation, Fort Frances High School and Sturgeon Creek Elementary School in Chapple.
- Impact and Benefits Agreement completed with Big Grassy First Nation (January 2015).
- On-going discussions with other First Nation communities including Naotkamegwanning, Ojibways of Onigaming, Big Island and Northwest Angle #37.

New Gold continues to track consultation and engagement activities on an ongoing basis.

1.5 Human Resources

- 165 New Gold team members employed at the RRP in a range of positions, including: surface miners, environmental technicians, heavy equipment operators and miscellaneous support functions. The majority of the team are from the local area.

- 500+ construction team members on site at the end of 2015 working for the numerous contractors who are helping to build the RRP.

- Implementation on an online e-recruit program

- Partnered with various local agencies and institutions to support local training and hiring.

- With Aboriginal partners, developed and implemented an Anishinaabe Engagement (cultural awareness) program for all New Gold employees and all on-site contractors.

2.0 REGULATORY UPDATE

Rainy River Resources Ltd., predecessor to New Gold, submitted a Project Description to the Canadian Environmental Assessment Agency (CEA Agency) pursuant to the *Canadian Environmental Assessment Act, 2012*, that was approved on August 31, 2012. On December 18, 2012, Rainy River Resources was informed that a Standard Assessment would be required for the RRP and final Environmental Impact Statement Guidelines were issued by the CEA Agency. In parallel, Rainy River Resources volunteered to be subject to an individual EA for the RRP under the Ontario *Environmental Assessment Act*. The Proposed Terms of Reference as amended, was approved by the Ontario Minister of the Environment on May 15, 2013.

On January 17, 2014, New Gold submitted documentation intended to fulfill the EA requirements as defined by the Provincially-approved Terms of Reference and Federal Environmental Impact Statement Guidelines:

> *Rainy River Project, Township of Chapple, Final Environmental Assessment Report (Environmental Impact Statement), Version 2*. Prepared for Rainy River Resources Ltd. by AMEC Environment & Infrastructure.

A positive Federal EA Decision Statement was issued on January 12, 2015 and a favourable Provincial EA Notice of Approval was released on January 29, 2015.

A number of environmental approval applications were submitted in advance of completion of the EA process. After EA approval and on completion of the necessary regulatory review and consultation, the initial environmental approvals required to start construction were issued (or filed in the case of the Closure Plan) by the regulatory authorities.

Table 1 provides a summary of the environmental approvals related to the RRP received by New Gold during 2015.

Table 1: Environmental Approvals Received during 2015

Agency	Type	Number	Description	Comments
Ontario Ministry of Environment and Climate Change	Permit to Take Water	8776-9W2QN3	Pinewood River	
		7631-9VULMS	Mine Dewatering	
		3638-9VTNRM	Tait Quarry	
		2133-9VUPVZ	Construction Minor Takings	
		1386-9VTP2H	Aggregate Sources (OC3, OC4, Roen)	
		0040-9VUL6B	Tailings Management Area Construction	
	Environmental Compliance Approval	5781-9VJQ2J	Construction Phase / Tait Quarry	
		5178-9TUPD9	Industrial Sewage	
		8567-9ZXG8U	Air / Noise	Superseded
		0412-A2LR4V	Air / Noise	Amended
Ontario Ministry of Natural Resources and Forestry	Work Permit / Letter of Authority (*Lakes and Rivers Improvement Act* / *Public Lands Act*)	FF-2015-01	Culverts C2, C6, C8	
		FF-2015-02	West Creek Diversion	
		FF-2015-03	Clark Creek Diversion	
		FF-2015-04	TMA	
		FF-2015-05	Mine Rock Pond	
		FF-2015-07	Pinewood River Intake / Outfall	
		FF-2015-08	Culvert C15	
		FF-11-2015/16	Highway 600 Crossing	
		FF2-2015/16	East Access Road Construction	
		FF6-2016/2016	East Access Road Construction (amendment)	
		FF-11-2015/16	Pinewood River - bridge crossing	
	Endangered Species Act Permit	FF-C-001-14	Permit Under 17(2)(c) (Note: issued during 2014)	
	Aggregate Resources Licence	625851	Tait Quarry	

Ontario Ministry of Natural Resources and Forestry	Forestry Resource Licence	553212, 553213, 553214, 553223, 553224, 553225, 553226, 553227, 553271, 553272	Crown forest resources	
		553037, 553038, 553039	Crown forest resources	Expired March 31, 2015
	Licence to Harvest	B12011, B12013, B12014, B12032, B12033, B12039, B12040, B12052, B12053	Licence to Harvest on Private Land	
		B12008, B12009	Licence to Harvest on Private Land	Expired March 31, 2015
	Authority to Haul	216310, 216366, 216367, 216822, 216823, 216833, 216836, 216838, 216882, 216883, 216884, 216885, 216886, 217018, 217019, 217020, 217021	Authority to Haul	
		216269, 216277, 216278, 216279, 216280	Authority to Haul	Expired March 31, 2015
	Land Use Permit	1134-1003161, 1134-1003162, 1134-1003167	Land Use Permit - Wood Storage	
		1134-1003160, 1134-1003163, 1134-1003164	Land Use Permit - Wood Storage	Expired March 31, 2015
	Other Permits	1079341	Fish Collection Permit - Culvert C3, C7, C8	
		1080070	Fish Collection Permit - Fish Salvage	
		2015-764 / 1081093	Authorization for wildlife interference	
		1079145	Authorization for wildlife interference	
		1081168	Wildlife Scientific Collectors Authorization - Turtle Relocation	

Ontario Ministry of Northern Development and Mines	Closure Plan	-	Filed by Ministry of Northern Development and Mines (February 23, 2015)	
Ontario Ministry of Transportation	Entrance Permit	13+ approvals		
	Encroachment Permit	14+ approvals		
	Land Use	11+ approvals		
Fisheries and Oceans Canada	Authorization	15-HCAA-00039	Section 35(2)	
	Letter of Advice	KE-12-0963	Road Crossings	
Transport Canada	Letter	15-0045	Linear Structure	No objection from NavCan
	Letter	15-0046	Blasting Zone	No objection from NavCan
	Clearance	ATS-15-16-00026521	Transmission Line - Aeronautic Obstruction Clearance	No lighting or marking required

3.0 ANNUAL EA COMPLIANCE REPORT REQUIREMENTS

3.1 Regulatory Background

Condition 2.3 of the Federal EA Decision Statement required that:

- *The Proponent shall submit to the Agency an annual report on the implementation of the conditions set out in this Decision Statement with a supporting analysis for each of the conditions for the preceding calendar year on or before March 31, starting from the commencement of any activities in connection with the carrying out of the Designated Project. Each annual report shall describe how the Proponent has considered and incorporated the factors outlined in condition 2.1 in the implementation of the conditions set out in this Decision Statement.*

Condition 2.5 requires that the report be available on the Proponent website within 30 days of submission to the CEA Agency. This posting will be completed by April 30, 2016.

Condition 6 of the Provincial Notice of Approval also indicated a requirement for an annual EA compliance report:

- *Condition 6.1: The Proponent shall prepare an annual Compliance Report which describes its compliance with the conditions of approval set out in this Notice of Approval, and which describes the results of the Proponent's Environmental Assessment Compliance Monitoring Program required by Condition 5 of this Notice of Approval.*

- *Condition 6.2: The first annual Compliance Report shall be submitted to the Director, for the public record, within one year from the Start of Construction and shall cover all activities of the previous 12 month period.*

Per an e-mail communication between Mr. Kyle Stanfield, New Gold and Ms Sasha McLeod of the Ministry of Environment and Climate Change on March 2, 2015, the timing of the Provincial EA Compliance Report was aligned with the Federal requirement, and will be due on March 31st each year.

This report is intended to meet the Federal annual EA compliance report requirements.

3.2 Report Content Requirements

In accordance with the Federal EA Decision Statement this Annual EA Compliance Report contains the following:

- Guidance to the Proponent Decision Statement Reporting and Notification Requirements Rainy River Project

The Federal Decision Statement included a number of conditions that were to be tracked to completion. The excel spreadsheet provided – Guidance to Proponents – Reporting Requirements for a Decision Statement – Rainy River is attached in Appendix B. This spreadsheet provides the status and supporting analysis in the form of a description of the activities for each condition as well as supporting documentation for validation in the attached Appendices. It demonstrates how the first year of the construction phase met the conditions of the Decision Statement, recognizing that 2015 was not a full year of activities.

APPENDIX A

PHOTOGRAPHS

APPENDIX A: 2015 PHOTOGRAPHS

Construction meeting (March 13, 2015):

Silt fence installation (April 16, 2015):

Open pit development (December 4, 2015):

Batch plant (July 2015):

Outcrop 3 Quarry (July 2015):

Plant site (October 24, 2015):

Pinewood River crossing (October 24, 2015):

Plant site (October 24, 2015):

Plant site (November 25, 2015):

Plant site (November 23, 2015):

Smudging Agreement (January 9, 2015):

Elders tour of fish relocation (June 30, 2015):

Couchiching Youth Forum (February 3, 2015):

Surface Mine Aboriginal Trainee (September 9, 2015):

Ceremony Offering (October 6, 2015):

Women in Mining (May 6, 2015):

Archaeology Day (August 24, 2015):

APPENDIX B

GUIDANCE TO PROPONENT DECISION STATEMENT REPORTING AND NOTIFICATION REQUIREMENTS RAINY RIVER PROJECT
ANNEX 1

Project Name: Rainy River Project
Proponent: New Gold Inc.
Decision Statement Issued: 1/12/2015
CEARIS Ref. Number: 80007
Reporting Period: 2015

Condition 2 - General Conditions

Condition 2.1
The Proponent shall, throughout all phases of the Designated Project, inform its actions in meeting the conditions set in this Decision Statement by the best available information and knowledge, based on validated methods and models, undertaken by qualified individuals and apply the best available economically and technologically feasible mitigation measures.
Status: Ongoing
Supporting Analysis:

Completed to date. The first year of construction was primarily associated with site development and was directed by the submitted EA and environmental approval applications, all of which were reviewed and approved by the applicable Regulatory Authorities.

Condition 2.2
Where consultation is a requirement of the conditions set out in this Decision Statement, the Proponent shall first consult Aboriginal groups on the most appropriate manner in which to engage in consultation with them.
Status: Ongoing
Supporting Analysis:

Consultation and engagement methods were significant discussion items throughout the EA process; processes and direction provided by communities on consultation and engagement continued through 2015.

Condition 2.3
The Proponent shall submit to the Agency an annual report on the implementation of the conditions set out in this Decision Statement with a supporting analysis for each of the conditions for the preceding calendar year on or before March 31, starting from the commencement of any activities in connection with the carrying out of the Designated Project. Each annual report shall describe how the Proponent has considered and incorporated the factors outlined in condition 2.1 in the implementation of the conditions set out in this Decision Statement.
Status: Completed
Supporting Analysis:

This table forms part of the Annual Compliance Report for 2015.

Condition 2.4

The Proponent shall, in consideration of the annual report for condition 2.3, provide documentation to the Agency indicating the results of any monitoring for conditions 3.8, 4.6, 5.2, 5.3, 5.4, 6.4, and 8.4. The documentation shall demonstrate whether the mitigation measures have proven effective and whether the predictions made during the environmental assessment were accurate. The documentation shall also detail any corrective actions taken by the Proponent should the mitigation measures prove not to be effective.

Status: Ongoing

Supporting Analysis:

2015 was only a partial year of construction. Therefore, some of the monitoring was not yet necessary. For the monitoring work that was done (3.8.2, 3.8.4, 4.6, 5.2, 5.4, and 8.4), their detail and results are provided in the individual sections.

Condition 2.5

The Proponent shall make the report and documentation referred to in conditions 2.3 and 2.4 available on its website no later than 30 days after submission to the Agency.

Status: Completed

Supporting Analysis:

This table forms part of the first annual report. It will be made available as required.
NOTE FOR CEAA: We will be all supporting documentation on the website once the submission is final.

Project Name: Rainy River Project
Proponent: New Gold Inc.
Decision Statement Issued: 1/12/2015
CEARIS Ref. Number: 80007
Reporting Period: 2015

Condition 3- Fish and fish habitat

Condition 3.1

The Proponent shall minimize changes caused by the Designated Project to water levels and water flows in the Pinewood River, the Minor Creek System, and the Modified Minor Creek System in such a way as to protect fish and fish habitat, by implementing mitigation measures including, but not limited to:

Status: Ongoing
Supporting Analysis:

Refer to supporting analysis 3.1.1 to 3.1.4

Condition 3.1.1

recycling of water, for ore processing, from the tailings management area and ponds constructed for water management;
Status: Not applicable at this time
Supporting Analysis:

There have been no significant Project - related changes in 2015. Since the project is partially constructed there was no processing use or recycling of water during 2015. Construction of portions of the Tailings Management Facility and Water Management Pond were initiated but not completed in 2015. New Gold has obtained all applicable Permits to Take Water from the Ministry of Environment and Climate Change (MOECC) which regulate the volume of water that can be taken from the Pinewood River System and supporting tributaries. This condition will come into effect during 2017.

Condition 3.1.2

optimizing the timing, position and quantity of final effluent discharge between the final effluent discharge points;
Status: Ongoing
Supporting Analysis:

There have been no significant Project-related changes, as 2015 included only a partial year of construction and changes to watershed areas/capture of watershed areas during the year were negligible. There were no significant effluent discharges from the site during 2015 related to ore processing and tailings. During the planning and permitting stages of the project New Gold has received a number of Permits to Take Water from the Ministry of Environment and Climate Change which regulate the volume of water the project is permitted to take and to discharge including effluent from temporary sediment ponds. All discharge points have been obtained through the Environment Canada Metal Mining Effluent Notification Process. For detailed information on the location of the effluent discharge points being utilized in 2015 refer to the map 'Sediment Ponds and Seepage Collection' in Appendix C of this report.

Condition 3.1.3

filling the open pit during the decommissioning and abandonment phases in a manner which meets the flow requirements in the Pinewood River while allowing the pit to be filled as expeditiously as possible to reduce any adverse environmental effects
Status: Not applicable at this time
Supporting Analysis:

This condition will come into effect during pit closure planned for 2031

Condition 3.1.4
not taking water from the Pinewood River when flows are below the minimum threshold set by Ontario.
Status: Not applicable at this time
Supporting Analysis:

There were no direct takings from the Pinewood River during 2015. Water taking from the Pinewood River is anticipated during mid 2016.

Condition 3.2
The Proponent shall, for all effluent, comply with the Metal Mining Effluent Regulations, the Fisheries Act and any site-specific water quality requirements set by Ontario. To ensure compliance, the Proponent shall implement, at a minimum, the following mitigation measures:
Status: Ongoing
Supporting Analysis:

Refer to supporting analysis 3.2.1 to 3.2.5

Condition 3.2.1
treat effluent prior to discharge to the environment;
Status: Ongoing
Supporting Analysis:

During 2015 effluent discharges to the environment as defined by the Metal Mining Effluent Regulation (MMER) were related to temporary construction seepage ponds on the Plant Site. Effluent was generated from storm water runoff and contact water associated with blasting bedrock for the development of infrastructure foundations and treatment consisted of flocculent addition to reduce total suspended solids and dry ice to reduce ammonia levels. All water was treated and tested in accordance with applicable permits and legislation from Environment Canada (EC), Ministry of Environment and Climate Change (MOECC) and Fisheries and Oceans Canada (DFO). During the 2015 construction period there were 10 effluent discharges from construction dewatering sediment ponds designed to capture contact water and provide adequate treatment for Total Suspended Solids (TSS) and Ammonia prior to discharge to the environment. These discharges occurred between September and December. All discharge water met the water quality objectives outlined in the Environment Canada Metal Mining Effluent Regulation and the Ministry of Environment and Climate Change (MOECC) Construction Environmental Compliance Approval. The daily maximum discharge of TSS is 30mg/L and on November 5, 2015 there was one exceedance of TSS from the Plant Site Sediment Pond at 63mg/L. This discharge location is to a rock splash pad in a vegetated area where water then flows into a tributary that feeds the West Creek prior to entering the Pinewood River. No sediment from the discharge entered the West Creek or Pinewood River Systems. Further investigation into the cause of the TSS spike indicated that sampling error occurred while taking the water sample. Additional information related to all ten of the discharges including water quality results and discharge locations can be found in the 2015 New Gold Rainy River Effluent Sampling and Discharge Results included in Appendix C of this document. In 2017 tailings from ore reclaiming will be treated in the Tailings Management Facility. Water quality objectives and sampling requirements for the Rainy River Project are outlined in the MMER and the MOECC Environmental Compliance Approvals for Construction and Operations. Additional information related to surface water sampling and effluent treatment sampling and discharge can be found in Appendix C.

Condition 3.2.2
treat tailings slurry to break down cyanide and precipitate heavy metals;
Status: Not applicable at this time
Supporting Analysis:

This condition is not applicable to the current construction phase of the project. During 2017 tailings will be generated and treated in accordance with the Metal Mining Effluent Regulation and the Environmental Compliance Approval for the Rainy River Project.

Condition 3.2.3

collect site contact water and seepage in ditches and divert to either the tailings management area or water management facilities for release via final discharge points;

Status: Ongoing

Supporting Analysis:

Site contact water generated from blasting and construction activities is collected in a temporary water management facility on the Plant Site where it is treated, sampled and discharged in accordance with approvals and legislation from Environment Canada, Department of Fisheries and Oceans and the Ministry of Environment and Climate Change. During 2016 as the project advances in construction phase several temporary water management facilities are designed for the Open Pit and overburden stockpiles until the completion of permanent water and tailings management facilities in 2016 and 2017. For detailed information regarding the location of construction phase water management facilities please refer to the map "Sediment Ponds and Seepage Collection Systems" in Appendix C.

Condition 3.2.4

install and operate a water quality control structure in the constructed wetland to prevent the release of final effluent discharge not compliant with the Regulations or requirements; and

Status: Not applicable at this time

Supporting Analysis:

This condition is not applicable to the current construction phase. Construction of the constructed wetland is scheduled for late 2016 and will include a water quality control structure.

Condition 3.2.5

install secondary containment on pipelines that cross the West Creek Diversion Channel to prevent accidental discharge of

Status: Not applicable at this time

Supporting Analysis:

Pipelines and secondary containments have been designed and will be installed in 2016.

Condition 3.3

The Proponent shall control acid rock drainage and metal leaching so that all effluent and passive outflow from the Project Site comply with the Metal Mining Effluent Regulations, any site-specific water quality requirements set by Ontario, and the Fisheries Act, as applicable at any time. To ensure compliance, the Proponent shall implement, at a minimum, the following mitigation measures:

Status: Ongoing

Supporting Analysis:

Refer to supporting analysis 3.3.1 to 3.3.8

Condition 3.3.1

line the former Clark Creek channel (under the east mine rock stockpile) with non-potentially acid generating material;

Status: Not applicable at this time

Supporting Analysis:

During 2015 the East Mine Rock Stockpile had not been developed. In late 2016 non acid generating rock will be used to line the former Clark Creek Channel as per the commitment.

Condition 3.3.2

sort waste rock into potentially acid generating and non-potentially acid generating rock stockpiles through the development and implementation of a detailed mine rock segregation program using criteria for determining potentially acid generating material set by Ontario;

Status: Ongoing

Supporting Analysis:

Blasting and rock excavation from the Rainy River Open pit Mine began in October 2015 and is expected to continue through 2016. Construction activities and infrastructure development require and consume the Non-acid Generating (NAG) waste rock we produce and therefore no stockpile for NAG rock was started in 2015. PAG Rock has been avoided for the most part. During this early stage, blasting patterns were drilled on a smaller pattern (6 x 7 x 10m grids) than proposed in Waste Rock management plan. Representative samples were taken on each drill hole to establish what would eventually become a representative dataset. Blasted material was held in the pit until Leco carbon and Sulphur results were processed for material evaluation. New Gold made the decision to manage material movement on a 2 NPR threshold, instead of the 1.65 NPR threshold submitted for permitting to add an extra level of safety until the metal leaching and acid generating potential of the rock could be well understood. All material leaving the open pit has placement data associated with it as per regulations. Additional testing and evaluation of the waste rock program is expected in 2016 as the mine rock dataset now exceeds the 366 samples the waste rock program was initially developed upon.

Condition 3.3.3

design and construct the perimeter ditching around the east mine rock stockpile and low grade ore stockpile to accommodate a 100-year flood event;

Status: Not applicable at this time

Supporting Analysis:

During 2015 a minimal amount of overburden removed from construction of foundations on the plant site was placed in the west portion of the east mine rock stockpile and temporary perimeter ditching and settling pond were constructed to capture runoff. All water is treated in accordance with the Construction Environmental Compliance Approval issued by Ministry of Environment and Climate Change as well as regulations under the Metal Mining Effluent Regulation. Water is discharged to an approved Environment Canada discharge location which drains into Clark Creek, however in 2015 there wasn't a need to discharge water. The perimeter ditching is planned for 2016 as material is extracted from the open pit.

Condition 3.3.4

use potentially acid generating material only for the purpose of constructing the tailing management dam, where saturated conditions can be maintained. Potentially acid generating material must not be used for any other construction purpose;

Status: Not applicable at this time

Supporting Analysis:

In 2015, no work allowing the use of PAG rock was done on the Tailings Management Pond. All waste rock has been characterized for it's NAG and PAG characteristics and it's placement during construction has been documented.

Condition 3.3.5
place an engineered cover over the east mine rock stockpile and any remaining ore stockpiles at or before the decommissioning phase. The cover should be designed to prevent infiltration of water and to limit infiltration of air during the decommissioning and abandonment phases;
Status: Not applicable at this time
Supporting Analysis:

Work to be completed in accordance with this condition at mine closure

Condition 3.3.6
cover the tailings with water and maintain the tailings in a perpetually saturated state during the decommissioning and abandonment phases;
Status: Not applicable at this time
Supporting Analysis:

This condition is not relevant to this phase of the project and will be implemented at mine closure

Condition 3.3.7
fill the open pit, in accordance with condition 3.1.3 and 3.1.4, as rapidly as practicable during the decommissioning and abandonment phases, using all available means, including directing drainage from the east mine rock stockpile into the pit; and
Status: Not applicable at this time
Supporting Analysis:

This condition is not relevant to this phase of the project. Open pit decommissioning is currently planned for 2031.

Condition 3.3.8
control water quality in the open pit lake during the abandonment phase.
Status: Not applicable at this time
Supporting Analysis:

This condition is not relevant to the construction phase and will be implemented during open pit decommissioning.

Condition 3.4
The Proponent shall design and construct new road watercourse crossings for the realignment of Highway 600 to allow for fish passage in accordance with the Environmental Guide for Fish and Fish Habitat.
Status: Completed
Supporting Analysis:

During the realignment of Highway 600 there was one water crossing required in a fish baring watercourse located at the Pinewood River. In the Fall of 2015 a clear span bridge was installed over the Pinewood River. There was no in water work required for the installation therefore no alterations to the original river channel that would impact or alter fish habitat or passage.

Condition 3.5

The Proponent shall design and construct new road watercourse crossings for the realignment of Highway 600 to meet the Highway Drainage Design Standards of the Ministry of Transportation of Ontario.

Status: Completed

Supporting Analysis:

During the design phase of the Highway 600 realignment routine meetings were held between New Gold (formally Rainy River Resources) and the Ministry of Transportation of Ontario (MTO). The road and its associated crossings have been designed and constructed to meet MTO standards and was completed under the MTO Construction Administration and Inspection Task Manual (CAITM) protocol. Highway 600 will be turned over to the MTO in 2016.

Condition 3.6

The Proponent shall design and construct water intakes meeting standards set out in the Freshwater Intake End-of-Pipe Fish Screen Guideline of the Department of Fisheries and Oceans Canada (DFO).

Status: Ongoing

Supporting Analysis:

No freshwater intakes have been installed at this time. In 2016 a freshwater intake will be installed at the Pinewood River to pump water from the river to the Water Management Pond. A fish screen system has been incorporated into the design that meets the guidelines outlined by DFO. Construction dewatering pumps used during the installation of permitted culverts in fish baring streams are equipped with end of pipe fish screens. This requirement has been implemented into the New Gold Site Procedure for Construction Dewatering and Monitoring (ENV PRCD-003) which can be located in Appendix C.

Condition 3.7

The Proponent shall both offset any residual serious harm to fish in accordance with subsection 35(2) of the Fisheries Act and associated regulations, and compensate for the loss of fish habitat resulting from the deposition of a deleterious substance into a tailings impoundment area in accordance with the Metal Mining Effluent Regulations, by recreating fish habitat in the West Creek Diversion Channel, West Creek Pond, Stockpile Pond Diversion Channel, Stockpile Pond, Clark Creek Diversion Channel, Clark Creek Pond, and Teeple Road Pond.

Status: Ongoing

Supporting Analysis:

Fish habitat compensation was designed by qualified experts and was reviewed by the Ministry of Natural Resources and Forestry and the Department of Fisheries and Oceans Canada (DFO) during the permit approval phase. In 2015 all structures excluding the Clark Creek Pond and Teeple Pond were excavated and some of the features were constructed. Work will continue in 2016 with completion anticipated late in the spring. Once the channels and ponds are commissioned a five year monitoring program will be implemented as specified in DFO Authorization number 15-HCAA-00039 issued to New Gold on June 15, 2015. Photos of the Teeple Diversion from October 2015 can be found in Appendix C.

Condition 3.8

The Proponent shall monitor water quality and quantity, and fish and fish habitat, to determine the effectiveness of the mitigation measures under conditions 3.1, 3.2, 3.3 and 3.7. In doing so, the Proponent shall monitor, at a minimum:

Status: Ongoing

Supporting Analysis:

Refer to supporting analysis 3.8.1 to 3.8.6

Condition 3.8.1

water levels and flows, with respect to minimum flow thresholds for the Pinewood River set by Ontario, during periods of water taking as authorized pursuant to the Ontario Water Resources Act;

Status: Ongoing

Supporting Analysis:

During 2015 a Flow Monitoring Station was installed in the Pinewood River to track elevations and flow rates of water in the Pinewood River System. A Flow Monitoring Station belonging to the Ministry of Environment and Climate Change (MOECC) is also located downstream of the project on the Pinewood River. New Gold is able to access this data. During 2015 no water was taken directly from the Pinewood River, however in 2016 commissioning of the Pinewood River Pumphouse will occur and water will be drawn from the river based on data collected from the station to ensure operation in accordance with the projects Permit to Take Water issued by MOECC on August 31, 2015. Furthermore the project has 5 additional Permits to Take Water for the Open Pit, Tailings Management Facility, Construction Workings and Aggregate. All water takings are monitored using calibrated flow meters and data obtained from these takings is submitted annually via the MOECC online reporting protocol. Water taking data is recorded in accordance with the New Gold Site Procedure for Tracking Water Related to PTTW and ECA developed on July 12, 2015 (procedure is located in Appendix C). This monitoring will be required for the life of the mine. Under PTTW #8776-9W2QN2 Industrial Water Supply for the Pinewood River New Gold was required to develop and submit to MOECC a Biological Monitoring that addresses methods for monitoring and identifying fish kills and fish stranding and a contingency plan to address adverse effects. This monitoring plan will be finalized for submission in early 2016 and will commence in 2016 following the installation and commissioning of the pumphouse.

Condition 3.8.2

effluent quality as per the requirements set out in the Metal Mining Effluent Regulations;

Status: Ongoing

Supporting Analysis:

During 2015 effluent discharges to the environment as defined by the Metal Mining Effluent Regulation (MMER) were related to temporary construction seepage ponds on the Plant Site. Effluent was generated from storm water runoff and contact water associated with blasting bedrock for the development of infrastructure foundations and treatment consisted of flocculent addition to reduce total suspended solids and dry ice to reduce ammonia levels. All water was treated and tested in accordance with applicable permits and legislation from Environment Canada (EC), Ministry of Environment and Climate Change (MOECC) and Fisheries and Oceans Canada (DFO). During the 2015 construction period there were 10 effluent discharges from construction dewatering sediment ponds designed to capture contact water and provide adequate treatment for Total Suspended Solids (TSS) and Ammonia prior to discharge to the environment. These discharges occurred between September and December. All discharge water met the water quality objectives outlined in the Environment Canada Metal Mining Effluent Regulation (MMER) and the Ministry of Environment and Climate Change (MOECC) Construction Environmental Compliance Approval. The daily maximum discharge of TSS is 30mg/L and on November 5, 2015 there was one exceedance of TSS from the Plant Site Sediment Pond at 63mg/L. This discharge location is to a rock splash pad in a vegetated area where water then flows into a tributary that feeds the West Creek prior to entering the Pinewood River. No sediment from the discharge entered the West Creek or Pinewood River Systems. Further investigation into the cause of the TSS spike indicated that sampling error occurred while taking the water sample. Additional information related to all ten of the discharges including water quality results and discharge locations can be found in the 2015 New Gold Rainy River Effluent Sampling and Discharge Results included in Appendix C of this document. In 2017 tailings from ore reclaiming will be treated in the Tailings Management Facility. Water quality objectives and sampling requirements for the Rainy River Project are outlined in the MMER and the MOECC Environmental Compliance Approvals for Construction and Operations. Further information and results related to surface water sampling and effluent sampling, treatment and discharge can be found in Appendix C.

Condition 3.8.3
the effectiveness of recreated fish habitat. The monitoring shall be designed in accordance with any authorizations pursuant to subsection 35(2) of the Fisheries Act and associated regulations and/or the Metal Mining Effluent Regulations;
Status: Ongoing
Supporting Analysis:

Fish habitat compensation was designed by qualified experts and was reviewed by the Ministry of Natural Resources and Forestry and the Department of Fisheries and Oceans Canada (DFO) during the permit approval phase. In 2015 all structures excluding the Clark Creek Pond and Teeple Pond were excavated and some of the features were constructed. Work will continue in 2016 with completion anticipated late in the spring. Once the channels and ponds are commissioned a five year monitoring program will be implemented as specified in DFO Authorization number 15-HCAA-00039 issued to New Gold on June 15, 2015. The monitoring program is designed to reveal the success of the compensation by looking at population diversity, density and migration. Details from the monitoring study will be included in the 2016 annual report.

Condition 3.8.4
the effectiveness of the potentially acid generating and non-potentially acid generating rock segregation program through ongoing geochemical verification of the waste rock during any period that waste rock is generated;
Status: Ongoing
Supporting Analysis:

Through 2015 and anticipated through 2016, the sampling to date has confirmed that the categorization of waste rock has been effective and the program is being evaluated on an ongoing basis.

Condition 3.8.5
water quality in the open pit, pursuant to any requirements set by Ontario in the Mine Closure Plan for the Designated Project; and
Status: Not applicable at this time
Supporting Analysis:

This condition is currently not relevant as the project is in its construction phase.

Condition 3.8.6
the maintenance of a perpetually saturated state of the tailings, for 25 years from the start of the decommissioning phase of the Designated Project.
Status: Not applicable at this time
Supporting Analysis:

This condition is currently not relevant as the project is in its construction phase

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Condition 4- Migratory birds

Condition 4.1
The Proponent shall carry out all phases of the Designated Project in a manner that avoids harming or killing migratory birds, or disturbing, destroying or the taking of nests or eggs, with consideration of guidance provided in:
Status: Ongoing
Supporting Analysis:

Refer to supporting analysis 4.1.1 to 4.1.2

Condition 4.1.1
Environment Canada's policy on Incidental Take of Migratory Birds in Canada; and
Status: Ongoing
Supporting Analysis:

The Rainy River Project Environmental Department has implemented site wide notices regarding the breeding bird window, the requirements for bird sweeps in new construction areas or areas that have been inactive for periods of time. The department is also the primary contact for any incidents or mortalities to birds, nests or eggs. In 2015 there were no incidental take of Migratory Birds on site. The Environmental Department will continue to implement monitoring programs and employee awareness in 2016.

Condition 4.1.2
Environment Canada's avoidance guidelines on General Nesting Periods of Migratory Birds in Canada.
Status: Ongoing
Supporting Analysis:

Members of the Rainy River Project Environmental Department have been trained by qualified professionals on conducting bird sweeps and identifying Species at Risk bird species. Sixty seven bird sweeps were conducted between April and August in construction areas to ensure the absence of nesting birds or species at risk prior to excavation. In areas where nests were found, appropriate buffers were flagged off around the perimeter of the buffer zone and the nests were monitored on a weekly basis until the nests were abandoned. Buffer zones were established based on input from New Gold's consulting experts in conjunction with discussions from the Ministry of Natural Resources and Forestry. Vegetation clearing was prohibited during these months. This program will continue in 2016. Data collected from the 2015 bird sweeps can be found in Appendix D.

Condition 4.2
The Proponent shall, at all times, implement noise reduction measures to control sound levels from machinery to avoid harassing migratory birds.
Status: Ongoing
Supporting Analysis:

During the 2015 construction phase noise reduction measures employed during the first year of construction are compliant with the EIS commitments. Reducing the size of blasts where appropriate and maintaining tree buffers where applicable provided other solutions to noise mitigation. Furthermore vegetation clearing and constructing development in known nesting areas and mature forests was prohibited through the breeding bird window (May 1 to August 15).
In 2015 New Gold hired a qualified consulting firm to conduct Species at Risk Monitoring which included sound level monitoring in Eastern Whip-poor-will Receptor Habitats during May and June, 2015. Results indicated that there were no exceedances of the hourly sound criteria threshold at either receptor that were attributable to Project related activities. Further information regarding this study can be found in the 2015 Species at Risk Monitoring Report included in Appendix D of this report.

Condition 4.3
The Proponent shall install and use site lighting fixtures in a manner that reduces light pollution in the surrounding environment to avoid disturbance to nocturnal species, such as the Common Nighthawk (Chordeiles minor).
Status: Ongoing
Supporting Analysis:

During the construction phase of the project there are limited permanent lightning fixtures installed on the project. Temporary light plants are used only in areas where employees are working a night shift or if required for safety purposes. Light plants are designed so that lights can be angled toward the ground. During routine field inspections members of the Rainy River Environmental Department check lighting plants to ensure they are angled appropriately and used only when necessary. Monitoring and consideration to this condition will continue to be implemented as the project advances.

Condition 4.4
The Proponent shall deter migratory birds from using the tailings management area.
Status: Not applicable at this time
Supporting Analysis:

During 2015 limited construction occurred on the Tailings Management Facility. In 2016 construction will commence on building the Tailings Management Facility and in mid 2017 tailings will be deposited into the containment. A plan to deter migratory birds from using the tailings management facility will be implemented in early 2017.

Condition 4.5
The Proponent shall provide comparable replacement artificial nesting structures for Barn Swallows (Hirundo rustica) prior to the removal of existing nesting structures.
Status: Ongoing
Supporting Analysis:

Four artificial nesting structures were put in place in April 2015, prior to the 2015 breeding season. There are several homesteads and old barns and garages on the Rainy River Project. In later 2014 and early 2015 six residential structures were removed from the plant site area prior to the nesting period. As the project advances there may be the need to remove additional structures. It is understood by the site construction department that all structures must be removed prior to April of each year. New Gold Environmental Department will continue to monitor the use of the artificial nesting structures and determine if they are adequate or if more nesting structures need to be implemented to off set the loss of man-made structures (i.e.; barns). A location map of the nesting boxes and photographs can be found in Appendix D.

Condition 4.6

The Proponent shall monitor migratory birds, breeding activity and mortality, to evaluate the effectiveness of mitigation measures under conditions 4.1 to 4.3. If monitoring demonstrates an inconsistency with those conditions, then document how this has been rectified. Monitoring starts at construction and ceases at the end of the decommissioning phase.

Status: Ongoing

Supporting Analysis:

During 2015 the project obtained the professional assistance of AMEC Foster Wheeler to conduct appropriate monitoring of migratory birds and their breeding activity as well as provide future monitoring recommendations. Studies included;
- Breeding bird surveys carried out along the transmission line corridor prior to construction (Spring/Summer 2014)
- Visual inspections of four artificial barn swallow nesting structures installed in April 2015.
- Development of a detailed Wildlife Monitoring Plan that is currently under review by the MNRF which will be implemented in 2016. The plan includes Species at Risk Monitoring and includes monitoring during the construction and operations phase as well as post mine closure.
- Acoustic monitoring in areas of non Whip-poor-will presence to ensure sound decibels are within an appropriate range
- Targeted point count surveys for diurnal SAR including Golden-winged Warbler, Barn Swallow and Bobolink and for woodland area-sensitive breeding birds in suitable habitat. Point counts will be based on standardized survey protocols described for the Ontario Breeding Bird Atlas Guide for Participants (OBBA 2001) so as to be consistent with baselines study methodology (Section 5.2.12);
- Incidental data collection for SAR and provincially rare species which are currently present at lower abundance including: Canada Warbler, Olive-sided Flycatcher, Short-eared Owl, American Pelican, Bald Eagle and Black-billed Magpie;
- Targeted twilight surveys for Eastern Whip-poor-will in suitable habitat. Whip-poor-will monitoring efforts will follow standardized survey protocols as outlined in the whip-poor-will Roadside Survey Participant's Guide (BSC 2012);
- Concurrent data collection for Common Nighthawk to be undertaken during targeted Eastern Whip-poor-will surveys as described above as no standardized survey protocols have been developed specifically for this species;
- Annual monitoring of active Bald Eagle nests which occur in close proximity the RRP site. Monitoring will attempt to establish fledging success;
- Implementation of a wildlife log of general breeding bird observations at the RRP site by employees (focused on raptors and raptor nests, and SAR species); and

In regard to mitigation strategies that are being implemented on the project to assist in monitoring and reduce adverse effects these include;
- Acquiring of 1468 hectares of lands to provide Eastern Whip-poor-will breeding territories and 348 hectares of field habitat suitable for Bobolink breeding habitat. These offset benefit lands are to compensate for habitat lost during the construction of the mine. Monitoring the success of these areas and potential impacts to the bird species is conducted through three phases; visual monitoring, monitoring of habitat use in the offset benefit lands and monitoring or rehabilitation plans during mine closure. In 2015 monitoring of phase 1 and 2 were completed.
- Reduction of speed limits on the project to reduce vehicle collisions with birds
- Restricting habitat displacement for mine infrastructure to periods outside the breeding bird season (May 1 to August 15)

In order to track mortality New Gold has an on site reporting system for employees to report any road collisions with birds and wildlife. During 2015 there were no bird mortalities reported.
Further information related to the Species at Risk Monitoring Program and data collected in 2015 please refer to the 2015 Species at Risk Monitoring Report included in Appendix D of this document.

Condition 4.7

The Proponent shall monitor use of the tailings management area by migratory birds under condition 4.4 from the start of the operations phase to the end of the decommissioning phase.

Status: Not applicable at this time

Supporting Analysis:

During 2015 limited construction occurred on the Tailings Management Facility. In 2016 construction will commence on building the Tailings Management Facility and in mid 2017 tailings will be deposited into the containment. A plan to monitor migratory birds trying to use the tailings management facility and the effectiveness of the deterrents will be implemented in early 2017.

Condition 4.8

The Proponent shall monitor the effectiveness of the artificial nesting structures created for Barn Swallows (Hirundo rustica).

Status: Ongoing

Supporting Analysis:

During the 2015 breeding season, visual inspections were conducted on June 4 and June 25. A follow up inspection was conducted in August. Visual inspections were conducted by first monitoring the nesting structures from a distance to determine if barn swallows were flying in and out of the nesting structures. Then the boxes were approached quietly for an up close inspection to check for the presence of nests. It was reported during all visual observations that no barn swallows were using the nesting structures. In 2016 New Gold Environmental Staff will be using the Bird Studies Canada NestWatch protocol and intend to conduct inspections of the four nesting structures on a routine basis between May and early August. A location map of the nesting boxes and photographs can be found in Appendix D.

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Proponent: New Gold Inc.
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Condition 5- Health of Aboriginal Peoples

Condition 5.1
The Proponent shall, during the construction, operations, and decommissioning phases of the Designated Project, control exceedances of the Canadian Ambient Air Quality Standards and meet air quality requirements established by Ontario at the nearest human receptor by:
Status: Ongoing
Supporting Analysis:

See supporting analysis outlined in Conditions 5.1.1 to 5.1.6

Condition 5.1.1
implementing fugitive dust best management practices;
Status: Ongoing
Supporting Analysis:

Fugitive dust is being managed during the construction phase in accordance with industry best management practices. Fugitive Dust Management Plans for the development and operations phases of the project have been developed in draft format with guidance from the Ontario Ministry of Environmental and Climate Change (MOECC). Final submission of these documents to MOECC will occur in the early part of 2016 as per requirements set out in the MOECC Construction and Operations Environmental Compliance Approvals for the Rainy River Project.

Condition 5.1.2
maintaining site roadways to control silt loading;
Status: Ongoing
Supporting Analysis:

Silt loading along roadways within the project footprint is currently being managed through the following methods:
- water application or calcium application when roads are dusty
- grading roadways
- application of road surfacing material (crushed aggregate) when necessary to reduce dust and silt migration during rainfall events
- installation of temporary erosion control products around streams and in drainage ditches where necessary.

Temporary erosion control products include; rock check dams, coir logs, silt fence, straw bales and vegetation application. Throughout the Spring and Fall rainy seasons New Gold obtained the assistance of Erosion Control Experts to identify problem areas and implement erosion control methods were necessary. It is the projects' intent to maintain this program in 2016.

Condition 5.1.3
using water sprays at the crusher and at active stockpiles;
Status: Ongoing
Supporting Analysis:

Water sprays have been utilized as required to control dust emissions.

Condition 5.1.4
using dust control equipment;
Status: Ongoing
Supporting Analysis:

During 2015 dust control equipment was primarily used on roads, equipment laydown areas and in on-site quarries. Equipment used included; water trucks and water bars. Additional mitigation was implemented by applying calcium to roads when necessary and enforcing reduced speeds on project roadways. As the project advances in 2016 the need for further dust suppression will occur in the open pit on mine haul roads and in areas where rock drilling is occurring.

Condition 5.1.5
using low-sulphur diesel equipment and using pollution control equipment on mobile heavy equipment and meeting the Canadian Environmental Protection Act for the emissions from this equipment and vehicles; and
Status: Ongoing
Supporting Analysis:

Low sulphur diesel equipment with applicable pollution control equipment have been used during 2015. All heavy equipment mobile vehicles manufactured after 2015 and used onsite, are equipped with environmental requirements as per the manufacturers' standards and applicable Ontario legislation.

Condition 5.1.6
revegetating disturbed areas in a manner that minimizes all exposed dust sources.
Status: Ongoing
Supporting Analysis:

2015 was only a partial year of construction. Areas are exposed to be developed. As a result, limited revegetation occurred during 2015; however, it is the standard practice at the RRP site to revegetate disturbed areas as soon as practical in order to control sediment release to runoff and air.

Condition 5.2
The Proponent shall monitor air quality to evaluate the effectiveness of mitigation measures under condition 5.1. Monitoring starts with construction and ceases at the commencement of the decommissioning phase.
Status: Ongoing
Supporting Analysis:

An air quality monitoring program was established during Q2 2015. Two air quality sampling stations were established in May 2015: one to the south of the site near the beginning of the Highway 600 reroute on Tait Road, and one to the east of the site on Gallinger Road. There were no measured exceedances of MOECC air quality standards, guidelines, or AAQCs, nor were there any exceedances of the Federal CAAQS for PM2.5 or other established criteria. All air quality parameters were well below corresponding limits. In August 2015 MOECC visited the two air quality stations to provide feedback on the installation methods. During that time the primary comment was the proximity of trees to the station on Tait Road. These trees were removed in the Fall of 2015. A map of the air quality monitoring stations as well as sample results can be found in Appendix E.

Condition 5.2.1
The Proponent shall alert the Aboriginal groups in cases of exceedances of the Canadian Ambient Air Quality Standards and air quality requirements established by Ontario at the nearest human receptor.
Status: Ongoing
Supporting Analysis:

There were no measured exceedances of Ministry of Environment and Climate Change air quality standards, guidelines, or AAQCs, nor were there any exceedances of the Federal CAAQS for PM2.5 or other established criteria. All air quality parameters were well below corresponding limits at the monitoring stations at the property boundary (and hence even more so at the nearest human receptor).

Condition 5.3
The Proponent shall monitor wells located within the open pit dewatering zone of influence, used by Aboriginal groups for drinking water, for water quality and quantity. Monitoring starts with construction and ceases after the first 10 years of the decommissioning phase.
Status: Ongoing
Supporting Analysis:

During 2015 the need to dewater in the open pit was not critical due to project status. Through the consultation phase New Gold has not been informed of the locations of any wells utilized by Aboriginal groups within the proximal of the zone of influence. The need to de-water the open pit will occur in 2016 and the current method to be used in the development phases will be temporary treatment ponds located within the Open Pit footprint. These treatment ponds are regulated by MOECC through the Construction Environmental Compliance Approval and a Permit to Take Water as well they will have a regulated discharge point through Environment Canada. A map of the Zone of Influence can be found in Appendix E.

Condition 5.3.1
The Proponent shall alert Aboriginal groups who use wells located within the open pit dewatering zone of influence for drinking water in cases of exceedance of water quality standards established by Ontario. The Proponent shall alert these Aboriginal groups as soon as possible once any exceedance is detected.
Status: Ongoing
Supporting Analysis:

To date New Gold has not been informed of an wells used by Aboriginal groups within the Open Pit zone of influence therefore the need to alert these groups is void (the Zone of Influence map is available in Appendix E). However, New Gold does have a ground water monitoring program that will be increased during 2016 which will include monitoring wells within the zone of influence.

Condition 5.4

The Proponent shall monitor key contaminants, including mercury, arsenic, cadmium and lead, for their concentrations in Northern Pike (Esox lucius) and Walleye (Sander vitreus) in the Pinewood River. Monitoring starts with construction and ceases 10 years after the start of the decommissioning phase.

Status: Ongoing

Supporting Analysis:

During the Fall of 2015 New Gold hired Minnow Environmental Inc. to conduct the fish tissue assessment throughout the Pinewood River downstream of the Rainy River Project extending to approximately 450m upstream of the confluence of the Rainy River. The focus of the study was to collect tissue samples from northern pike and walleye. Three tissue samples were collected from each fish; muscle and liver samples were collected to meet regulatory requirements while additional ovary tissues were samples (as available), as it has yet to be confirmed whether roe is regularly eaten from fish caught in the system. Each tissue sample was sent to a certified lab to characterize concentrations of contaminants of potential concern which include; arsenic, boron, cadmium, cobalt, copper, chromium, iron, lead, manganese, mercury, molybdenum, nickel, selenium and zinc. In 2015 there was no discharge of water directly to the Pinewood River therefore all monitoring is providing baseline data prior to the implementation of the Pinewood River Pumphouse and Constructed Wetland Systems. Results obtained from the study indicated; fish communities are consistent with results from previous sampling efforts, muscle, liver and ovary tissue samples contained metals with established tolerable daily intake values and average mercury values were below the human consumption benchmark however in individual samples it was concluded that mercury in northern pike occurs at concentrations above consumption benchmarks in larger fish (greater than 55cm in length). These values are consistent with previous baseline values. Mercury concentrations in fish muscle tissue is found to often occur naturally in northern environments and do not indicate that that project has influenced fish tissue quality. Further sampling results and data can be found in the 2015 Fish Tissue Monitoring Program Report attached in Appendix E of this document. Further studies will be conducted in 2016.

Condition 5.4.1

The Proponent shall alert the Aboriginal groups in cases of exceedance of provincial, federal or international health-based criteria. The Proponent shall alert these Aboriginal groups as soon as possible once any exceedance is detected.

Status: Ongoing

Supporting Analysis:

There were no cases of exceedances of provincial, federal or international health-based criteria.

Condition 5.5

The proponent shall consult with the Aboriginal groups on the implementation of conditions 5.2, 5.3 and 5.4.

Status: Ongoing

Supporting Analysis:

There was no information indicating exceedances of health-based criteria occurred in 2015, and accordingly, no related consultation occurred.

5.2 - Air quality monitoring was initiated in 2015; there were no measured exceedances of the Federal CAAQS for PM2.5 or other established criteria.

5.3 - Mine dewatering did not commence in 2015.

5.4 -Monitoring was initiated in 2015 although reporting was not complete in 2015.

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Condition 6- Current use of lands and resources for traditional purposes

Condition 6.1
The Proponent shall provide access to private lands to Aboriginal groups for their current use of land, including hunting and plant harvesting.
Status: Ongoing
Supporting Analysis:

New Gold provides access when it is safe to do so. In June 2015, a community member came on site to practice ceremony. In July, 2015 a community member came on site to look for a medicine as a result of a dream.

Condition 6.2
The Proponent shall avoid use of herbicides along the transmission line corridor unless required to prevent fire hazards. The Proponent shall minimize the removal of non-woody vegetation within the transmission line corridor.
Status: Ongoing
Supporting Analysis:

During the spring and summer of 2014 rare plant surveys were conducted along portions of the proposed transmission line corridor prior to approvals being granted for the construction. Construction of the line started in the late fall of 2015 following frost to limit the impact to non-woody vegetation and birds. All access to the right of way was provided by existing infrastructure (some requiring upgrades). Construction completion of the hydro line is scheduled for March 2016. There is no plan to use herbicides as a vegetation control method at any time on the project.

Condition 6.3

The Proponent shall, throughout all phases of the Designated Project, undertake progressive habitat restoration as per any requirements set by Ontario in the Mine Closure Plan for the Designated Project. Habitat restoration shall include:
Status: Not applicable at this time
Supporting Analysis:

Refer to supporting analysis in conditions 6.3.1 to 6.3.2

Condition 6.3.1

a consideration of habitat types that support a diversity of wildlife species and traditional uses by Aboriginal peoples, including ungulates and furbearers, as well as native plant species previously collected at the Project Site for food and medicinal purposes; and

Status: Not applicable at this time

Supporting Analysis:

Habitat restoration was not initiated in 2015 as this was the first year of construction. We anticipate habitat restoration will be initiated in 2016 and going forward.

Condition 6.3.2

separating and stockpiling removed organic rich material during construction (of open pit and during tailings dam stripping) for use to support revegetation and other reclamation activities.

Status: Ongoing

Supporting Analysis:

During the construction phase topsoil is stripped and salvaged to be used for future reclamation where topsoil is present or of sufficient quality. In 2016 as the project advances efforts to salvage larger areas of topsoil in the Tailings Management Area and Open Pit will be implemented. A topsoil stockpile map can be found in Appendix F.

Condition 6.4

The Proponent shall monitor habitat restoration to verify the success of revegetation efforts. Monitoring starts with construction and ends once habitat has been restored and proven effective.

Status: Not applicable at this time

Supporting Analysis:

During 2015 New Gold hired the assistance of a qualified Sediment Erosion Control Specialist to assist with temporary and permanent erosion control measures as well as revegetation efforts. To date no projects have been completed that allow for re-vegetation efforts. As the project advances toward operations there will be more opportunity for revegetation efforts and monitoring programs in 2016.

Condition 6.5

The Proponent shall restore access to the Project Site for the Aboriginal groups during the decommissioning phase, to the extent that such access is safe, for their traditional purposes.

Status: Not applicable at this time

Supporting Analysis:

This condition is not relevant to the construction phase.

Condition 6.6

The proponent shall consult with the Aboriginal groups on the implementation of conditions 6.1, 6.4 and 6.5.

Status: Ongoing

Supporting Analysis:

6.1. Through negotiated agreements and on-going discussions with communities where there is not an agreement yet in place, New Gold has has numerous discussions on access.
6.4 While construction was initiated in 2015, revegetation efforts were limited to grass and fielded areas for erosion control and not habitat restoration. Therefore, no consultation was undertaken.
6.5 Not applicable during the construction phase.

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Condition 7- Aboriginal archaeological, heritage and cultural resources

Condition 7.1.1
[The Proponent shall, for all phases of the Designated Project:]
avoid known culturally significant sites;
Status: Completed
Supporting Analysis:

No culturally significant sites were disturbed in 2015.

Condition 7.1.2
assess additional culturally significant sites, if discovered;
Status: Completed
Supporting Analysis:

No additional culturally significant sites were identified during 2015.

Condition 7.1.3
establish a procedure for Aboriginal groups to safely access the Project Site for cultural and ceremonial purposes;
Status: Completed
Supporting Analysis:

A formal procedure was identified in Section 4.0 of the Aborignal Aboriginal Consultation Plan (Provincial Environmental Assessment, Notice of Approval Condition 9).

Condition 7.1.4
preserve any discovered burial sites;
Status: Not applicable at this time
Supporting Analysis:

No burial sites were discovered or disturbed during 2015.

Condition 7.1.5
salvage and preserve any artifacts that cannot be maintained in-situ; and
Status: Completed
Supporting Analysis:

New Gold had archaeologists on site to excavate artifacts as per Provincial Standards and Guidelines. All excavations were were on previously identfied archaeological sites; no excavations were considered salvage sites. The archaeologists currently hold the artifacts and will make arrangements to transfer the artifacts to appropriate facilites upon consultation with Aboriginal people.

Condition 7.1.6
transfer artifacts in condition 7.1.5 to a facility identified by Aboriginal groups, in consultation with the Ontario Ministry of Tourism, Culture and Sport.
Status: Ongoing
Supporting Analysis:

Artifacts will be transferred from the archaeologist once the reports for MTCS are complete and consultation with Aboriginal groups regarding the artifacts is complete.

Condition 7.2
The proponent shall consult with the Aboriginal groups on the implementation of condition 7.1.
Status: Ongoing
Supporting Analysis:

Consultation on cultural sites has been ongoing since 2012. New Gold, as part of the EA process, worked with communities on gathering traditonal knowedge. New Gold also hired cultural resource professionals to conduct built heritage studies and archaeological studies at the site. These reports are published on www.NewGold.com as part of the Rainy River Project Environmental Assessment. New Gold also supported traditonal knowledge work with communities, of which New Gold does not own this data and it is not published. As there were no new sites identifed in 2015, no new assessments were completed.

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CEARIS Ref. Number: 80007
Reporting Period: 2015

Condition 8- Subsection 5(2) effects related to components of the Designated Project that may be associated with federal authorizations

Condition 8.1.1
[The proponent shall, in implementing condition 3.7, take measures to avoid or lessen adverse effects:]
on migratory birds and their habitats;
Status: Ongoing
Supporting Analysis:

Completed to date. 2015 was only a partial year of construction although establishment of compensation-related habitat has been initiated. New Gold is aware and has taken extra care during the construction phase with regards to the potential for effects on migratory birds during nesting periods, in accordance with the nesting timing directed by the local Ministry of Natural Resources and Forestry office.

Condition 8.1.2
on terrestrial species, including amphibians and reptiles, and their habitats;
Status: Ongoing
Supporting Analysis:

Completed to date. 2015 was only a partial year of construction although establishment of compensation-related habitat has been initiated. New Gold is aware and has taken care during the construction phase with regards to the potential for effects on terrestrial species and their habitats, consistent with the proposed mitigation measures described in the EIS.

Condition 8.1.3
on species at risk and their habitats;
Status: Ongoing
Supporting Analysis:

Completed to date. 2015 was only a partial year of construction although establishment of compensation-related habitat has been initiated. New Gold has taken extra care during the construction phase with regards to the potential for effects Species at Risk and their habitats, including completing activities in compliance with the Provincial Endagered Species Act permit.

Condition 8.1.4
on current use of lands and resources for traditional purposes by Aboriginal peoples;
Status: Ongoing
Supporting Analysis:

The construction which occurred during 2015 related to compensation-related habitat was consistent with the EIS and detailed project designs, which fully considered available Traditional Knowledge and New Gold's understanding of traditional uses of local lands by local Aboriginal peoples.

Condition 8.1.5
on sites of cultural significance to Aboriginal peoples; and
Status: Ongoing
Supporting Analysis:

Establishment of compensation-related habitat initiated during 2015 did not impinge on any identified sites of cultural significance to Aboriginal peoples.

Condition 8.1.6
from potential sources of contamination (e.g. mercury, arsenic, cadmium and lead).
Status: Ongoing
Supporting Analysis:

Completed to date. Establishment of compensation-related habitat was initiated during 2015. There is no expectation that the compensation-related habitat will result in a potential source of contamination.

Condition 8.2
The Proponent shall, in implementing condition 6.3, take into consideration the habitat needs of species at risk consistent with final recovery strategies or action plans, or alternatively, rely on best available information where recovery plans or action plans for the species are not yet completed for the species at risk.
Status: Ongoing
Supporting Analysis:

No progressive habitat restoration has been completed to date as 2015 was only a partial year of construction. New Gold considered Species at Risk and the potential for habitat creation in site restoration activities to date, including in accordance with their Provincial Endangered Species Act permit. As part of the 2015 Species at Risk Monitoring Program, AMEC Foster Wheeler reviewed the areas of none sightings of Bobolink and Eastern-whip-poor-will to conduct a desk top study on soil conditions and vegetation types in preferred habitats. This information as well as information collected in future years will be used to assist in planning appropriate rehabilitation for Species at Risk bird species. For additional information related to this study refer to the 2015 Species at Risk Monitoring Report found in Appendix H of this document.

Condition 8.3
The Proponent shall provide about 1400 hectares of private land as habitat for Eastern Whip-poor-will (Antrostomus vociferous) and Bobolink (Dolichonyx oryzivorus).
Status: Completed
Supporting Analysis:

Prior to project development the Ministry of Natural Resources and Forestry (MNRF) determined that 18 identified Eastern Whip-poor-will breeding territories could potentially be affected by the projects development and that 348 ha of Bobolink habitat had the potentially to be impacted by the project. Based on this information to offset the loss of habitat New Gold obtained 1468.3 ha of lands to provide Eastern Whip-poor-will breeding territories and 348 ha of field habitat suitable for Bobolink breeding habitat.

Condition 8.4

The Proponent shall monitor the effectiveness of the habitat in condition 8.3.

Status: Ongoing

Supporting Analysis:

Monitoring the success of these areas and potential impacts to the bird species is conducted through three phases; visual monitoring, monitoring of habitat use in the offset benefit lands (OB Lands) and monitoring or rehabilitation plans during mine closure. In 2015 monitoring of phase 1 and 2 were completed. Based on field research conducted it was determined that 22 Whip-Poor-Wills were utilizing the OB lands in 2015 and that 96 Bobolink were utilizing two of the four OB lands. For detailed information related to the 2015 study refer to the 2015 Species at Risk Monitoring Report included in Appendix H of this document.

Condition 8.5.1

[The Proponent shall:]

maintain a fence around the tailings management area to prevent access by wildlife; and

Status: Not applicable at this time

Supporting Analysis:

This condition is not relevant to 2015 as the intent of this condition based on other communications, was to avoid potential wildlife interactions with the tailings and supernatant liquid, as no tailings have been produced or stored to date. There was no fence in place during 2015. During the construction phase of the Tailings Management Facility in 2016 advancements will be made regarding the installation of fencing around the perimeter of the facility in preparation for tailings storage in mid 2017.

Condition 8.5.2

implement measures to prevent Snapping Turtles (Chelydra serpentine) from entering the following components of the Designated Project:
tailings management area;
water management pond;
water discharge pond;
constructed wetland;
overburden pile;
west mine rock pile; and
sediment ponds 1 & 2.

Status: Not applicable at this time

Supporting Analysis:

Tailings Management Area: Agreed. This condition is not relevant to the construction phase as the intent of this conditions based on other communications, was to avoid potential Snapping Turtle interactions with the tailings and supernatant liquid, as no tailings have been produced or stored to date. Similarly, no contact water has been discharged to the area. No mitigation measures were in place during 2015. Construction is scheduled for 2016.
Water Management Pond: This condition is not relevant for 2015 as the Water Management Pond has not as yet been constructed. No contact water has been discharged to the area. Construction completion is scheduled for 2016.
Water Discharge Pond: This condition is not relevant for 2015 as the Water Discharge Pond has not as yet been constructed. No contact water has been discharged to the area. Construction is scheduled for 2017.
Constructed Wetland: This condition is not relevant for 2015 as the Constructed Wetland has not as yet been constructed. No contact water has been discharged to the area. Construction is scheduled for 2017.
Overburden Pile: This condition is not relevant for 2015 as the Overburden Stockpile will not be constructed until 2016
West Mine Rock Pond: This condition is not relevant for 2015 as the West Mine Rock Stockpile will not be constructed until 2016
Sediment Ponds 1 and 2: This condition is not relevant for 2015 as Sediment Ponds 1 and 2 will not be constructed until 2016

APPENDIX C

CONDITION 3
SUPPORTING DOCUMENTATION

SEDIMENT PONDS & SEEPAGE COLLECTION SYSTEMS

ESA PROJECT SITE BOUNDARY, MNRF

MINE FOOTPRINT

SEDIMENT PONDS AND SEEPAGE COLLECTION SYSTEMS:

- DISCHARGE LOCATION
- POND OR SUMP (2015)
- DRAINAGE DITCH (2015)
- POND OR SUMP (PLANED FOR 2016)
- DRAINAGE DITCH (PLANNED FOR 2016)

0 0.5 1 1.5 2

Kilometers

newgold™

Rainy River Project

GIS GROUP, THUNDER BAY

SEDIMENT PONDS AND SEEPAGE COLLECTION SYSTEMS WERE DIGITIZED FROM PROVIDED HAND-DRAWINGS, AERIAL IMAGERY OR OBTAINED FROM LEGACY DATASETS WHERE AVAILABLE. ALL SHOWN FEATURES ARE APPROXIMATE!

94°7'0"W 94°6'0"W 94°5'0"W 94°4'0"W 94°3'0"W 94°2'0"W 94°1'0"W 94°0'0"W 93°59'0"W 93°58'0"W

48°52'30"N 48°52'0"N 48°51'30"N 48°51'10"N 48°50'30"N 48°50'0"N 48°49'30"N 48°49'0"N

5414000 5413000 5412000 5411000 5410000 5409000 5408000

McCallum Creek
Split Rock Road
HIGHWAY 600
SEEPAGE COLLECTION SUMP #3
SEEPAGE COLLECTION SUMP #2
SEEPAGE COLLECTION SUMP #1
TAILINGS MANAGEMENT AREA
WATER MANAGEMENT POND
Richardson Road
Marr Road
230 KV TRANSMISSION LINE AND 40M CORRIDOR
Loslo Creek
Roen Road
WATER DISCHARGE POND
Elliott Road
Gorgeson Road
SEDIMENT POND #1
NORTH RUNOFF POND
MILL
CONSTRUCTED WETLAND
OVERBURDEN STOCKPILE
West Creek
EXISTING PLANT SITE TEMPORARY SEDIMENT AND POLISHING POND
SOUTH RUNOFF POND
NORTH OVERBURDEN SUMP AND CLAY SOURCE
COARSE ORE CRUSHING
ROAD CLOSURE (MTO)
ROAD CLOSURE (MTO)
WEST MINE ROCK STOCKPILE
Marr Creek
SEDIMENT POND #2
Loslo Road
TEMPORARY (OPEN PIT) SUMP #3
OPEN PIT
OUTCROP 3 SUMP
Clark Creek
LOW GRADE ORE STOCKPILE
EAST MINE ROCK STOCKPILE
WEST STOCKPILE POND SOUTH SUMP #1
WEST STOCKPILE POND SOUTH SUMP #2
TEMPORARY (OPEN PIT) SUMP #4
LAYDOWN AREA 7 SUMP
SOUTH OVERBURDEN POLISHING POND
SOUTH OVERBURDEN SEDIMENT POND
MINE ROCK POND
PRELIMINARY PHASE MPR
MPR
Teepee Road
Pinewood River

1:30,000

418000 419000 420000 421000 422000 423000 424000 425000 426000 427000 428000 429000

T:\GIS\MAP DOCUMENTS\RAINY RIVER PROJECT\2016\2016-08-04 EC 2015 ANNUAL REPORT MAPS\2016-08-08 SEDIMENT PONDS AND SEEPAGE COLLECTION SYSTEMS (EC 2015 ANNUAL REPORT MAPS).MXD

Memorandum

To: Ray Boivin, Senior Environmental Officer, Kenora Area, MOECC

From: Nigel Fisher, Manager, Environment

Date: June 24th, 2015

Re: **Monthly Surface Water Quality Results Summary – May 2015**

The following document has been provided consistent with Environmental Compliance Approval (ECA) # 5781-9VJQ2J, section 13(3) issued May 8, 2015. The purpose of the report is to provide a summary of monitoring activities related to the approved works.

Monitoring for May 2015 was applicable to the stage of project development;

- None of the approved works were constructed or operating;
- The plant site and crusher area sediment pond 1 was under construction; and
- Surface water sampling was conducted on May 14, within 7 days of permit issuance.

1.0 Plant Site and Crusher Area Sediment Pond 1

The plant site and crusher area sediment pond commenced construction on May 17, 2015. Prior to that time sediment and erosion control measured were put in place beginning on 5 May which included silt fencing and settling ponds. As part of site preparation, water was released and used for dust suppression from the site consistent with section 7(5) of the ECA. The release was to a vegetated area west of Roen Road.

There was one externally reportable spill during this time. This occurred on the plant site on May 26, 2015 when 130 L of hydraulic oil was spilled to native material. Clean up was successful per report to yourself on June 5, 2015.

2.0 Surface Water Sampling

Surface water sampling was conducted on May 14, 2015. The following sites were not sampled for the given reasons;

- SW23, SW24, SW28 and SW29 do not require sampling as of yet as the triggering milestones have not yet been reached with construction; and
- SW26 and SW27, although identified as requiring sampling within one month of the receipt of the ECA, are located along the planned route of the West Creek Diversion which has yet to be constructed.

Sampling was conducted at the remaining sites following MISA protocols.

2.1 Summary of Analysis

There were no exceedances of the ECA approval during the month. Exceedances in PWQO and CEQG were noted at multiple sites in both the Pinewood and Rainy Rivers for turbidity, aluminum, iron and cobalt (Table 5-1). These reflect historic sampling results in the same systems (where sampling has previously occurred) with the exception of T-Al at SW10, which, while the concentration was greater than the aforementioned guidelines, was lower than historic values.

QA/QC procedures met expected controls e.g., 20 % relative percent difference except;

- D-Cu was shown to exceed the 40% RPD limit in the Field Duplicate sample (60.9%). Measured results for D-Cu were 0.0015 (MISA indicator <T) and 0.0008 (MISA indicator <W) mg/L in the sample and field duplicate, respectively. As a result, no implications to data quality are expected based on this exceedance.
- Hold times for the field blank were exceeded (see section 4).

3.0 Non-Routine Procedures

With the one exception, there were no non-routine calibration or maintenance procedures carried out on any major structure, equipment, apparatus, mechanism or thing forming a part of the sewage works during the reporting period. The field blank was analyzed separately from the other samples, however, no data integrity issues were identified during the QA/QC review of the analysis of the field blank.

4.0 Bypass or Upset Summary

No bypass or upset conditions occurred during the reporting period.

Table 4-1: Summary of Surface Water Sampling Results Where PWQO or CEQG Were Exceeded

Site	Water Body	Parameter	Sample Concentration (mg/L)	PWQO (mg/L)	CEQG (mg/L)	MISA Qualifier	Historic Avg (mg/L)	Historic Max (mg/L)	Historic Min (mg/L)	Historic Median (mg/L)
SW3	Pinewood River	Turbidity	5.56	2.26		-	13.55	84.3	0.7	8.62
SW3	Pinewood River	T-Al	0.322	0.075	0.1	-	0.36	2.77	0.0508	0.2625
SW3	Pinewood River	T-Fe	0.47	0.3	0.3	-	1.11	6.97	0.064	0.6885
SW10	Pinewood River	T-Al	0.17	0.075	0.1	-	0.8	32.3	0.292	0.1915
SW15	Pinewood River	T-Al	1.54	0.075	0.1	-	0.68	4.95	0.05	0.46
SW15	Pinewood River	T-Co	0.00101	0.0009		<T	0.00066	0.00346	0.00007	0.0005
SW15	Pinewood River	T-Fe	1.91	0.3	0.3	-	1.07	5.99	0.09	0.92
SW20	Pinewood River	T-Al	0.25	0.075	0.1	-	-	-	-	-
SW21	Pinewood River	T-Fe	0.35	0.3		-	-	-	-	-
SW21	Pinewood River	T-Al	0.129	0.075	0.1		-	-	-	-
SW22	Pinewood River	T-Al	0.088	0.075		-	-	-	-	-
SW16	Rainy River	T-Al	0.284	0.075	0.1	-	0.31	2.65	0.04	0.17
SW16	Rainy River	T-Fe	0.38	0.3	0.3	-	0.44	3.28	0.06	0.25
SW17	Rainy River	T-Al	0.21	0.075	0.1	-	0.23	1.71	0.05	0.13

Memorandum

To: Ray Boivin, Senior Environmental Officer, Kenora Area, MOECC

From: Nigel Fisher, Manager, Environment

Date: June 24th, 2015

Re: **Monthly Surface Water Quality Results Summary – June 2015**

The following document has been provided consistent with Environmental Compliance Approval (ECA) # 5781-9VJQ2J, section 13(3) issued May 8, 2015. The purpose of the report is to provide a summary of monitoring activities related to the approved works.

Monitoring for June 2015 was applicable to the stage of project development;

- None of the approved works were constructed or operating;
- The plant site and crusher area sediment pond 1 was under construction; and
- Surface water sampling was conducted on June 9, 2015.

1.0 Plant Site and Crusher Area Sediment Pond 1

The plant site and crusher area sediment pond commenced construction on May 17, 2015. Prior to that time sediment and erosion control measured were put in place beginning on 5 May which included silt fencing and settling ponds. As part of site preparation, water was released and used for dust suppression from the site consistent with section 7(5) of the ECA. The release was to a vegetated area west of Roen Road.

2.0 Surface Water Sampling

Surface water sampling was conducted on June 9, 2015. The following sites were not sampled for the given reasons;

- SW23, SW24, SW28 and SW29 do not require sampling as of yet as the triggering milestones have not yet been reached with construction; and
- SW26 and SW27, although identified as requiring sampling within one month of the receipt of the ECA, are located along the planned route of the West Creek Diversion which has yet to be constructed.

Sampling was conducted at the remaining sites following MISA protocols.

2.1 Summary of Analysis

There were two exceedances of the ECA approval during the month, both for total suspended solids (TSS). SW15 (Pinewood river at Hwy 619 crossing) exceeded the 30 day average concentration limit of 15 mg/L TSS (27.5 mg/L), while SW27 (Loslo creek downstream of Hwy 600) exceeded the maximum concentration limit of 30 mg/L TSS (89 mg/L). As no project activities occurred within the vicinity of either sample site, it is assumed that these are natural levels, as is supported by historic levels at SW15 and SW13, which is a baseline sample location on Loslo creek upstream of SW27 (see table 5.1).

Exceedances in PWQO and CEQG limits were noted at multiple sites in both the Pinewood and Rainy Rivers for aluminum and iron as well as in Loslo creek for aluminum and iron (Table 5-1). Copper was shown to exceed the CEQG limit at SW15. These reflect historic sampling results in the same systems (where sampling has previously occurred) with the exception of parameters at SW15 and SW17, where concentrations were greater than the historic values. Both SW15 and SW17 (Rainy River at Worthington Rd # 4 near Rainy River, ON) are located more than 20 km from the RRP site, with numerous other potential inputs and as such it is not possible to define these exceedances as related to activities at the RRP.

QA/QC procedures met expected controls (e.g., 20 % relative percent difference) except;

- Some field duplicate parameter pairs exceeded the RPD limit of 40%, although none of these parameter pairs exhibited concentrations of both parameters greater than three times the detection limit. As a result, no implications to data quality are expected based on this exceedance.

3.0 Non-Routine Procedures

There were no non-routine calibration or maintenance procedures carried out on any major structure, equipment, apparatus, mechanism or thing forming a part of the sewage works during the reporting period.

4.0 Bypass or Upset Summary

No bypass or upset conditions occurred during the reporting period.

Table 4-1: Summary of Surface Water Sampling Results Where PWQO or CEQG Were Exceeded

Site	Water Body	Parameter	Sample Concentration (mg/L)	PWQO (mg/L)	CEQG (mg/L)	ECA (mg/L)	MISA Qualifier	Historic Avg (mg/L)	Historic Max (mg/L)	Historic Min (mg/L)	Historic Median (mg/L)
SW3	Pinewood River	Turbidity	6.02	2.101	-	-	-	13.55	84.3	0.7	8.62
SW3	Pinewood River	T-Al	0.259	0.075	0.1	-	-	0.36	2.77	0.0508	0.2625
SW3	Pinewood River	T-Fe	0.51	0.3	0.3	-	-	1.11	6.97	0.064	0.6885
SW10	Pinewood River	T-Al	0.178	0.075	0.1	-	-	0.8	32.3	0.292	0.1915
SW10	Pinewood River	T-Fe	0.43	0.3	0.3	-	-	1.70	42.3	0.287	0.623
SW15	Pinewood River	TSS	27.5	-	-	15 (30D)	-	24.6	243	2	12
SW15	Pinewood River	T-Al	1.26	0.075	0.1	-	-	0.68	4.95	0.05	0.46
SW15	Pinewood River	T-Cu	0.0031	-	0.0024	-	<T	0.0022	0.0076	0.001	0.002
SW15	Pinewood River	T-Fe	1.59	0.3	0.3	-	-	1.07	5.99	0.09	0.92
SW20	Pinewood River	T-Al	0.242	0.075	0.1	-	-	-	-	-	-
SW20	Pinewood River	T-Fe	0.48	0.3	0.3	-	-	-	-	-	-
SW21	Pinewood River	Turbidity	5.8	4.015	-	-	-	-	-	-	-
SW21	Pinewood River	T-Al	0.131	0.075	0.1		-	-	-	-	-
SW21	Pinewood River	T-Fe	0.36	0.3	0.3	-	-	-	-	-	-
SW27	Loslo Creek	TSS	89	-	-	30 (Max)	-	-	-	-	-
SW27	Loslo Creek	T-Al	0.586	0.075	0.1	-	-	-	-	-	-
SW27	Loslo Creek	T-Fe	1.0	0.3	0.3	-	-	-	-	-	-
SW16	Rainy River	T-Al	0.267	0.075	0.1	-	-	0.31	2.65	0.04	0.17
SW16	Rainy River	T-Fe	0.45	0.3	0.3	-	-	0.44	3.28	0.06	0.25
SW17	Rainy River	T-Al	0.318	0.075	0.1	-	-	0.23	1.71	0.05	0.13
SW17	Rainy River	T-Fe	0.49	0.3	0.3	-	-	0.33	1.95	0.08	0.24

Memorandum

To: Ray Boivin, Senior Environmental Officer, Kenora Area, MOECC

From: Nigel Fisher, Manager, Environment

Date: August 6, 2015

Re: **Monthly Surface Water Quality Results Summary – July 2015**

The following document has been provided consistent with Environmental Compliance Approval (ECA) # 5781-9VJQ2J, section 13(3) issued May 8, 2015. The purpose of the report is to provide a summary of monitoring activities related to the approved works.

Monitoring for July 2015 was applicable to the stage of project development;

- Construction on the plant site pond was completed at the end of July and work subsequently commenced on the process plant overburden pile pond;
- Surface water sampling was conducted on July 21 and 22, 2015; and
- Construction discharge sampling for the Plant Site Sediment Pond was conducted on 29 July, 2015 from water starting to naturally collect in the upstream pond (i.e., not the polishing pond).

1.0 Plant Site and Crusher Area Sediment Pond 1

The plant site and crusher area sediment pond commenced construction on May 17, 2015. Prior to that time sediment and erosion control measured were put in place beginning on 5 May which included silt fencing and settling ponds. As part of site preparation, water was released and used for dust suppression from the site consistent with section 7(5) of the ECA. A single-polymer flocculant system was installed and commissioned on 15 July, 2015. This system was not utilized in July. No discharge occurred from any works during July.

2.0 Effluent Sampling and Results

Effluent sampling was conducted from the plant site pond on July 29. The sampling was to provide indication of performance of works relative to predicted performance and allow for water treatment to be tailored based on inputs. No parameters were found to have concentrations greater than the monthly average limits listed in the ECA, with concentrations generally an order of magnitude less than the monthly average limits.

3.0 Surface Water Sampling

Surface water sampling was conducted on July 21 and 22, 2015. The following sites were not sampled for the given reasons;

- SW23, SW24, SW28 and SW29 do not require sampling as of yet as the triggering milestones have not yet been reached with construction; and

- SW26 and SW27, although identified as requiring sampling within one month of the receipt of the ECA, are located along the planned route of the West Creek Diversion which has yet to be constructed.

Sampling was conducted at the remaining sites following MISA protocols.

3.1 Summary of Analysis

Surface water sampling results met PWQO and CEQG levels except for turbidity, total iron and aluminum at some sites in the Pinewood and Rainy Rivers (Table 1). The sites were both upstream and downstream of the Project site and results are consistent with baseline results.

QA/QC procedures met expected controls (e.g., 20 % relative percent difference) except;

- Some field duplicate parameter pairs exceeded the RPD limit of 40%, although none of these parameter pairs exhibited concentrations of both parameters greater than three times the detection limit. As a result, no implications to data quality are expected based on this exceedance.
- Dissolved concentrations of copper and zinc exceeded total concentrations in several samples, including trip blank, field blank and field duplicate samples. The analytical laboratory has been queried as to the cause of this irregularity and its implications to data integrity. This remains under investigation by the laboratory. Given other parameters are within guidelines/objectives and no copper or zinc concentrations were found to be greater than PWQO or CEQG there is no concern relative to surface water quality.

4.0 Non-Routine Procedures

There were no non-routine calibration or maintenance procedures carried out on any major structure, equipment, apparatus, mechanism or thing forming a part of the sewage works during the reporting period.

Surface water sampling site SW15 (immediately adjacent to the Pinewood River crossing of highway 619) and an associated field duplicate were sampled on 22 July, 2015 rather than 21 July 2015 with the other sampling sites due to road resurfacing work which was occurring directly overhead of the sampling location, precluding safe access and increasing the potential for sample contamination.

5.0 Bypass or Upset Summary

No bypass or upset conditions occurred during the reporting period.

Table 1: Summary of Surface Water Sampling Results Where PWQO or CEQG Were Exceeded

Site	Water Body	Parameter	Sample Concentration (mg/L)	PWQO (mg/L)	CEQG (mg/L)	ECA (mg/L)	MISA Qualifier	Historic Avg (mg/L)	Historic Max (mg/L)	Historic Min (mg/L)	Historic Median (mg/L)
SW3	Pinewood River	Turbidity	3.96	1.66	-	-	-	13.55	84.3	0.7	8.62
SW3	Pinewood River	T-Al	0.202	0.075	0.1	-	-	0.36	2.77	0.0508	0.2625
SW3	Pinewood River	T-Fe	0.670	0.3	0.3	-	-	1.11	6.97	0.064	0.6885
SW10	Pinewood River	Turbidity	11.1	3.74	-	-	-	18.24	6.38	2.5	6.16
SW10	Pinewood River	T-Al	0.647	0.075	0.1	-	-	0.8	32.3	0.292	0.1915
SW10	Pinewood River	T-Fe	1.23	0.3	0.3	-	-	1.70	42.3	0.287	0.623
SW15	Pinewood River	Turbidity	24.6	3.96	-	-	-	21.3	127	1.81	15.5
SW15	Pinewood River	T-Al	0.773	0.075	0.1	-	-	0.68	4.95	0.05	0.46
SW15	Pinewood River	T-Fe	1.31	0.3	0.3	-	-	1.07	5.99	0.09	0.92
SW20	Pinewood River	T-Al	0.183	0.075	0.1	-	-	-	-	-	-
SW20	Pinewood River	T-Fe	0.790	0.3	0.3	-	-	-	-	-	-
SW21	Pinewood River	T-Fe	0.61	0.3	0.3	-	-	-	-	-	-
SW22	Pinewood River	T-Fe	0.39	0.3	0.3	-	-	-	-	-	-
SW16	Rainy River	T-Al	0.209	0.075	0.1	-	-	0.31	2.65	0.04	0.17
SW17	Rainy River	Turbidity	6.85	4.95	-	-	-	6.81	31.0	1.5	4.7
SW17	Rainy River	T-Al	0.23	0.075	0.1	-	-	0.23	1.71	0.05	0.13
SW17	Rainy River	T-Fe	0.4	0.3	0.3	-	-	0.33	1.95	0.08	0.24

Memorandum

To: Director, Ministry of Environment and Climate Change
C/O Ray Boivin, Senior Environmental Officer, Kenora Area, MOECC

From: Cailey Anderson, Site Environmental Manager *(Acting)*

Date: September 29, 2015

Re: **Monthly Surface Water Quality Results Summary – August 2015**

The following document has been provided consistent with Environmental Compliance Approval (ECA) # 5781-9VJQ2J, section 13(3) issued May 8, 2015. The purpose of the report is to provide a summary of monitoring activities related to the approved works.

Monitoring for August 2015 was applicable to the stage of project development;

- Construction on the plant site pond was completed at the end of July and work subsequently commenced on the process plant overburden pile pond;
- Surface water sampling was conducted on August 25, 2015; and
- Construction discharge sampling for the Plant Site Sediment Pond was conducted on August 5, 10, 13, and 20, 2015 from water in the upstream pond (i.e., not the polishing pond). A sample was taken from the polishing pond on August 31, 2015.

1.0 Plant Site and Crusher Area Sediment Pond 1

The plant site and crusher area sediment pond commenced construction on May 17, 2015. Prior to that time sediment and erosion control measured were put in place beginning on 5 May which included silt fencing and settling ponds. As part of site preparation, water was released and used for dust suppression from the site consistent with section 7(5) of the ECA. A single-polymer flocculant system was installed and commissioned on 15 July, 2015. This system was not utilized in July. No discharge occurred from any works during August.

2.0 Effluent Sampling and Results

Effluent sampling was conducted from the plant site pond on August 5, 10, 13, 20, and 31. The sampling was to provide indication of performance of works relative to predicted performance and allow for water treatment to be tailored based on inputs. Un-ionized ammonia and total suspended sediment were found to have concentrations greater than the monthly average limits listed in the ECA. No discharge has taken place and treatment will occur. Dry ice will be used to reduce the pH which will decrease un-ionized ammonia. Flocculant and cycling of water will reduce the total suspended sediment.

3.0 Surface Water Sampling

Surface water sampling was conducted on August 25, 2015. The following sites were not sampled for the given reasons;

- SW23, SW24, SW28 and SW29 do not require sampling as of yet as the triggering milestones have not yet been reached with construction; and
- SW25 and SW26, although identified as requiring sampling within one month of the receipt of the ECA, are located along the planned route of the West Creek Diversion which has yet to be constructed.

Sampling was conducted at the remaining sites following MISA protocols.

3.1 Summary of Analysis

Surface water sampling results met PWQO and CEQG levels except for turbidity, total iron and aluminum at some sites in the Pinewood and Rainy Rivers (Table 1). The sites were both upstream and downstream of the Project site and results are consistent with baseline results.

QA/QC procedures met expected controls (e.g., 20 % relative percent difference) except;

- Some field duplicate parameter pairs exceeded the RPD limit of 40%, although none of these parameter pairs exhibited concentrations of both parameters greater than three times the detection limit. As a result, no implications to data quality are expected based on this exceedance.
- Dissolved concentrations of aluminum exceeded total concentrations in SW21. The analytical laboratory has been queried as to the cause of this irregularity and its implications to data integrity. This remains under investigation by the laboratory. Given other parameters are within guidelines/objectives and the aluminum concentration was found to be less than PWQO or CEQG there is no concern relative to surface water quality.

4.0 Non-Routine Procedures

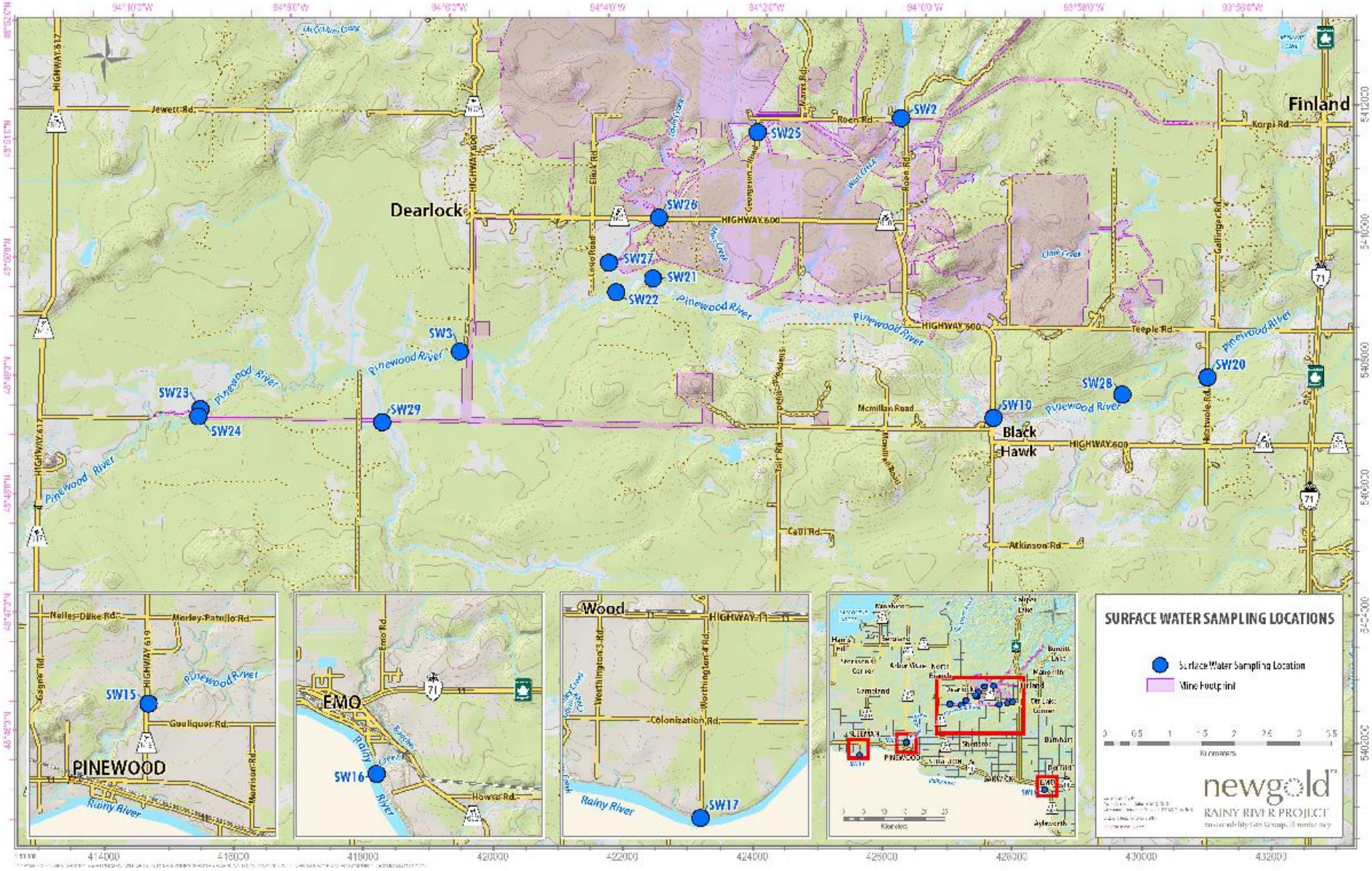
There were no non-routine calibration or maintenance procedures carried out on any major structure, equipment, apparatus, or mechanism forming a part of the sewage works during the reporting period.

5.0 Bypass or Upset Summary

No bypass or upset conditions occurred during the reporting period.

Table 1: Summary of Surface Water Sampling Results Where PWQO or CEQG Were Exceeded

Site	Water Body	Parameter	Sample Concentration (mg/L)	PWQO (mg/L)	CEQG (mg/L)	ECA (mg/L)	MISA Qualifier	Historic Avg (mg/L)	Historic Max (mg/L)	Historic Min (mg/L)	Historic Median (mg/L)
SW3	Pinewood River	Turbidity	7.64	2.97	-	-	-	13.55	84.3	0.7	8.62
SW3	Pinewood River	T-Al	0.258	0.075	0.1	-	-	0.36	2.77	0.0508	0.2625
SW3	Pinewood River	T-Fe	0.570	0.3	0.3	-	-	1.11	6.97	0.064	0.6885
SW10	Pinewood River	Turbidity	3.76	2.97	-	-	-	18.24	6.38	2.5	6.16
SW10	Pinewood River	T-Al	0.116	0.075	0.1	-	-	0.8	32.3	0.292	0.1915
SW10	Pinewood River	T-Fe	0.660	0.3	0.3	-	-	1.70	42.3	0.287	0.623
SW15	Pinewood River	Turbidity	26.5	15.00	-	-	-	21.3	127	1.81	15.5
SW15	Pinewood River	T-Al	1.35	0.075	0.1	-	-	0.68	4.95	0.05	0.46
SW15	Pinewood River	T-Fe	1.95	0.3	0.3	-	-	1.07	5.99	0.09	0.92
SW20	Pinewood River	T-Fe	0.790	0.3	0.3	-	-	-	-	-	-
SW21	Pinewood River	T-Fe	0.410	0.3	0.3	-	-	-	-	-	-
SW22	Pinewood River	T-Fe	0.390	0.3	0.3	-	-	-	-	-	-
SW16	Rainy River	T-Al	0.237	0.075	0.1	-	-	0.31	2.65	0.04	0.17
SW17	Rainy River	T-Al	0.144	0.075	0.1	-	-	0.23	1.71	0.05	0.13


Dearlock
Finland
Black Hawk
PINEWOOD
EMO
Wood
SW2
SW3
SW10
SW15
SW16
SW17
SW20
SW21
SW22
SW23
SW24
SW25
SW26
SW27
SW28
SW29
Pinewood River
Rainy River
HIGHWAY 600
HIGHWAY 617
HIGHWAY 11
Jewett Rd.
Roen Rd.
Korpi Rd.
Teeple Rd.
Atkinson Rd.
Colonization Rd.
Gouliquer Rd.
Howse Rd.
SURFACE WATER SAMPLING LOCATIONS
Surface Water Sampling Location
Mine Footprint
newgold
RAINY RIVER PROJECT

Memorandum

To: Ray Boivin, Senior Environmental Officer, Kenora Area, MOECC

From: Cailey Anderson, Manager, Environment

Date: October 12, 2015

Re: **Monthly Surface Water Quality Results Summary – September 2015**

The following document has been provided consistent with Environmental Compliance Approval (ECA) # 5781-9VJQ2J, section 13(3) issued May 8, 2015. The purpose of the report is to provide a summary of monitoring activities related to the approved works.

Monitoring for September 2015 was applicable to the stage of project development;

- Construction on the plant site pond was completed at the end of July and work subsequently commenced on the process plant overburden pile pond;
- Surface water sampling was conducted on September, 2015; and
- Construction discharge sampling for the Temporary Plant Site Sediment Pond was conducted on September 8, 14, 15, 23, and 28, 2015 from the North Polishing Pond.

1.0 Plant Site and Crusher Area Sediment Pond 1

The Temporary Plant Site Sediment Pond commenced construction on May 17, 2015. Prior to that time sediment and erosion control measures were put in place beginning on 5 May which included silt fencing and settling ponds. As part of site preparation, water was released and used for dust suppression from the site consistent with section 7(5) of the ECA. A single-polymer flocculant system was installed and commissioned on 15 July, 2015. This system was utilized in September and a discharge took place on September 17, 2015. Table 2 displays the effluent results at the time of discharge.

2.0 Effluent Sampling and Results

Effluent sampling was conducted from the Temporary Plant Site Sediment Pond on September 8, 14, 15, 23, and 28. The sampling was to provide indication of performance of works relative to predicted performance and allow for water treatment to be tailored based on inputs. Effluent results did not exceed the effluent limits prescribed in the ECA 5781-9VAJQ2J.

3.0 Surface Water Sampling

Surface water sampling was conducted on September 16, 2015. The following sites were not sampled for the given reasons;

- SW23, SW24, SW28 and SW29 do not require sampling as of yet as the triggering milestones have not yet been reached with construction; and

- SW25 and SW26, although identified as requiring sampling within one month of the receipt of the ECA, are located along the planned route of the West Creek Diversion which has yet to be commissioned.

Sampling was conducted at the remaining sites following MISA protocols.

3.1 Summary of Analysis

Surface water sampling results met PWQO and CEQG levels except for turbidity, total iron, total aluminum, and un-ionized ammonia at some sites in the Pinewood River, the Rainy River, and West Creek (Table 1). The sites were both upstream and downstream of the Project site and results are consistent with baseline results.

QA/QC procedures met expected controls (e.g., 20 % relative percent difference) except;

- Some field duplicate parameter pairs exceeded the RPD limit of 40%, although none of these parameter pairs exhibited concentrations of both parameters greater than three times the detection limit. As a result, no implications to data quality are expected based on this exceedance.
- Dissolved concentrations of zinc exceeded total concentrations in the field blank. The analytical laboratory has been queried as to the cause of this irregularity and its implications to data integrity. This remains under investigation by the laboratory. Given other parameters are within guidelines/objectives and the aluminum concentration was found to be less than PWQO or CEQG there is no concern relative to surface water quality.

4.0 Non-Routine Procedures

There were no non-routine calibration or maintenance procedures carried out on any major structure, equipment, apparatus, mechanism or thing forming a part of the sewage works during the reporting period.

5.0 Bypass or Upset Summary

No bypass or upset conditions occurred during the reporting period.

Table 1: Summary of Surface Water Sampling Results Where PWQO or CEQG Were Exceeded

Site	Water Body	Parameter	Sample Concentration (mg/L)	PWQO (mg/L)	CEQG (mg/L)	ECA (mg/L)	MISA Qualifier	Historic Avg (mg/L)	Historic Max (mg/L)	Historic Min (mg/L)	Historic Median (mg/L)
SW2	West Creek	T-Al	0.126	0.075	0.1	-	-	0.1304	0.621	0.0262	0.0805
SW2	West Creek	T-Fe	0.710	0.3	0.3	-	-	0.6142	2.07	0.111	0.3745
SW3	Pinewood River	Turbidity	12.1 NTU	2.31 NTU	-	-	-	13.55	84.3	0.7	8.62
SW3	Pinewood River	Un-ionized Ammonia	0.053384	0.02	0.019	-	-	-	-	-	-
SW3	Pinewood River	T-Al	0.317	0.075	0.1	-	-	0.36	2.77	0.0508	0.2625
SW3	Pinewood River	T-Fe	0.660	0.3	0.3	-	-	1.11	6.97	0.064	0.6885
SW3	Pinewood River	T-Zn	0.215	0.02	-	-	-	0.006224	0.0217	0.0030	0.0042
SW10	Pinewood River	Turbidity	6.80 NTU	2.96 NTU	-	-	-	18.24	6.38	2.5	6.16
SW10	Pinewood River	T-Al	0.153	0.075	0.1	-	-	0.8	32.3	0.292	0.1915
SW10	Pinewood River	T-Fe	0.620	0.3	0.3	-	-	1.70	42.3	0.287	0.623
SW15	Pinewood River	Turbidity	37.2 NTU	15.00 NTU	-	-	-	21.3	127	1.81	15.5
SW15	Pinewood River	T-Al	1.20	0.075	0.1	-	-	0.68	4.95	0.05	0.46
SW15	Pinewood River	T-Fe	1.75	0.3	0.3	-	-	1.07	5.99	0.09	0.92
SW20	Pinewood River	T-Fe	0.420	0.3	0.3	-	-	-	-	-	-
SW21	Pinewood River	T-Fe	0.350	0.3	0.3	-	-	-	-	-	-
SW22	Pinewood River	T-Fe	0.450	0.3	0.3	-	-	-	-	-	-
SW16	Rainy River	T-Al	0.189	0.075	0.1	-	-	0.31	2.65	0.04	0.17
SW17	Rainy River	T-Al	0.131	0.075	0.1	-	-	0.23	1.71	0.05	0.13

Table 2: Summary of Effluent Results for Construction Phase Works Discharge

Effluent Parameter	Daily Maximum Concentration (mg/L)	Monthly Average Concentration (mg/L)	Process Plant and Crusher Area Sediment Pond 1 (mg/L)
Total Suspended Solids	30	15	6.5
Total Arsenic	0.034	0.017	0.0019
Total Copper	0.028	0.014	0.0034
Total Nickel	0.094	0.047	0.0017
Total Lead	0.030	0.015	0.0002
Total Zinc	0.348	0.174	0.0030
Un-ionized Ammonia	0.2	0.1	0.005
Acute Toxicity (Rainbow Trout and Daphnia Magna)	Non-acutely lethal (not greater than 50% mortality in undiluted effluent)		Pass
pH of the effluent maintained between 6.0 to 9.5, inclusive, at all times			7.19

Memorandum

To: Ray Boivin, Senior Environmental Officer, Kenora Area, MOECC

From: Dave Hall, Manager, Environment

Date: November 30, 2015

Re: **Monthly Surface Water Quality Results Summary – October 2015**

The following document has been provided consistent with Environmental Compliance Approval (ECA) # 5781-9VJQ2J, section 13(3) issued May 8, 2015. The purpose of the report is to provide a summary of monitoring activities related to the approved works.

Monitoring for October 2015 was applicable to the stage of project development;

- Construction on the Plant Site and Crusher Area Sediment Pond 1 was completed at the end of July;
- Surface water sampling was conducted on October 27, 2015; and
- Construction discharge sampling for the Plant Side and Crusher Area Sediment Pond 1 was conducted on October 5, 13, 19, 26, and 27, 2015 from the Plant Site and Crusher Area Polishing Pond.

1.0 Plant Site and Crusher Area Sediment Pond 1

The Plant Site and Crusher Area Sediment Pond 1 commenced construction on May 17, 2015. Prior to that time sediment and erosion control measures were put in place beginning on 5 May which included silt fencing and settling ponds. As part of site preparation, water was released and used for dust suppression from the site consistent with section 7(5) of the ECA. A single-polymer flocculant system was installed and commissioned on 15 July, 2015. This system was utilized in October and a discharge took place on October 19, 2015. Table 1 displays the effluent results at the time of discharge.

2.0 Effluent Sampling and Results

Effluent sampling was conducted from the Plant Site and Crusher Area Sediment Pond 1 on October 5, 13, 19, 26, and 27, 2015. The sampling was to provide indication of performance of works relative to predicted performance and allow for water treatment to be tailored based on inputs. Effluent results did not exceed the effluent limits prescribed in the ECA 5781-9VAJQ2J.

3.0 Surface Water Sampling

Surface water sampling was conducted on October 27, 2015. The following sites were not sampled for the given reasons;

- SW23, SW24, SW28 and SW29 do not require sampling as of yet as the triggering milestones have not yet been reached with construction; and
- SW25 and SW26, although identified as requiring sampling within one month of the receipt of the ECA, are located along the planned route of the West Creek Diversion which has yet to be commissioned.

Sampling was conducted at the remaining sites following MISA protocols.

3.1 Summary of Analysis

Surface water sampling results met PWQO and CEQG levels except for total iron, total aluminum, total copper, total cobalt, and total lead at some sites in the Pinewood River, the Rainy River, and Loslo Creek (Table 2). The sites were both upstream and downstream of the Project site and results are consistent with baseline results.

QA/QC procedures met expected controls (e.g., 20 % relative percent difference) except;

- Some field duplicate parameter pairs exceeded the RPD limit of 40%, although none of these parameter pairs exhibited concentrations of both parameters greater than three times the detection limit. As a result, no implications to data quality are expected based on this exceedance.
- Dissolved concentrations of zinc exceeded total concentrations in the field blank. The analytical laboratory has been queried as to the cause of this irregularity and its implications to data integrity. This remains under investigation by the laboratory. Given other parameters are within guidelines/objectives and the aluminum concentration was found to be less than PWQO or CEQG there is no concern relative to surface water quality.

4.0 Non-Routine Procedures

There were no non-routine calibration or maintenance procedures carried out on any major structure, equipment, apparatus, mechanism or thing forming a part of the sewage works during the reporting period. The period between sampling dates (September 15, 2015 to October 27, 2015) was greater than 40 days. This occurred due to the appropriate sampling equipment arriving late.

5.0 Bypass or Upset Summary

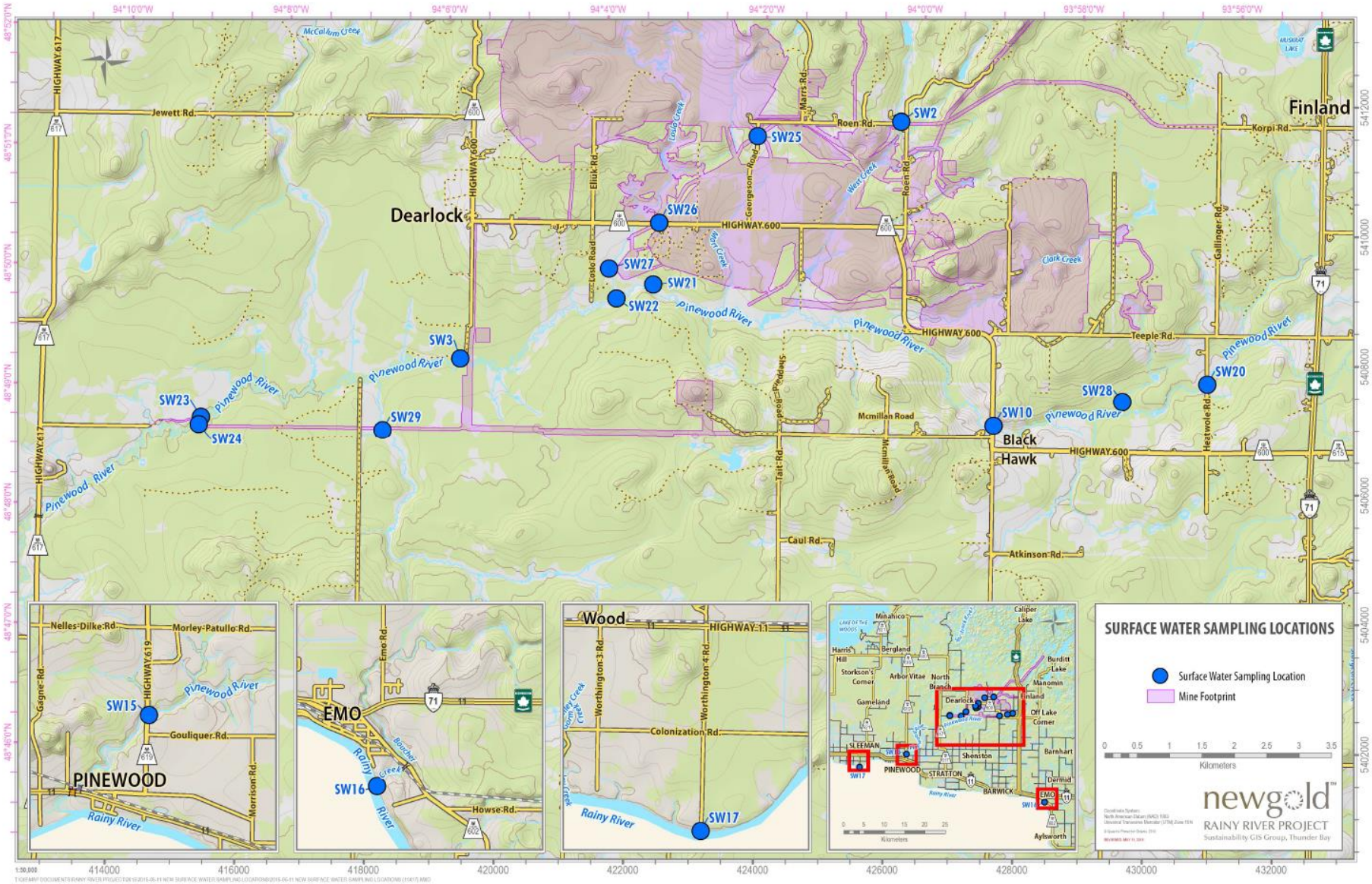
No bypass or upset conditions occurred during the reporting period.

Table 1: Summary of Effluent Results for Construction Phase Works Discharge 19-Oct-15

Effluent Parameter	Daily Maximum Concentration (mg/L)	Monthly Average Concentration (mg/L)	Process Plant and Crusher Area Sediment Pond 1 (mg/L)
Total Suspended Solids	30	15	10.0
Total Arsenic	0.034	0.017	0.0016
Total Copper	0.028	0.014	0.0029
Total Nickel	0.094	0.047	0.0018
Total Lead	0.030	0.015	0.00008
Total Zinc	0.348	0.174	0.0040
Un-ionized Ammonia	0.2	0.1	0.011
Acute Toxicity (Rainbow Trout and Daphnia Magna)	Non-acutely lethal (not greater than 50% mortality in undiluted effluent)		Pass
pH of the effluent maintained between 6.0 to 9.5, inclusive, at all times			7.76

Table 2: Summary of Surface Water Sampling Results Where PWQO or CEQG Were Exceeded

Site	Water Body	Parameter	Sample Concentration (mg/L)	PWQO (mg/L)	CEQG (mg/L)	ECA (mg/L)	MISA Qualifier	Historic Avg (mg/L)	Historic Max (mg/L)	Historic Min (mg/L)	Historic Median (mg/L)
SW27	Loslo Creek	T-Fe	0.320	0.3	0.3	-	-	-	-	-	-
SW3	Pinewood River	T-Al	0.234	0.075	0.1	-	-	0.36	2.77	0.0508	0.2625
SW3	Pinewood River	T-Fe	0.570	0.3	0.3	-	-	1.11	6.97	0.064	0.6885
SW10	Pinewood River	T-Al	0.127	0.075	0.1	-	-	0.8	32.3	0.292	0.1915
SW10	Pinewood River	T-Fe	0.45	0.3	0.3	-	-	1.70	42.3	0.287	0.623
SW15	Pinewood River	T-Al	1.07	0.075	0.1	-	-	0.68	4.95	0.05	0.46
SW15	Pinewood River	T-Fe	1.54	0.3	0.3	-	-	1.07	5.99	0.09	0.92
SW20	Pinewood River	T-Al	0.184	0.3	0.3	-	-	-	-	-	-
SW20	Pinewood River	T-Fe	0.530	0.3	0.3	-	-	-	-	-	-
SW21	Pinewood River	T-Fe	0.310	0.3	0.3	-	-	-	-	-	-
SW16	Rainy River	T-Al	0.096	0.075	0.1	-	-	0.31	2.65	0.04	0.17
SW17	Rainy River	T-Al	1.38	0.075	0.1	-	-	0.23	1.71	0.05	0.13
SW17	Rainy River	T-Co	0.00096	0.0009	-	-	-	0.0005	0.005	0.0001	0.0005
SW17	Rainy River	T-Cu	0.0027	-	0.002	-	-	0.0016	0.01	0.001	0.0013
SW17	Rainy River	T-Fe	1.72	0.3	0.3	-	-	0.35	1.95	0.08	0.24
SW17	Rainy River	T-Pb	0.001	-	0.001	-	-	0.0009	0.01	0.0001	0.001


SURFACE WATER SAMPLING LOCATIONS
Surface Water Sampling Location
Mine Footprint
Kilometers
newgold™
RAINY RIVER PROJECT
Sustainability GIS Group, Thunder Bay
Dearlock
Finland
Black Hawk
PINEWOOD
EMO
Wood
SW2
SW3
SW10
SW15
SW16
SW17
SW20
SW21
SW22
SW23
SW24
SW25
SW26
SW27
SW28
SW29
Pinewood River
Rainy River
HIGHWAY 600
HIGHWAY 617
HIGHWAY 619
HIGHWAY 11
Jewett Rd.
Roen Rd.
Korpi Rd.
Teeple Rd.
Mcmillan Road
Caul Rd.
Atkinson Rd.
Nelles Dilke Rd.
Morley Patullo Rd.
Gouliquer Rd.
Morrison Rd.
Howse Rd.
Colonization Rd.
Worthington 3 Rd.
Worthington 4 Rd.
Aylsworth

Memorandum

To: Ray Boivin, Senior Environmental Officer, Kenora Area, MOECC

From: Dave Hall, Manager, Environment

Date: December 29, 2015

Re: **Monthly Surface Water Quality Results Summary – November 2015**

The following document has been provided consistent with Environmental Compliance Approval (ECA) # 5781-9VJQ2J, section 13(3) issued May 8, 2015. The purpose of the report is to provide a summary of monitoring activities related to the approved works.

Monitoring for November 2015 was applicable to the stage of project development;

- Construction on the Plant Site and Crusher Area Temporary Treatment Ponds was completed at the end of July;
- Surface water sampling was conducted on November 18, 2015; and
- Construction discharge sampling for the Plant Site and Crusher Area Temporary Treatment Ponds was conducted on November 5, 6, 7, 8, 9, and 16, 2015.

1.0 Plant Site and Crusher Area Sediment Pond 1

The Plant Site and Crusher Area Temporary Sediment Ponds commenced construction on May 17, 2015. Prior to that time sediment and erosion control measures were put in place beginning on 5 May which included silt fencing and settling ponds. As part of site preparation, water was released and used for dust suppression from the site consistent with section 7(5) of the ECA. A single-polymer flocculant system was installed and commissioned on 15 July, 2015. This system was utilized in November and a discharge took place on November 5, 7, 8, and 9, 2015. Table 1 displays the effluent results at the times of discharge.

2.0 Effluent Sampling and Results

Effluent sampling was conducted from the Plant Site and Crusher Area Temporary Sediment Ponds on November 5, 6, 7, 8, 9, and 16, 2015. The sampling was to provide indication of performance of works relative to predicted performance and allow for water treatment to be tailored based on inputs. Effluent results for total suspended solids exceeded for the November 5 discharge. This was determined to be a sampling error and the sampling procedure was reviewed with all environmental staff to ensure sample quality is maintained in the future. All other discharges did not exceed the effluent limits prescribed in the ECA 5781-9VJQ2J.

3.0 Surface Water Sampling

Surface water sampling was conducted on November 18, 2015. The following sites were not sampled for the given reasons;

- SW23, SW24, SW28 and SW29 do not require sampling as of yet as the triggering milestones have not yet been reached with construction; and
- SW25 and SW26, although identified as requiring sampling within one month of the receipt of the ECA, are located along the planned route of the West Creek Diversion which has yet to be commissioned.
- SW3 was inaccessible due to heavy construction activity occurring on the Highway 600 realignment.

Sampling was conducted at the remaining sites following MISA protocols.

3.1 Summary of Analysis

Surface water sampling results met PWQO and CEQG levels except for total iron, total aluminum, and dissolved aluminum at some sites in the Pinewood River, the Rainy River, Loslo Creek, and West Creek (Table 2). The sites were both upstream and downstream of the Project site and results are consistent with baseline results.

QA/QC procedures met expected controls (e.g., 20 % relative percent difference) except;

- Some field duplicate parameter pairs exceeded the RPD limit of 40%, although none of these parameter pairs exhibited concentrations greater than three times the detection limit. As a result, no implications to data quality are expected based on these exceedances.
- Dissolved concentrations of zinc and zirconium exceeded total concentrations in the field blank. The analytical laboratory has been queried as to the cause of this irregularity and its implications to data integrity. This remains under investigation by the laboratory. Given other parameters are within guidelines/objectives there is no concern relative to surface water quality.

4.0 Non-Routine Procedures

There were no non-routine calibration or maintenance procedures carried out on any major structure, equipment, apparatus, mechanism or thing forming a part of the sewage works during the reporting period.

5.0 Bypass or Upset Summary

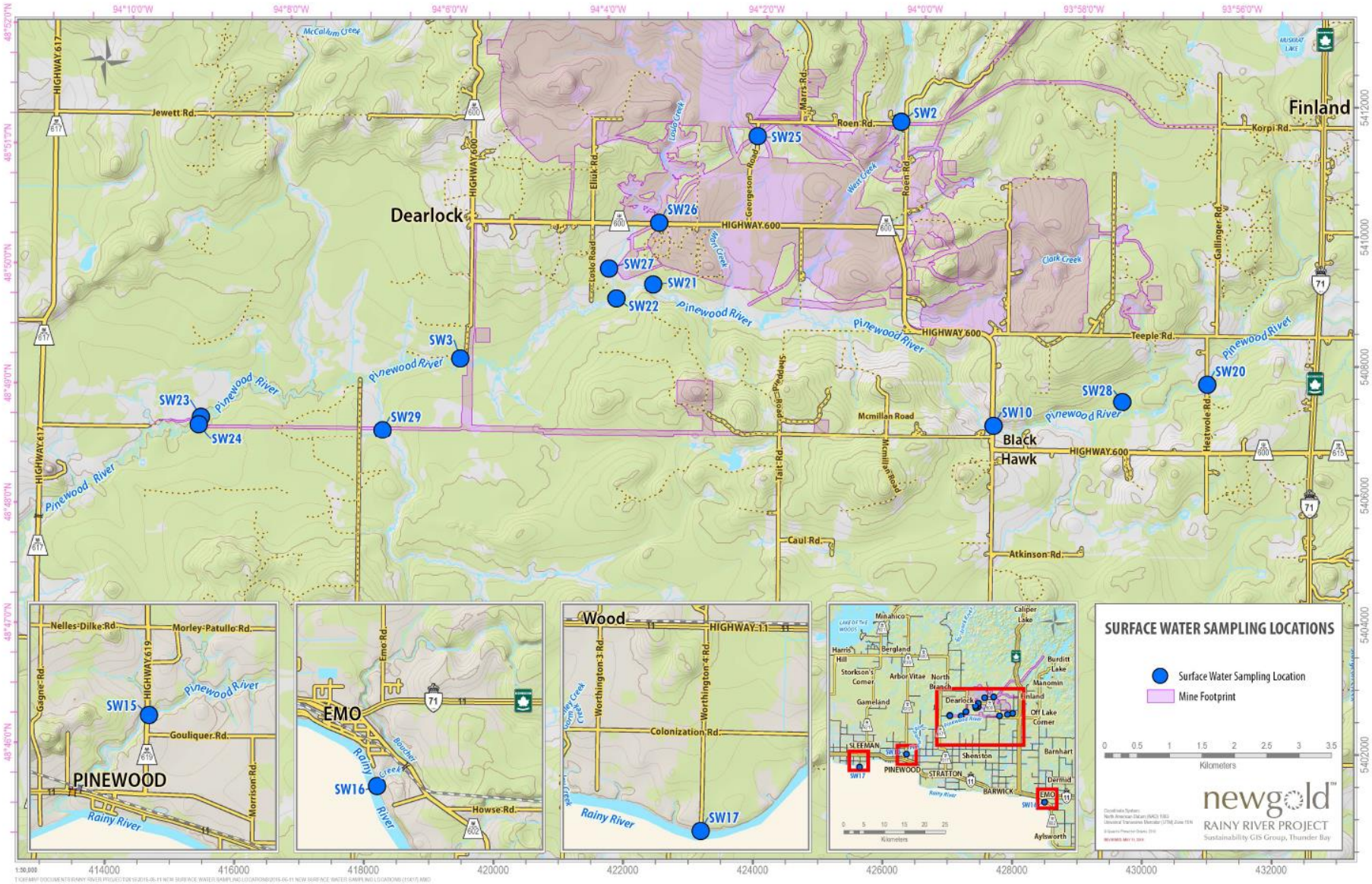
No bypass or upset conditions occurred during the reporting period.

Table 1: Summary of Effluent Results for Construction Phase Works Discharge

Effluent Parameter	Daily Maximum Concentration (mg/L)	Monthly Average Concentration (mg/L)	November 5, 2015 Process Plant and Crusher Area Temporary Sediment Ponds (mg/L)	November 7, 2015 Process Plant and Crusher Area Temporary Sediment Ponds (mg/L)	November 8, 2015 Process Plant and Crusher Area Temporary Sediment Ponds (mg/L)	November 9, 2015 Process Plant and Crusher Area Temporary Sediment Ponds (mg/L)
Total Suspended Solids	30	15	63.0	6.5	7.0	6.0
Total Arsenic	0.034	0.017	0.0016	0.0016	0.0017	0.0017
Total Copper	0.028	0.014	0.0040	0.0026	0.0027	0.0026
Total Nickel	0.094	0.047	0.0025	0.0016	0.0015	0.0015
Total Lead	0.030	0.015	0.0005	0.0002	0.0001	0.0001
Total Zinc	0.348	0.174	0.0055	0.0400	0.0400	0.0380
Un-ionized Ammonia	0.2	0.1	<0.001	0.004	0.004	0.004
Acute Toxicity (Rainbow Trout and Daphnia Magna)	Non-acutely lethal (not greater than 50% mortality in undiluted effluent)		Pass	Pass	Pass	Pass
pH of the effluent maintained between 6.0 to 9.5, inclusive, at all times			6.28	7.71	7.76	7.77

Table 2: Summary of Surface Water Sampling Results Where PWQO or CEQG Were Exceeded

Site	Water Body	Parameter	Sample Concentration (mg/L)	PWQO (mg/L)	CEQG (mg/L)	ECA (mg/L)	MISA Qualifier	Historic Avg (mg/L)	Historic Max (mg/L)	Historic Min (mg/L)	Historic Median (mg/L)
SW27	Loslo Creek	T-Al	0.0955	0.075	-	-	-	-	-	-	-
SW27	Loslo Creek	T-Fe	0.320	0.3	0.3	-	-	-	-	-	-
SW2	West Creek	T-Al	0.230	0.075	0.1	-	-	0.11	0.62	0.02	0.08
SW2	West Creek	T-Fe	0.450	0.3	0.3	-	-	0.56	2.07	0.11	0.40
SW10	Pinewood River	T-Al	0.393	0.075	0.1	-	-	0.8	32.3	0.292	0.1915
SW10	Pinewood River	T-Fe	0.700	0.3	0.3	-	-	1.70	42.3	0.287	0.623
SW15	Pinewood River	T-Al	0.571	0.075	0.1	-	-	0.68	4.95	0.05	0.46
SW15	Pinewood River	T-Fe	0.840	0.3	0.3	-	-	1.07	5.99	0.09	0.92
SW15	Pinewood River	D-Al	0.093	0.075	-	-	-	0.04	0.20	0.01	0.03
SW20	Pinewood River	T-Al	0.301	0.3	0.3	-	-	-	-	-	-
SW20	Pinewood River	T-Fe	0.560	0.3	0.3	-	-	-	-	-	-
SW21	Pinewood River	T-Al	0.098	0.075	-	-	-	-	-	-	-
SW21	Pinewood River	T-Fe	0.320	0.3	0.3	-	-	-	-	-	-
SW22a	Pinewood River	T-Al	0.0785	0.075	-	-	-	-	-	-	-
SW16	Rainy River	T-Al	0.213	0.075	0.1	-	-	0.31	2.65	0.04	0.17
SW17	Rainy River	T-Al	0.152	0.075	0.1	-	-	0.23	1.71	0.05	0.13


SURFACE WATER SAMPLING LOCATIONS
Surface Water Sampling Location
Mine Footprint
Kilometers
newgold™
RAINY RIVER PROJECT
Sustainability GIS Group, Thunder Bay
Dearlock
Finland
Black Hawk
PINEWOOD
EMO
Wood
SW2
SW3
SW10
SW15
SW16
SW17
SW20
SW21
SW22
SW23
SW24
SW25
SW26
SW27
SW28
SW29
Pinewood River
Rainy River
HIGHWAY 600
HIGHWAY 617
HIGHWAY 619
HIGHWAY 11
Jewett Rd.
Roen Rd.
Korpi Rd.
Teeple Rd.
Mcmillan Road
Caul Rd.
Atkinson Rd.
Nelles Dilke Rd.
Morley Patullo Rd.
Gouliquer Rd.
Morrison Rd.
Howse Rd.
Colonization Rd.
Worthington 3 Rd.
Worthington 4 Rd.
Gallinger Rd.
Hestwole Rd.
Tait Rd.
Eliuk Rd.
Georgeson Road
Marris Rd.
Sweppenhead Road
McCallum Creek
Clark Creek
West Creek
Loslo Creek
Boucher Creek
Rainy River
Pinewood River
Minahico
Caliper Lake
Burditt Lake
Manomin
Harris Hill
Bergland
Storkson's Corner
Arbor Vitae
North Branch
Gameland
Off Lake Corner
SLEEMAN
Shenston
Barnhart
STRATTON
BARWICK
Dermid
Aylsworth
94°10'0"W
94°8'0"W
94°6'0"W
94°4'0"W
94°2'0"W
94°0'0"W
93°58'0"W
93°56'0"W
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Memorandum

To: Ray Boivin, Senior Environmental Officer, Kenora Area, MOECC

From: Dave Hall, Manager, Environment

Date: February 1, 2016

Re: **Monthly Surface Water Quality Results Summary – December 2015**

The following document has been provided consistent with Environmental Compliance Approval (ECA) # 5781-9VJQ2J, section 13(3) issued May 8, 2015. The purpose of the report is to provide a summary of monitoring activities related to the approved works.

Monitoring for December 2015 was applicable to the stage of project development;

- Construction on the Plant Site and Crusher Area Temporary Treatment Ponds was completed at the end of July;
- Surface water sampling was conducted on December 17 and 21, 2015; and
- Construction discharge sampling for the Plant Site and Crusher Area Temporary Treatment Ponds was conducted on December 8 and 10, 2015.
- Construction discharge sampling for In-Pit Sump 3 was conducted on December 13, 2015.

1.0 Plant Site and Crusher Area Sediment Ponds

The Plant Site and Crusher Area Temporary Sediment Ponds commenced construction on May 17, 2015. Prior to that time sediment and erosion control measures were put in place beginning on 5 May which included silt fencing and settling ponds. As part of site preparation, water was released and used for dust suppression from the site consistent with section 7(5) of the ECA. A single-polymer flocculant system was installed and commissioned on 15 July, 2015. This system was utilized in December and a discharge took place on December 8 and 10, 2015. Table 1 displays the effluent results at the times of discharge.

1.1 In-Pit Sump 3

In-Pit Sump 3 commenced construction on August 20, 2015. Prior to that time sediment and erosion control measures were put in place which included silt fencing. As part of site preparation, water was released and used for dust suppression from the site consistent with section 7(5) of the ECA. No water was pumped to this sump as all water that collected was from natural overland flow and precipitation. A discharge took place on December 13, 2015. Table 1 displays the effluent results at the time of discharge.

2.0 Effluent Sampling and Results

Effluent sampling was conducted from the Plant Site and Crusher Area Temporary Sediment Ponds on December 8 and 10, 2015 and on December 13, 2015 from In-Pit Sump 3. The sampling was to provide indication of performance of works relative to predicted performance and allow for water treatment to be tailored based on inputs. All discharges did not exceed the effluent limits prescribed in the ECA 5781-9VJQ2J.

3.0 Surface Water Sampling

Surface water sampling was conducted on December 17 and 21, 2015. The following sites were not sampled for the given reasons;

- SW23, SW24, SW28 and SW29 do not require sampling as of yet as the triggering milestones have not yet been reached with construction.
- SW25 and SW26, although identified as requiring sampling within one month of the receipt of the ECA, are located along the planned route of the West Creek Diversion which has yet to be commissioned.
- SW15 and SW21 due to unsafe ice conditions at the sampling site.

Sampling was conducted at the remaining sites following MISA protocols.

3.1 Summary of Analysis

Surface water sampling results met PWQO and CEQG levels except for total iron and total aluminum at some sites in the Pinewood River, the Rainy River, Loslo Creek, and West Creek (Table 2). The sites were both upstream and downstream of the Project site and results are consistent with baseline results.

QA/QC procedures met expected controls (e.g., 20 % relative percent difference) except;

- Some field duplicate parameter pairs exceeded the RPD limit of 40%, although none of these parameter pairs exhibited concentrations greater than three times the detection limit. As a result, no implications to data quality are expected based on these exceedances.
- Dissolved concentrations of zinc exceeded total concentrations in SW22a. The analytical laboratory has been queried as to the cause of this irregularity and its implications to data integrity. This remains under investigation by the laboratory. Given other parameters are within guidelines/objectives there is no concern relative to surface water quality.

4.0 Non-Routine Procedures

There were no non-routine calibration or maintenance procedures carried out on any major structure, equipment, apparatus, mechanism or thing forming a part of the sewage works during the reporting period.

5.0 Bypass or Upset Summary

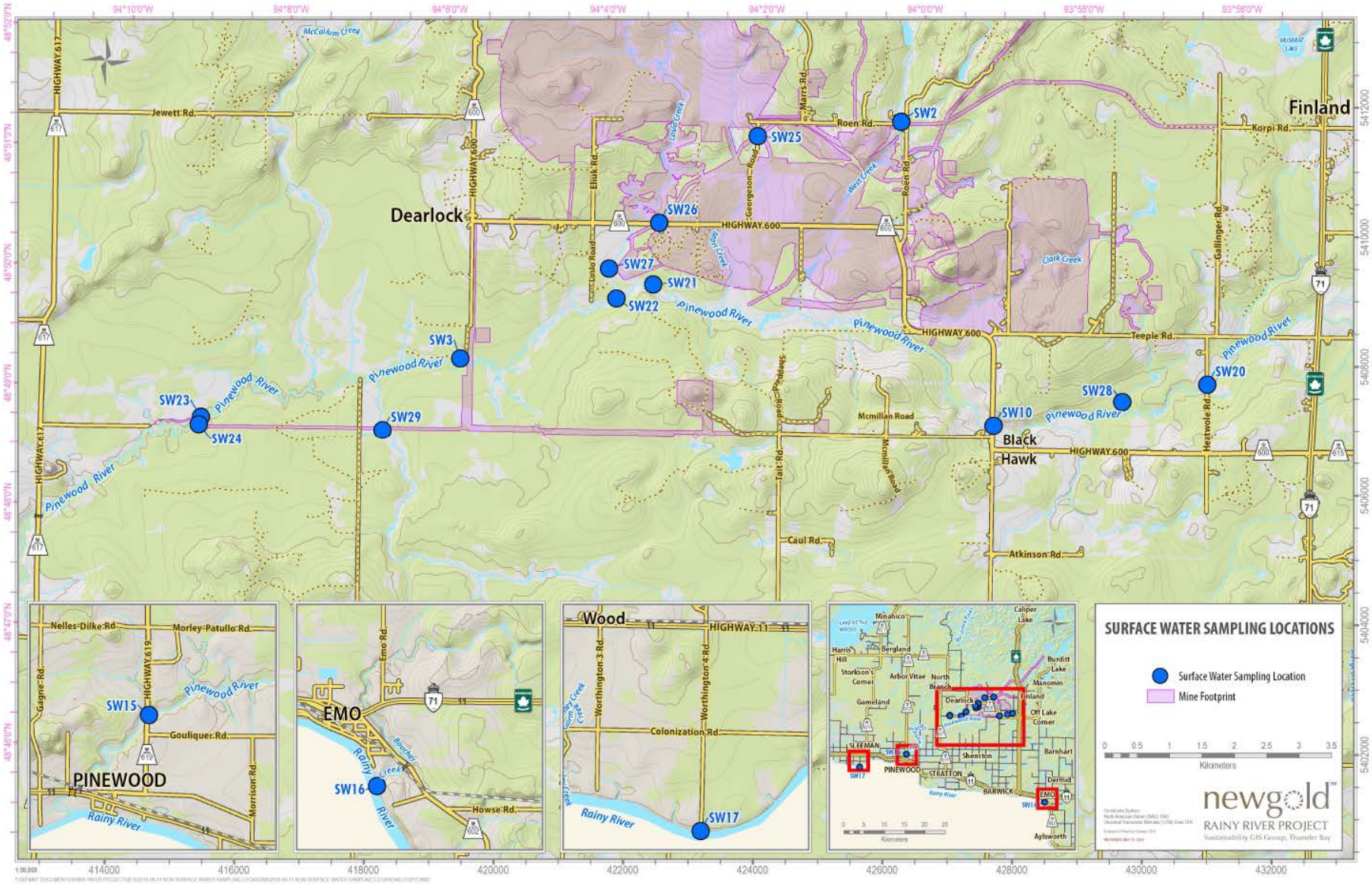
No bypass or upset conditions occurred during the reporting period.

Table 1: Summary of Effluent Results for Construction Phase Works Discharge

Effluent Parameter	Daily Maximum Concentration (mg/L)	Monthly Average Concentration (mg/L)	December 8, 2015 Process Plant and Crusher Area Temporary Sediment Ponds (mg/L)	December 10, 2015 Process Plant and Crusher Area Temporary Sediment Ponds (mg/L)	December 13, 2015 In-Pit Sump 3 (mg/L)
Total Suspended Solids	30	15	3.5	11.5	4.5
Total Arsenic	0.034	0.017	0.0017	0.0018	0.0018
Total Copper	0.028	0.014	0.0027	0.0030	0.0007
Total Nickel	0.094	0.047	0.0017	0.0018	0.0007
Total Lead	0.030	0.015	0.0001	0.0004	0.0002
Total Zinc	0.348	0.174	0.139	0.0940	0.0040
Un-ionized Ammonia	0.2	0.1	<0.001	<0.001	<0.001
Acute Toxicity (Rainbow Trout and Daphnia Magna)	Non-acutely lethal (not greater than 50% mortality in undiluted effluent)		Pass	Pass	Pass
pH of the effluent maintained between 6.0 to 9.5, inclusive, at all times			7.32	7.36	7.75

Table 2: Summary of Surface Water Sampling Results Where PWQO or CEQG Were Exceeded

Site	Water Body	Parameter	Sample Concentration (mg/L)	PWQO (mg/L)	CEQG (mg/L)	ECA (mg/L)	MISA Qualifier	Historic Avg (mg/L)	Historic Max (mg/L)	Historic Min (mg/L)	Historic Median (mg/L)
SW27	Loslo Creek	T-Fe	0.420	0.3	0.3	-	-	-	-	-	-
SW2	West Creek	T-Fe	0.340	0.3	0.3	-	-	0.56	2.07	0.11	0.40
SW3	Pinewood River	T-Al	0.219	0.075	0.1	-	-	0.36	2.77	0.0508	0.2625
SW3	Pinewood River	T-Fe	0.710	0.3	0.3	-	-	1.11	6.97	0.064	0.6885
SW10	Pinewood River	T-Al	0.189	0.075	0.1	-	-	0.8	32.3	0.292	0.1915
SW10	Pinewood River	T-Fe	0.550	0.3	0.3	-	-	1.70	42.3	0.287	0.623
SW15	Pinewood River	T-Al	0.571	0.075	0.1	-	-	0.68	4.95	0.05	0.46
SW15	Pinewood River	T-Fe	0.840	0.3	0.3	-	-	1.07	5.99	0.09	0.92
SW15	Pinewood River	D-Al	0.093	0.075	-	-	-	0.04	0.20	0.01	0.03
SW20	Pinewood River	T-Al	0.169	0.3	0.3	-	-	-	-	-	-
SW20	Pinewood River	T-Fe	0.470	0.3	0.3	-	-	-	-	-	-
SW21	Pinewood River	T-Al	0.098	0.075	-	-	-	-	-	-	-
SW21	Pinewood River	T-Fe	0.320	0.3	0.3	-	-	-	-	-	-
SW22a	Pinewood River	T-Al	0.0785	0.075	-	-	-	-	-	-	-
SW22a	Pinewood River	T-Fe	0.480	0.3	0.3	-	-	-	-	-	-
SW16	Rainy River	T-Al	0.184	0.075	0.1	-	-	0.31	2.65	0.04	0.17
SW17	Rainy River	T-Al	0.219	0.075	0.1	-	-	0.23	1.71	0.05	0.13
SW17	Rainy River	T-Fe	0.380	0.075	0.1	-	-	0.35	1.95	0.08	0.24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Nelles-Dilke Rd.
Morley-Patullo Rd.
Gouliquer Rd.
Howse Rd.
Colonization Rd.

newgold™ Rainy River Project

Tait Quarry/Hwy 600 Environmental Inspection Form

Date of Inspection: 2015_12_14	Time of Inspection: 9:30
Inspection Conducted By: Garnet Cornell, Nathan Baird	Weather: Overcast -5C
Persons Present/Organization: Garnet (NG), Nathan Baird (NG)	
Work Activity Underway and Scope of Inspection: Bringing road to grade and removing side cast material. The scope of the inspection was to ensure side cast material removal by the Pinewood River. No inspection occurred South of the bridge.	

OBSERVATIONS

STANDARD	IN COMPLIANCE? Yes	No	N/A	COMMENTS	Remedial Action?
A – Aggregate Permit #: 625581					
A1. Dust Mitigation (ESA)	☒	☐	☐	No issues at time of inspection.	No
A2. Noise Levels (ESA)	☒	☐	☐	Excavator, dozer, haul/rock truck activity on Tait Rd and Hwy 600 realignment during inspection.	No
A3. TSSA Liquid Fuels Handling Code	☐	☐	☒		No
A4. Wetland and Bird Nest Protection From ARA Application	☒	☐	☐	No concerns.	No
A5. Spills Contingency Plan	☒	☐	☐	Signed and returned to New Gold.	No
A6. Blasting Monitoring Reports Complete and Available.	☒	☐	☐	Received.	No
A7. Signage Present and Correct (Aggregate Resources Act Permit #625851)	☒	☐	☐	Sign present.	No
A8. Signage Present and Correct (No Trespassing, Danger – Open Excavation)	☒	☐	☐	Sign present.	No
A9. Compliance Assessment Report	☒	☐	☐	Completed: 2015-09-30 (NEW GOLD)	No
B – CEAA Conditions					
B1. 3.3/3.8 Geochemical Sampling and Segregation Underway and Effective	☒	☐	☐	Program confirmed NAG rock – sampling conducted by geology department.	No
B2. Blasting Design Protects Fish	☒	☐	☐		No
B3. 3.5/3.6 Stream Crossings Meet Fisheries Guidelines and MTO Drainage Standards	☒	☐	☐	ESC plan submitted and received.	No
B4. 4.6 (Migratory bird protection and lighting considerations for Nighthawk)	☒	☐	☐		No
B5. 5.2 (BMP applied for dust management)	☒	☐	☐	No issues at time of inspection.	No
B6. 6.4 (Status of reclamation)	☐	☒	☐	No seeding (Spring) has been applied. Road still under construction. Side cast material being removed/stockpiled.	No
B7. 7 (Archaeology sites respected)	☒	☐	☐		No
C – PTTW: 3270 l/min 24/7365 for the Purposes of Dewatering					
C1. Permit available at site	☒	☐	☐	Permits located in Veert Tait Office and Veert Site Office.	No
C2. Calibration records on file	☐	☐	☒		No
C3. Pumping records complete	☐	☐	☒		No
C4. All Water Taken no Directly Discharged to Environment (Except Dust)	☐	☐	☒		No
C5. Any Complaints Noted/Reported	☐	☐	☒		No
C14. Machinery Operation (Above high water mark)	☐	☐	☒		No
D – ECA: 20,000m^2 Pond for 70,000m^3 With 8,000m^3 Retained at all Time, 95m^3/h Discharge					
D1. Laydown area sump and pump present for 950m3 and 41m3/hr capacity pump	☐	☐	☒	Sump not installed. No water accumulation issues.	No
D2. Outlet spillway present and batch pumping system available 400mm above pond bed with splash pad at end of hose	☐	☐	☒		No
D3. Log book present with spills, maintenance, remedial actions and inspections recorded	☐	☐	☒		No
D4. EPSC measures in place, maintained	☐	☐	☒		No

D5. Any excess build-up of sediment/vegetation in the works?	☐	☐	☒		No
D6. Discharges free from floating settleable material	☐	☐	☒		No
D7. Flow measuring devise present, calibrated for batch pumping	☐	☐	☒		No
D8. Discharge records available	☐	☐	☒		No
D9. Water quality records up to date	☐	☐	☒		No
E – Work Permit #: FF-11-2015/2016 (Construction of Water Crossing Across Crown Lands)					
E1. Permit available at site.	☒	☐	☐	Veert office.	No
E2. Construction machinery above high water mark.	☒	☐	☐	Bridge construction complete.	No
E3. Any filling or disruption above the high water mark shall be contained or stabilized.	☒	☐	☐		No
E4. All stockpiled materials must be contained. (ESC)	☐	☒	☐	Stockpiled material in process of being hauled.	Ongoing
E5. No staging pads are permitted within flood plain.	☒	☐	☐		No
E6. Exposed mineral soil within 100m of waterbody graded to 3:1 slope.	☐	☐	☒		No
E7. Preserve the low vegetative cover within 100m. (e.g. grasses, shrubs) Unless effective mitigation techniques are in place. (ESC)	☒	☐	☐		No
E8. No obstruction of watercourses.	☒	☐	☐		No
E9. Machinery maintenance away from water.	☒	☐	☐		No
E10. **Upon Completion:** Removal of all construction materials, equipment and refuse from site.	☐	☐	☒	Road still under construction.	No
F – Summary					
F1. Immediate Areas of Concern	Stockpile removal. Spill kits and drip trays at light plants.				
F2. Action Required	Continue hauling stockpiles along road. Ensure all light plants have drip trays under them and have spill kits.				
G – General Comments					
Ensure drip trays are placed under parked “leaky” equipment. We noticed the light plant North of the Pinewood River bridge did not have a spill kit placed at it.					
Emergency spill kit at fuel tanks was used. This spill kit is only to be used in an emergency. Make sure it is restocked appropriately as there were spill pads missing.					

Station	Discharge Coordinates (UTM)	Discharge Date	pH_Field	Temp_Field	DO_Field	Colour	Conductivity	Hardness	pH_Lab	TSS	TDS	Turbidity	Alkalinity (Total as CaCO3)
Process Plant and Crusher Area Temporary Sediment Ponds **Discharge**	426012E 5410720N	17-Sep-15	7.45	18.94		5.3	606	275	7.70	17.5	380	12.9	217
Process Plant and Crusher Area Temporary Sediment Ponds **Discharge**	426012E 5410720N	19-Oct-15	7.76	8			647	273	7.98	10.0			218
Process Plant and Crusher Area Temporary Sediment Ponds **Discharge**	426012E 5410720N	05-Nov-15	6.28	7.63			629	297	7.10	63.0			224
Process Plant and Crusher Area Temporary Sediment Ponds **Discharge**	426012E 5410720N	07-Nov-15	7.71	5.29			563	275	8.15	6.5			218
Process Plant and Crusher Area Temporary Sediment Ponds **Discharge**	426012E 5410720N	08-Nov-15	7.76	5.05			567	271	8.15	7.0			221
Process Plant and Crusher Area Temporary Sediment Ponds **Discharge**	426012E 5410720N	09-Nov-15	7.77	5.57			577	279	8.18	6.0			227
Process Plant and Crusher Area Temporary Sediment Ponds **Discharge**	426012E 5410720N	08-Dec-15	6.79	1.58		5.2	629	298	7.70	11.0	375	7.61	230
Process Plant and Crusher Area Temporary Sediment Ponds **Discharge**	426012E 5410720N	10-Dec-15	6.91	1.96			602	281	7.36	11.5			229
In Pit Sump 3 **Discharge**	424982E 5409309N	7-Dec-15	7.63	3.25			616	298	7.99	1.0			328
In Pit Sump 3 **Discharge**	424982E 5409309N	13-Dec-15	7.33	1.85			688	341	7.75	4.5			344

Station	Discharge Coordinates (UTM)	Discharge Date	Acidity as CaCO3	Total Ammonia-N	Ammonia - U	Bromide (Br)	Chloride (Cl)	Fluoride (F-)	Nitrate (N)	Nitrite (N)	Total Kjeldahl Nitrogen (TKN)	Orthophosphate (P)	Total Dissolved Phosphate As P	Total Phosphate as P
Process Plant and Crusher Area Temporary Sediment Ponds **Discharge**	426012E 5410720N	17-Sep-15	6.0	2.06	0.021		2.68	0.152	10.6	1.13		0.003		
Process Plant and Crusher Area Temporary Sediment Ponds **Discharge**	426012E 5410720N	19-Oct-15		1.17	0.011		2.73							
Process Plant and Crusher Area Temporary Sediment Ponds **Discharge**	426012E 5410720N	05-Nov-15		1.28	0.001		2.65							
Process Plant and Crusher Area Temporary Sediment Ponds **Discharge**	426012E 5410720N	07-Nov-15		0.566	0.004		2.37							
Process Plant and Crusher Area Temporary Sediment Ponds **Discharge**	426012E 5410720N	08-Nov-15		0.596	0.004		2.34							
Process Plant and Crusher Area Temporary Sediment Ponds **Discharge**	426012E 5410720N	09-Nov-15		0.546	0.004		2.36							
Process Plant and Crusher Area Temporary Sediment Ponds **Discharge**	426012E 5410720N	08-Dec-15	10.2	0.604	0.001		3.02	0.181	8.36	0.314		0.003		
Process Plant and Crusher Area Temporary Sediment Ponds **Discharge**	426012E 5410720N	10-Dec-15		0.474	0.001		3.23		5.58					
In Pit Sump 3 **Discharge**	424982E 5409309N	7-Dec-15		0.080	0.001		7.28							
In Pit Sump 3 **Discharge**	424982E 5409309N	13-Dec-15		0.004	0.001		5.94		0.025					

Station	Discharge Coordinates (UTM)	Discharge Date	Sulfate (SO4)	DOC	TOC	Cyanide, Free	Total Cyanide (CN)	T. Aluminum (Al)	T. Antimony (Sb)	T. Arsenic (As)	T. Barium (Ba)	T. Beryllium (Be)	T. Bismuth (Bi)	T. Boron (B)
Process Plant and Crusher Area Temporary Sediment Ponds **Discharge**	426012E 5410720N	17-Sep-15	73.3	5.6	5.4			0.186	0.00207	0.0019	0.0499	0.00002	0.00002	0.308
Process Plant and Crusher Area Temporary Sediment Ponds **Discharge**	426012E 5410720N	19-Oct-15	76.0						0.00198	0.0016				
Process Plant and Crusher Area Temporary Sediment Ponds **Discharge**	426012E 5410720N	05-Nov-15	73.5						0.00183	0.0016				
Process Plant and Crusher Area Temporary Sediment Ponds **Discharge**	426012E 5410720N	07-Nov-15	62.6						0.00121	0.0016				
Process Plant and Crusher Area Temporary Sediment Ponds **Discharge**	426012E 5410720N	08-Nov-15	62.6						0.00127	0.0017				
Process Plant and Crusher Area Temporary Sediment Ponds **Discharge**	426012E 5410720N	09-Nov-15	62.7						0.00121	0.0017				
Process Plant and Crusher Area Temporary Sediment Ponds **Discharge**	426012E 5410720N	08-Dec-15	71.7	4.7	4.9			0.250	0.00136	0.0018	0.0533	0.00001	0.00002	0.182
Process Plant and Crusher Area Temporary Sediment Ponds **Discharge**	426012E 5410720N	10-Dec-15	65.7						0.00098	0.0018				
In Pit Sump 3 **Discharge**	424982E 5409309N	7-Dec-15	33.0						0.00011	0.0022				
In Pit Sump 3 **Discharge**	424982E 5409309N	13-Dec-15	28.7						0.00008	0.0018				

Station	Discharge Coordinates (UTM)	Discharge Date	T. Cadmium (Cd)	T. Calcium (Ca)	T. Chromium (Cr)	T. Cobalt (Co)	T. Copper (Cu)	T. Iron (Fe)	T. Lead (Pb)	T. Lithium (Li)	T. Magnesium (Mg)	T. Manganese (Mn)	T. Mercury (Hg)	T. Molybdenum (Mo)
Process Plant and Crusher Area Temporary Sediment Ponds **Discharge**	426012E 5410720N	17-Sep-15	0.000020	59.8	0.0012	0.00083	0.0034	0.28	0.00015	0.0306	32.3	0.0141	0.000002	0.0147
Process Plant and Crusher Area Temporary Sediment Ponds **Discharge**	426012E 5410720N	19-Oct-15	0.000020			0.00072	0.0029		0.00008					
Process Plant and Crusher Area Temporary Sediment Ponds **Discharge**	426012E 5410720N	05-Nov-15	0.000030			0.00099	0.0040		0.00047					
Process Plant and Crusher Area Temporary Sediment Ponds **Discharge**	426012E 5410720N	07-Nov-15	0.000015			0.00058	0.0026		0.00015					
Process Plant and Crusher Area Temporary Sediment Ponds **Discharge**	426012E 5410720N	08-Nov-15	0.000010			0.00057	0.0027		0.00014					
Process Plant and Crusher Area Temporary Sediment Ponds **Discharge**	426012E 5410720N	09-Nov-15	0.000015			0.00055	0.0026		0.00011					
Process Plant and Crusher Area Temporary Sediment Ponds **Discharge**	426012E 5410720N	08-Dec-15	0.000020	67.7	0.0009	0.00077	0.0032	0.24	0.00019	0.0228	33.1	0.0583	0.000002	0.0130
Process Plant and Crusher Area Temporary Sediment Ponds **Discharge**	426012E 5410720N	10-Dec-15	0.000020			0.00071	0.0030		0.00035					
In Pit Sump 3 **Discharge**	424982E 5409309N	7-Dec-15	0.000005			0.00007	0.0009		0.00005					
In Pit Sump 3 **Discharge**	424982E 5409309N	13-Dec-15	0.000005			0.00006	0.0007		0.00020					

Station	Discharge Coordinates (UTM)	Discharge Date	T. Nickel (Ni)	T. Phosphorus (P)	T. Potassium (K)	T. Selenium (Se)	T. Silicon (Si)	T. Silver (Ag)	T. Sodium (Na)	T. Strontium (Sr)	T. Tellurium (Te)	T. Thallium (Tl)	T. Tin (Sn)	T. Titanium (Ti)
Process Plant and Crusher Area Temporary Sediment Ponds **Discharge**	426012E 5410720N	17-Sep-15	0.0017		6.49	0.0022		0.00002	13.7	0.267	0.00004	0.000016	0.00006	
Process Plant and Crusher Area Temporary Sediment Ponds **Discharge**	426012E 5410720N	19-Oct-15	0.0018											
Process Plant and Crusher Area Temporary Sediment Ponds **Discharge**	426012E 5410720N	05-Nov-15	0.0025											
Process Plant and Crusher Area Temporary Sediment Ponds **Discharge**	426012E 5410720N	07-Nov-15	0.0016											
Process Plant and Crusher Area Temporary Sediment Ponds **Discharge**	426012E 5410720N	08-Nov-15	0.0015											
Process Plant and Crusher Area Temporary Sediment Ponds **Discharge**	426012E 5410720N	09-Nov-15	0.0015											
Process Plant and Crusher Area Temporary Sediment Ponds **Discharge**	426012E 5410720N	08-Dec-15	0.0019		6.29	0.0034		0.00001	13.2	0.255	0.00004	0.000018	0.00008	
Process Plant and Crusher Area Temporary Sediment Ponds **Discharge**	426012E 5410720N	10-Dec-15	0.0018											
In Pit Sump 3 **Discharge**	424982E 5409309N	7-Dec-15	0.0008											
In Pit Sump 3 **Discharge**	424982E 5409309N	13-Dec-15	0.0007											

Station	Discharge Coordinates (UTM)	Discharge Date	T. Tungsten (W)	T. Uranium (U)	T. Vanadium (V)	T. Zinc (Zn)	T. Zirconium (Zr)	D. Aluminum (Al)	D. Antimony (Sb)	D. Arsenic (As)	D. Barium (Ba)	D. Beryllium (Be)	D. Bismuth (Bi)	D. Boron (B)
Process Plant and Crusher Area Temporary Sediment Ponds **Discharge**	426012E 5410720N	17-Sep-15	0.00019	0.00680	0.00255	0.0030	0.00032	0.005	0.00200	0.00176	0.0495	0.00001	0.00002	0.256
Process Plant and Crusher Area Temporary Sediment Ponds **Discharge**	426012E 5410720N	19-Oct-15				0.0040			0.00194	0.00168				
Process Plant and Crusher Area Temporary Sediment Ponds **Discharge**	426012E 5410720N	05-Nov-15				0.0055			0.00191	0.00142				
Process Plant and Crusher Area Temporary Sediment Ponds **Discharge**	426012E 5410720N	07-Nov-15				0.0400			0.00130	0.00164				
Process Plant and Crusher Area Temporary Sediment Ponds **Discharge**	426012E 5410720N	08-Nov-15				0.0400			0.00129	0.00164				
Process Plant and Crusher Area Temporary Sediment Ponds **Discharge**	426012E 5410720N	09-Nov-15				0.0380			0.00129	0.00158				
Process Plant and Crusher Area Temporary Sediment Ponds **Discharge**	426012E 5410720N	08-Dec-15	0.00015	0.00772	0.00175	0.0705	0.00102	0.001	0.00133	0.00175	0.0516	0.00001	0.00002	0.181
Process Plant and Crusher Area Temporary Sediment Ponds **Discharge**	426012E 5410720N	10-Dec-15				0.0940			0.00099	0.00165				
In Pit Sump 3 **Discharge**	424982E 5409309N	7-Dec-15				0.0020			0.00011	0.00193				
In Pit Sump 3 **Discharge**	424982E 5409309N	13-Dec-15				0.0040			0.00007	0.00155				

Station	Discharge Coordinates (UTM)	Discharge Date	D. Cadmium (Cd)	D. Calcium (Ca)	D. Chromium (Cr)	D. Cobalt (Co)	D. Copper (Cu)	D. Iron (Fe)	D. Lead (Pb)	D. Lithium (Li)	D. Magnesium (Mg)	D. Manganese (Mn)	D. Mercury (Hg)	D. Molybdenum (Mo)
Process Plant and Crusher Area Temporary Sediment Ponds **Discharge**	426012E 5410720N	17-Sep-15	0.000015	57.4	0.0007	0.00062	0.0026	0.01	0.00001	0.0300	32.0	0.0056	0.000002	0.0142
Process Plant and Crusher Area Temporary Sediment Ponds **Discharge**	426012E 5410720N	19-Oct-15	0.000020			0.00064	0.0024		0.00001					
Process Plant and Crusher Area Temporary Sediment Ponds **Discharge**	426012E 5410720N	05-Nov-15	0.000025			0.00064	0.0025		0.00001					
Process Plant and Crusher Area Temporary Sediment Ponds **Discharge**	426012E 5410720N	07-Nov-15	0.000005			0.00051	0.0021		0.00002					
Process Plant and Crusher Area Temporary Sediment Ponds **Discharge**	426012E 5410720N	08-Nov-15	0.000010			0.00049	0.0021		0.00003					
Process Plant and Crusher Area Temporary Sediment Ponds **Discharge**	426012E 5410720N	09-Nov-15	0.000005			0.00049	0.0021		0.00001					
Process Plant and Crusher Area Temporary Sediment Ponds **Discharge**	426012E 5410720N	08-Dec-15	0.000020	67.4	0.0004	0.00063	0.0026	0.01	0.00002	0.0234	31.5	0.0513	0.000002	0.0122
Process Plant and Crusher Area Temporary Sediment Ponds **Discharge**	426012E 5410720N	10-Dec-15	0.000020			0.00060	0.0026		0.00009					
In Pit Sump 3 **Discharge**	424982E 5409309N	7-Dec-15	0.000005			0.00006	0.0006		0.00001					
In Pit Sump 3 **Discharge**	424982E 5409309N	13-Dec-15	0.000005			0.00004	0.0006		0.00009					

Station	Discharge Coordinates (UTM)	Discharge Date	D. Nickel (Ni)	D. Phosphorus (P)	D. Potassium (K)	D. Selenium (Se)	D. Silicon (Si)	D. Silver (Ag)	D. Sodium (Na)	D. Strontium (Sr)	D. Tellurium (Te)	D. Thallium (Tl)	D. Tin (Sn)	D. Titanium (Ti)
Process Plant and Crusher Area Temporary Sediment Ponds **Discharge**	426012E 5410720N	17-Sep-15	0.0014		7.09	0.0024		0.00002	13.5	0.253	0.00001	0.000012	0.00002	
Process Plant and Crusher Area Temporary Sediment Ponds **Discharge**	426012E 5410720N	19-Oct-15	0.0014											
Process Plant and Crusher Area Temporary Sediment Ponds **Discharge**	426012E 5410720N	05-Nov-15	0.0015											
Process Plant and Crusher Area Temporary Sediment Ponds **Discharge**	426012E 5410720N	07-Nov-15	0.0013											
Process Plant and Crusher Area Temporary Sediment Ponds **Discharge**	426012E 5410720N	08-Nov-15	0.0013											
Process Plant and Crusher Area Temporary Sediment Ponds **Discharge**	426012E 5410720N	09-Nov-15	0.0013											
Process Plant and Crusher Area Temporary Sediment Ponds **Discharge**	426012E 5410720N	08-Dec-15	0.0015		6.16	0.0036		0.00001	12.6	0.240	0.00002	0.000014	0.00006	
Process Plant and Crusher Area Temporary Sediment Ponds **Discharge**	426012E 5410720N	10-Dec-15	0.0014											
In Pit Sump 3 **Discharge**	424982E 5409309N	7-Dec-15	0.0007											
In Pit Sump 3 **Discharge**	424982E 5409309N	13-Dec-15	0.0007											

Station	Discharge Coordinates (UTM)	Discharge Date	D. Tungsten (W)	D. Uranium (U)	D. Vanadium (V)	D. Zinc (Zn)	D. Zirconium (Zr)	Total Oil & Grease
Process Plant and Crusher Area Temporary Sediment Ponds **Discharge**	426012E 5410720N	17-Sep-15	0.00018	0.00630	0.00185	0.0025	0.00004	0.2
Process Plant and Crusher Area Temporary Sediment Ponds **Discharge**	426012E 5410720N	19-Oct-15				0.0030		
Process Plant and Crusher Area Temporary Sediment Ponds **Discharge**	426012E 5410720N	05-Nov-15				0.0040		
Process Plant and Crusher Area Temporary Sediment Ponds **Discharge**	426012E 5410720N	07-Nov-15				0.0370		
Process Plant and Crusher Area Temporary Sediment Ponds **Discharge**	426012E 5410720N	08-Nov-15				0.0375		
Process Plant and Crusher Area Temporary Sediment Ponds **Discharge**	426012E 5410720N	09-Nov-15				0.0360		
Process Plant and Crusher Area Temporary Sediment Ponds **Discharge**	426012E 5410720N	08-Dec-15	0.00017	0.00736	0.00095	0.0680	0.00008	0.2
Process Plant and Crusher Area Temporary Sediment Ponds **Discharge**	426012E 5410720N	10-Dec-15				0.0940		
In Pit Sump 3 **Discharge**	424982E 5409309N	7-Dec-15				0.0015		
In Pit Sump 3 **Discharge**	424982E 5409309N	13-Dec-15				0.0065		

newgold Rainy River Project		ENV-PRCD-003 Site Procedure for Construction Dewatering and Monitoring	
Author: Manager Environment November 7, 2015	**Approver**: Construction Director November 7, 2015	**Revision Number**: V1.0	**Creation Date**: November 7, 2015 **Date Last Modified**: November 7, 2015 **Review Frequency: 1 Year**

The use of portable water pumps on the Rainy River Project to de-water construction work areas including; but not limited to: de-watering for diversion channels, temporary sumps, sediment traps/pond and culvert installations must adhere to the information provided in this policy and procedure. Furthermore all water taking must be tracked and recorded daily for each pump location and data needs to be submitted to New Gold Environment as per the New Gold Water Taking Procedure. Any sediment release into a stream or pond is considered a REPORTABLE SPILL and your Supervisor is to be contacted immediately and the requirements of New Golds Spill Reporting Procedure are to be implemented.

This document contains information on the following:

- Selecting appropriate locations for water pump discharge locations;
- Environmental requirements for setting up a portable pump system;
- Operational monitoring requirements; and
- Removal of pumps.

Choosing Appropriate Location for Water Discharge

1. Review aerial photos and/or maps to find a location that will drain away from work area and has adequate vegetation to act as a natural buffer prior to draining to natural watercourses on the project site.
2. Conduct field review with New Gold Environmental Department to receive approval for location. If applicable New Gold will provide a maximum daily water taking rate as per Ministry of Environment and Climate Change approval guidelines.

Note: By-Pass Pumping Systems for Culvert Installation

Pump around systems for culvert installations will require an Erosion Sediment Control plan to be provided to New Gold Environmental Department 1 week prior to culvert installation.

Within 48 hours of culvert installation the construction contractor MUST have upstream and downstream plug locations marked in field with pickets and labeled “plug”. New Gold Environmental Department will then assess the area and conduct a final fish salvage program if necessary.

Before and after construction photos of crossing location (upstream and downstream) will be taken by New Gold Environment.

Environmental Set-Up Requirements for Portable Water Pumps

1. All pumps must be placed in plastic drip tray on level ground.
2. Pump intakes in waterways require fish screens as per Department of Fisheries and Oceans Regulations. Sump excavations do not require fish screens.
3. Fuel cans and oil to be stored in a separate spill tray, 50m from any water (waterway or wet excavation).
4. Rock splash pads MUST be designed to attached specifications outlined in In some circumstances the use of a silt sock instead of a rock splash pad may be acceptable.

All installations require final approval from New Gold Environmental prior to the commencement of pumping.

Environmental Monitoring During Operation

1. A minimum of 1 documented inspection per 12 hr shift is required and must be submitted to rainyriver.enviro@newgold.com daily.
2. Inspection must be completed using attached form.
3. All water taking must be tracked and recorded daily for each pump location and data needs to be submitted to New Gold Environment every 7 days as per the New Gold Water Taking Procedure.

Removal of Pump

1. Splash pads may remain in place during the duration of construction and are to be removed when de-watering is complete
2. Removal of pump from a work area is to be documented on final inspection form.

Reference Documents

- New Gold Spill Reporting Procedure
- New Gold Water Taking Procedure
- OPSS 518 : Construction specification for control of water from dewatering operations
- OPSS 517 : Construction specifications for dewatering of pipeline utility and associated structure excavation
- Typical Splash Pad Drawing – Figure 1 attached

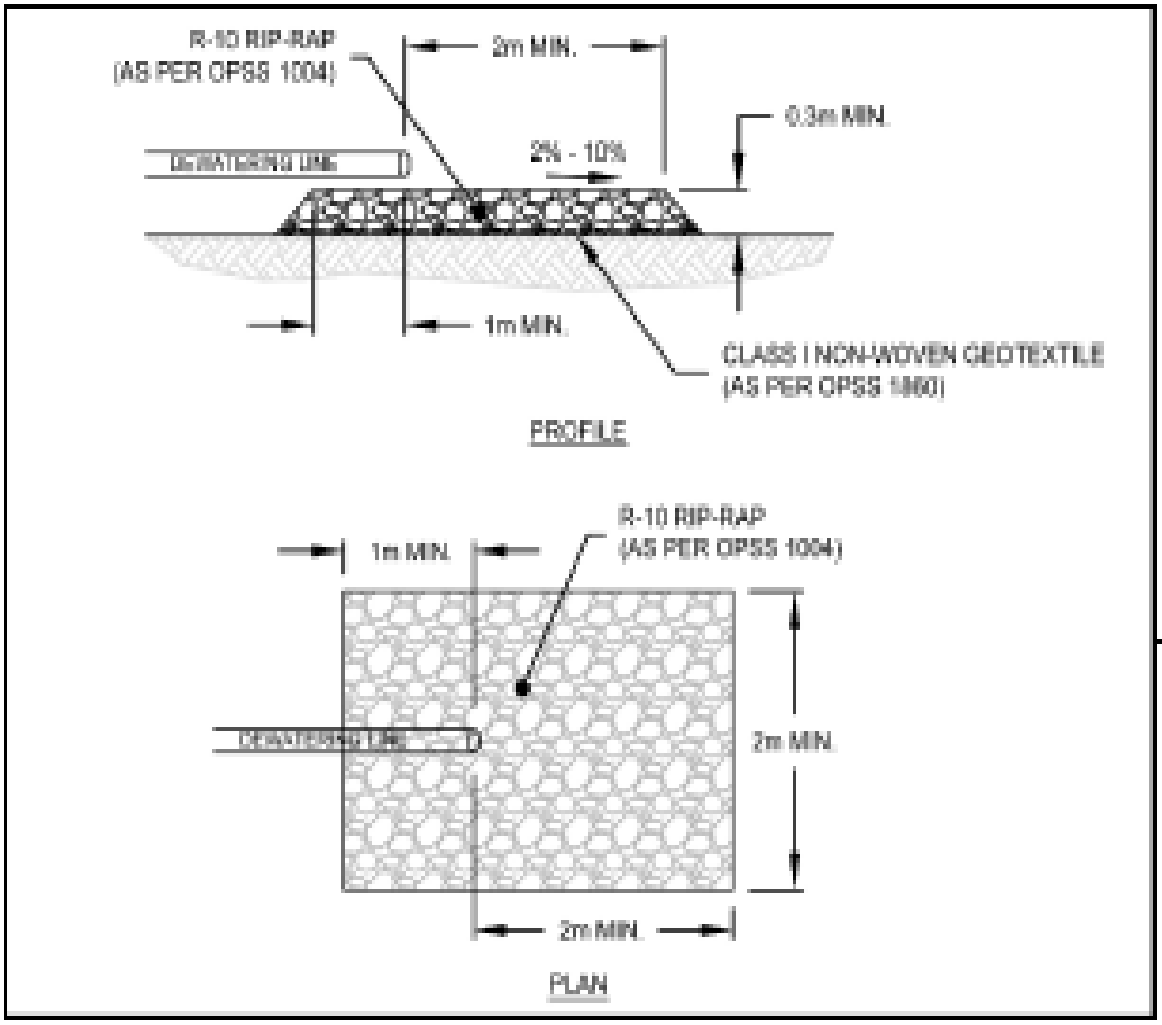


Figure 1; Typical Splash Pad drawing to be followed for all construction de-watering splash pads

Teeple Diversion and Fish Habitat Construction - Oct 2015

newgold Rainy River Project		ENV-PRCD-002 Site Procedure for Tracking Water Related to PTTW and ECA	
Author: Manager Environment Approved July 12	**Approver**: Construction Director Approved July 12	**Revision Number**: V1.0	**Creation Date**: July 12, 2015 **Date Last Modified**: July 12, 2015 **Review Frequency: 1 Year**

Purpose

The purpose of this procedure is to clarify requirements relating to the taking of water for any use and to support the implementation of environmental regulatory approvals aimed at protecting stream flow and water quality including the Pinewood River. Management of water takings and discharge is required by legislation to protect water resources and a flow threshold has been set for the Pinewood River which must be maintained.

Any pumping of water must be tracked consistent with regulatory approvals and while this procedure is intended to support the implementation of those approvals it is the responsibility of the organization doing the pumping to ensure regulatory approvals are followed.

This procedure applies to all surface and groundwater pumping on the Project site.

Regulatory Requirements

Applicable legislation and permit conditions must be followed. These include but are not limited to;

- PTTW 3638-9VTNRM, PTTW 1386-9VTP2H, PTTW2133-9VUPVZ and PTTW 0040-9VUL6B;
- Environmental Compliance Approval 5781-9VJQ2J
- Ontario Water Resources Act including O.Reg 387/04; and
- Management of water used for dust suppression and other industrial uses (RRP_Water Use Management_Ver1_(Jun022015)_toGov);

Consistent with relevant section of the permit, no water taken under the authority of a PTTW may be discharged directly to the natural environment without prior treatment in accordance with an OWRA, R.S.O. 1990, Section 53, Industrial Sewage Works Approval, with the exception of the following:

a) Water taken for dust suppression and other industrial uses, provided the plan for management of water for dust suppression and other industrial uses is followed; and with the exception of PTTW 3638-9VTNRM

b) Non-contact water from by-pass pumping when standard sediment and erosion control practices are used. Which water takings are bypass pumping are defined in Table 1 and Mapped in Figure 3.1 for PTTW2133-9VUPVZ.

For the ECA and consistent with section 7.5; surface water runoff or seepage must not be discharged directly to the natural environment, from worksites, but instead directed to the contact water management system for further treatment if the concentration of parameters exceeds those authorized for discharge [e.g., 15 mg/l TSS and 0.1 mg/l unionized ammonia (monthly average)], unless the water is taken for dust suppression, industrial use or during site preparation, or is discharged using standard sediment and erosion control practices.

All water taken or discharged must be recorded by an annually calibrated flow measuring device with an accuracy of plus or minus 15 percent of the actual flow.

Procedure;

Pumping of any water on site must follow this procedure. The only exceptions are for water used for domestic use, potable water and fire suppression. The procedure has the following required steps;

1. Request for pumping approval submitted to New Gold together with calibration records
    a. Determine if pumping is (Environmental Compliance Approval) ECA or Permit to Take Water (PTTW) related
    b. Provide Details of pumping plans and environmental controls
    c. Provide information for flow metering and associated calibration records
2. Track water taking/pumping
3. Limitations and restrictions on cumulative consumptive takings

Step 1: Request for pumping approval submitted to New Gold together with calibration records

Prior to ANY pumping of surface or ground water on site a request must be made through the contracts department and ultimately to the environmental department using the form included with this procedure (Pump/Flow Meter Site Authorization Form; Permit to Take Water). The purpose of the form is a onetime process to support communication of Permit requirements and provide New Gold with documentation regarding the proposed pumping including volume, rate, duration and the calibration records of flow measuring devices.

Step 1 must be completed prior to completion of pumping. In the event of an emergency this process can be bypassed with authorization of the Environment Manager or designate provided the information is still captured e.g., flow rates, volumes etc and provided after the event.

Step 1a: Determination of PTTW, ECA related pumping or pumping from groundwater

Step 1a is required to identify the approved permit and legislation allowing for the proposed pumping. The information determined in Step 1a is to be recorded on Part A of the form.

All approved water takings by a PTTW are listed in Table 1 and must follow the corresponding PTTW approval. If the required pumping is not listed in Table 1 then the pumping is related to an ECA and must follow the ECA approval particularly sections 7.5 and 9.6. However, water takings in Table 1 may also be subject to the ECA which are highlighted in blue in Table 1 and in this case both PTTW and ECA conditions apply.

Table 1 provides a summary of approved water takings consistent with the approved Permits To Take Water. There are 4 categories as colour coded in Table 1;

- To ECA approved water treatment
- Bypass with sediment and erosion control
- Bypass to enhanced sediment and erosion control (but not ECA)
- Consumptive taking

All PTTW related pumping fits into one of these categories. A description is to be provided of the pump e.g., for dewatering a work area associated with excavation water that will be pumped to a vegetative area with applicable sediment and erosion control.

If groundwater pumping is permitted through a PTTW a similar process must be followed as for PTTW approved takings for surface water. In the absence of a PTTW for groundwater pumping then water tracking is required consistent with surface water for PTTW takings to ensure 50 m^3/day is not exceeded.

Pumping of all other surface water is related to the ECA as approved under section 7.5 and must be done with standard sediment erosion control practices or taken for dust suppression/industrial uses. Standard sediment and erosion control practices include those listed in OPSS 805, or as identified in sediment and erosion control plans for the site and/or specific works e.g., any LRIA approvals. Takings for dust suppression must follow the Management of water used for dust suppression and other industrial uses plan (RRP_Water Use Management_Ver1_(Jun022015)_toGov).

There are 8 approved final treated water discharge locations based on the ECA which is excluded from this procedure. No discharge from these locations may occur without authorization from the New Gold site environmental department. Once these treatment works are completed all water related to those works must go through the treatment works.

Step 1b Provide Details of pumping plans and environmental controls

The details of pumping and environmental controls required depend on the type of pumping and the enabling permit. The information determined from step 1b is to be recorded in Part B of the form.

For a PTTW the source of water taking, discharge location and a maximum volume, rate and duration of pumping has been defined in the PTTW. Therefore this information is required to ensure awareness of the permit requirement. The permit approves a maximum for each of these data fields which cannot be exceeded. Table 1 lists the approved pumping limits, sources and discharge points which can be used to populate Part B of the form.

For ECA related pumping there are no limits on the volume, duration or rate of pumping however, standard sediment and erosion control measures must be applied as identified above, these measures are to be identified on the form.

For dust suppression reference must be made to conformance with the following plan: RRP_Water Use Management_Ver1_(Jun022015)_toGov including specific control measures as applicable.

Step 1c Provide information for flow metering and associated calibration records

To ensure pumping records and volumes are accurate measuring pumping is required for any pumping. The measuring of water pumping must conform to one or more of the following criteria;

1. a flow measuring device(s) to an accuracy of ± 15% of the actual flow rate. The flow measuring device shall be calibrated at least once per year over the range of flow going through the meter
2. water truck with certified volume and the number of loads, volume and rate of taking is recorded

3. other method as approved by New Gold through MOECC – this can be proposed to New Gold for New Gold submission to MOECC.

Therefore in Part C of the form the proposed method of flow metering and the associated calibration/certification method must be provided along with the supporting documentation e.g., calibration records. A method of unique identification of the flow meter must be provided such that this can be tracked during field inspections/audits. In the event of water for dust suppression this may be a tank identifier or water truck identifier.

Step 2: Track water taking/pumping

The tracking of water takings or discharge requires the following must be recorded for each day water is taken/discharged: date, volume of water, and the rate of water pumped/discharged as measured using the flow metering device as proposed in step 1c. This tracking must be completed by the person/organization responsible for the pumping.

In the event no water is pumped this needs to be recorded also as 'no takings/discharge' or equivalent. A separate record must be submitted for each source as determined in Table 1 for PTTW pumping, for each groundwater well or ECA discharge.

To support collation and submission of water tracking data to New Gold a form is provided with this procedure and available in excel format to track water taking.

Completion and submission of water taking data is the responsibility of the contractor/the organization responsible for operating the pumps. Tracking sheets must be emailed to rainyriver.enviro@newgold.com at least weekly and by 0700 on Wednesdays for the previous week. The submission must be in electronic (excel) format and not hand written notes.

A record of water taking must be maintained by the person/organization conducting the pumping on site and available for inspection. The environment department will compile the submissions for completion of annual reporting.

Step 3: Limitations and restrictions on cumulative consumptive takings

A limit of either 15 or 20 % of Pinewood River flows, depending on the time of year, has been established for consumptive water taking. Consumptive taking (indicated in green in Table 1) is considered the impoundment of water that would otherwise drain to the Pinewood River and excludes bypass pumping. Impoundment of water relates to the Water Management Pond, the Tailings Management Area and the Mine Rock Pond and not ponds related to fish habitat works.

The summer low flow in the Pinewood typically doesn't drop below 150 L/s, equivalent to a maximum taking of 1,950 m3/ day taking at 15 %. In the event pumping authorization is given for consumptive use through this procedure that may cumulatively exceeds this volume, or exceeds the maximum consumptive take from the Pinewood River at any time, pumping limitations put in place by the site environmental team.

Table 1; Summary of Permitted Water Takings			Maximum Water Taking		
PTTW Permit	**Source**	**Type of Taking**	**Litres/min**	**Litres/day**	**Duration**
3638-9VTNRM	Tait Quarry dug out pond	To wet pond	3270	4700000	365
1386-9VTP2H	Outcrop 3 Quarry	By pass pump and retain	910	1300000	365
1386-9VTP2H	Outcrop 4 Quarry		770	1100000	365
1386-9VTP2H	Roen Road Pit	By pass pump	3000	4300000	365
2133-9VUPVZ	Loslo Creek (C6)	By pass pump	13,792	19,860,000	90
2133-9VUPVZ	Loslo Creek Water discharge pond dam (WDPD)	To terminal constructed wetland sediment pond	14,200	20,448,000	90
2133-9VUPVZ	Loslo Creek (CWPD1)		14,961	21,544,000	90
2133-9VUPVZ	Loslo Creek (CWPD2)		15,074	21,706,000	90
2133-9VUPVZ	Loslo Creek (CWPD3)		15,525	22,355,000	90
2133-9VUPVZ	Loslo Creek (CWPD4)	By pass pump	17,765	22,581,000	90
2133-9VUPVZ	Marr Creek Temporary Sediment Pond Dam (TSPD)	To temporary west stockpile pond	4,790	6,897,000	90
2133-9VUPVZ	Marr Creek culvert (C5)	By pass pump	2,564	3,692,000	90
2133-9VUPVZ	Marr Creek culvert (C9)	By pass pump	3,790	5,457,000	90
2133-9VUPVZ	West Creek Stockpile Dam (SPD)	By pass to temporary SPD channel excavation	4,395	6,329,000	90
2133-9VUPVZ	West Creek Stockpile Diversion (SPDC)	By pass pump or to sediment pond 1	2,212	3,185,000	90
2133-9VUPVZ	West Creek Pond Dam (WCPD)	By pass pump	9,551	13,754,000	90
2133-9VUPVZ	West Creek Culvert (C1)	By pass pump	11,524	16,594,000	90
2133-9VUPVZ	West Creek Culvert (C2)	By pass pump	21,033	30,287,000	90
2133-9VUPVZ	West Creek Culvert (C3)	By pass pump	4,776	6,877,000	90
2133-9VUPVZ	West Creek Culvert (C4)	By pass pump	775	1,116,000	90
2133-9VUPVZ	West Creek Culvert (C7)	By pass pump	2,310	3,327,000	90
2133-9VUPVZ	Clark Creek Diversion (CCDC)	Bypass to teeple pond	5,396	7,770,000	90
2133-9VUPVZ	Clark Creek Teeple Pond Dam (TPD)	By pass pump	1,113	1,603,000	90
2133-9VUPVZ	Clark Creek Pond Dam (CCPD)	Bypass to teeple pond	5,396	7,770,000	90
2133-9VUPVZ	Clark Creek Mine Rock Pond Diversion Dam (MRPDD)		5,410	7,790,000	90
2133-9VUPVZ	Clark Creek Culvert (C8)	By pass pump	5,705	8,216,000	90
2133-9VUPVZ	Sediment Pond #1 (SP1) Plant site	By pass pump	32,498	46,797,000	180
2133-9VUPVZ	Sediment Pond #2 (SP2) Plant Site	By pass pump	7,285	10,490,000	90
2133-9VUPVZ	Plant site Sumps PS1, PS2 and PS3	To plant site sed pond 1	13,730	19,771,000	180
0040-9VUL6B	WMP Dam	To WMP excavated settling pond	19,050	22,854,000	365
0040-9VUL6B	Loslo Creek (TMA Construction)	Bypass of Loslo Creek, or to WMP	20,010	24,015,000	365
0040-9VUL6B	TMA West Dam	To WMP excavated settling pond	7,590	9,102,000	365
0040-9VUL6B	Loslo Creek (TMA South Dam)	Pump to construction diversion dam pond and then WMP	17,770	21,327,000	365
0040-9VUL6B	TMA North Dam	To WMP	3,420	4,100,000	365
0040-9VUL6B	WMP Control Outlet	To WMP	2,290	2,743,000	365
0040-9VUL6B	WMP Emergency Spillway	Pump to TMA construction diversion dam pond	310	376,000	365
0040-9VUL6B	TMA Emergency Spillway	Pump water to TMA basin	440	531,000	365
0040-9VUL6B	Borrow Area A (WMP)	To WMP excavated settling pond	7,210	8,650,000	365
0040-9VUL6B	Borrow Area B (TMA)	To WMP	12,670	15,204,000	365

Pump/Flow Meter Site Authorization Form; Permit to Take Water

Part A; Purpose for pumping – indicate those that apply					
☐ PTTW taking	☐ ECA pumping		☐ Other:		
PTTW to ECA approved water treatment			PTTW Bypass with enhanced protection measures		
PTTW bypass with sediment and erosion control			PTTW Consumptive Taking		
ECA pumping (section 7.5 of ECA approval)			Other		
Description of pumping purpose					

Part B; Details of Pumping			
PTTW/ECA Permit Number			
Estimate daily volume (litres/day) (PTTW only)		Estimated rate (l/min) (PTTW only)	
Maximum pumping capacity (litres/min) (PTTW only)			
Proposed duration (number of days water will be taken)			
Source(s) (for PTTW see Table 1)			
Discharge location (see table 1 for PTTW)			
Discharge location sediment and erosion controls			

Part C; Flow Metering and Calibration Information	
Proposed flow rate and volume measuring method	
Calibration Record Details (attach record)	
Calibration date	
Unique identifier of flow meter	

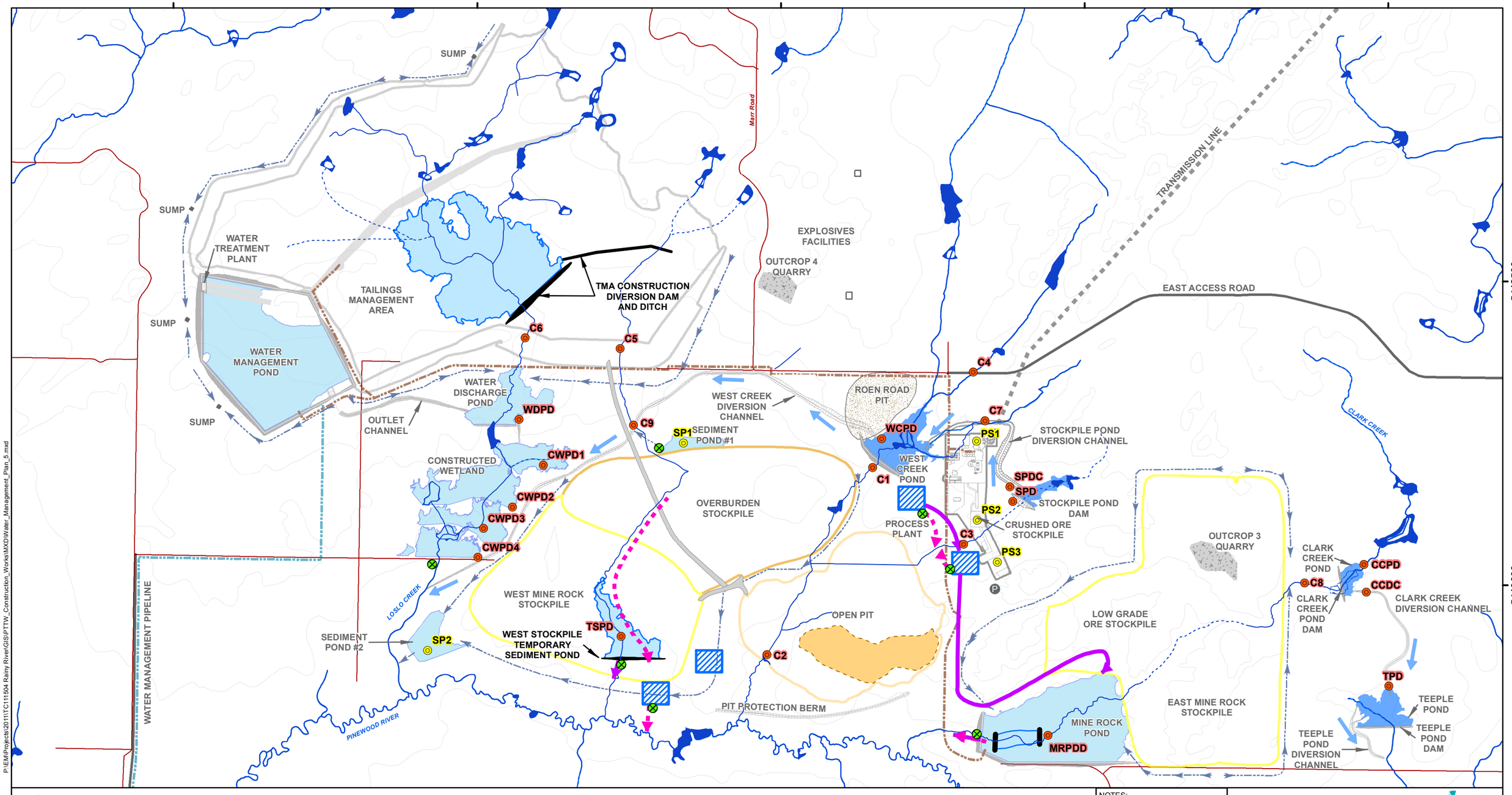
Part D; Approvals	Name	Signature
Contractor / Requestor		
Area Manager		
Environmental Manager		
Assigned Approval ID		

Rainy River Project Water Taking and Discharge Record Form	**DATE**
Contractor:	**Flow measuring device/truck ID:**
Person Reporting:	**Permit #:**
Source of taking and description;	
Discharge Location:	

PTTW to ECA approved water treatment		PTTW Bypass with enhanced protection measures	
PTTW bypass with sediment and erosion control		PTTW consumptive Taking	
ECA pumping (section 7.5 of ECA approval)		Other (specify);	

Day of month	For flow pumping			For water truck dust suppression				All
	Pump flow rate	Duration		Size of truck	Duration to fill truck	Number of loads		Daily Total
	L/min	minutes		Litres	minutes	n		Litres
1								
2								
3								
4								
5								
6								
7								
8								
9								
10								
11								
12								
13								
14								
15								
16								
17								
18								
19								
20								
21								
22								
23								
24								
25								
26								
27								
28								
29								
30								
31								

	ALL TAKINGS TO BE REPORTING IN LITRES PER MINUTE; 1 US gallon = 3.785 litres
	RECORD MUST BE MADE DAILY; IF NO TAKINGS OCCUR - WRITE 'NO TAKINGS'
	SEPARATE FORM FOR EACH WATER SOURCE OR POINT OF TAKING
	NOTIFY NEW GOLD IMMEDIATELY IF ANY COMPLAINTS ARE RECEIVED FOR WATER TAKING
	SEND REPORT AT LEAST WEEKLY BY 0700 WEDNESDAY To: RainyRiver.Enviro@newgold.com



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LEGEND

Water Taking Locations (27 locations; labelled with ID)

- Bypass Pump (not to scale)
- Sump (not to scale)
- Final Compliance Point
- Excavated Pond
- Near Surface Bedrock Ridge (approximate outline)

- Initial Water Diversion Route
- Later Water Diversion Route
- Ultimate Water Collection Ditch
- Quarry

Existing Watercourse/Waterbody

- Permanent Watercourse
- Intermittent Watercourse

0 1 2 4 6 8 Kilometres

NOTES:
- Ultimate footprint site plan layout is shown as a faded backdrop for reference purposes.

Datum: NAD83
Projection: UTM Zone 15N

newgold™ Rainy River Project

amec foster wheeler

RAINY RIVER PROJECT

Water Management Plan Construction Phase

PROJECT N°: TC111504	**FIGURE: 3-1**
SCALE: 1:30,000	DATE: February 2015

APPENDIX D

CONDITION 4
SUPPORTING DOCUMENTATION

2015 Bird Sweeps

Condition 4.1.2

Date	Location	Results	Action	Cleared Date	Completion
25-May-15	Veert Laydown	No bird nesting activity observed in the area	Work approved	25-May-15	Cleared
26-May-15	PROP15-047	No bird nesting activity observed in this area	Work approved	26-May-15	Cleared
26-May-15	PROP15-002	No bird nesting activity observed in this area	Work approved	26-May-15	Cleared
26-May-15	PROP15-008	No bird nesting activity observed in the area	Work approved	26-May-15	Cleared
3-Jun-15	Continuation of Magazine Road and Emulsion Plant Pad	No bird nesting activity observed in the area	Work approved	3-Jun-15	Cleared
4-Jun-15	AECON Haul Road @ Roen-Clark Connector Intersection	No bird nesting activity observed in the area	Work approved	4-Jun-15	Cleared
4-Jun-15	North side of East end of Roen-Clark Connector @ Clark Road	No bird nesting activity observed in the area	Work approved	4-Jun-15	Cleared
4-Jun-15	PROP15-019	No bird nesting activity observed in the area	Work approved	4-Jun-15	Cleared
4-Jun-15	PROP15-021	No bird nesting activity observed in the area	Work approved	4-Jun-15	Cleared
4-Jun-15	PROP15-026	No bird nesting activity observed in the area	Work approved	4-Jun-15	Cleared
7-Jun-15	Detention Pond and associated pad/access	No bird nesting activity observed in the area	Work approved	7-Jun-15	Cleared
8-Jun-15	AECON Mowing Area Section 2 (South of South West Creek tributary)	No bird nesting activity observed in the area	Work approved	8-Jun-15	Cleared
9-Jun-15	AECON Mowing Area Section 3 (South of AECON Laydown)	No bird nesting activity observed in the area	Work approved	9-Jun-15	Cleared
9-Jun-15	PROP15-044	No bird nesting activity observed in the area	Work approved	9-Jun-15	Cleared
9-Jun-15	PROP15-042	No bird nesting activity observed in the area	Work approved	9-Jun-15	Cleared
9-Jun-15	PROP15-022	No bird nesting activity observed in the area	Work approved	9-Jun-15	Cleared
9-Jun-15	PROP15-032	No bird nesting activity observed in the area	Work approved	9-Jun-15	Cleared
9-Jun-15	PROP15-038	No bird nesting activity observed in the area	Work approved	9-Jun-15	Cleared
10-Jun-15	Veert Laydown Expansion	No bird nesting activity observed in the area	Work approved	10-Jun-15	Cleared
10-Jun-15	AECON Temporary Haul Road Twinning of Roen-Clark Connector to Overburden Stockpile (AECON)	Nest and hachlings observed ~50m South of Roen-Clark connector	ESA signage placed at 25m buffer around nest and rerouted AECON Temporary Haul Road	19-Jun-15	Cleared
10-Jun-15	Alternative AECON Temprary Haul Road	No bird nesting activity observed in the area	Work approved	10-Jun-15	Cleared
11-Jun-15	PROP15-009	No bird nesting activity observed in the area	Work approved	11-Jun-15	Cleared
11-Jun-15	PROP15-058	No bird nesting activity observed in the area	Work approved	11-Jun-15	Cleared
11-Jun-15	PROP15-056	No bird nesting activity observed in the area	Work approved	11-Jun-15	Cleared
11-Jun-15	PROP15-054	No bird nesting activity observed in the area	Work approved	11-Jun-15	Cleared
11-Jun-15	AECON Mowing Areas Section 4 and 5 (North of North West Creek Tributary)	Nest and eggs observed ~300m East of Roen Road and 5m North of creek	ESA signage placed at 30m buffer around nest and notified contractor of location	24-Jun-15	Cleared
11-Jun-15	West Creek Diversion South of Highway 600	No bird nesting activity observed in the area	Work approved	11-Jun-15	Cleared
15-Jun-15	West Creek Diversion North of Highway 600	No bird nesting activity observed in the area	Work approved	15-Jun-15	Cleared
16-Jun-15	PROP15-054	No bird nesting activity observed in the area	Work approved	16-Jun-15	Cleared
16-Jun-15	PROP15-055	No bird nesting activity observed in the area	Work approved	16-Jun-15	Cleared
16-Jun-15	PROP15-053	No bird nesting activity observed in the area	Work approved	16-Jun-15	Cleared
16-Jun-15	PROP15-052	No bird nesting activity observed in the area	Work approved	16-Jun-15	Cleared
16-Jun-15	New drill access trail	Very high potential for nesting birds - Ideal habitat	Work not approved and flagged off entrance and exit of trail. Original trail to be used by NDC.		Not Cleared
16-Jun-15	Barron Site	Magpie nest observed in trees West of house	No activity noted at time of inspection, continue normal activity as the nest was built with normal level of disturbance	16-Jun-15	Cleared
17-Jun-15	Laydown Area 5	No bird nesting activity observed in the area	Work approved	17-Jun-15	Cleared
17-Jun-15	Laydown Area 2A	No bird nesting activity observed in the area	Work approved	17-Jun-15	Cleared
18-Jun-15	Southeast end of Roen Pit	Bank Swallow nest observed	ESA signage placed at 30m buffer and notified area manager	26-Jun-15	Cleared
22-Jun-15	Georgeson Road - North and South of house	No bird nesting activity observed in the area	Work approved	22-Jun-15	Cleared
23-Jun-15	Laydown 7	No bird nesting activity observed in the area	Work approved	23-Jun-15	Cleared
24-Jun-15	AECON Mowing Area Section 5 (East of AECON Laydown)	No bird nesting activity observed in the area	Work approved	24-Jun-15	Cleared
25-Jun-15	Laydown Area 2A	Snipe nest and eggs observed	ESA signage placed at 30m buffer around nest and notified area manager	16-Jul-15	Cleared
26-Jun-15	PROP15-053	No bird nesting activity observed in the area	Work approved	26-Jun-15	Cleared
26-Jun-15	PROP15-055	No bird nesting activity observed in the area	Work approved	26-Jun-15	Cleared
26-Jun-15	PROP15-058	No bird nesting activity observed in the area	Work approved	26-Jun-15	Cleared
26-Jun-15	PROP15-056	No bird nesting activity observed in the area	Work approved	26-Jun-15	Cleared
26-Jun-15	PROP15-047	No bird nesting activity observed in the area	Work approved	26-Jun-15	Cleared
29-Jun-15	East end of Roen-Clark Connector (AECON culverts)	Sparrow nest and eggs observed in the area - nesting in culvert stacks	ESA signage placed at 20m buffer around nest	19-Jul-15	Cleared
4-Jul-15	Widening of Laydown 7 entrance	No bird nesting activity observed in the area	Work approved	4-Jul-15	Cleared
4-Jul-15	West Creek Diversion - South of Highway 600 to Loslo Creek	No bird nesting activity observed in the area	Work approved	4-Jul-15	Cleared
6-Jul-15	Assembly pad area	No bird nesting activity observed in the area	Work approved	6-Jul-15	Cleared
7-Jul-15	West Creek Diversion - East of Georgeson Road to tree line	No bird nesting activity observed in the area	Work approved	7-Jul-15	Cleared
7-Jul-15	West Creek Diversion - West of Georgeson Road to Highway 600	Ne bird nesting activity observed in the area	Work approved	7-Jul-15	Cleared
7-Jul-15	West Creek Diversion - South of Batch Plant to West Creek Pond	No bird nesting activity observed in the area	Work approved	7-Jul-15	Cleared
7-Jul-15	West Creek Diversion - Stockpile South of Batch Plant	No bird nesting activity observed in the area	Work approved	7-Jul-15	Cleared
7-Jul-15	South access to Roen Pit - Path	No bird nesting activity observed in the area	Work approved	7-Jul-15	Cleared
7-Jul-15	West Creek Diversion - Access trail South of Marr Creek	No bird nesting activity observed in the area	Work approved	7-Jul-15	Cleared

2015 Bird Sweeps

Condition 4.1.2

9-Jul-15	Laydown 16	No bird nesting activity observed in the area	Work approved	9-Jul-15	Cleared
9-Jul-15	Road access East from Batch Plant pad to Roen Pit	No bird nesting activity observed in the area	Work approved	9-Jul-15	Cleared
13-Jul-15	Expanding Barron Site parking lot North to fence line	No bird nesting or amphibian activity observed in the area	Work approved	13-Jul-15	Cleared
16-Jul-15	Haul Road 2 between Laydown Area 14 and Laydown Area 9	No bird nesting activity observed in the area	Work approved	16-Jul-15	Cleared
16-Jul-15	Laydown Area 4	No bird nesting activity observed in the area	Work approved	16-Jul-15	Cleared
20-Jul-15	Haul Road 2 between Laydown Area 9 and Haul Road 1	No bird nesting activity observed in the area	Work approved	20-Jul-15	Cleared
27-Jul-15	West Creek Diversion Haul Road to Laydown 5	No bird nesting activity observed in the area	Work approved	27-Jul-15	Cleared
27-Jul-15	East end of Roen-Clark Connector (AECON culverts)	Active nest observed with hatchlings	ESA signage placed at 20m buffer around nest	15-Aug-15	Cleared
30-Jul-15	West Creek Diversion immediately N of Laydown 5	No bird nesting activity observed in the area	Work approved	30-Jul-15	Cleared
31-Jul-15	S ditch of Teeple Rd W of Heatwole Rd **to Heatwole Rd sign**	No bird nesting activity observed in the area	Work approved	31-Jul-15	Cleared
4-Aug-15	West Creek Diversion - 40 m East of Georgeson Road	No bird nesting activity observed in the area	Work approved	4-Aug-15	Cleared

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RAINY RIVER PROJECT
VEGETATION CLEARING PLAN
COMPLIANCE REPORT

PER PROVINCIAL
NOTICE OF APPROVAL CONDITION 15
EA File No. EA 05-09-02
EAIMS File No. 13102

VERSION 3

Date	Rev. #	Revision(s)	Originator
May 28	0	Complete draft for internal review	AB/NF
May 30	1	Complete for submission	NF
June 6	2	Update to section 4.6	SJ/NF
June 24	3	Update to 4.6 and table reflecting MOECC comments	NF

May 2015

newgold™ Rainy River Project

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Emo, Ontario P0W 1E0
nigel.fisher@newgold.com
Telephone: (807) 482-0951

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1.0 BACKGROUND

New Gold Inc. (NG; formerly Rainy River Resources Limited) is planning to construct, operate and eventually reclaim a new open pit and underground gold mine, the Rainy River Project (RRP), to produce doré bars (gold with silver) for sale.

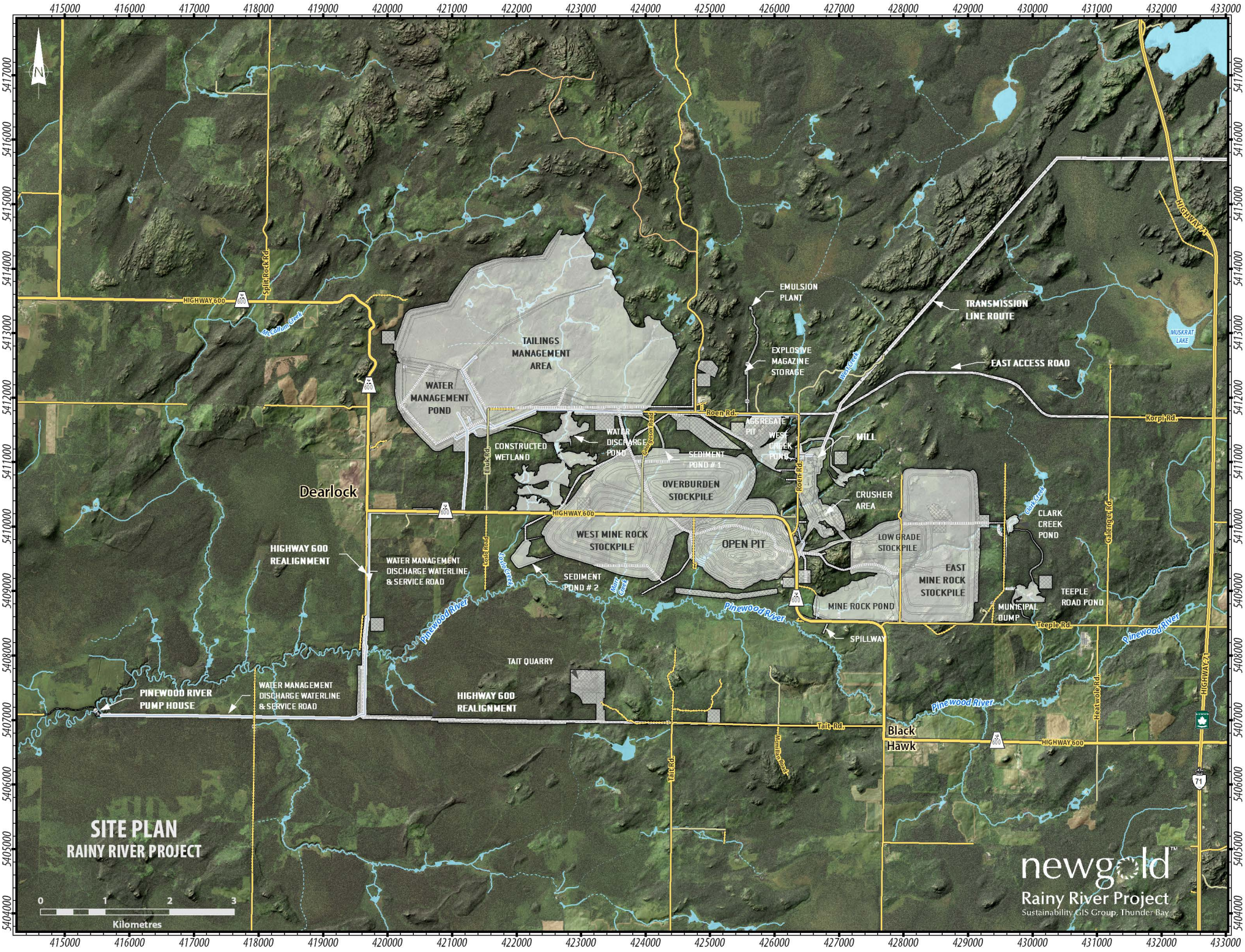
Physical works related to the RRP will consist primarily of;

- Open pit;
- Underground mine;
- Overburden, mine rock and low grade ore stockpiles;
- Primary crusher and process plant;
- Tailings management area;
- 230 kilovolt transmission line;
- Relocation of a portion of gravel-surfaced Highway 600; and
- Associated buildings, facilities and infrastructure, supported by related piping and power infrastructure as needed.

Figure 1 on the following page shows the site plan.

Following the approval of the Provincial Environmental Assessment on January 28, 2015, New Gold planned and initiated vegetation clearing activities in order to remove breeding bird habitat prior to the nesting period (1 May to 15 Aug). This clearing will allow site construction activities within cleared areas to occur during the nesting period. Clearing work was completed in a manner consistent with section 15 of the Provincial EA approval conditions including the approved Vegetation Clearing Plan, which described how New Gold was to conduct initial vegetation clearing activities intended to occur on the site before May 1, 2015.

This report is has been prepared in fulfillment of EA approval condition 15.3 in that it describes and provides evidence of compliance with Condition 15 and is being submitted to the Director within 30 days of completing vegetation clearing activities. This includes all sections of Condition 15 and cross referenced plans including fulfillment of EA commitments with regard to wildlife habitat and terrestrial systems.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N
HIGHWAY 600
Split Rock Rd.
McCallum Creek
TAILINGS MANAGEMENT AREA
WATER MANAGEMENT POND
CONSTRUCTED WETLAND
WATER DISCHARGE POND
SEDIMENT POND # 1
OVERBURDEN STOCKPILE
Dearlock
HIGHWAY 600 REALIGNMENT
WATER MANAGEMENT DISCHARGE WATERLINE & SERVICE ROAD
Eade Rd.
Eade Creek
SEDIMENT POND # 2
Mail Creek
WEST MINE ROCK STOCKPILE
OPEN PIT
Pinewood River
PINEWOOD RIVER PUMP HOUSE
WATER MANAGEMENT DISCHARGE WATERLINE & SERVICE ROAD
TAIT QUARRY
HIGHWAY 600 REALIGNMENT
Tait Rd.
Hamilton Creek
EMULSION PLANT
EXPLOSIVE MAGAZINE STORAGE
Roen Rd.
Gibson Rd.
AGGREGATE PIT
WEST CREEK POND
MILL
Roen Rd.
CRUSHER AREA
LOW GRADE STOCKPILE
EAST MINE ROCK STOCKPILE
MINE ROCK POND
SPILLWAY
Clark Creek
CLARK CREEK POND
Calanger Rd.
MUNICIPAL DUMP
TEEPLE ROAD POND
Teeple Rd.
TRANSMISSION LINE ROUTE
EAST ACCESS ROAD
Werner Creek
MUSKRAT LAKE
Korpi Rd.
HIGHWAY 71
Heatwole Rd.
Black Hawk
HIGHWAY 600
SITE PLAN
RAINY RIVER PROJECT
0 1 2 3
Kilometres
newgold™
Rainy River Project
Sustainability GIS Group, Thunder Bay
T:\GIS\MAP DOCUMENTS\RAINY RIVER PROJECT\2015\2015-05-25 SITE PLAN AND CLEARING FOR REPORT (ALYSON)\2015-05-25 SITE PLAN (8.5X11).MXD

2.0 REGULATORY FRAMEWORK

The following regulatory aspects applicable to the clearing activities conducted to May 1, 2015 include;

- Environmental assessment approval conditions (provincial and federal)
- Endangered Species Act approval FF-C-001-14
- Forest Licences and approvals: B12014/216557 and 553145/216310
- Authorities to Haul: 553037, 553038 and B12009
- Land Use Permits: 1134-1003163 and 1134-1003164
- Other legislation as applicable e.g., *Forest Fire Prevention Act*
- Best Management Practices including;
    - Ministry of Natural Resources (MNR). 1988. Timber Management Guidelines for the Protection of Fish Habitat.
    - Ministry of Natural Resources (MNR). 1995. Forest Operations and Silviculture Manual, First Edition.
    - Ministry of Natural Resources (MNR). 2010. Forest Management Guide for Conserving Biodiversity at the Stand and Site Scales
    - Ontario Sustainable Forestry Initiative Implementation Committee. 2011. A Guide to Best Management Practices for Forest Operations in Northern Ontario for Private Landowners and Logging Contractors.

NG volunteered to be subject to an individual EA under the Ontario *Environmental Assessment Act*. On January 17, 2014, NG submitted documentation intended to fulfill the EA requirements as defined by the Provincially-approved Terms of Reference and Federal Environmental Impact Statement Guidelines: AMEC. 2014. Rainy River Project, Township of Chapple, Final Environmental Assessment Report (Environmental Impact Statement), Version 2. Prepared for Rainy River Resources Ltd.

As part of the provincial EA approval, condition 15 required New Gold to develop a vegetation clearing plan and requirements relating to the following (Notice of Approval for EA File 05-9-02, January 28, 2015);

1. Preparation of a vegetation clearing plan and communication of the plan
2. Compliance monitoring for vegetation clearing activities
3. Compliance reporting for Vegetation Clearing activities
4. Complaint protocol for vegetation clearing activities
5. Community notification for vegetation clearing activities
6. Consultation with Aboriginal Communities for vegetation clearing activities
7. Terrestrial systems and habitat monitoring for vegetation clearing activities
8. Disclosure of condition 15
9. Mandatory amendments to clearing plan
10. Complete of clearing plan, as amended by the Director
11. Availability of documentation
12. Reference clearing plan conditions in other materials, as appropriate

In order to conduct clearing, additional permits were issued e.g., under the *Endangered Species Act*, but do not form part of this report except where these is an overlap with an applicable EA approval condition related to clearing.

3.0 CLEARING COMPLETED

Clearing took place between February 28, 2015 and April 30, 2015 consistent with the method outlined in the Approved Vegetation Clearing Plan for Initial Clearing Prior to May 1, 2015 (the Plan) (Version 3, February 21, 2015). Figure 2, on the following page, demonstrates where the clearing occurred.

Start and completion dates for the clearing activities for the main clearing areas are provided in Table 1. All clearing activities ceased in advance of 1 May 15. Work was performed by New Gold as well as contractors. During clearing an additional 9.15 ha was permitted for clearing associated with the plant site and water pipeline. The area cleared was consistent with estimate area to be cleared and within the expected error of sampling (Table 2).

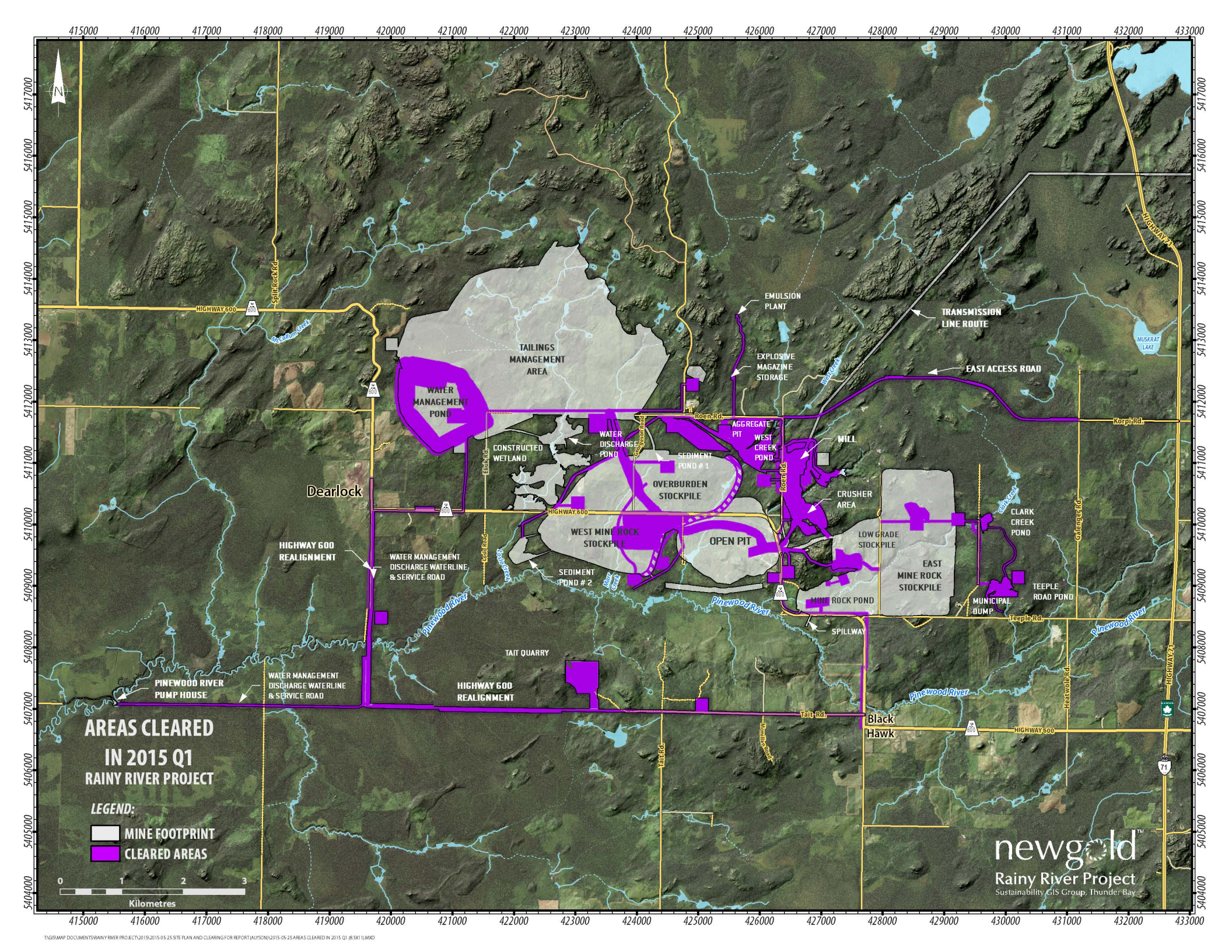
Table 1: Start and Completion Dates for the Clearing Activities Conducted

Clearing Area	Start Date	Completion Date
Water Management Pond, mine rock pond and low grade stockpile pond	28-Feb-15	20-Apr-15
Highway 600 realignment, pipeline and pumphouse	28-Feb-15	22-Apr-15
Organic stockpile and haul roads South of Roen Rd	28-Feb-15	30-Mar-15
Clark Creek and Teeple Ponds and diversion channels	5-Mar-15	19-Apr-15
West mine rock stockpile and associated haul roads	11-Mar-15	5-Apr-15
Mill and crusher	28-Mar-15	23-Apr-15
East Access Road	28-Mar-15	21-Apr-15
Roen pit	26-Mar-15	27-Apr-15
West Creek Pond and diversion	20-Mar-15	30-Apr-15
Tait Quarry	25-Apr-15	29-Apr-15

Table 2: Comparison to the Estimated Area and Actual Area Cleared

Clearing Type	Estimated Area (ha)	Area Cleared (ha)
Forested	459	-
Non-forested	166	-
Additional	9	-
Logged	As determined in the field	93
Mulched		224
Cleared		419
Total	634	643*

*excludes logged areas as these were assumed mulched or cleared post logging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5417000 5416000 5415000 5414000 5413000 5412000 5411000 5410000 5409000 5408000 5407000 5406000 5405000 5404000
N
HIGHWAY 600
Split Rock Rd.
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EMULSION PLANT
TRANSMISSION LINE ROUTE
EXPLOSIVE MAGAZINE STORAGE
Wabigoon
MUSKRAT LAKE
EAST ACCESS ROAD
Roen Rd.
Korpi Rd.
AGGREGATE PIT
WEST CREEK POND
MILL
WATER DISCHARGE POND
Gov Creek
SEDIMENT POND # 1
Roen Rd.
OVERBURDEN STOCKPILE
CRUSHER AREA
Clark Creek
CLARK CREEK POND
Gelanger Rd.
HIGHWAY 600
WEST MINE ROCK STOCKPILE
OPEN PIT
LOW GRADE STOCKPILE
EAST MINE ROCK STOCKPILE
HIGHWAY 600 REALIGNMENT
WATER MANAGEMENT DISCHARGE WATERLINE & SERVICE ROAD
Eagle Road
Eagle Creek
SEDIMENT POND # 2
Mud Creek
Pinewood River
MINE ROCK POND
MUNICIPAL DUMP
TEEPLE ROAD POND
Teeple Rd.
SPILLWAY
TAIT QUARRY
PINEWOOD RIVER PUMP HOUSE
WATER MANAGEMENT DISCHARGE WATERLINE & SERVICE ROAD
HIGHWAY 600 REALIGNMENT
Tait Rd.
Black Hawk
Hamilton Creek
Heatwole Rd.
HIGHWAY 71
AREAS CLEARED IN 2015 Q1
RAINY RIVER PROJECT
LEGEND:
MINE FOOTPRINT
CLEARED AREAS
0 1 2 3
Kilometres
newgold™
Rainy River Project
Sustainability GIS Group, Thunder Bay
T:\GIS\MAP DOCUMENTS\RAINY RIVER PROJECT\2015\2015-05-25 SITE PLAN AND CLEARING FOR REPORT (ALYSON)\2015-05-25 AREAS CLEARED IN 2015 Q1 (8.5X11).MXD

Logging, mulching, clearing and stripping were used to clear the site. Stripping (and root mat removal) was limited to the Highway 600 realignment and the East Access Road. Root mat removal was required to meet Ministry of Transportation requirements and associated Ontario Provincial Standards and Specifications prior to the construction of these roads. Limiting the stripping provided a means of reducing the effort required in manage erosion and sediment thereby increasing environmental protection. Prior to stripping material was mulched or logged and accounted for in Table 2 above.

Where logging occurred merchantable-marketable timber use was maximised and hauled to the Ainsworth mill under MNRF authorizations 553037, 553038 and B12009 for a total of 6,300 m^3 comprising of; 1800 m^3 Spruce, 4500 m^3 Poplar, 500 m^3 Red Pine and 500 m^3 Balsam. The amount of merchantable-marketable timber hauled to the mill was less than the 11,027 m^3 (+/- 15 %) estimated. This resulted from no market being identified for cedar, a change in access to protect Species at Risk and site access conditions limiting the marketability of the wood.

Non-merchantable and merchantable-nonmarketable debris was windrowed and mulched. This material will be comingled with overburden during stripping and stockpiling of areas through the construction phase. The mulched fibre was left on the ground to be removed with overburden during stripping and stockpiling of areas through the construction phase.

Clearing was conducted using excavators, dozers, flails, hydro-axes and hand saws. The method of clearing varied depending on the nature of vegetation to be cleared, topography, ground conditions and the proximity to sensitive receptors e.g., watercourses. Hand clearing was conducted for vegetation within 5 m of the high water mark and in places out to 20 m to protect the integrity of the riparian zone to the extent possible.

4.0 CONDITION 15 COMPLIANCE

New Gold completed clearing work in a manner consistent with section 15 of the Provincial EA approval conditions including the approved Vegetation Clearing Plan, as evidenced in the subsections below. These measures included preparation and communication of the plan as well as a complaint protocol, community notification and Aboriginal consultation, compliance monitoring, and compliance reporting.

4.1 Preparation of a vegetation clearing plan and communication of the plan

The Vegetation Clearing Plan was prepared to communicate how clearing would be conducted and initially submitted to MNRF as Version 0 on January 16, 2015. The initial submission and revisions through to Version 2 were provided more than 15 days prior to the commencement of clearing on February 28, 2015 as required under EA condition 15.1. Through a series of meetings and discussions the document was revised to reflect the comments received and the plan finalized as Version 3 on February 21, 2015. The V2 of the plan was posted on New Golds website on February 12, 2015, 16 days prior to the commencement of clearing and subsequently updated.

4.2 Compliance monitoring for vegetation clearing activities

The following subsection documents compliance monitoring conducted with respect to EA commitments related to Vegetation Clearing including proposed mitigation, commitments made in the vegetation clearing plan. Other subsections document, as applicable to the subsection compliance with other conditions included in section 15 of the notice of EA approval.

The process for compliance monitoring followed four primary steps; identification of compliance requirements, communication of those requirements, checking that the requirements were being met and follow/up actions, if required.

4.2.1 Identification of Compliance Requirements

Compliance requirements were listed in the EA approval(s), permits, legislation and vegetation clearing plan (Version 3). EA conditions pertaining to clearing were included in the vegetation clearing plan for completeness. The BMPs listed in the Plan were reviewed and used where applicable, noting this was not a forestry operation but a clearing plan for mining development.

4.2.2 Communication of Requirements

The communication of requirements was conducted through the following mechanisms;

- Project orientation for all persons working on the Project;
- Clearing kick off meeting with crews and contractors to review the Vegetation Clear Plan
- Preparation and distribution of toolbox summaries of the Plan for use a toolbox meetings and reference in the field
- Establishment of processes to meet commitments e.g., map enabled GPS, flagging of boundaries and sensitive areas such as West Creek

4.2.3 Checking for Compliance

A total of 27 formal inspections were completed by NG environmental staff during vegetation clearing, at an approximate average interval of once every other day during clearing activities. However, the frequency of inspection was varied based on the activities being undertaken and the potential for environmental effects. Formal inspections were substituted with additional informal observations and discussions by NG environmental staff and crews during clearing. Formal inspections used checklists developed to demonstrate compliance or highlight areas for improvement.

Results from the compliance monitoring indicated clearing generally consistent with the Vegetation clearing plan including;

- Vegetation retention – staying within clearing boundaries
    - Only areas within the footprint of the project or required for the construction of the

project were cleared consistent with the approved clearing limits.
    - Root mat removal was limited to the east access road and Highway 600 realignment as required for the construction method. In both these cases stockpiling of debris was such it could be maintained and reused to support reclamation
- Maximise fibre utilisation and minimizing waste of wood
    - 6,300 m3 of wood was hauled under licence to the mill
    - No part cut trees were observed during inspections and where logging occurred stumps were taken to no more than 30 cm e.g., Tait Quarry
    - Remaining wood waste was windrowed for mulching or mulching consistent with the plan e.g., West Creek diversion and Roen pit
- Minimising impact to riparian environments
    - Riparian areas were flagged with a minimum 5 m set back from water courses
    - Vegetation in the riparian area not required for the development of the project was retained and where vegetation was cleared the root mat was retained. This includes stockpile pond area where grasses and shrubs were retained in some areas and the root mat retention led to regeneration of grasses in other areas including where minor disturbance of mineral soil occurred
    - Cleared vegetation was generally kept 5 m back from the high water mark of water courses, this was confirmed by a number of inspections specifically in riparian areas
    - No evidence of natural stream flow diversion, impediment or acceleration was observed throughout clearing
    - Fuel handling followed the clearing plan and fuelling/vehicle maintenance took place at least 50 m from watercourses as confirm by inspections and the absence of any spills in the riparian area
    - Spill kits and secondary containment were typically present during inspections
- Minimising sedimentation and erosion
    - Clearing was conducted, to the extent possible, during favourable ground conditions, and where this wasn't possible alternative methods were used
    - Hand clearing within 5 m of all water courses and up to 20 m from water courses depending on site conditions e.g., in West Creek pond in late April
    - Modification of clearing practice i.e., use of alternate equipment when approaching water courses
    - Standard sediment and erosion control practices (silt fence, mulching and erosion blanket) were applied in the following areas as a result of an exposure of mineral soil; stockpile pond, West Creek and pond pump house access road. Ongoing inspections and maintenance of the applied sediment and erosion control measures have demonstrated their effectiveness.
    - Access was managed to limit the number of access to work areas e.g., a single access was used to log and clear the water management pond and separately for Tait Quarry

4.2.4 Follow Up

Follow up action and feedback was provided in areas where opportunities for improvement were identified or modifications were made to meet commitments. This included riparian management, sediment and erosion control fuel management and forest fire management.

Riparian management was conducted as outlined in the previous section. Depending on the nature of channel around which the riparian area had developed and the method of clearing there was a potential for wood waste to be deposited below the high water mark or disturbance to mineral soil. Therefore changes were made in places to the clearing method/equipment used including in some cases requiring hand falling out to 20 m from the high water mark of water courses. Riparian vegetation that, despite efforts to the contrary, fell within the high water mark were removed e.g., a tree from the realigned highway 600 crossing of the Pinewood River.

Through planning and clearing practices sediment and erosion control measures were applied as described above. However, physical sediment and erosion control measures were applied as a result of changing field conditions and exposure of mineral soils. Changes to clearing practices were made to reduce the risk of erosion and sedimentation through minimising the exposure of mineral soils e.g., in stockpile pond and west creek pond areas.

Inspections regarding fuel management identified limited concerns regarding secondary containment, presence of spill kits and spills. In all follow up cases corrections were made within the same shift if not immediately. There were no spills of sufficient volume to require external reporting under Ontario Reg 675/98. When spills occurred they were reported to site environmental staff, assessed for potential environmental effect and cleaned up successfully with the material disposed of in an appropriate manner. The internal spills reporting procedure was updated during clearing to support spill reduction and identify root cause which was effective in reducing the number of spills.

Consistent with the clearing plan, waste vegetation and organic material was pushed to the boundary of some of the cleared areas e.g., organic stockpile, west creek diversion. The intent is that this is a temporary measure and future work is planned to ensure compliance with the *Forest Fires Prevention Act* i.e., piling, chipping or burning of organic material will be completed. Further, through construction in 2015 the chip piles on the plant site will be spread.

4.3 Compliance reporting for Vegetation Clearing activities

The provincial EA condition 15.3 is addressed by this report in describing and providing evidence of compliance with condition 15.

4.4 Complaint protocol for vegetation clearing activities

A complaint protocol outlining how inquires and complaints received during the clearing would be handled was included in the Vegetation Clearing Plan as posted to the New Gold website and is currently available (New Gold website as accessed May 23, 2015). A telephone and email contact

information were provided. The protocol for handling complaints included a response from the General Manager or designate, development of corrective actions and a follow up process to determine the effectiveness of the follow up actions. No complaints were received through the complaint protocol during clearing activities or subsequent relating to clearing activities.

4.5 Community notification for vegetation clearing activities

Notifications were sent via email to interested parties, as listed below, per the Community Communications Plan developed from Condition 8 of the Notice of Approval. Notification were sent on February 13, 2015, fifteen days prior to the commencement of clearing which included a link to the vegetation clearing plan and an invitation to comment on the plan.

- private citizen – name withheld by New Gold
- private citizen – name withheld by New Gold
- private citizen – name withheld by New Gold
- private citizen – name withheld by New Gold
- private citizen – name withheld by New Gold
- Town of Emo
- Township of Chapple
- Township of Sioux Narrows-Nestor Falls
- Town of Fort Frances
- Town of Rainy River
- Town of Atikokan
- Township of Alberton
- Township of LaVallee
- Lake of the Woods Township
- Township of Morley
- Natural Resources Advisory Committee
- Ontario Federation of Anglers and Hunters
- Rainy Lake Conservancy
- Rainy River District Stewardship Council
- Rainy River Future Development Corp.
- Resolute Forest Products
- Rainy River Soil and Crop Improvement Association
- Fort Frances Sportsmen's Club

New Gold received one comment with respect to the Plan. An adjacent landowner requested clarification on a property boundary as it related to a clearing boundary. The comment was received through the comment email address February 21, 2015 and addressed by the Manager of Community Relations on March 11, 2015. In a follow up conversation more information was provided and the landowner was satisfied with New Gold's response.

4.6 Consultation with Aboriginal Communities for vegetation clearing activities

The clearing plan was sent to Aboriginal Communities as identified in the EA approval condition 9.4, and all other Aboriginal Communities New Gold continues to engage with. This notification was sent on February 13, 2015

On February 13, 2015, notifications were sent via email to the Aboriginal Communities listed in section 9.4 of the Notice of Approval, and in addition it was sent to all other communities that NG continues to engage with. These are listed below.

Chief Carl Tuesday	Big Grassy First Nation
Chief Will Windigo	Nigigoonsiminikaaning
Chief Patricia Big George	Anishinaabeg of Naongashiing First Nation
Chief Norman Jordan	Lac La Croix First Nation
Chief Jim Leonard	Rainy River First Nations
Chief Janice Henderson	Mitaanjigamiing First Nation
Chief Kathy Kishiqueb	Ojibways of Onigaming First Nation
Chief Earl Klyne	Seine River First Nation
Chief Howard Kabestra	Naotkamegwanning First Nation
Chief John Thunder	Buffalo Point First Nation
Chief Wayne Smith	Naicatchewenin First Nation
Chief Aileen Oshie-White	Northwest Angle No. 37 First Nation
Chief Sara Mainville	Couchiching First Nation
Chief Darlene Comegan	Northwest Angle No. 33 First Nation
Chief Chris Skead	Anishinabe of Wauzhushk Onigum
Dean McMahon	Sunset Country Metis

One comment was received, from Naotkamegwanning First Nation via letter on February 23, 2015 expressing concern regarding fulfillment of EA commitments and notification. This comment was addressed through New Gold postponing the commencement of clearing allowing Naotkamegwanning to conduct a ceremony at the Gallinger Road ceremony site on February 26, 2015. This was the second pre-clearing ceremony with a site pre-clearing blessing ceremony held on February 6, 2015 at the Marr Site location. All Aboriginal groups were invited to attend. The ceremony was officiated by a community Elder of Rainy River First Nations.

4.7 Terrestrial systems and habitat monitoring for vegetation clearing activities

Condition 15.7 of the provincial EA approval required New Gold to meet its EA commitments during clearing activities and to rehabilitating wildlife habitat and terrestrial systems. Table 3 describes steps taken in meeting commitments applicable at this stage of the project and for the scope of the clearing activities i.e., excludes transmission commitments and habitat rehabilitation.

Table 3: Steps Taken in Meeting EA Commitments Applicable at this during Clearing

Environmental Assessment Commitment and steps taken in meeting commitments	**Commitment ID**
Clearing of forests having a density of at least 10 cavity trees per hectare with a diameter at breast height greater than 25 cm will be limited to outside of the bat roosting season (April 1 to November 15) unless cleared by a bat biologist that has surveyed the trees for bat activity. – *in review of habitat on the site this is not applicable as these types of habitat are not present at the Project*	87
A more detailed wildlife follow-up monitoring plan will be developed through consultation with the MNR and EC. As suggested by the reviewer, additional control	92

Environmental Assessment Commitment and steps taken in meeting commitments	Commitment ID
sites around the periphery of the mine footprint can be developed and monitored following mine construction and periodically throughout mine operations. A draft plan will be issued to MNR and EC prior to commencement of construction. NG will provide opportunities to Aboriginal groups to participate in the development of the plan. - *NG submitted a draft wildlife monitoring plan on January 22, 2015 to MNRF. Subsequently MNRF, EC and NG have met and at time of report preparation and the monitoring plan is being revised prior to further distribution and consultation.*	
Maintenance to the extent practical of a 120 m buffer zone adjacent to rivers and creeks to protect watercourses and their associated vegetated margins; - *clearing was limited to what was required for project construction and operations. In order to construct the project this included clearing within 120 m of West, Clark and Marr creeks for site infrastructure and the Pinewood River for the pumphouse and Hwy 600 realignment.*	95
Restricting the clearing of terrestrial amphibian breeding habitats to periods outside the amphibian breeding season as directed by the MNR; - *clearing was limited to outside the breeding bird window which is concurrent with the amphibian breeding window, clearing ceased prior to May 1, 2015*	96
Scheduling of RRP development activities will consider environmental aspects, such as fish spawning and bird nesting seasons. Tree and woodland clearing will be restricted to periods outside of the breeding bird season (May 1 to August 15). Clearing or modification of known Trumpeter Swan breeding habitat will be restricted to outside the breeding season (March 15 to August 15). - *clearing was limited to outside the breeding bird window and ceased prior to May 1, 2015*	98, 101, 102, 110, 112, 113
• Inclusion of wildlife awareness information into regular safety and environmental inductions performed by the mine. Wildlife sighting logs or information boards will be installed to notify workers of local observations. Workers will be made aware of seasonal changes in local animal behaviour or presence in proximity to the mine; - *Wildlife awareness information is provided to staff and contractors as part of their site orientation and is also delivered via daily notices and meetings as seasonal changes occur or increase in presence of wildlife is noted.* • Minimizing the level of potentially disturbing activities near any known or subsequently discovered active raptor and raven nest sites until the nest is vacated; *- no new raptor or raven nests were identified during clearing activities through either site inspections or field observations* • Annual monitoring of the Bald Eagle nest in Woodland 122 to determine seasonal eagle activity at the nest site which will guide RRP activities occurring in proximity to the nest. Should eagles continue to use the nest site and raise offspring, work will be adjusted appropriately to reduce adverse effects to the breeding success of the local pair; - *The identified Bald Eagle nesting location ('Woodland 122') southeast of the project footprint was monitored beginning in March 2015 for occupancy and a breeding pair was noted to be present through March and April. No clearing related activities occurred in proximity to this nest.*	101

Environmental Assessment Commitment and steps taken in meeting commitments	Commitment ID
Monitoring of key terrestrial systems and SAR: during the construction and operations phase, with post closure habitat development and utilization by wildlife to continue at reduced frequencies consistent with SAR Permit requirements; *The following steps were taken relating to terrestrial systems and SAR;* • *Wildlife and SAR awareness is a part of site orientation presentations provided as a condition of site access to all staff/contractors* • *responsibilities of individuals to report sightings - no SAR sighting reports were made during clearing activities* • *Toolbox talks were given regarding SAR species* • *Signage was posted identifying SAR habitats to be protected* • *Offset habitat was placed for barn swallows in 4 locations as discussed with MNRF* • *Development and implementation of the terrestrial monitoring plan including wildlife logs which recorded 102 wildlife observations of which 71 % were deer, 9 % avian species and 20 % furbearers (primarily wolf and skunk). There were no apparent patterns to the wildlife data and no SAR observations.* • *Implementation of a site wide 60 kph speed limit, 20 kph below provincial highway 600 speed to reduce collisions with wildlife – no wildlife road mortalities were observed or reporting*	109
Maintenance of forest buffers between RRP components and whip-poor-will nesting and foraging habitat where practical; - *clearing was limited to what was required for project construction and operations consistent with the permit conditions* Management of dust through dust suppression activities (best management practices);- *dust suppression was applied through an MOECC approved dust suppression agent, calcium chloride, along Roen and Tait roads and Highway 600.*	110
Where NG has control, commercially reasonable efforts will be made to work with Resolute, MNR and local loggers to facilitate the use of merchantable timber by local mills, in recognition of the importance of mills to the local economy. – *6,300 m3 of merchantable and marketable wood was hauled to a mill as a result of clearing activities*	140
All NG staff will undergo cultural awareness training. Temporary contractors will undergo an awareness program as part of the regular induction program when working at the mine (Letter to Chiefs from Kyle Stanfield, October 2013). This will ensure that people that work at the site are aware of indigenous culture and values, and are respectful of the principles and values of the Ojibwe people. – *Cultural awareness is being conducted and scheduled for new workers at the Project as available through the provider. A total of 61 persons received the training as of April 30, 2015.*	167
NG will commit to clearing of flammable debris within a minimum 30 m buffer area. **–** *this commitment is being addressed consistent with the vegetation clearing plan; temporary wood waste piles at the boundary of clearing will be managed consistent with the Forest Fire Prevention Act*	201

4.8 Disclosure of condition 15

In submission of the Vegetation Clearing Plan a statement was appended indicating that its submission is intended to fulfil Condition 15 of this Notice of Approval (Page 2 of Version 3 of the Vegetation Clearing Plan).

4.9 Mandatory amendments to clearing plan

No amendments were received regarding the Vegetation Clearing Plan following completion of Version 3.

4.10 Completion of clearing plan, as amended by the Director

No amendments to the clearing plan were completed because as noted above no amendments were received. The clearing was completed as described in the sections above.

4.11 Availability of documentation

Documentation regarding the Vegetation Clearing Plan is available to the Ministry, or designated, as requested. To date no requests for documentation have been received.

4.12 Reference clearing plan conditions in other materials, as appropriate

At the time of report preparation, vegetation clearing activities have not been mentioned in other materials produced in fulfilment of provincial EA approval conditions. However, as the project proceeds reference to vegetation clearing is expected in relevant materials.

5.0 SUMMARY OF COMPLIANCE WITH EA CONDITION 15

The following table summarises the description of and evidence provided in this report in compliance with condition 15 of the provincial EA approval.

Table 4: Summary of Compliance with Provincial EA Approval Condition 15

Condition ID	Condition	Compliance Summary
15.1	Preparation of a vegetation clearing plan and communication of the plan	NG along with MNRF completed a vegetation clearing plan to outline the methods by which clearing was permitted to occur prior to May 1, 2015.
15.2	Compliance monitoring for vegetation clearing activities	Through the identification of requirements, communication of requirements, formal inspections and observations and follow up

Condition ID	Condition	Compliance Summary
		compliance monitoring was completed.
15.3	Compliance reporting for Vegetation Clearing activities	The provincial EA condition 15.3 is addressed by this report in describing and providing evidence of compliance with condition 15.
15.4	Complaint protocol for vegetation clearing activities	A compliant protocol was developed by NG and implemented for use in conjunction with the clearing plan.
15.5	Community notification for vegetation clearing activities	Notification was provided 15 days prior to the start of clearing activities 15 days prior to the start of clearing. One question was received from a landowner which was addressed.
15.6	Consultation with Aboriginal Communities for vegetation clearing activities	Notification was provided 15 days prior to the start of clearing as outlined in the plan. Comment was received from Naotkamegwanning and address through delaying clearing allowing for a ceremony to be conducted
15.7	Terrestrial systems and habitat monitoring for vegetation clearing activities	Consistent with the EA commitments and conditions, where applicable to clearing and the phase of the project, terrestrial systems were monitored including dust management, wildlife logs, orientations to personnel and field observations.
15.8	Disclosure of condition 15	In submission of the Vegetation Clearing Plan a statement was appended indicating that its submission is intended to fulfil Condition 15 of this Notice of Approval (Page 2 of Version 3 of the Vegetation Clearing Plan).
15.9	Mandatory amendments to clearing plan	No amendments were received regarding the Vegetation Clearing Plan following completion of Version 3.
15.10	Complete of clearing plan, as amended by the Director	No amendments to the clearing plan were completed because as noted above no amendments were received. The clearing was completed as described in the sections above.
15.11	Availability of documentation	Documentation regarding the Vegetation Clearing Plan is available to the Ministry, or designated, as requested. To date no requests for documentation have been received.
15.12	Reference clearing plan conditions in other materials, as appropriate	At the time of report preparation, vegetation clearing activities have not been mentioned in other materials produced in fulfilment of provincial EA approval conditions. However, as

Condition ID	Condition	Compliance Summary
		the project proceeds reference to vegetation clearing is expected in relevant materials.

6.0 REFERENCES

- AMEC 2013. Rainy River Resources Ltd. Rainy River Project 2013 Terrestrial Baseline Study: Bats.
- AMEC 2015. Rainy River Project Vegetation Clearing Plan for Initial Clearing Prior to May 1, 2015.
- OPSS 804 Construction Specifications for Seed and Cover
- OPSS 805 Construction Specifications for Temporary Erosion and Sediment Control Measures
- OPSS .MUNI 182 General Specifications for Environmental Protection for Construction in Waterbodies and on Waterbody Banks

APPENDIX A

RAINY RIVER PROJECT COMMITMENTS REGISTRY (VER. 12) – EXCERPTS

Commitments / Mitigation Specifically Related to Clearing / Rehabilitation of Habitat and Terrestrial Systems

#	*Environmental Assessment Commitments / Mitigation Specifically Related to Clearing / Rehabilitation of Habitat and Terrestrial Systems*	**Project Phase**
72	Related to the transmission line: • ***Tree stumps, root mats and ground vegetation cover will be left intact to reduce the potential for surface erosion and to help maintain groundcover for plant and wildlife habitat (CL);*** • ***Vegetation (shrub) screens will be left to the extent practical along the single creek crossing that exists between Beadle and Preachers Lake, near the east end of the alignment, for erosion protection, while ensuring clearance requirements for conductors (CL);*** • No in-water work will be conducted and all poles will be placed above the high water mark; • ***Industry standard sediment interception and erosion control practices will be applied wherever appropriate / needed (CL);*** • ***Should any erosion of the ground be identified at the end of the construction period (or during any intervening inspections), the exposed area would be re-seeded or otherwise stabilized to control erosion until native vegetation takes hold. If the erosion is more severe, other methods such as placement of straw matting or equivalent will be used (CL);*** • Where required in larger quantities, construction materials will be stored a minimum distance of 200 m from any open (non-frozen) surface water, **and from major access points; and** • ***Fuelling and maintenance of vehicles will not occur within 50 m of surface waterbodies (CL).***	C
85	The principal mitigation measures that are proposed to limit short and long term adverse effects to local vegetation communities include: • Minimizing dust production along primary mine rock and overburden transportation routes by implementing dust suppression methods and thereby minimizing the zone of influence. Primary dust suppression methods will include road watering. • Annual monitoring of dust deposition on vegetation adjacent to mine roads; and • ***Active revegetation and encouragement of natural revegetation / recolonization of disturbed areas as part of progressive reclamation during operation and active reclamation at mine closure.***	C,O,D
86	In regards to the transmission line: • Additional rare plant and breeding bird surveys to be undertaken in May and June, 2014 to identify any further potential environmental constraints that might require construction modification, such avoidance of disruption to rare plant sites (if present) through site specific habitat protection measures; • ***Undertaking transmission line construction in winter (normally December 1 to March 31) to better protect ground cover in sensitive areas where the protection of wetlands, rare plants and SAR is required, and completion of the remainder of transmission line construction in the late summer and fall, outside of the breeding bird season (CL);*** • ***Vegetation removal will be reduced to the extent necessary to support construction activities and longer-term transmission line reliability (from interference with conductors and fall of adjacent hazard trees). Minimizing vegetation removal includes retaining existing low vegetation ground cover (CL);*** • Access to the right of way (ROW) will be provided from existing infrastructure (some of which may need to be upgraded, as reasonable for personnel, material and equipment access), but no new permanent access roads are proposed. Generally, where access is poor, the ROW will be accessed along the ROW itself. Construction vehicles will not be allowed to travel through surface waters; and • ***Mechanical means will be used for periodic vegetation height maintenance along the transmission line, instead of herbicides.***	E,C
87	Scheduling of RRP development activities will consider environmental aspects. ***Clearing of forests having a density of at least 10 cavity trees per hectare with a diameter at breast height greater than 25 cm will be limited to outside of the bat roosting season (April 1 to November 15) unless cleared by a bat biologist that has surveyed the trees for bat activity (CL).*** Timing of the transmission line construction will be planned to avoid the breeding bird and main tourist season, as possible.	E,C,O

#	***Environmental Assessment Commitments / Mitigation Specifically Related to Clearing / Rehabilitation of Habitat and Terrestrial Systems***	**Project Phase**
95	The primary mitigation strategies for limiting adverse effects to wildlife will include: • Preventing hunting from occurring on all lands owned by NG (required for the safety of workers; this is currently ongoing during exploration as well); • ***Maintenance to the extent practical of a 120 m buffer zone adjacent to rivers and creeks to protect watercourses and their associated vegetated margins (CL);*** • ***Restoration of disturbed habitats at closure, including the development of habitats capable of supporting a diversity of wildlife species, including ungulates, large predators, furbearers and bats (CL);*** • Enforcement of speed limits along proposed mine access roads to reduce the potential for collisions with ungulates. Signs warning drivers of the possibility of wildlife encounters will be posted in areas of high wildlife activity. A log of collisions will be kept to monitor the effectiveness of the proposed mitigation and additional mitigation measures will be implemented if necessary; • Inclusion of wildlife awareness information into regular safety and environmental inductions performed by the mine. Workers and contractors will be made aware of seasonal changes in local deer or large mammal behaviour or presence in proximity to the mine. Workers and contractors will be made aware of seasonal changes in local mammal behaviour or presence in proximity to the mine; • Treatment of the tailings slurry to levels equal to or less than 1 mg/L weak acid dissociable cyanide before deposition in the tailings management area (which is well below the 50 mg/L weak acid dissociable cyanide threshold criteria outlined by the International Cyanide Management Code); • Fencing the tailings management area to prevent access; • Covering the exposed tailings beach at closure with a layer of overburden and flooding the remaining tailings with a layer of water to prevent the tailings from oxidizing over the longer term. This will ensure that the tailings pond waters remain of high quality, such that they will not pose a threat to wildlife. The margins of the tailings pond will develop as wetland habitat; • Minimizing dust production along primary haulage routes by implementing dust suppression methods and thereby minimizing the RRP zone of influence; and • Disposing of food wastes generated on site in a manner that limit the attraction of wildlife, such as Black Bear and wolves.	E,C,O,D

#	***Environmental Assessment Commitments / Mitigation Specifically Related to Clearing / Rehabilitation of Habitat and Terrestrial Systems***	**Project Phase**
96	Mitigation measures that will be used to reduce potential adverse effects to amphibians will include the following: • Development of a compact RRP site to reduce overall habitat loss and to limit potential adverse effects related to sound emissions to the extent practical; • ***Restricting the clearing of terrestrial amphibian breeding habitats to periods outside the amphibian breeding season as directed by the MNR (CL);*** • Implementation of sound abatement strategies to dampen sound infiltrating habitats surrounding high traffic areas of the mine; • Enforcement of speed limits along proposed mine access roads to reduce the potential adverse effects of increased vehicular traffic associated with the RRP. Signs warning drivers of the possibility of wildlife encounters will be posted in areas of high wildlife activity. A log of collisions will be kept to monitor the effectiveness of the proposed mitigation and additional mitigation measures will be implemented if necessary; • If frog mortality on roadways is found to be a problem along mine access roads or the re-aligned Highway 600, silt fencing may be installed to prevent frogs from crossing the road and may direct them to the nearest culvert(s); • Inclusion of wildlife awareness information into regular safety and environmental inductions performed by the mine. Workers and contractors should continually be made aware of seasonal changes in local wildlife behaviour or presence in proximity to the mine; • Treatment of tailings slurry containing cyanide and associated heavy metals from the ore leaching process in the process plant using the SO_2/Air process before being discharged to the tailings management area; • Discharge of effluent that will result in protection of aquatic life standards in the Pinewood River so that no adverse water quality effects to amphibians are anticipated; • Maintenance of generally abiotic conditions within the tailings management area to discourage wildlife presence; and • Covering the exposed tailings beach at closure with a layer of overburden and flooding the remaining tailings with a layer of water to prevent the tailings from oxidizing over the longer term. This will ensure that the tailings pond waters remain of high quality such that they will not pose a threat to wildlife. Margins of the tailings pond will be developed into wetland habitat.	E,C,O,D
98	***Scheduling of RRP development activities will consider environmental aspects, such as fish spawning and bird nesting seasons. Tree and woodland clearing will be restricted to periods outside of the breeding bird season (May 1 to August 15). Clearing or modification of known Trumpeter Swan breeding habitat will be restricted to outside the breeding season (March 15 to August 15) (CL).***	C

#	***Environmental Assessment Commitments / Mitigation Specifically Related to Clearing / Rehabilitation of Habitat and Terrestrial Systems***	**Project Phase**
101	The primary mitigation strategies for limiting adverse effects to birds and habitat: • Inclusion of wildlife awareness information into regular safety and environmental inductions performed by the mine. Wildlife sighting logs or information boards will be installed to notify workers of local observations. Workers will be made aware of seasonal changes in local animal behaviour or presence in proximity to the mine; • Minimizing the level of potentially disturbing activities near any known or subsequently discovered active raptor and raven nest sites until the nest is vacated; • Annual monitoring of the Bald Eagle nest in Woodland 122 to determine seasonal eagle activity at the nest site which will guide RRP activities occurring in proximity to the nest. Should eagles continue to use the nest site and raise offspring, work will be adjusted appropriately to reduce adverse effects to the breeding success of the local pair; • Maintenance of a safe distance between RRP activities and the nest as well as maintenance of landscape buffer areas (preferably forested or natural) between the activity and nest trees. To avoid disturbing nesting Bald Eagles, no buffer is necessary around nest sites outside of the breeding season once the juvenile eagles are known to have vacated the defined significant wildlife habitat; • Limiting less typical activities in proximity to the nest site during the nest building and breeding season. The local eagle pair appears tolerant of agricultural activities and road grading; • Environmental induction programs and ongoing environmental updates provided to workers will make them aware of Bald Eagle nesting activities prior to the commencement of new or irregular activities in proximity to an active eagle nest (within 500 m), and having them observe proper protocol in order to avoid disturbance during these activities; • ***Restriction of tree and woodland clearing to periods outside of the breeding bird season which extends between May 1 and August 15 (CL);*** • Protection of suitable breeding habitat as a result of the provision of compensatory habitat for species protected under the *Endangered Species Act*; • ***Restoration of disturbed habitats at closure to habitats capable of supporting a diversity of wildlife species;*** • Implementation of sound abatement strategies; • Enforcement of speed limits along proposed mine access roads to reduce the potential adverse effects of increased vehicular traffic associated with the RRP. Signs warning drivers of the possibility of wildlife encounters will be posted in areas of high wildlife activity. A log of collisions will be kept to monitor the effectiveness of the proposed mitigation and additional mitigation measures will be implemented if necessary; • ***Restrictions to clearing or modification of known Trumpeter Swan breeding habitat to outside the breeding season (March 15 to August 15) to prevent the disturbance of nesting swans or impact the likelihood of cygnet survival (CL);*** • (Cont'd)	E,C,O,D
101	(Cont'd) • Disposing of food wastes generated on site in an appropriate manner that limits the attraction of wildlife, including Common Ravens, Turkey Vultures and Bald Eagles; • Timely removal of carcasses of road-killed animals or any other carcasses found onsite to limit the attraction of wildlife, such as Common Ravens and Turkey Vultures; and • Treatment of tailings slurry containing cyanide and associated heavy metals from the ore leaching process in the process plant using the SO_2/Air process before being discharged to the tailings management area; and • Creation of generally abiotic conditions within the fenced tailings management area during operations to limit the interest of the pond to waterfowl.	E,C,O,D

#	***Environmental Assessment Commitments / Mitigation Specifically Related to Clearing / Rehabilitation of Habitat and Terrestrial Systems***	**Project Phase**
102	In regards to the transmission line: • Additional rare plant and breeding bird surveys to be undertaken in May and June, 2014 to identify any further potential environmental constraints that might require construction modification, such avoidance of disruption to rare plant sites (if present) through site specific habitat protection measures; • ***Tree clearing to take place outside of the breeding bird nesting season, defined as the period from May 1 to July 31 (CL);*** • ***Undertaking transmission line construction in winter (normally December 1 to March 31) to better protect ground cover in sensitive areas where the protection of wetlands, rare plants and SAR is required,*** and completion of the remainder of transmission line construction in the late summer and fall, outside of the breeding bird season; • Direct impacts to raptor nesting areas will be avoided. There are currently no stick nests on or near the proposed ROW. Should any stick nests be identified during construction, the area will be avoided until a qualified avian biologist can be contacted for direction; • Conductor wire separation distances will be sufficiently far apart to preclude larger avian species, particularly raptors which frequently use hydro pole for perching or nesting, from electrocution by contacting two conductor wires simultaneously; • Construction crews will be advised not to interfere with or harass wildlife. No hunting or fishing by construction crews will be allowed. Disciplinary actions will be taken should either occur; and • Contractors will be required to handle food and food wastes in a responsible manner, and to educate workers to ensure no feeding of wildlife.	E,C
103	***The site will be rendered suitable for other compatible land uses and functions after the mine has closed and the land has been reclaimed. NG will encourage and, as practical, actively restore the RRP site to productive, naturalized vegetation communities on cessation of mining capable of supporting a diversity of wildlife species. RRP revegetation efforts at closure will include providing suitable habitat for SAR species, most notably whip-poor-will, and other species of interest, if practical.***	D,P
109	***Monitoring of key terrestrial systems and SAR: during the construction and operations phase, with post closure habitat development and utilization by wildlife to continue at reduced frequencies consistent with SAR Permit requirements (CL)***	C,O,D

#	***Environmental Assessment Commitments / Mitigation Specifically Related to Clearing / Rehabilitation of Habitat and Terrestrial Systems***	**Project Phase**
110	Mitigation measures that will be used to reduce potential adverse effects to Eastern Whip-poor-will will include the following: • Provision of compensatory whip-poor-will habitat that protects known territories and other identified suitable habitat; • ***Restricting the clearing of habitats to periods outside the breeding bird season which occurs from May 1 to August 15 (CL);*** • Implementation of sound abatement strategies to dampen sound infiltrating habitats surrounding high traffic areas of the mine; • Where feasible, management of site lighting fixtures to reduce excess light production near whip-poor-will foraging areas so as to minimize disturbing these nocturnal birds (with all appropriate health and safety issues considered); • ***Maintenance of forest buffers between RRP components and whip-poor-will nesting and foraging habitat where practical (CL);*** • ***Management of dust through dust suppression activities (best management practices) (CL);*** • Enforcement of speed limits along mine-controlled roads to reduce the potential adverse effects of increased vehicular traffic associated with the RRP. Signs warning drivers of the possibility of wildlife encounters will be posted in areas of high wildlife activity. A log of collisions will be kept to monitor the effectiveness of the proposed mitigation and additional mitigation measures will be implemented if necessary; • Environmental induction of RRP personnel, including SAR identification and sensitivities, and knowledge of *Endangered Species Act* permit conditions; • Implementation of a monitoring plan for Eastern Whip-poor-will populations and nesting in proximity to the proposed mine and transmission line sites, within compensatory habitat areas and in appropriate control areas; and • Continue funding external research programs in collaboration with the MNR in order to further our understanding of this poorly studied species, as part of a larger overall benefits compensation package required by the *Endangered Species Act* permit.	E,C,O,D
111	The primary mitigation strategies for limiting adverse effects to Bobolink will include: • Restricting the development of open country habitats to periods outside the breeding bird season which occurs from May 1 to July 31; • Acquiring and protecting compensatory open country breeding bird habitat suitable for Bobolink breeding at a ratio of 1:1 for open-country habitat removed for RRP development; • Enforcement of speed limits along mine controlled roads to reduce the potential adverse effects of increased vehicular traffic associated with the RRP. Signs warning drivers of the possibility of wildlife encounters will be posted in areas of high wildlife activity. A log of collisions will be kept to monitor the effectiveness of the proposed mitigation and additional mitigation measures will be implemented if necessary; • Environmental induction of RRP personnel, including SAR identification and sensitivities and knowledge of *Endangered Species Act* permit conditions; • Implementation of sound abatement strategies to dampen sound infiltrating habitats surrounding high traffic areas of the mine; • ***Restoration of disturbed habitats at mine closure or encouraging development of habitats capable of supporting Bobolink and other open country species; and*** • Implementation of a monitoring plan for Bobolink populations and nesting in proximity to the proposed mine site within compensatory habitat areas, and in appropriate control areas.	E,C,O,D

#	***Environmental Assessment Commitments / Mitigation Specifically Related to Clearing / Rehabilitation of Habitat and Terrestrial Systems***	**Project Phase**
112	Mitigation measures that will be used to reduce potential adverse effects to Barn Swallows will include the following: • Identification of Barn Swallow nesting colonies prior to mine construction; • ***Restricting habitat displacement for mine infrastructure to periods outside the breeding bird season which occurs from May 1 to August 15 (CL);*** • Creation of artificial nesting structures to encourage recolonization or new colonization by Barn Swallows in areas where farm structures are removed; • ***Restoration of disturbed habitats at closure or encouraging development of habitats capable of providing suitable Barn Swallow foraging habitat;*** • Sound abatement strategies will be implemented to dampen sound infiltrating habitats surrounding high traffic areas of the mine; • Establishment of zones where Barn Swallow colonization is desired, tolerated or not wanted. These measures may be necessary to prevent colonization in areas of high human or vehicular activity that would put swallows and swallow breeding success at risk or where order and cleanliness are desired. In this case, discouraging tactics may be implemented to discourage colonization. Conversely, protection may be provided to swallows nesting in other locations where their presence is encouraged and does not cause problems to mine operations; • Enforcement of speed limits along mine controlled roads to reduce potential adverse effects of increased vehicular traffic associated with the RRP. Signs warning drivers of the possibility of wildlife encounters will be posted in areas of high wildlife activity. A log of collisions will be kept to monitor the effectiveness of the proposed mitigation and additional mitigation measures will be implemented if necessary; and • Implementation of a monitoring plan for Barn Swallow populations in proximity to the proposed mine and transmission line sites and in appropriate control areas.	E,C,O,D
113	Mitigation measures that will be used to reduce potential adverse effects to all species of Special Concern and Provincially rare species will include the following: • ***Restriction of principal habitat displacement for mine infrastructure to periods outside the breeding bird season which MNR has indicated occurs from May 1 to August 15 (CL);*** • Implementation of sound abatement strategies to dampen sound infiltrating habitats surrounding high traffic areas of the mine; • Where feasible, RRP lighting fixtures will be directed in such a fashion as to reduce excess production of light to the surrounding environment. • Establishment of zones where Black-billed Magpie colonization is desired, tolerated, or not wanted. These measures may be necessary to prevent colonization in areas of high human vehicular activity that could put magpie and magpie breeding success at risk. Discouraging tactics may be implemented to discourage colonization. Conversely, protection may be provided to magpies nesting in other locations where their presence is encouraged and does not cause problems to mine operations. • Enforcement of speed limits along mine controlled roads to reduce the potential for adverse effects of increased vehicular traffic associated with the RRP. Signs warning drivers of the possibility of wildlife encounters will be posted in areas of high wildlife activity. A log of collisions will be kept to monitor the effectiveness of the proposed mitigation and additional mitigation measures will be implemented if necessary; • Inclusion of wildlife awareness information into regular safety inductions performed by the mine. Workers will be made aware of seasonal changes in wildlife behaviour or presence in proximity to the mine; • Treatment of tailings slurry containing cyanide and associated heavy metals in the process plant using the SO_2/Air process before being discharged to the tailings management area; and • ***Restoration of disturbed habitats at closure including the development of habitats capable of supporting a diversity of wildlife species, including Species of Special Concern and rare species.***	E,C,O,D

#	*Environmental Assessment Commitments / Mitigation Specifically Related to Clearing / Rehabilitation of Habitat and Terrestrial Systems*	**Project Phase**
135	Related to the transmission line: • ***Compensation will be provided for merchantable timber value where applicable (CL);*** • ***Maintain transmission line set back distances of not less than 100 m from area lakes to provide effective visual screening from open waters (CL);*** • ***Landscape screening to minimize the contrast in landscape character; for example by leaving shrub cover vegetation that will not affect the conductors (i.e., the wire) in the ROW at creek crossings (CL); and*** • Minimizing land use conflicts and concerns by consulting with other users and stakeholders (i.e., Aboriginal peoples, hunters, trappers, outdoor recreationalists) to identify and implement other means of conflict resolution.	E,C,O
140	***Where NG has control, commercially reasonable efforts will be made to work with Resolute, MNR and local loggers to facilitate the use of merchantable timber by local mills, in recognition of the importance of mills to the local economy (CL).***	E,C
150	NG will ensure that safe access to properties is maintained during the construction and operation phases of the project. Once detailed plans are progressed, NG would welcome the opportunity to discuss further.	E,C,O
167	NG has committed to ensure that First Nations (including Rainy River First Nations, Naicatchewenin First Nation, Big Grassy River First Nation, Big Island First Nation, Naotkamegwanning First Nation, and Ojibways of Onigaming First Nation) and Métis community members have the: • Ability to access the site for cultural and ceremonial purposes, so that local Aboriginal people can undertake ceremonies at different times of the year to show respect for the land and its spiritual aspects. • ***All NG staff will undergo cultural awareness training. Temporary contractors will undergo an awareness program as part of the regular induction program when working at the mine (Letter to Chiefs from Kyle Stanfield, October 2013). This will ensure that people that work at the site are aware of indigenous culture and values, and are respectful of the principles and values of the Ojibwe people (CL).*** This mitigation has been identified as a result of the Draft EA independent First Nation review and agreed to by NG. NG will follow up directly with the BGRFN regarding any additional mitigation and accommodation measures.	E,C,O,D,P
177	***A targeted site investigation will be conducted at the end of mine life to identify soils that may have been affected by hydrocarbons or chemicals in specific areas (e.g. truck refuelling area). Soil materials found to exceed the appropriate clean up criteria for hydrocarbons will be remediated according to government requirements. If there is reason to suspect an area of soil has been affected by chemicals other than hydrocarbons, soil samples will be collected and tested. If the applicable regulatory requirements are exceeded, an appropriate method of disposal will be sought in consultation with the relevant authorities.***	O,D

#	***Environmental Assessment Commitments / Mitigation Specifically Related to Clearing / Rehabilitation of Habitat and Terrestrial Systems***	**Project Phase**
197	Related to transmission line construction, environmental monitoring will include (but will not be limited to) inspection of: • ROW to ensure excessive vegetation clearing is not conducted; • Appropriateness of equipment choice and maintenance of equipment to minimize environmental impacts; • ***Effectiveness of erosion control measures where applicable (CL);*** • ***Construction activities and equipment operation, including refueling exercises (CL);*** • ***Waste management, including wood waste from clearing and domestic wastes (CL)***; • Monitoring of remedial actions associated with malfunctions and accidents (if any); and • Any requirements contained in environmental approvals and permits required to construct the transmission line. ***At a minimum, weekly inspections by a qualified person will occur of worksites and related areas, during clearing of the ROW and construction of the transmission line. Contractors will be required to have properly trained personnel to provide guidance to construction teams in the absence of the qualified environmental persons. The results of the inspections will be documented and follow-up actions, if any, delineated. Completion of follow-up actions will be confirmed during subsequent inspections. Inspection frequency will be increased should the need be identified (CL).*** The duration of post-construction inspections, will depend on the results of the construction inspection. At a minimum, periodic aerial inspection will occur for environmental aspects during operation, coincident with other aerial surveys.	C
201	***NG will commit to clearing of flammable debris within a minimum 30 m buffer area. (CL)***	E,C,O

Commitment numbering relates to the Commitments Registry.

E: Engineering and procurement; C: Construction; O: Operations; D: Decommissioning and active closure; P: Post active closure

(CL) Commitments that will specifically be met during clearing activities. All commitments listed will be implemented by NG and/or its designated representatives / contractors.

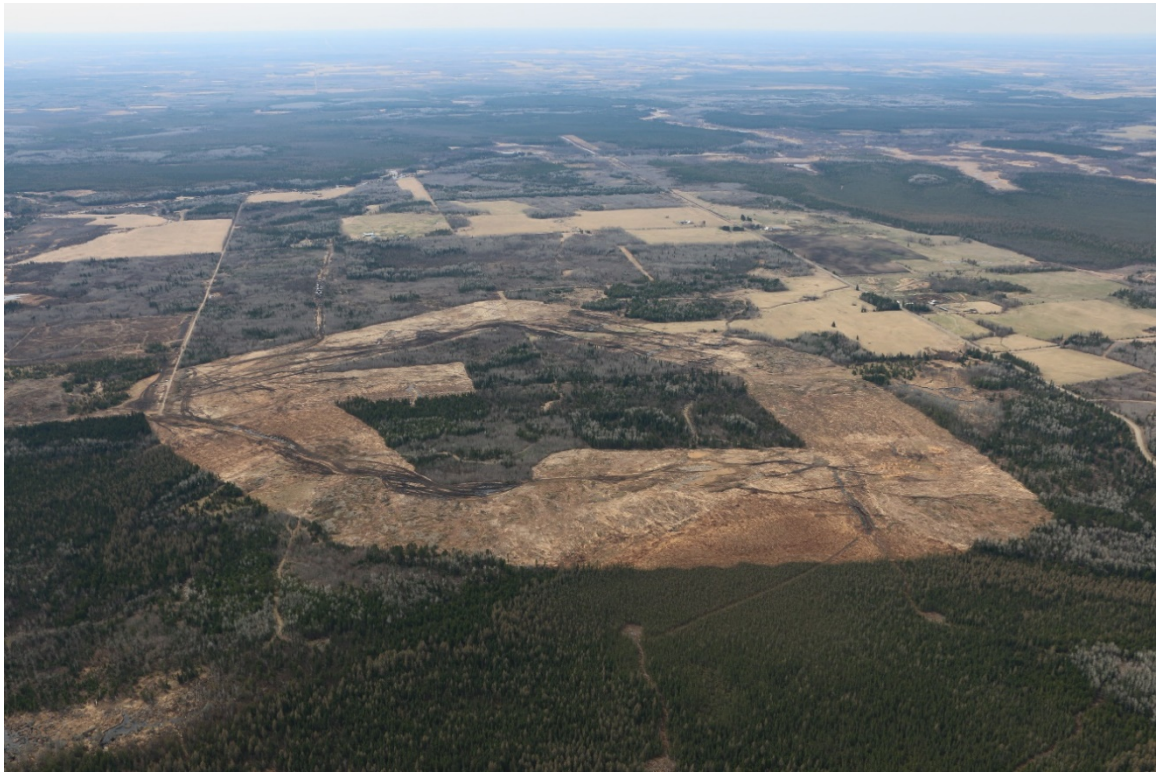
APPENDIX B

Clearing Photos

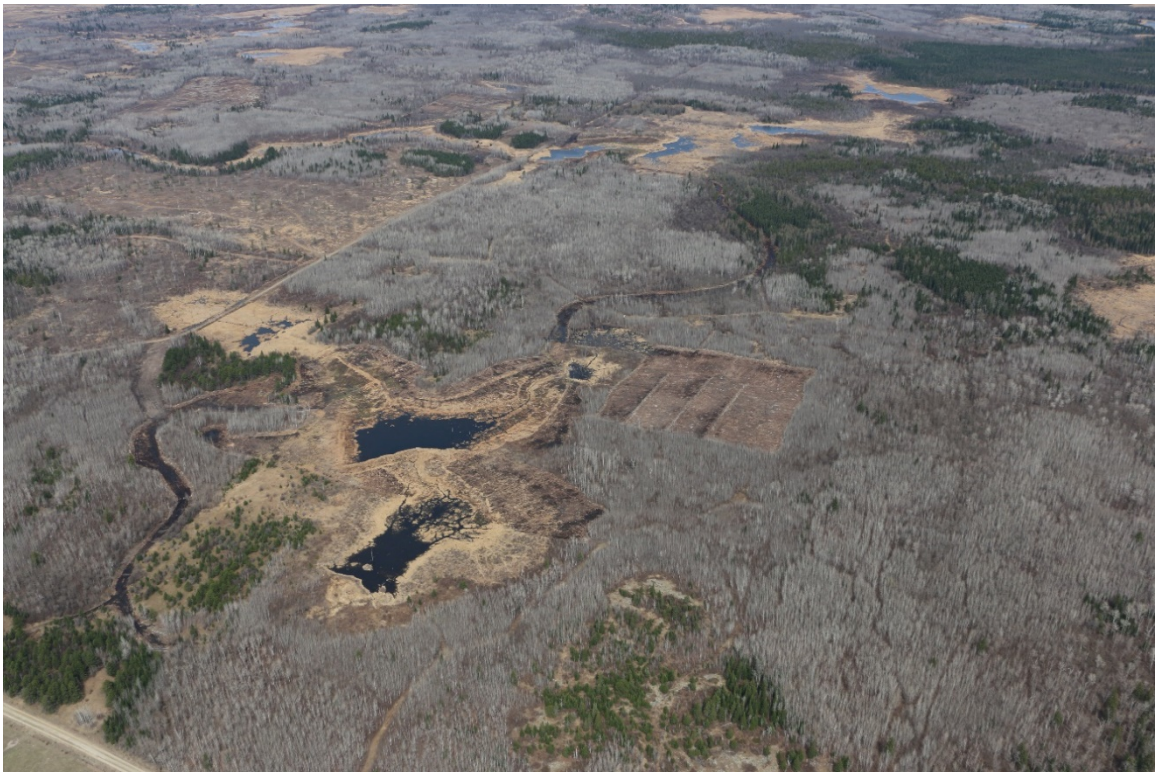
Highway 600 Re-alignment looking north towards the pinewood river showing root mat removal and side cast for the highway alignment and mulching of wood for the pipeline alignment to the west

Plant Site looking north towards the East Access Road showing mulched wood piles

Pumphouse Location and water pipeline from the Pinewood River



Water Management Pond which was the primary area of logging activity



Clark Pond and Teeple Pond looking north-north-west

Roen Pit, West Creek Pond, organics and plant site in background showing mulched piles, clearing boundaries and mineral soil protection through vegetation retention

Mine Rock Pond with cleared perimeter and vegetation retention around Clark Creek.

Mine Rock Pond Clearing and protection of mineral soils within the riparian area of Clark Creek

Standard sediment and erosion control measures including erosion blanket, check dams, sumps and silt fence

East Access Road Clearing looking east from Roen Road showing mulched wood waste

AIR QUALITY MONITORING STATIONS & BARN SWALLOW NEST BOXES

BARN SWALLOW NEST BOX

AIR QUALITY MONITORING STATION

ESA PROJECT SITE BOUNDARY, MNRF

MINE FOOTPRINT

0 1 2 3

Kilometers

newgold™

Rainy River Project

GIS GROUP, THUNDER BAY

94°6'0"W 94°4'0"W 94°2'0"W 94°0'0"W 93°58'0"W 93°56'0"W 93°54'0"W

48°53'0"N 48°52'0"N 48°51'0"N 48°50'0"N 48°49'0"N 48°48'0"N

5414000 5412000 5410000 5408000 5406000

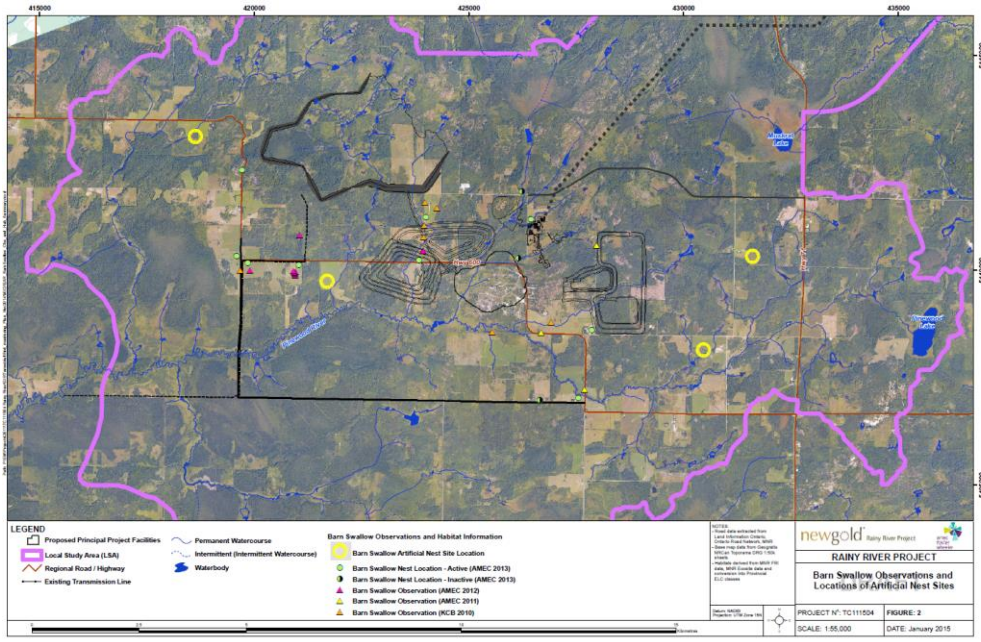
Split Rock Road
Richardson Road
Marr Road
SPLIT ROCK RIVER EAST BRANCH
230 KV TRANSMISSION LINE AND 40M CORRIDOR
HIGHWAY 71
McCallum Creek
TAILINGS MANAGEMENT AREA
Muskrat Lake
FINLAND
Korpi Road
Lampi Road
Clark Creek
Eliuk Road
Georgeson Road
CONSTRUCTED WETLAND
OVERBURDEN STOCKPILE
MILL
COARSE ORE CRUSHING
DEARLOCK
ROAD CLOSURE (MTO)
WEST MINE ROCK STOCKPILE
OPEN PIT
Roen Road
LOW GRADE ORE STOCKPILE
EAST MINE ROCK STOCKPILE
Unnamed (Waste Disposal) Road
Galenger Road
White Road
Loslo Road
West Creek
Marr Creek
Pinewood River
MINE ROCK POND
Clark Creek
Teeple Road
Westra Road
Heatwole Road
HIGHWAY 600 REALIGNMENT
Tait Road
Black Hawk
HIGHWAY 600
HIGHWAY 615
Barwick Road
Caul Road
Atkinson Road

1:42,000

418000 420000 422000 424000 426000 428000 430000 432000 434000

T:\GIS\MAP DOCUMENTS\RAINY RIVER PROJECT\2016\2016-08-04 EC 2015 ANNUAL REPORT MAPS\2016-08-08 AIR MONITORING STATIONS AND BARN SWALLOW NEST BOXES (EC 2015 ANNUAL REPORT MAPS).MXD

Barn Swallow Nest Boxes (4)



BASW Nest Box Locations

NEW GOLD INC.
RAINY RIVER PROJECT

2015 SPECIES AT RISK MONITORING REPORT

Per Condition 7.2(a) of Permit FF-C-001-14 under the *Endangered Species Act*

Submitted by:

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January 2016
TC111504

amec foster wheeler

EXECUTIVE SUMMARY

A Provincial *Endangered Species Act* (ESA) permit for Species at Risk (SAR) was issued to New Gold Inc. for their Rainy River Project (RRP) by the Minister of Natural Resources and Forestry on November 7, 2014. The ESA permit addresses two Provincially Threatened bird species, Eastern Whip-poor-will and Bobolink, and allows construction and operation of the RRP which is anticipated to have adverse effects to these two species. Where adverse effects to SAR habitat were anticipated to occur, New Gold, through provisions of the ESA permit, has provided compensatory habitat, referred to as Overall Benefit Areas, to offset such adverse effects. The ESA permit requires New Gold to manage these Overall Benefit Areas for the benefit of Eastern Whip-poor-will and Bobolink, until such time as habitat restoration can be completed at the Rainy River Project mine to a level where it can be demonstrated that restored habitats are capable of supporting the prescribed number of SAR bird territories, or acreages, defined in the ESA permit.

A comprehensive monitoring program is defined in Condition 6 of the ESA permit, with reporting requirements for this monitoring program defined in Condition 7, to ensure that adverse effects to Eastern Whip-poor-will and Bobolink are limited to those identified in the ESA permit, and that Overall Benefit Areas are functioning as intended to provide the required offsets. This 2015 Annual Monitoring Report addresses Phases 1 and 2 of the monitoring programs for Eastern Whip-poor-will and Bobolink, as per Appendices G and J of the ESA permit.

Condition 4.1(g) of the ESA permit also requires sound monitoring to be carried out at two Eastern Whip-poor-will receptor habitats, where the highest sound levels are expected to occur (positioned north and south of the Project site), during the first week in May and again during June of each year of construction. This report summarizes the results of these sound monitoring activities. Details are provided in separate reports (Amec Foster Wheeler 2015a, 2015b).

Condition 5.1(d) of the ESA permit requires that a research program on Eastern Whip-poor-will be implemented to enhance knowledge of this species. This report provides the first year of results for this multi-year program that will attempt to assess habitat selection by Eastern Whip-poor-will in the area of the RRP and in the Eastern Whip-poor-will Overall Benefit Areas (as outlined in Amec Foster Wheeler 2014a). Desktop and field studies were conducted to characterize habitats within 20 areas known to be occupied by Eastern Whip-poor-will (e.g., within known whip-poor-will core ranges and home ranges as defined by Rand 2014). Aerial photo interpretation was conducted to determine percent rocky habitat present, proximity to foraging habitat (open areas) and the amount, type and size of foraging habitat present within the core range and home range of the 20 occupied areas and field studies involved the collection of macro- and micro-habitat characteristics.

In 2015, 19 Eastern Whip-poor-will were recorded within the Project site boundary, or around its periphery, and 22 Eastern Whip-poor-will were recorded within the Eastern Whip-poor-will Overall Benefit Areas. No Bobolink were located within the Project site boundary; however, 4 individuals were recorded around its periphery, and 33 individuals were recorded within the Bobolink Overall Benefit Areas. Other SAR recorded during the 2015 surveys included (in order to abundance from

highest to lowest): Barn Swallow, Eastern Wood-pewee, Golden-winged Warbler, Common Nighthawk, American White Pelican, Canada Warbler, Wood Thrush, Bald Eagle and Eastern Meadowlark.

Sound level monitoring was carried out in Eastern Whip-poor-will Receptor Habitats during May and June, 2015. There were no exceedances of the hourly Leq 50 dBA sound criteria threshold at either receptor, in either month, that were attributable to Project-related activities. During the May monitoring period there was only one exceedance of the hourly Leq 50 dBA sound criteria threshold. That exceedance occurred at the north Receptor Habitat location, where the sound monitor had been tipped over by excessive wind, or by wildlife. During the June monitoring period there were seven exceedances of the hourly Leq 50 dBA sound criteria threshold at the north Receptor Habitat, and three exceedances at the south Receptor Habitat. Based on a review of audio tapes, these were all associated with inclement weather, chirping birds or planes.

Desktop habitat analysis of 20 Eastern Whip-poor-will occupied areas, within the Eastern Whip-poor-will Overall Benefit Areas, determined that whip-poor-will are most often associated with upland deciduous forests as well as both deciduous and coniferous forests associated with shallow soils and exposed bedrock. Similarly, field surveys determined that whip-poor-will were most often associated with semi-open forests (both deciduous and coniferous) with exposed bedrock, young to mid-aged deciduous forests with dense tree stems, open groundcover (largely comprised of leaf litter) and semi-open mature forests with little or no understory. No patterns were observed in the abundance or size of snags or downed woody debris present within the plots or in the species composition or species richness.

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1.0 INTRODUCTION

1.1 Purpose of Application

A Provincial *Endangered Species Act* (*ESA*) permit for Species at Risk (SAR) was issued to New Gold Inc. (New Gold) for their Rainy River Project (RRP) by the Minister of Natural Resources and Forestry (MNRF) on November 7, 2014. The ESA permit addresses two Provincially Threatened bird species: Eastern Whip-poor-will (*Antrostomus vociferous*) and Bobolink (*Dolichonyx oryzivorus*); and allows construction and operation of the RRP which is anticipated to have adverse effects to these two species. Adverse effects were anticipated to occur to Eastern Whip-poor-will and Bobolink involving:

- Species habitat which is destroyed;
- Species habitat which is damaged; and
- Potential harm and harassment to birds outside of habitats which are either destroyed or damaged.

Destroyed habitats are defined to include Eastern Whip-poor-will and Bobolink occupancy areas and habitats that are anticipated to be directly displaced by mine developments, such as through open pit mining, the construction of buildings and yard areas, and the development of mineral stockpiles and tailings areas.

Damaged habitats are defined as those habitats located adjacent to, or near to, destroyed habitats, where a reduction in habitat suitability is anticipated to occur, over the longer-term, mainly as a result of Project related noise emissions. Damaged habitats were defined in the ESA permit as those SAR habitats located outside of directly displaced habitats, where sound level thresholds, due to Project related activities, were anticipated to exceed a sound level threshold of 50 decibel A-Weighted (dBA). The 50 dBA threshold is defined as the 50 dBA sound level averaged over one hour (50 dBA, L_{Aeq} 1 hr), as determined through standard Ministry of the Environment and Climate Change (MOECC) NPC-103 monitoring procedures, and excluding blast noise. Frequent or continuous sound levels in excess of 50 dBA have the potential to diminish habitat suitability for sensitive bird species.

The potential to harm and harass SAR species was defined to include adverse sound effects to SAR habitats existing adjacent or near to destroyed or damaged habitats, where increased sound levels due to Project related activities were expected to be short-term, such as those related to certain stages of construction.

Where adverse effects to SAR habitat were anticipated to occur, New Gold has provided compensatory habitat through provisions of the ESA permit, referred to as Overall Benefit Areas (OB Areas), to offset such adverse effects. The ESA permit requires New Gold to manage these OB Areas for the benefit of Eastern Whip-poor-will and Bobolink, until such time as habitat

restoration can be completed at the RRP mine, to a level where it can be demonstrated that restored habitats are capable of supporting the prescribed number of SAR bird territories, or acreages, defined in the ESA permit.

For Eastern Whip-poor-will, the MNRF determined that 18 identified Eastern Whip-poor-will breeding territories could potentially be affected by mine developments. To offset this effect, New Gold acquired land title (surface rights) to a total of 1,468.3 hectares (ha) of lands having the potential to support 36.07 Eastern Whip-poor-will breeding territories, providing a 2:1 ratio of offset to affected territories. This 2:1 ratio was set as a conservative measure to account for any uncertainties in the quality or utilization of offset territories by Eastern Whip-poor-will.

In the case of Bobolink, MNRF determined that 348 ha of Bobolink habitat had the potential to be adversely affected by mine developments (destroyed or damaged). To offset this effect, New Gold acquired, for protection and management, land surface rights to a total of 348 ha of field habitat considered to be suitable for use as breeding habitat by Bobolink.

To ensure that adverse effects to Eastern Whip-poor-will and Bobolink are limited to those identified in the ESA permit, and that OB Areas are functioning as intended to provide the required offsets, a comprehensive monitoring program is defined in Condition 6 of the ESA permit, with reporting requirements for this monitoring program defined in Condition 7.

The monitoring program for Eastern Whip-poor-will provides for:

- Phase 1 monitoring to determine whether, during and after construction and operation activities, that areas within and peripheral to the Project Site are occupied by Eastern Whip-poor-will. Phase 1 monitoring is also to include an assessment of sound levels, during the breeding season in identified Eastern Whip-poor-will receptor habitats.

- Phase 2 monitoring of the OB Areas to determine which areas are occupied by Eastern-Whip-poor-will, and to assess the distribution of the areas relative to implemented management actions, as set out in the Management Plan.

- Phase 3 monitoring after implementation of the Eastern Whip-poor-will site rehabilitation plan, as part of mine site reclamation following mine closure, to determine Eastern Whip-poor-will occupancy rates at the mine site in comparison to the pre-mining condition.

Specific guidance is provided in Condition 6.2 and Appendix G of the ESA permit describing how the monitoring program for Eastern Whip-poor-will is to be carried out. This guidance includes the times during which monitoring is to be carried out, qualifications of the monitors, and the information to be collected.

The monitoring program for Bobolink includes:

- Phase 1 monitoring to determine the response of Bobolink to construction and operation activities within the Project site and within the peripheral occupancy area;
- Phase 2 monitoring to determine habitat use by Bobolink within the OB Areas; and
- Phase 3 monitoring after implementation of the Bobolink rehabilitation plan, as part of mine site rehabilitation following mine closure, to determine Bobolink occupancy rates at the mine site in comparison to the pre-mining condition.

Specific guidance is provided in Condition 6.3 and Appendix J of the ESA permit regarding how the monitoring program for Bobolink is to be conducted, including the times during which monitoring is to be carried out, qualifications of the monitors, and the information to be collected.

This 2015 annual monitoring report addresses both Phase 1 and Phase 2 of the monitoring programs for Eastern Whip-poor-will and Bobolink. Phase 3 monitoring is not required until after mine closure and site rehabilitation and accordingly is not described herein.

1.2 Adaptive Management

A key component of the monitoring program is adaptive management, whereby ongoing results of the monitoring program are used to inform response strategies. In the case of SAR monitoring for the RRP, it is anticipated that monitoring results will:

- Confirm sound level predictions in relation to damaged, and harmed and harassed impact areas; and
- Confirm Eastern Whip-poor-will and Bobolink occupancies within and peripheral to the Project site.

In the event that Project-related sound levels in Eastern Whip-poor-will receptor habitat should be shown to exceed sound level thresholds defined in the ESA permit, additional mitigation measures are to be implemented to reduce sound levels in accordance with Condition 4.1(g) and 4.2(b) of the ESA permit.

Should Eastern Whip-poor-will and Bobolink occupancies in areas peripheral to the Project site be diminished in comparison to historic and control data (where available), including allowances for increased sound levels in damaged and harmed and harassed areas, New Gold will investigate the basis for any such diminished use. If related to Project operations, New Gold will attempt to mitigate any related adverse effects.

2.0 METHODS

2.1 Eastern Whip-poor-will Surveys

Surveys were conducted in accordance with the survey protocol provided by the Whip-poor-will Roadside Survey Participant's Guide (BSC 2012). Surveys commenced 30 minutes after sunset and continued until approximately midnight or 1:00 am (depending on weather conditions, brightness of the moon, and level of singing activity by the birds). Surveys were conducted on calm, clear nights with little or no cloud cover, no precipitation and winds of no greater than 3 on the Beaufort Scale.

Whip-poor-wills are known to call most actively during periods of high lunar illumination when at least 50% of the moon face is illuminated (Mills 1986; Wilson and Watts 2006). Accordingly, two study periods were completed during 2015 to coincide with periods of greatest lunar illumination. Surveys were conducted between the first and third quarters of the lunar cycle, both in May and in June (during the whip-poor-will breeding period). These lunar phases occurred between May 25 and June 9, and between June 24 and July 8, 2015. The 2015 whip-poor-will surveys at RRP were conducted from June 2 to June 6 and from June 24 to June 30, 2015. Survey stations (Figure 2-1) visited in May were repeated in June to ascertain whether birds occurring in May were still present in June, and therefore assumed to have established breeding territories.

A total of 106 survey stations were surveyed for whip-poor-will: 24 were located in proximity to the proposed mine site footprint (e.g., within the footprint or within 3 kilometres; km of the footprint; Figure 2-1); and 82 were located within whip-poor-will OB Areas (Figure 2-1). Surveys lasted six minutes at each station, during which all whip-poor-wills heard were recorded on a data sheet, and distance and direction to the bird from the station. When possible, the bird's location was determined by triangulating from additional survey locations added ad-hoc during the survey.

Upon the completion of field studies, whip-poor-will field data was analyzed to establish the approximate location of occupied areas and to estimate the number of birds present. Whip-poor-will locations (recorded in the field by means of mapped sightings and triangulation) were compared between repeated visits and between adjacent survey stations in an attempt to accurately establish whether recorded observations were repeats of the same bird.

2.2 Bobolink Surveys

Point count surveys for Bobolink were undertaken at predetermined long-term monitoring survey stations located within the Bobolink OB Areas and in other areas around the Project site. Surveys were conducted according to protocols described in *Mining Project Baseline Desktop Assessment and Survey Requirements* (Environment Canada 2014) and the Atlas of Breeding Birds of Ontario (Cadman et al. 2007).

Two rounds of point count surveys were conducted in June 2015 by qualified biologists skilled in the identification of birds by sight and sound. Surveys were initiated prior to sunrise and extended

to five hours after sunrise, depending on the weather conditions. Point count surveys were aborted or postponed if weather conditions were not optimal (e.g., presence of moderate to high winds, or rain). Surveys were conducted for ten minutes at each point count station and all birds seen or heard within four distance regimes (0 to 50 m; 50 to 100 m; outside 100 m; and birds seen flying overhead) were recorded. Bird observations were also recorded within three time intervals (0 to 3 minutes, 4 to 5 minutes, and 6 to 10 minutes).

A total of 44 point count stations were established within Bobolink OB Areas and 31 stations were established in other areas of large open habitat (primarily hay fields and old pasture areas) providing suitable nesting habitat for Bobolink (Figure 2-2). Point count stations were pre-determined using digital Forest Resource Inventory (FRI) imagery and satellite imagery and were stationed approximately 250 m apart from each other to maximize coverage and minimize overlap. Stations were geo-referenced in the field using a hand-held GPS unit with 5 m accuracy. The first round of surveys was conducted from June 2 to 6, 2015 and the second round of surveys was conducted from June 24 to 27, 2015. During the second round of sampling, stations were surveyed in the reverse order from the first round (to the greatest extent possible) to reduce temporal sampling bias.

2.3 Sound Monitoring

Condition 4.1(g) of the ESA permit provides for sound monitoring to be carried out at two Eastern Whip-poor-will receptor habitats, where the highest sound levels are expected to occur, during the first week in May and again during June of each year of construction. The selected monitoring locations were positioned north and south of the Project site (Figure 2-3). Sound monitoring for May occurred from April 30 through May 8, 2015 and for June occurred from June 1 through June 8, 2015. Detailed results are available from Amec Foster Wheeler (2015a,b).

For both time periods, hourly L_{eq} sound levels were measured and compared with the 50 dBA criteria limit for the assessment, following technical requirements set out in MOECC guidelines NPC-102 and NPC-103, and as defined in the ESA permit. Measurements taken during periods of inclement weather, defined as when wind velocities exceeded 20 km/h, or relative humidity was greater than 90% (typically indicative of precipitation) were noted. Microphones also recorded sound types to allow interpretation of the data.

2.4 Habitat Assessment

As per Condition 5.1(d) of the ESA permit, an Eastern Whip-poor-will Research Program (Amec Foster Wheeler 2014a) was implemented in 2015 to enhance knowledge of this species. This report provides the first year of results for this multi-year program that will attempt to assess habitat selection by Eastern Whip-poor-will in the area of the RRP and in the Eastern Whip-poor-will Overall Benefit Areas, as outlined in Amec Foster Wheeler (2014a).

Field inventories were conducted between July 18 and 22, 2015 and recorded macro- and micro-habitat characteristics within 10 m x 10 m field plots established in 20 areas known to be occupied

by Eastern Whip-poor-will (e.g., within known whip-poor-will core ranges and home ranges as defined in Rand 2014 and described below). These 20 occupied areas (Figure 2-4) were identified from the results of whip-poor-will surveys undertaken in previous years by Klohn Crippen Berger in 2010 (KCB 2011), the Ministry of Natural Resources (MNR) in 2010 to 2013 (MNR 2013), Trent University in conjunction with the MNR in 2011 and 2012 (Rand 2014) and Amec Foster Wheeler between 2011 and 2014 (AMEC 2011; 2012; 2013; Amec Foster Wheeler 2014b).

Macro-habitat characteristics recorded included habitat variables at the forest stand level such as: tree density (basal area) and species composition, size class analysis of live trees and snags, height of canopy and sub-canopy, average stand age class, and percent canopy and sub-canopy cover. Micro-habitat features recorded included variables at the understory level that may be important to nesting female whip-poor-will such as: percent understory cover, average height of understory cover, type of cover (vegetation species) and percent composition of groundcover (rock, moss, litter, lichen, downed woody debris, etc.). Appendix A provides copies of the completed datasheets.

Prior to conducting the field inventories, preliminary delineation of vegetation communities was obtained from FRI mapping (MNR 2008) for the 20 identified occupied areas. FRI mapping includes vegetation community details of stand age and canopy species composition, as well as ecosite classification based on the Ecosites of Ontario Field Manual (Boreal Ecosites; MNR 2009). Boreal Ecosites are described using macro- and micro-habitat characteristics such as canopy composition and height, species richness and composition of understory and groundcover layers and include some limited information on percent cover of vegetation strata.

Aerial photo interpretation was conducted to determine: percent rocky habitat present, proximity to foraging habitat (open areas) and the amount, type and size of foraging habitat present within the core range and home range of the 20 identified occupied areas. Rand (2014) defined Eastern Whip-poor-will core range, and home range to be 30.99 ha and 136.23 ha, respectively, during 2011 and 2012 studies conducted at the RRP by Trent University in collaboration with the MNRF and New Gold. For the purpose of aerial photo interpretation, the core range and home range were illustrated as two circles, with their centers based on the whip-poor-will observation point, and with a radius of 314 m and 657 m, respectively. Aerial photo interpretation was determined to be the most accurate approach for identifying rocky areas and open foraging habitats as FRI mapping often does not distinguish the smaller patches of open foraging habitat from the greater forest community within which they occur. Aerial imagery from July 2014 was utilized for the analysis, and interpretation was undertaken at a scale of 1:8,500 m.

3.0 RESULTS

3.1 Eastern Whip-poor-will Observations within and Peripheral to the Mine Site (Phase 1 Monitoring)

Figure 3-1 shows the results of the two 2015 Eastern Whip-poor-will surveys. Figures 3-1b, 3-1c and 3-1d provide the results within the Project site or around the periphery (within 3 km), satisfying the requirements of Phase 1 of Eastern Whip-poor-will monitoring (…*monitoring to determine whether, during and after construction and operation activities, that areas within and peripheral to the Project Site are occupied by Eastern Whip-poor-will*), as outlined in Condition 6 and Appendix G of the ESA permit.

The results shown in Figures 3-1b, 3-1c and 3-1d indicate that while no Eastern Whip-poor-will were located directly within the Project footprint (as much of this area had been cleared), eight individuals were located within the Project site boundary (two shown in Figure 3-1c and six in Figure 3-1d). Eleven Eastern Whip-poor-will were located outside of the Project site boundary but within the periphery of the Project footprint (two shown in Figure 3-1b, four in Figure 3-1c and five in Figure 3-1d). Therefore, 19 Eastern Whip-poor-will were recorded within the Project site or around its periphery in 2015.

Surveys at these precise locations (e.g., the survey stations shown in Figures 2-1 and 3-1b, 3-1c and 3-1d) were not conducted in past years, but the general Project area (the footprint and surrounding areas) was well studied in 2010 to 2013 (AMEC 2011, 2012, 2013; KCB 2011; MNR 2013a; Amec Foster Wheeler 2014b; Rand 2014; per Figure 3-2).

3.1.1 Sound Monitoring

Sound level monitoring was carried out in two Eastern Whip-poor-will Receptor Habitats (Figure 2-3) during the first weeks of May and June, 2015, as described in Section 2.3 and as required by Phase 1 of Eastern Whip-poor-will monitoring outlined in Condition 6 of the ESA permit. Monitoring results are presented in Table 3-1 and detailed discussions of these results are presented in Amec Foster Wheeler (2015a,b).

There were no exceedances of the hourly L_{eq} 50 dBA sound criteria threshold at either receptor, in either month, that were attributable to Project-related activities. During the May 2015 monitoring period, there was only one exceedance of the hourly L_{eq} 50 dBA sound criteria threshold. That event occurred at the north Receptor Habitat location, during the 19:00 hr on May 2 when the sound monitor was tipped over (by excessive wind or by wildlife). During the June monitoring period there were seven exceedances of the hourly L_{eq} 50 dBA sound criteria threshold at the north Receptor Habitat, and three exceedances at the south Receptor Habitat. All of these exceedances but one were associated with inclement weather. A review of audio tapes indicated that the exceedances were caused by sound from: wind, rain, thunder, chirping birds and planes.

During the first week in May, 2015, Project-related construction activities were principally confined to: the process plant and crusher site area, Roen Road aggregate pit, development of the bulk emulsion plant and access to and initial development of the Tait quarry.

During the first week in June, 2015, Project-related construction activities were principally confined to the process plant and crusher site area, the Roen Road aggregate pit, development of the bulk emulsion plant, ongoing development of the Tait quarry, and initial construction of the Highway 600 re-alignment.

3.2 Eastern Whip-poor-will Observations within the Overall Benefit Areas (Phase 2 Monitoring)

Figure 3-1 shows the results of the two 2015 Eastern Whip-poor-will surveys. Figures 3-1a and 3-1b indicate the locations of Eastern Whip-poor-will observations within the two OB Areas, satisfying the requirements of Phase 2 of Eastern Whip-poor-will monitoring (…*monitoring of the OB Areas to determine which areas are occupied by Eastern-Whip-poor-will*), as required by Condition 6 and Appendix G of the ESA permit.

A total of 11 Eastern Whip-poor-will were observed in the northern OB Area (Figure 3-1a) during both the first and second survey periods. During each survey, these 11 birds were considered to be separate individuals and were considered to be established territorial males (observed during both surveys). Surveys at these precise locations (e.g., survey stations shown in Figures 2-1 and 3-1a) were not conducted in past years but the northern OB Area was well studied in 2010 to 2013, inclusive (AMEC 2012, 2013; MNR 2013a; Amec Foster Wheeler 2014b; Rand 2014; per Figure 3-2).

In the southern OB Area (Figure 3-1b), a total of 11 Eastern Whip-poor-will were also observed during both the first and second survey periods. Similar to the northern OB Area, these 11 birds were considered to be separate established territorial males. Also similar to the northern OB Area, surveys at these precise locations (e.g., the survey stations shown in Figures 2-1 and 3-1b) were not conducted in past years but the southern OB Area was well studied in 2010 to 2013, inclusive (AMEC 2012, 2013; MNR 2013a; Amec Foster Wheeler 2014b; Rand 2014; per Figure 3-2).

These results indicate that at least 22 Eastern Whip-poor-will occupied the two OB Areas in 2015.

3.3 Bobolink Observations within and Peripheral to the Mine Site (Phase 1 Monitoring)

Figure 3-3 shows the results of the two 2015 Bobolink surveys including the locations of Bobolink observations within the Project site or around its periphery (within 3 km), satisfying the requirements of Phase 1 of Bobolink monitoring (…*monitoring to determine the response of Bobolink to construction and operation activities within the Project site and within the peripheral occupancy area*), as outlined in Condition 6 and Appendix J of the ESA permit.

No Bobolink were located directly within the Project footprint (as much of this area had been disturbed), nor within the Project site boundary. Twenty-seven Bobolink were recorded around the periphery of the Project site (Figure 3-3) but outside of the Bobolink OB Areas (discussed in Section 3.4). Twenty of these 27 observations were located directly south of the proposed Open Pit and the Pinewood River.

Surveys at these precise locations (e.g., survey stations shown in Figures 2-2 and 3-3) were not conducted in past years but the general Project area (footprint and surrounding areas) was well studied in 2010, 2011 and 2012 (AMEC 2011, KCB 2011, AMEC 2012, MNR 2013b, Amec Foster Wheeler 2014b; see Figure 3-4).

3.4 Bobolink Observations within the Overall Benefit Areas (Phase 2 Monitoring)

Figure 3-3 shows the results of the two 2015 Bobolink surveys, including the Bobolink OB Areas, satisfying the requirements of Phase 2 of Bobolink monitoring ("…*monitoring to determine habitat use by Bobolink within the OB Area*"), as outlined in Condition 6 and Appendix J of the ESA permit.

There was a total of 94 Bobolink observations in the OB Areas and they were observed in all but two of the OB Areas shown in Figure 3-3. Two additional OB Areas, not shown in Figure 3-3, that are located to the northwest (see Figure 2-2) did not have any Bobolink sightings.

Surveys at these precise locations (e.g., survey stations shown in Figures 2-2 and 3-3) were not conducted in past years but the general Project area (footprint and surrounding areas) was well studied in 2010, 2011 and 2012 (AMEC 2011, KCB 2011, AMEC 2012, MNR 2013b, Amec Foster Wheeler 2014b; see Figure 3-4).

3.5 Other Species at Risk Observations

Figure 3-5 shows the locations of other SAR observations within the study area in 2015, recorded during the following four surveys:

- Morning point count surveys for Bobolink;
- Morning point count surveys for the overall RRP Wildlife Monitoring Program (Amec Foster Wheeler 2015c);
- Crepuscular bird surveys for Eastern Whip-poor-will; and
- Crepuscular bird surveys for the overall RRP Wildlife Monitoring Program.

The following observations were made:

- 3 Bald Eagles and four American White Pelicans were recorded as a fly-overs (only) at three point count stations.

- A total of 29 individual Barn Swallows were recorded at ten point count sites, all of which were in Bobolink OB Areas.

- 4 individual Canada Warblers were recorded at three point count sites. One Eastern Meadowlark was recorded within a Bobolink OB Areas.

- 18 Eastern Wood-pewees were recorded at 13 point count sites. Sixteen Golden-winged Warblers were recorded at 11 point count sites.

- 4 Wood Thrushes were recorded at three point count sites.

- 13 Common Nighthawks were recorded at eight crepuscular bird survey stations.

3.6 Vegetation

3.6.1 Desktop Ecosite Analysis

Based on the desktop analysis, over half (54.6%; Table 3-2) of all Eastern Whip-poor-will observations made between 2010 and 2013 occurred within the Fresh, Silty to Fine Loamy: Aspen – Birch Hardwood (B104) vegetation community type (see Figure 2-4 for whip-poor-will observations and vegetation ecosite mapping). This community type is one of the most common vegetation communities present within the RRP area. An additional 15.6% of whip-poor-will observations occurred within communities which are dominated by aspen and birch (Dry to Fresh, Coarse: Aspen – Birch Hardwood [B055] and Moist, Fine: Aspen – Birch Hardwood [B119]; 9.6% and 6.0%, respectively), with smaller abundances recorded in Very Shallow, Dry to Fresh: Pine – Black Spruce Conifer (B012; 5.6%), and Very Shallow, Dry to Fresh: Aspen – Birch Hardwood (B016; 5.2%).

The Fresh, Silty to Fine Loamy: Aspen – Birch Hardwood (B104) community is one of the most commonly occurring communities in the RRP area. The canopy of this community consists mostly of Trembling Aspen (*Populus tremuloides*) and/or White Birch (*Betula papyrifera*), with >50% cover comprised of hardwood (deciduous) species. Coniferous species including Balsam Fir (*Abies balsamea*), White Spruce (*Picea glauca*) and Black Spruce (*Picea mariana*) also occur in the canopy in lower proportions. Canopy closure is variable but is rarely sparse, with greater than 25% cover. This community tends to be rich in shrub and herbaceous species, with the ground surface being mostly broadleaf litter with woody debris, moss and conifer litter. Common understory vegetation includes: Dwarf Raspberry (*Rubus pubescens*), Bush Honeysuckle (*Diervilla lonicera*), Beaked Hazel (*Corylus cornuta*), Wild Sarsaparilla (*Aralia nudicaulis*), Bunchberry (*Cornus canadensis*), Wild Lily-of-the-valley (*Maianthemum canadensis*) and feathermoss.

The Dry to Fresh, Coarse: Aspen – Birch Hardwood (B055) community is similar to that of B104, with some differences arising from a course soil substrate as opposed to a silty to fine loam. The canopy of this community may be a near pure stand of Trembling Aspen or White Birch

(>50% cover by hardwood species), and is often mixed with Balsam Fir, Black Spruce and White Spruce. The community is rich in shrub species, but tends to be herb poor. Richness of herbaceous species increases on loamy substrates. The ground surface consists mostly of broadleaf litter with moss, woody debris, and conifer litter. Common understory vegetation includes: Bush Honeysuckle, Mountain Maple (*Acer spicata*), Dwarf Raspberry, Wild Lily-of-the-valley, Wild Sarsaparilla, Bluebead-lily (*Clintonia borealis*), Ground-pine (*Dendrolycopodium dendroideum*) and feathermoss.

The Fine: Aspen – Birch Hardwood (B119) community is also dominated by hardwood species (>50% cover), mainly Trembling Aspen and White Birch in the canopy, and may include Balsam Poplar (*Populus balsamifera*) and/or Yellow Birch (*Betula allegheniensis*). Coniferous species such as Balsam Fir, Black Spruce or White Spruce may also be present. This community occurs on fine, moist soil substrates and, as such, is moderately rich in shrub and herbaceous species. The ground surface consists mostly of broadleaf litter with moss, woody debris, and conifer litter. Common understory vegetation includes: Dwarf Raspberry, Wild Red Current (*Ribes triste*), Twinflower (*Linnea borealis*), Wild Lily-of-the-valley, Naked Miterwort (*Mitella nuda*), Wild Sarsaparilla and feathermoss.

The Very Shallow, Dry to Fresh: Pine – Black Spruce Conifer (B012) community is one which is dominated (>50% cover) by conifer species, mostly Black Spruce and/or Jack Pine (*Pinus banksiana*), however, canopy closure is variable and may be sparse. The canopy may also be mixed with balsam fir and white birch. Shrub and herbaceous species diversity is poor. The ground surface is mostly moss with woody debris, conifer litter, lichen, and broadleaf litter. As soil depth is very shallow, this community may often be associated with exposed bedrock. Common understory vegetation includes: Velvet-leaf Blueberry (*Vaccinium myrtilloides*), Low Sweet Blueberry (*Vaccinium angustifolia*), Creeping Snowberry (*Gaultheria hispidula*), Wild Lily-of-the-valley, Bunchberry, Blue-bead-lily, Feathermoss and Foliose Lichen.

The Very Shallow, Dry to Fresh: Aspen – Birch Hardwood (B016) community is a hardwood forest community which is associated with shallow soils and exposed bedrock. The canopy is dominated by hardwood species (>50% cover), mainly White Birch and/or Trembling Aspen, often mixed with Black Spruce, White Spruce, and Balsam Fir. The canopy closure is variable and may be sparse. The richness of shrub and herbaceous species varies from poor to moderately rich. The ground surface is mostly broadleaf litter with moss, woody debris, and exposed bedrock. Common understory vegetation includes: Low Sweet Blueberry, Showy Mountain-ash (*Sorbus decora*), Velvet-leaf Blueberry, Blue-bead-lily, Bunchberry, Wild Lily-of-the-valley, Club-moss and Schreber's Moss.

It should be noted that those whip-poor-will observations which were recorded within the Fresh, Silty to Fine Loamy: Field (B093) community (which often represents agricultural or cultural meadows) typically occur adjacent to the edge of an upland forest community such as B104 and/or B055 (see Figure 2-4), not near the center of the open field. Whip-poor-will observations were rare in open wetland communities (B136, B142 and B146) and when they did occur in these communities, were also often associated with a nearby forest edge. Other vegetation communities

which occur in the RRP area but within which whip-poor-will were not recorded include both upland shrub communities and thicket swamps, as well as coniferous swamps. Swamp communities are typically associated with vernal pools or the presence of standing water, have an abundant shrub understory (both tall and low shrub), and abundant moss and herb cover.

3.6.2 Field Survey Habitat Characterization

Results of habitat characterization field surveys are summarized in Table 3-3. Completed data sheets are provided in Appendix A. A list of plant species recorded in each field plot including species richness is presented in Appendix B and photos of each plot are presented in Appendix C. Some initial patterns in whip-poor-will habitat selection are evident in the 2015 field data and are described below. Of the twenty field survey plots studied, ten occurred in areas of open bedrock, seven in young to mid-aged deciduous forest stands and three in mature deciduous forests (Figure 3-4).

Of the ten field survey plots that occurred in areas of open bedrock:

- Eight occurred in gaps within the canopy of the deciduous forest community B104 (Fresh, Silty to Fine Loamy: Aspen - Birch Hardwood);
- One occurred in a gap within the canopy of coniferous forest community B116 (Moist, Fine: Spruce - Fir Conifer); and
- One within the B016 deciduous community (Very Shallow, Dry to Fresh: Aspen - Birch Hardwood) which, because of its shallow soils, is often associated with exposed bedrock.

Groundcover in these plots was comprised mainly of rock (10 to 70% cover, average of 40% [±14%] cover), surface lichen (5 to 50% cover, average of 26.5% [±9.4%] cover), and dwarf shrubs (10 to 30% cover, average of 20% [±3.9%] cover). Forbs and graminoid species were the next most abundant groundcover (3 to 30% cover with an average of 11.5% [±5.5%] cover, and 5 to 30% cover with an average of 13% [±4.7%] cover, respectively). Low shrub cover (height ranging between 0.5 to 2 m) was generally sparse and ranged from 5 to 20% cover, with an average of 12% [±3.0%] cover. Understory cover (height ranging between 2 to 5 m height) was very sparse and ranged from 2 to 15% cover with an average of 6.2% [±3.0%] cover. Canopy and sub-canopy cover was variable but also very sparse with their combined cover ranging from 0 to 37%, and an average of 13% [±7.7%] cover.

Seven field survey plots were associated with young to mid-aged deciduous forests, six within young deciduous forests and one within a mid-aged deciduous forest). Five plots occurred in ecosite B104, and two in ecosite B119 (Moist, Fine: Aspen - Birch Hardwood). Trees and large shrubs with a diameter at breast height (DBH) less than 10 cm were abundant within these plots. Trees in the 10 to 24 cm DBH size class were less abundant and trees in the 25 to 50 cm DBH size class were rare and were only found in the mid-aged forest. The canopies of these communities were closed with the combined canopy and sub-canopies providing a minimum of

50% cover (average of 70.7% ±17.6%). The understory cover ranged from 15 to 35% with an average of 22.9% (±8.5%) cover and the low shrub cover ranged from 3 to 20% with an average of 11.9% (±4.5%) cover. Groundcover of the plots was quick open, comprising mainly of leaf litter which ranged from 40 to 90% cover, with an average of 70% (±12.1%) cover (most plots with >60% cover). Forbs were the next most common form of groundcover ranged from 30 to 70% cover with an average of 57% (±10%) cover.

Three field survey plots occurred in mature deciduous forests (all within ecosite B104). Two of these plots occurred in forests with a moderately sparse canopy (18% to 35% cover of the canopy and sub-canopy combined; average of 26% ±16%). Understory cover was also sparse and ranged from 15 to 25% cover (average of 20% [±9.8] cover), and low shrub cover was 10% in both plots. Groundcover was mainly comprised of graminoid species with 40% cover in both plots. Forb cover ranged from 25 to 40% (average of 32.5% [±15%] cover) and litter cover from 20 to 25% (22.5% [±4.9%] average).

The third plot occurring in a mature forest stand had a closed canopy (70% cover by the canopy and sub-canopy combined), a very sparse shrub layer (1% understory cover and 3% low shrub cover) and an open understory. Forb cover in the ground layer was 60% while open leaf litter occurred at 90% cover. As such, all eight plots occurring in closed canopy forests (including the seven plots in young to mid-aged deciduous forests, as described above) have a fairly open groundcover comprised mainly of open leaf litter (most plots with >60% cover of litter).

No patterns were observed in the abundance or size of snags or downed woody debris (DWD) present within the plots (Table 3-3), or in the species composition or species richness (Appendix B).

3.6.3 Aerial Photo Interpretation of Rocky Habitat and Open Foraging Areas in Eastern Whip-poor-will Occupancy Areas

Aerial photo interpretation was undertaken to determine percent rocky habitat present, proximity to open foraging habitat and the amount, type and size of foraging habitat present within core ranges and home ranges of the 20 occupied areas. Open habitats captured as part of potential whip-poor-will foraging habitat included upland communities (e.g., exposed bedrock communities, upland fields/gaps in forest canopy, semi-open forests) and open wetland communities (e.g., meadow marshes, wetlands which fluctuate between open water and shallow marsh, and semi-open swamps). A summary of results is presented in Table 3-4.

Open foraging habitat within the select whip-poor-will core ranges ranged from 3.2 to 17.8 ha, with an average of 9.1 ha (±1.8 ha) or 29% (±5.7%) cover of the core range. Open habitat within the home ranges ranged from 18.1 to 57.1 ha, with an average of 41.5 ha (±4.1 ha) or 31% (±3.0%) cover of the home range. Exposed bedrock communities were the most abundant type of open habitat occurring within both the core and home ranges. On average, 52% (±12.6%) of all open habitat types within the core ranges was comprised by exposed bedrock communities.

Within the home ranges, exposed bedrock communities accounted for 37.5% (on average; ±6.8%) of all open habitat types.

Percent rocky habitat (exposed bedrock) ranged from 0.1 to 38.6% (0.03 to 12.0 ha) within the core ranges, with an average of 17% (±5.5%) or 5.2 ha (±1.7 ha). Within the home ranges, percent rocky habitat ranged from 2.5 to 20.5% (3.3-27.9 ha), with an average of 11% (±2.5%) or 15.6 ha (±3.4 ha).

The next most common open habitat type was upland fields / gaps in forest canopies, which accounted for 19% (on average; ±7.6%) of all open habitats within the core range (5.1% ±2.4% cover of the core range), and 24% (on average; ±7.2%) of open habitat types within the home range (7.2% ± 2.1% cover of the home range).

In general, open upland habitats were more frequent than open wetland habitats. Within the core ranges, open upland habitats comprised 1.4 to 17.8 ha, with an average of 8.1 ha (±2.1 ha) or 26% (±6.7%) cover of the core range. Open wetland communities comprised 0 to 5.13 ha, with an average of 1.0 ha (±0.8 ha) or 8.1% (±3.1%) cover of the core range. Similarly, within the home ranges, open upland habitats comprised an average or 23% (±4.1%) cover of the home range (5.3 to 41.9 ha, average of 31.2 ha ±5.6 ha) while open wetland habitats comprised an average of 7.4% (±3.5%) cover of the home range (0 to 36.46 ha, average of 10.1 ha ±4.8 ha).

Distance from whip-poor-will observations to nearest forest edge (edge of open habitat) ranged from 0 to 115.4 m, with an average of 36.9 m (±14.2 m; Table 3-4). With only one exception, all of the open foraging habitats that were nearest to previous whip-poor-will observation points were upland communities and, most commonly were exposed bedrock communities.

4.0 SUMMARY OF 2015 EASTERN WHIP-POOR-WILL HABITAT ANALYSES

Existing literature on Eastern Whip-poor-will habitat selection was summarized in Rand (2014) and in the *Eastern Whip-poor-will Habitat Enhancement and Restoration Experimental Study – an Overall Benefits Component of Endangered Species Act Permitting* (Amec Foster Wheeler 2014a). The Eastern Whip-poor-will tends to be associated with a mixture of open habitats for foraging and forested habitats for nesting and roosting, but tends to avoid both large clearings and dense forest (Cink 2002, Cadman et al. 2007, Wilson and Watts 2008, COSEWIC 2009). There appears to be no predictable pattern with respect to forest species composition (Wilson 1985, Eastman 1991, Cink 2002, Wilson and Watts 2008, Cadman et al. 2007, COSEWIC 2009) but several studies have determined that whip-poor-will have a preference for open forest structure including:

- Semi-open mature deciduous, coniferous or mixed forests with little or no underbrush (Wilson 1985, James and Neal 1986, Cink 2002, Cadman et al. 2007, COSEWIC 2009); and

- Patchy forests with clearings or semi-open forests that are regenerating and are in a state of early to mid-forest succession following large disturbances (Mills 1987, Eastman 1991, Cink 2002, Wilson and Watts 2008) including transmission lines and roadway corridors (Palmer-Bell 1996). Wilson and Watts (2008) reported that the density of whip-poor-will in North Carolina increased in areas that were cleared by logging.

These birds tend to use semi-open habitats such as open woodlands, woodlands associated with rocky outcrop areas, sand barrens with scattered trees, savannahs, old burn sites or other disturbed sites for nesting (Wilson 1985; Cink 2002; COSEWIC 2009). Palmer-Bell (1996) determined that rocky areas with little ground cover are preferred for nesting and Eastman (1991) concluded that sparse ground cover and proximity to open areas for foraging are the key elements of habitat chosen by whip-poor-will.

Based on the 2015 desktop analysis of 20 areas occupied by Eastern Whip-poor-will in the RRP area, it was determined that whip-poor-will are most often associated with: upland deciduous forests, as well as both deciduous and coniferous forests which were associated with shallow soils and exposed bedrock. Similarly, based on field observations made during the 2015 whip-poor-will habitat characterization study, whip-poor-will were associated with: semi-open forests (both deciduous and coniferous) with exposed bedrock, young to mid-aged deciduous forests with dense tree stems <10 cm diameter at breast height (DBH), open groundcover (largely comprised of leaf litter) and semi-open mature forests with little or no understory.

The whip-poor-will study conducted at the RRP site in 2011 and 2012 by Trent University (Rand 2014) in collaboration with the MNRF and New Gold, determined that these birds were avoiding wetlands within their core ranges, and showed a pattern (although not statistically significant) of avoiding wetlands and scrublands and selecting rocky habitat within their home ranges. Rand (2014) speculated that wetlands and scrublands were avoided as they tend to have lower

abundance of the primary whip-poor-will prey species (moths, butterflies, scarab beetles) compared to forests, often lack perching sites and are too wet for nesting. Rand's (2014) results contrast findings by Palmer-Bell (1996) who determined that whip-poor-will often forage in wetlands and shrubby pastures when forest edge is present for perching.

Based on observations made during the 2015 whip-poor-will habitat characterization study, whip-poor-will core and home ranges generally had a greater amount of open upland foraging habitat than open wetland habitat, with exposed bedrock being the most common in these areas. Percent rocky habitat present ranged from 0.1 to 38.6% within the core ranges (average of 17% ±5.5%) and from 2.5 to 20.5% within the home ranges (average of 11% ±2.5%).

Whip-poor-will habitat characterization studies undertaken at the RRP in 2015 described herein, represent the first (pilot) year of habitat data collection in a multi-year whip-poor-will research program, as outlined in Amec Foster Wheeler 2014a. Future studies will:

- Include field surveys to describe the macro- and micro-habitat characteristics in those vegetation community types (ecosites) in which Eastern Whip-poor-will were mostly frequently recorded (e.g., B104 and B055) but where whip-poor-will were absent;

- Compare the macro- and micro-habitat features in areas occupied versus unoccupied by whip-poor-will through multivariate logistic regression or through habitat suitability index (HSI) models; and

- Try to draw conclusions on Eastern Whip-poor-will breeding habitat preferences and at what scale they occur (e.g., at the forest stand scale, at the nest site scale or a combination).

5.0 SUMMARY OF HABITAT MANAGEMENT ACTIVITIES UNDERTAKEN

5.1 Tait Quarry

The *Avoidance Alternatives Form* for the Tait Quarry at the RRP presents a rehabilitation plan for the Tait Quarry that will attempt to develop habitat suited to use by Eastern Whip-poor-will to commence one year after quarry operations cease (Amec Foster Wheeler 2014a). The purpose of the quarry is to provide rock fill aggregate for construction of the Highway 600 re-alignment.

Operations at the Tait Quarry were originally intended to commence in February 2015 and continue at least until October of 2015. The development start date for the quarry was delayed until early May 2015, and as of December 2015 the quarry was still in production. It is expected that Tait Quarry production will continue until approximately June 2016. The extended production end date relates to the delayed quarry start date and the need for additional rock fill to support mine site construction.

As such, no SAR habitat management activities were performed in connection with the Tait Quarry in 2015. It is expected that habitat restoration for the Tait Quarry will commence in the summer of 2016 following the completion of quarry activities.

5.2 Project Site

Project site development is expected to continue through the mine construction phase to mid-2017. It will continue as mine production proceeds and mineral stockpiles expand. During 2015, construction focused on the:

- Processing Plant and Crusher site area;
- Development of the early phase Open Pit;
- Development of the Roen Road aggregate pit and Outcrop Quarry 3;
- Construction of the West Creek and Clark Creek diversion channels;
- Development of the Water Management Pond; and
- Related access and water management facilities.

SAR habitat management activities for the Project site area in 2015 were essentially restricted to limiting tree clearing to those areas where such clearing was necessary to allow early phase Project site development.

5.3 Eastern Whip-poor-will Overall Benefit Areas

In accordance with Condition 5.1(b)(ii) of the ESA permit, the Management Plan for the Eastern Whip-poor-will OB Area is due to be submitted by New Gold to the MNRF no later than the fourth anniversary of the ESA permit Effective Date. The Effective Date is defined as the latter of the dates of the ESA permit issuance (November 7, 2014), or Provincial *Environmental Assessment*

Act approval (January 28, 2015). The Management Plan is to be approved by MNRF no later than the fifth anniversary of the ESA permit Effective Date, or January 28, 2020.

Until the Eastern Whip-poor-will OB Area Management Plan is approved, no physical work is scheduled to be undertaken within the OB Areas. As such no habitat management activities were undertaken in the Eastern Whip-poor-will OB Areas in 2015.

5.4 Bobolink Overall Benefit Areas

Condition 5.3(a) states that New Gold shall maintain and enhance "*at least 348 hectares of land that will be managed as Bobolink habitat in accordance with the sites delineated in Appendix I*", with such maintenance and enhancement to include:

- Bobolink OB Areas 3, 4, 5, and 7 to 21 totaling 317.5 ha to be managed from the ESA permit Effective Date (January 28, 2015); and

- With Bobolink OB Areas 1, 2 and 6 totaling 30.5 ha to be converted to suitable Bobolink habitat within two years of the ESA permit Effective Date (by January 28, 2017).

These OB Areas are to be maintained as hayfields in a condition suitable for Bobolink, consisting of late maturing grasses, with at least one grass species that exceeds 50 cm in height under normal growing conditions, and fields are to be void of woody species. Bobolink OB Areas require periodic renewal through ploughing and replanting, as per normal agricultural practice, to maintain the grasslands and to prevent invasion by woody species which would otherwise degrade the habitat. Such periodic renewal is set to begin in a few select fields in March and April of 2016 and will be completed prior to May 1, 2016. Other Bobolink OB Areas may need renewal in September and October of 2016 and the remaining OB Areas will undergo renewal in later years.

6.0 SUMMARY OF CONSTRUCTION ACTIVITIES UNDERTAKEN

During 2015, the following main Project site construction activities were undertaken, the majority of which continued until the end of the year unless otherwise noted:

- At the plant site and crusher area, the site was cleared and stripped, building and facility foundations were prepared, plant site steel was erected (in part), and associated yard areas and water management facilities were developed. These activities commenced in part during February.

- Construction of the bulk emulsion plant explosives manufacturing facility was initiated in February and occurred into March;

- Clearing and initial development of the early phase open pit commenced in February.

- Development of the Roen Road aggregate pit and Outcrop Quarry 3 commenced in February.

- Construction of the West Creek system diversion including: construction of the Stockpile Pond (in part), the Stockpile Pond Diversion Channel, and the West Creek Pond (in part), and the West Creek Diversion Channel commenced in February.

- Construction of the Clark Creek Diversion Channel and the Clark Creek Pond and the Teeple Pond started in February and continued through the remainder of the year;

- Construction of the preliminary phase Mine Rock Pond (in part) and diversion channel was initiated in August.

- Construction of the Water Management Pond dams (in part) started in August.

- Development of preliminary phase water management facilities for the Overburden and West Mine Rock Stockpile area, in the area east of Marr Creek and south of Highway 600 commenced in February.

- Related accesses were established on the same timelines as the facilities.

Main Project site area clearing and construction activities that were undertaken in 2015 are shown in Figure 6-1. These activities encompassed an area of approximately 1,446 ha (planned to the end of 2015) of which 405 ha were areas identified as *whip-poor-will impact areas to be destroyed* in Appendix C of the ESA permit, representing 31% of the whip-poor-will impact area to be destroyed, This includes the clearing of approximately 258 ha of forest habitat within the whip-poor-will impact areas to be destroyed.

The only Bobolink impact areas to be destroyed within the main Project site area that were cleared in 2015 were: the Mine Rock Pond area and small areas within the West Stockpile area; the Tailings Management Area; as well as a small portion of the West Creek Diversion Channel between Marr and Loslo Creeks (Figure 6-1). These areas total 115 ha, representing 43 % of the mine site area to-be-destroyed Bobolink habitat defined in Appendix I of the ESA permit.

Off-site construction activities undertaken during 2015 included:

- Development of the Tait Quarry (May through the remainder of the year);
- Construction of the Highway 600 Re-alignment (May until end of the year); and
- Partial clearing of the 230 kV transmission line (September).

Activities associated with development of the Tait Quarry and construction of the Highway 600 re-alignment resulted in the displacement of 4 ha of to-be-destroyed Eastern Whip-poor-will habitat. There are no Eastern Whip-poor-will or Bobolink to-be-destroyed areas associated with the transmission line, except for Eastern Whip-poor-will habitat in close proximity to the processing plant area, which is addressed above in association with the main Project area.

7.0 SUMMARY OF MORTALITY EVENTS AND ASSOCIATED ADAPTIVE MANAGEMENT MEASURES

Section 7.3(k) of the ESA permit requires that New Gold report any wildlife mortality events occurring within the Project site or in the OB Areas. There were no mortality events recorded in these areas in 2015.

8.0 HABITAT MANAGEMENT AND ASSESSMENT CRITERIA

8.1 Habitat Creation Criteria

8.1.1 Eastern Whip-poor-will

Habitat creation objectives (criteria) in relation to Eastern Whip-poor-will apply to mine site reclamation following the completion of mining and to rehabilitation of the Tait Quarry. Habitat management within the OB Areas is considered separate from habitat creation criteria. In general, habitat creation criteria for the development of Eastern Whip-poor-will habitats at closure are the following:

- Habitat restoration is to include provision for the creation of 13 Eastern Whip-poor-will territorial males, with the average territory being in the order of 30 ha; and

- Habitats are to be developed as self-sustaining, patchy forest habitat, consisting of an interspersed mix of mid-successional to mature trees and open patches, with generally limited to sparse understory development within forest patches.

The criterion of 13 male territories is defined in the ESA permit. Details of the idealized patchy forest type (or types) for reclamation targets will be developed through the Research Program; one of the objectives of which is to compare macro and micro habitat features, within the OB Areas and other Project lands that are associated with occupied territories, versus those associated with unoccupied neighboring habitats. Once research details are known, these will be used to refine habitat creation criteria.

8.1.2 Bobolink

Bobolink habitat preferences are well understood. Habitat creation criteria for this species, are the following:

- The quantity of Bobolink habitat developed at closure is to be equal to or greater than that which is destroyed as a result of Project development;

- Habitats are to be developed and maintained as late maturing grass hayfields, with a least one grass species that is greater than 50 cm in height, and devoid of invasive woody species; and

- Hayfields so developed are to greater than 4 ha in size.

8.2 Habitat Management Criteria

8.2.1 Eastern Whip-poor-will

In providing for Project site area habitat management in relation to Eastern Whip-poor-will, the following habitat management mitigations were developed, as per Condition 4.1 of the ESA permit:

- Avoid Project-related tree clearing during the breeding season, defined as occurring from May 1 to August 15 (criterion for success – timing windows adhered to);
- Where practicable, limit tree clearing in advance of, or following, the breeding season, to those areas which are needed for Project development in the near to intermediate term, as per Appendix E of the ESA permit (criterion for success – area of tree clearing consistent with associated construction works development need);
- To the extent reasonably possible, retain landscape topography and nature features (e.g., tree growth) around the perimeter of the Project development area (criterion for success – perimeter topography and features retained);
- Manage Project generated sound levels during the breeding season, such that sound levels do not exceed 50 dBA, as defined in the ESA permit, within whip-poor-will receptor habitats (criterion for success – no Project related exceedances of the hourly L_{eq} 50 dBA sound criteria threshold at receptor habitats);
- During the breeding season, ensure that blasting is carried out during the daytime only, defined as extending from a half hour after sunrise to a half hour before sunset (criterion for success – blasting carried out within the prescribed time interval);
- To the extent reasonably possible, and taking worker safety into consideration, direct Project related lighting inwards towards Project development areas, and away from the Project site perimeter (criterion for success – lighting directed inwards to extent practicable); and
- Use applicable dust control measures to avoid excessive dust suppression on Eastern Whip-poor-will receptor habitats, as defined in the ESA permit (criterion for success – total suspended particulate levels consistent with air quality model prediction for total particulate material).

In relation to Eastern Whip-poor-will, all of the above mitigation measures as applicable were employed / habitat management criteria were met in 2015 in connection with site development.

Habitat management criteria for the OB Areas and will be developed as part of the Management Plan for the Eastern Whip-poor-will Overall Benefit Areas. This plan is yet to be prepared.

8.2.2 Bobolink

The following habitat management criteria have been developed to provide for Project site area habitat management in relation to Bobolink, as per Condition 4.1 of the ESA permit:

- Avoid Project related habitat removal during the breeding season, defined as occurring from May 1 to July 31 (criterion for success – timing windows adhered to);

- Manage Project generated sound levels during the breeding season, such that sound levels do not exceed 50 dBA, as defined in the ESA permit, within proximal high quality Bobolink habitats to the south and west of the Project site; and

- Use applicable dust control measures to avoid excessive dust suppression on Eastern Whip-poor-will receptor habitats, as defined in the ESA permit (criterion for success – total suspended particulate levels consistent with model prediction for total particulate material).

All of the above mitigation measures as applicable were employed / habitat management criteria were met for Bobolink, during 2015 in connection with site development.

8.3 Effectiveness

All habitat management criteria related to Eastern Whip-poor-will and Bobolink were met without incident in 2015.

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Table 3-1: Eastern Whip-poor-will Receptor Habitat Sound Monitoring Results

	North Receptor	South Receptor
April 30 – May 8		
Total hourly data records	174	171
Hourly data records with inclement weather	30	30
Hourly data records without inclement weather	144	141
Number of exceedances of the hourly Leq 50 dBA threshold – all data	1	0
Number of exceedances of the hourly Leq 50 dBA threshold – non-inclement weather condition	1	0
June 1 – June 8		
Total hourly data records	155	162
Hourly data records with inclement weather	51	54
Hourly data records without inclement weather	104	108
Number of exceedances of the hourly Leq 50 dBA threshold – all data	7	3
Number of exceedances of the hourly Leq 50 dBA threshold – non-inclement weather condition	0	1

Note: Data taken from Amec Foster Wheeler 2015a and 2015b

Table 3-2: Vegetation Community Ecosites with Eastern Whip-poor-will Observations (2010 - 2013)

Vegetation Community (Boreal Ecosite Code[1])	Boreal Ecosite Community Name[1]	Whip-poor-will Observation	
		Tally	Percent (%)
B104	Fresh, silty to fine loamy: Aspen - Birch Hardwood	136	54.6
B055	Dry to fresh, coarse: Aspen - Birch Hardwood	24	9.6
B119	Moist, fine: Aspen - Birch Hardwood	15	6.0
B012	Very shallow, dry to fresh: Pine - Black Spruce Conifer	14	5.6
B016	Very shallow, dry to fresh: Aspen - Birch Hardwood	13	5.2
B093	Fresh, silty to fine loamy: field	8	3.2
B050	Dry to fresh, coarse: pine - Black Spruce Conifer	6	2.4
B054	Dry to fresh, coarse: Red Pine - White Pine Mixedwood	4	1.6
B101	Fresh, silty to fine loamy: Spruce - Fir Conifer	4	1.6
B011	Very shallow, dry to fresh: Red Pine - White Pine Conifer	3	1.2
B040	Dry, sandy: Aspen – Birch Hardwood	2	0.8
B048	Dry to fresh, coarse: Red Pine - White Pine Conifer	2	0.8
B049	Dry to fresh, coarse: Jack Pine - Black Spruce dominated	2	0.8
B070	Moist, coarse: Aspen - Birch Hardwood	2	0.8
B099	Fresh, silty to fine loamy: Black Spruce - Pine Conifer	2	0.8
B130	Intolerant Hardwood Swamp	2	0.8
B142	Mineral Meadow Marsh	2	0.8
B097	Fresh, silty to fine loamy: Red Pine - White Pine Conifer	1	0.4
B098	Fresh, silty to fine loamy: Black Spruce - Jack Pine Dominated	1	0.4
B102	Fresh, silty to fine loamy: Conifer	1	0.4
B103	Fresh, silty to fine loamy: Red Pine - White Pine Mixedwood	1	0.4
B116	Moist, fine: Spruce - Fir Conifer	1	0.4
B120	Moist, fine: Elm - Ash Hardwood	1	0.4
B136	Sparse Treed Fen	1	0.4
B146	Open Shore Fen	1	0.4

Note: [1] MNR 2009

Table 3-3: Macro- and Micro-Habitat Characteristics within 10 m x 10 m Survey Plots in Eastern Whip-poor-will Habitat

Measured Habitat Characteristics		Plot Number																			
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Boreal Ecosite		B104	B104	B104	B104	B104	B104	B104	B104	B0104	B016	B119	B104	B119	B104	B104	B104	B116	B104	B104	B104
Canopy / Sub-canopy Composition in Ecosite based on FRI[1] (Species[2], % of Canopy)		Pt60, Sb30, Ab10	Pt80, Bf10, Bw10	Pj100	Pt60, Ab30, Sb10	Pt90 Pj10	Pt60, Ab30, Sb10	Pt90, Bf10	Pt90, Bf10	Pt90, Bf10	Sb60, Bf30, Bw10	Pt70, Ab20, Bf10	Pt80, Bf10, Bw10	Cw30, Pt20, Pb20, Sb10, Sw10, Bf10	Pt80, Bf10, Bw10	Pt80, Bf10, Bw10	Pt30, Sb20, Bf20, Bw20, Sw10	Bf80, Pt20	Pt70, Sb10, Sw10, Cw10	Pt70, Sb10, Sw10, Cw10	Pt80, Bf10, Bw10
Age Class[3]		Mature	-	-	Young	-	Young	-	-	Young	-	Young	-	Mid-aged	-	Young	Mature	-	Mature	-	Young
Tree (Canopy) Height		>20 m	5-10 m	2-5 m	10-15m	10-15m	15-20m	10-15m	10-15m	15-20m	5-10 m	5-10m	5-10 m	10-15m	15-20m	10-15m	10-15m	2-5 m	10-15m	5-10 m	15-20m
Canopy/Sub-canopy Composition[3] (Species[2], % of Canopy)		Pt35, Bf45, Pb15, Bw05	Open bedrock	Open bedrock	Pt100	Open bedrock	Pt100	Open bedrock	Open bedrock	Pt70, Bw20, Bf05, Mr05	Open bedrock	Pb75, Ab25	Open bedrock	Pb70, Bf20, Pt10	Open bedrock	Pt60, Bf25, Pb15	Pt85, La10, Sw05	Open bedrock	Pt60, Sw35, Pb05	Open bedrock	Pt75, Bf30, Bw05
Basal Area (m^2/ha)[3]		32	-	-	12	6	28	-	-	22	-	12	-	16	8	6	12	-	2	-	16
Percent Cover (%)	Canopy	30	-	-	10	2	15	10	7	65	10	60	5	20	8	20	20	-	8	-	20
	Sub-canopy	40	2	-	50	35	40	15	10	40	5	45	-	40	15	30	15	-	10	7	40
	Understory (2-5 m)	1	2	5	25	-	30	10	10	5	3	15	5	15	2	35	25	10	15	15	35
	Low Shrub (0.5-2 m)	3	5	10	10	5	20	20	15	20	15	3	15	10	10	10	10	10	10	15	10
	Dwarf Shrub (<0.5 m)	-	30	20	-	25	5	10	25	2	20	-	10	-	20	-	-	20	-	20	-
	Forb	60	5	30	60	25	70	10	10	50	3	60	10	70	7	60	40	10	25	5	30
	Graminoid	5	5	30	2	5	5	10	20	3	10	2	10	3	15	8	40	15	40	10	10
	Moss	10	5	10	3	5	2	5	10	3	5	3	5	5	5	15	3	10	40	5	3
	Surface Lichen	-	15	5	-	20	-	20	10	-	40	-	20	-	40	-	-	50	-	40	-
	Rock	-	45	20	-	15	-	50	15	-	50	-	55	-	10	-	4	70	-	70	-
	Litter	90	2	5	80	30	80	10	5	90	1	70	5	40	5	60	25	5	20	2	70
	DWD[4]	15	2	5	5	1	5	5	6	7	2	7	1	15	2	5	5	-	3	3	5
Tree Size Class[5]	<10 cm	R	R	R	A	O	A	R	R	A	R	A	R	A	O	A	O	O	O	O	A
	10-24 cm	O	R	-	O	R	R	R	R	O	R	-	R	R	R	R	O	-	R	R	R
	25-50 cm	R	-	-	-	-	-	-	-	-	-	-	-	R	-	-	-	-	-	-	-
	>50 cm	-	-	-	-	-	-	-	-	-	-	-	-	-	R	-	-	-	-	-	-
Snag Size Class[5]	<10 cm	R	-	R	-	R	-	-	R	R	-	-	-	R	-	-	-	R	R	R	-
	10-24 cm	R	-	-	-	-	-	-	-	R	-	-	-	R	-	-	R	-	-	-	-
DWD Size Class[4]	<10 cm	O	R	R	R	-	R	R	R	O	R	O	R	O	R	O	R	-	R	R	R
	10-24 cm	R	-	-	-	-	-	R	R	R	R	-	-	R	-	R	R	-	-	R	-

Notes:
[1] MNR 2008
[2] Ab = Black Ash; Bf = Balsam Fir; Bw = White Birch; Cw = Eastern White Cedar; La = Larch; Mr = Red Maple; Pb = Balsam Poplar; Pt = Trembling Aspen, Pj = Jack Pine; Pr = Red Pine; Pw = White Pine Sb = Black Spruce; Sw = White Spruce
[3] For forested plots only, not applicable for open bedrock plots with limited tree cover
[4] Size class analysis based on abundance of stems (R = rare, <1% cover; O = occasional, 1 - 35% cover; A = abundant, 35 - 50% cover); sizes refer to DBH, diameter at breast height (cm)

Table 3-4: Composition of Open Foraging Habitats within 20 Select Eastern Whip-poor-will "Core" and "Home" Ranges and Distance to Nearest Edge

Plot	Associated Whip-poor-will Observation[1]	Territory Range[2]	Upland					Wetland				TOTAL	Distance to Nearest Forest Edge (m) (Type of Open Habitat)
			Exposed Bedrock	Fields/ Gaps in Canopy	Semi-Open Forests	Road Corridors	Total	Open Wetlands	Open Water/ Shallow Marsh	Semi-Open Swamps	Total		
1	173	Core (ha)	0.47 (1.5%)	-	-	1.0	1.4 (4.6%)	0.07	5.1	-	5.1 (14%)	6.6 (18%)	115.4
		Home (ha)	3.3 (2.5%)	0.53	-	3.4	7.3 (5.3%)	31.5	4.2	0.69	36.4 (27%)	43.7 (32%)	(Road)
2	137	Core (ha)	1.7 (5.4%)	0.11	-	0.73	2.5 (8.1%)	-	2.5	-	2.5 (6.9%)	5.0 (14%)	55.9
		Home (ha)	13.1 (9.7%)	0.45	-	2.6	16.2 (12%)	20.5	2.4	3.0	25.9 (19%)	42.1 (31%)	(Bedrock)
3	140	Core (ha)	9.0 (29%)	0.01	-	1.5	10.5 (34%)	0.13	1.7	-	1.8 (5.0%)	12.3 (34%)	0
		Home (ha)	14.2 (11%)	1.0	-	3.0	18.2 (13%)	10.7	1.2	9.0	20.9 (15%)	39.1 (29%)	(Bedrock)
4	138	Core (ha)	0.03 (0.1%)	0.10	-	1.4	1.5 (4.9%)	1.1	5.2	-	6.3 (18%)	7.8 (22%)	67.8
		Home (ha)	18.8 (14%)	1.9	-	3.7	24.3 (18%)	8.5	1.2	3.3	13.0 (9.6%)	37.4 (28%)	(Open wetland)
5	167	Core (ha)	8.1 (26%)	-	0.13	0.43	8.7 (28%)	-	-	-	-	8.7 (24%)	35.0
		Home (ha)	12.5 (9.2%)	2.1	1.8	1.2	17.7 (13%)	10.6	4.4	2.5	17.5 (13%)	35.2 (26%)	(Bedrock)
6	135	Core (ha)	4.8 (16%)	2.3	-	0.80	7.9 (26%)	-	1.6	-	1.6 (4.5%)	9.5 (26%)	35.9
		Home (ha)	9.6 (7.0%)	4.2	-	2.7	16.5 (12%)	15.5	5.0	5.6	26.1 (19%)	42.6 (31%)	(Bedrock)
7	129	Core (ha)	10.8 (35%)	1.8	-	-	12.6 (41%)	0.03	0.07	-	0.10 (0.3%)	12.7 (35%)	12.4
		Home (ha)	21.9 (16%)	15.9	-	1.2	39.0 (29%)	11.2	2.2	-	13.4 (9.8%)	52.4 (39%)	(Bedrock)
8	130	Core (ha)	3.7 (12%)	1.8	-	-	5.6 (18%)	0.38	2.2	-	2.6 (7.1%)	8.1 (23%)	23.9
		Home (ha)	19.1 (14%)	15.9	0.78	0.76	36.5 (27%)	16.5	2.9	-	19.3 (14%)	55.9 (41%)	(Bedrock)
9	127	Core (ha)	8.8 (28%)	6.1	-	0.69	15.6 (50%)	-	-	-	-	15.6 (43%)	43.2
		Home (ha)	22.9 (17%)	18.0	-	1.6	42.5 (31%)	4.6	0.37	-	5.0 (3.7%)	47.4 (35%)	(Field / Canopy Gap)
10	126	Core (ha)	12.0 (39%)	2.1	-	0.56	14.6 (47%)	-	-	-	-	14.6 (41%)	0
		Home (ha)	26.6 (20%)	15.5	-	1.6	43.8 (32%)	4.9	0.70	-	5.6 (4.1%)	49.4 (36%)	(Bedrock)
11	125	Core (ha)	11.3 (37%)	0.11	-	0.60	12.1 (39%)	-	-	-	-	12.1 (34%)	42.6
		Home (ha)	26.3 (19%)	6.4	0.68	2.1	35.5 (26%)	5.2	1.2	-	6.4 (4.7%)	41.9 (31%)	(Bedrock)
12	49	Core (ha)	2.5 (8.1%)	5.0	1.7	0.92	10.1 (33%)	-	-	-	-	10.1 (28%)	24.0
		Home (ha)	7.5 (5.5%)	14.5	8.4	2.2	32.6 (24%)	6.0	1.5	-	7.5 (5.5%)	40.1 (15%)	(Field / Canopy Gap)
13	46	Core (ha)	5.9 (19%)	1.3	-	-	7.2 (23%)	-	-	-	-	7.2 (20%)	89.9
		Home (ha)	7.5 (5.5%)	14.2	3.8	1.8	27.3 (20%)	3.3	0.47	-	3.8 (2.8%)	31.1 (23%)	(Field / Canopy Gap)
14	47	Core (ha)	2.9 (9.2%)	1.0	-	-	3.9 (13%)	-	-	-	-	3.9 (11%)	9.1
		Home (ha)	9.0 (6.6%)	8.3	0.83	-	18.1 (13%)	-	-	-	-	18.1 (13%)	(Bedrock)
15	132	Core (ha)	2.3 (7.4%)	2.4	0.01	-	4.7 (15%)	-	-	-	-	4.7 (13%)	65.5
		Home (ha)	7.4 (5.4%)	14.3	4.5	0.29	26.4 (19%)	-	-	-	-	26.4 (19%)	(Field / Canopy Gap)
16	131	Core (ha)	0.92 (3.0%)	1.5	2.1	0.84	5.4 (17%)	-	0.10	-	0.10 (0.3%)	5.5 (15%)	32.0
		Home (ha)	8.1 (6.0%)	9.7	15.0	2.2	35.0 (26%)	0.64	0.04	-	0.7 (0.5%)	35.7 (26%)	(Field / Canopy Gap)
17	228	Core (ha)	8.2 (27%)	0.35	8.6	0.63	17.8 (57%)	-	-	-	-	17.8 (50%)	-
		Home (ha)	13.8 (10%)	20.3	19.5	3.4	57.0 (42%)	-	0.13	-	0.13 (0.09%)	57.1 (42%)	(Semi-Open Forest)
18	45	Core (ha)	1.1 (3.4%)	0.7	-	1.4	3.2 (10%)	-	-	-	-	3.2 (9.0%)	70.0
		Home (ha)	25.9 (19%)	12.8	1.1	2.9	42.7 (31%)	-	-	-	-	45.8 (34%)	(Road)
19	53	Core (ha)	6.6 (21.3%)	1.2	0.28	0.85	8.9 (29%)	-	-	-	-	8.9 (25%)	15.4
		Home (ha)	27.9 (21%)	4.9	8.0	2.7	43.4 (32%)	-	-	-	-	43.4 (32%)	(Bedrock)
20	52	Core (ha)	2.2 (7.0%)	3.8	0.03	1.3	7.4 (24%)	-	-	-	-	7.4 (21%)	-
		Home (ha)	16.8 (12%)	14.0	10.6	2.8	44.1 (33%)	-	0.13	-	0.13 (0.09%)	44.3 (33%)	(Field / Canopy Gap)
Average[3]		Core (ha)	5.2 ± 1.7 (17% ± 5.5%)	1.6 ± 0.7 (5.2% ±2.4%)	0.6 ± 0.9 (2.1% ±2.7%)	0.7 ± 0.2 (2.2% ±0.7%)	8.1 ± 2.1 (26% ± 6.7%)	0.1 ± 0.1 (0.3% ±0.4%)	0.9 ± 0.7 (2.9% ± 2.3%)	-	1.0 ± 0.8 (8.1% ±3.1%)	9.1 ± 1.8 (29% ± 5.7%)	36.9 (±14.2)
		Home (ha)	15.6 ± 3.4 (11% ± 2.5%)	9.7 ± 6.5 (7.1% ± 2.1%)	3.7 ± 2.5 (2.8% ± 1.8%)	2.1 ± 0.5 (1.5% ± 0.3%)	31.2 ± 5.6 (23% ± 4.1%)	7.5 ± 3.7 (5.5% ± 2.7)	1.4 ± 0.7 (1.0% ± 0.5%)	1.2 ± 1.0 (0.9% ± 0.8%)	10.1 ± 4.8 (7.4% ± 3.5%)	41.5 ± 4.1 (30% ± 3.0%)	

Note:
[1] Eastern Whip-poor-will numbers based on arbitrary assignment of numbering in Figures 1 and 2
[2] Territory ranges "core" and "home" were defined as part of studies conducted at the RRP site in 2011 and 2012 by Trent University (Rand 2014) in collaboration with the MNRF and NG, and were determined to be 30.99 ha and 136.23 ha, respectively
[3] Confidence intervals are based on 95% confidence

Figure 2-1: Eastern Whip-poor-will Survey Stations

414000 416000 418000 420000 422000 424000 426000 428000 430000 432000

5426000 5424000 5422000 5420000 5418000 5416000 5414000 5412000 5410000 5408000 5406000 5404000 5402000

MCW-32 MCW-34 MCW-33 MCW-A MCW-35 MCW-29 MCW-71 MCW-28 MCW-B MCW-39 MCW-40 MCW-04 MCW-74 MCW-70 MCW-25 MCW-03 MCW-06 MCW-D MCW-C MCW-08 MCW-76 MCW-05 MCW-22 MCW-10 MCW-02 MCW-42 MCW-68 MCW-01 MCW-66 MCW-69 MCW-14 MCW-21 MCW-41 MCW-09 MCW-58 MCW-13 MCW-12 MCW-80 MCW-65 MCW-52 MCW-19 MCW-76A MCW-11 MCW-20 MCW-63 MCW-18 MCW-57 MCW-50 MCW-59 MCW-43 MCW-48 MCW-51 MCW-56 MCW-38 MCW-79 MCW-49 MCW-16 MCW-17 MCW-47 MCW-37

MCW-99 MCW-96 MCW-97 MCW-94 MCW-87 MCW-85 MCW-93 MCW-98 MCW-91 MCW-86 MCW-100 MCW-92 MCW-88 MCW-82 MCW-81 MCW-83 MCW-84

W-1 W-2 W-4 W-3 W-5 W-6 W-7 W-8 W-9 W-10 W-11 W-12 W-13 W-14 W-15 W-16 W-17 W-18 W-19 W-20 W-21 W-22 W-23 W-24

Log Creek
Highway 71
Spirit Rock River
Kishkakoesis River
Pinewood River
Sturgeon Creek

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LEGEND

- Monitoring Stations Located on Whip-poor-will Compensation Lands
- Additional Whip-poor-will Stations (Periphery of Mine Site)
- Whip-poor-will Compensation Areas
- Approximate Principal RRP Facilities
- Project Site Boundary (ESA)
- Natural Local Study Area
- Road
- Watercourse
- Waterbody

NOTES:
- Pleiades imagery September 2015
- Road and watercourse data extracted from Land Information Ontario, MNRF

Datum: NAD83
Projection: UTM Zone 15N

0 1 2 4 6 8 10 Kilometres

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Eastern Whip-poor-will Survey Stations

PROJECT N^{O}: TC111504	**FIGURE: 2-1**
SCALE: 1:75,000	DATE: January 2016

Figure 2-2: Bobolink Survey Stations

414000 416000 418000 420000 422000 424000 426000 428000 430000 432000

5426000 5424000 5422000 5420000 5418000 5416000 5414000 5412000 5410000 5408000 5406000 5404000 5402000

Mathieu Rd
Spiritrock River
Log Creek
Strachan Rd
Hwy 71
Fisher Rd
B-1 B-2 B-3 B-4 B-5
Kshkakosis River
Richardson Rd
Hwy 600
B-12 B-13 B-14
B-15 B-17 B-18 B-19 B-16 B-20 B-21 B-22 B-23 B-25 B-26 B-29 B-28 B-30 B-37 B-35 B-36 B-38 B-32 B-31 B-27 B-33 B-34
MI-13 MI-18 MI-03 MI-15 MI-14 MI-01 MI-17 MI-16 MI-04 MI-12 MI-33
B-44 B-43
MI-07 MI-29 MI-21 MI-24 B-42 MI-22 B-41 MI-23 MI-30 MI-05
MI-25 MI-09 MI-02 MI-26
B-39 B-40
MI-28 MI-10 MI-19 MI-11 MI-27 MI-36
Hwy 617
B-8 B-11 B-9 B-7 B-10 B-6
Pinewood River
Tait Rd
Caul Rd
MI-32
MI-31
Barwick Rd
Sturgeon Creek

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LEGEND

- Monitoring Impact Stations
- Monitoring Stations Located on Bobolink Compensation Lands
- Bobolink Compensation Areas
- Whip-poor-will Compensation Areas
- Approximate Principal RRP Facilities
- Project Site Boundary (ESA)
- Natural Local Study Area
- Road
- Watercourse
- Waterbody

NOTES:
- Pleiades imagery September 2015
- Road and watercourse data extracted from Land Information Ontario, MNRF

Datum: NAD83
Projection: UTM Zone 15N

0 1 2 4 6 8 10 Kilometres

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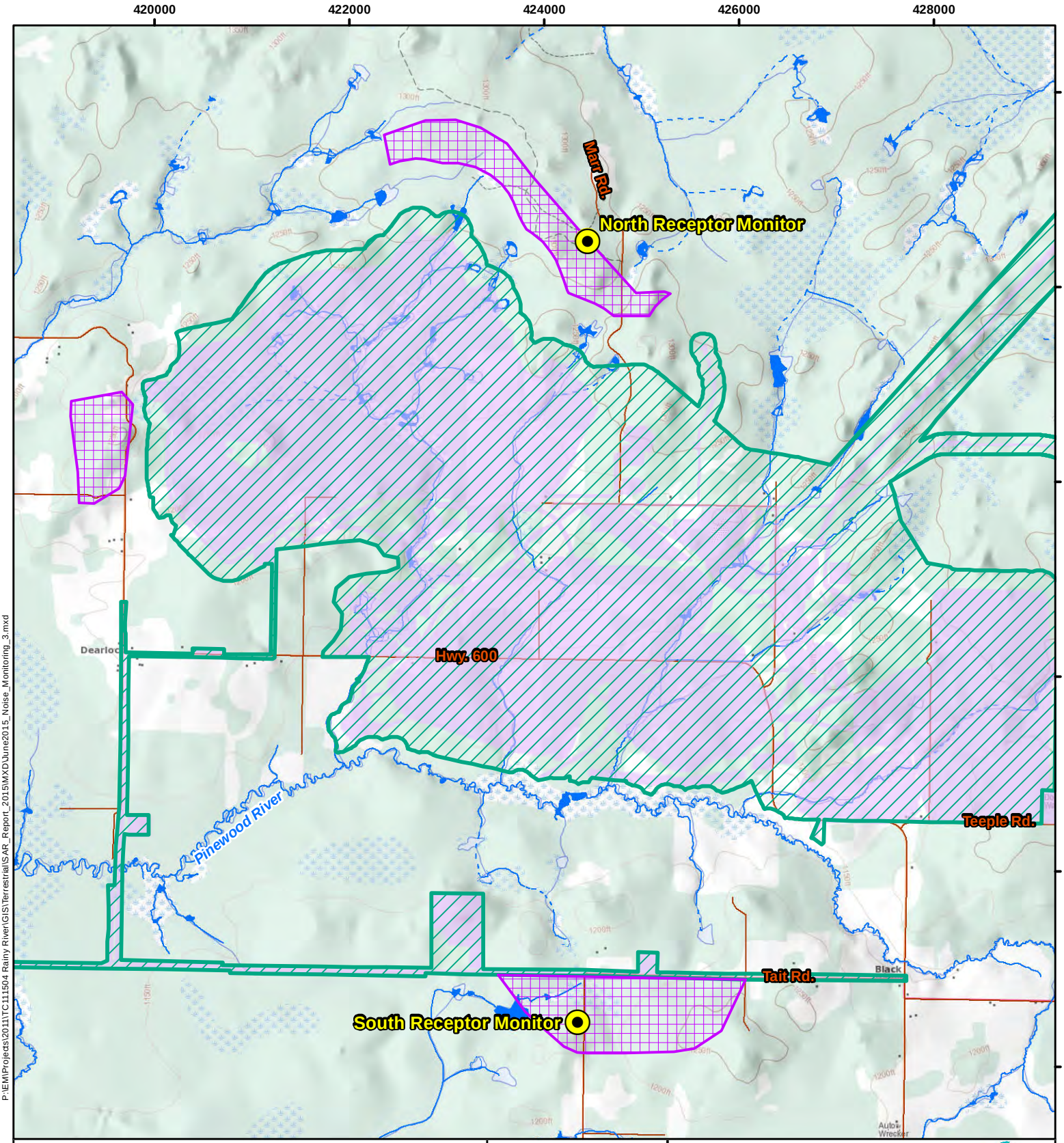
Bobolink Survey Stations

PROJECT N^{O}: TC111504	**FIGURE: 2-2**
SCALE: 1:75,000	DATE: January 2016

Figure 2-3: Eastern Whip-poor-will Receptor Habitat Noise Monitoring Locations



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LEGEND

- Approximate Principal RRP Facilities
- 2015 Noise Monitoring Locations
- Whip-poor-will Receptor Habitat
- Project Site Boundary (ESA)

NOTES:
- Road and watercourse data extracted from Land Information Ontario, MNRF

Datum: NAD83
Projection: UTM Zone 15N

0 1 2 3 4 Kilometres

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Whip-poor-will Receptor Habitat Noise Monitoring Locations

PROJECT N^{O}: TC111504	**FIGURE: 2-3**
SCALE: 1:53,000	DATE: January 2016

Figure 2-4: Eastern Whip-poor-will Observations (2010 – 2013) by Vegetation Ecosite and 2015 Habitat Characterization Field Plots

375000 380000 385000 390000 395000 400000 405000 410000 415000 420000 425000 430000 435000 440000

5430000 5425000 5420000 5415000 5410000 5405000 5400000

b c d e f g h i j

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LEGEND

- Eastern Whip-poor-will Observations
- Vegetation Plots
- Compensation Land
- Natural Local Study Area
- Map Index

0 2.5 5 10 15 20 Kilometres

NOTES:
- Imagery extracted from ERSI

Datum: NAD83
Projection: UTM Zone 15N

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RAINY RIVER PROJECT

Eastern Whip-poor-will Observations by Vegetation Ecosite and 2015 Habitat Characterization Field Plots

PROJECT N^{O}: TC111504	**FIGURE: 2-4a**
SCALE: 1:170,000	DATE: January 2016

377500 380000 382500 385000 387500

5415000

5412500

5410000

187 188 186 185 182 184 183 180

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LEGEND

- Eastern Whip-poor-will Observations
- Roads
- Unclassified
- Agriculture
- Open Water
- CUM
- B005
- B008
- B103

Thicket Swamp
- B135

Marsh
- B142

Fen
- B136
- B139
- B140
- B141
- B146

Coniferous Swamp
- B128
- B129

Shrub
- B095
- B096
- B010
- B111
- B112

Rock
- B007

Coniferous Forest
- B040
- B065
- B101
- B114
- B116
- B117

Hardwood Forest
- B016
- B018
- B055
- B070
- B071
- B104
- B105
- B106
- B119
- B120
- B130

0 0.5 1 2 3 4 5 Kilometres

NOTES:
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Datum: NAD83
Projection: UTM Zone 15N

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RAINY RIVER PROJECT

Eastern Whip-poor-will Observations by Vegetation Ecosite and 2015 Habitat Characterization Field Plots

PROJECT Nº: TC111504	**FIGURE: 2-4b**
SCALE: 1:30,000	DATE: January 2016

385000 387500 390000 392500 395000

5422500

5420000

ASKEL ROAD

153 152 150 151 149 148 147 146

193 194 192 191 190 189

LEGEND

- Eastern Whip-poor-will Observations (2010 to 2013)
- Roads
- Unclassified
- Agriculture
- Open Water
- B005
- Rock
  - B007
- Thicket Swamp
  - B135
- Marsh
  - B142
- Fen
  - B136
  - B139
  - B140
- Coniferous Swamp
  - B127
  - B128
  - B129
- Shrub
  - B095
  - B096
  - B111
  - B112
- Coniferous Forest
  - B012
  - B049
  - B050
  - B052
  - B085
  - B098
  - B099
  - B101
  - B114
  - B116
- Hardwood Forest
  - B016
  - B017
  - B055
  - B057
  - B070
  - B104
  - B105
  - B119
  - B120
  - B122
  - B130
  - B133

0 0.5 1 2 3 4 5 Kilometres

NOTES:
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Datum: NAD83
Projection: UTM Zone 15N

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Eastern Whip-poor-will Observations by Vegetation Ecosite and 2015 Habitat Characterization Field Plots

PROJECT N^{o}: TC111504	**FIGURE: 2-4c**
SCALE: 1:30,000	DATE: January 2016

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400000 402500 405000

5432500 5430000 5427500 5425000 5422500

LEGEND

Eastern Whip-poor-will Observations (2010 to 2013)
Roads
Unclassified
Agriculture
Open Water
CUM
Rock
B007

Thicket Swamp
B135
Marsh
B142
Fen
B139
B146
Coniferous Swamp
B128
B129

Shrub
B095
B096
B111
B112

Coniferous Forest
B011
B012
B014
B040
B049
B050
B052
B065
B068
B099
B114
B116
B117

Hardwood Forest
B016
B055
B070
B071
B104
B119
B120
B130

NOTES:
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Datum: NAD83
Projection: UTM Zone 15N

0 0.5 1 2 3 Kilometres

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Eastern Whip-poor-will Observations by Vegetation Ecosite and 2015 Habitat Characterization Field Plots

PROJECT N°: TC111504 | FIGURE: 2-4d

SCALE: 1:30,000 | DATE: January 2016

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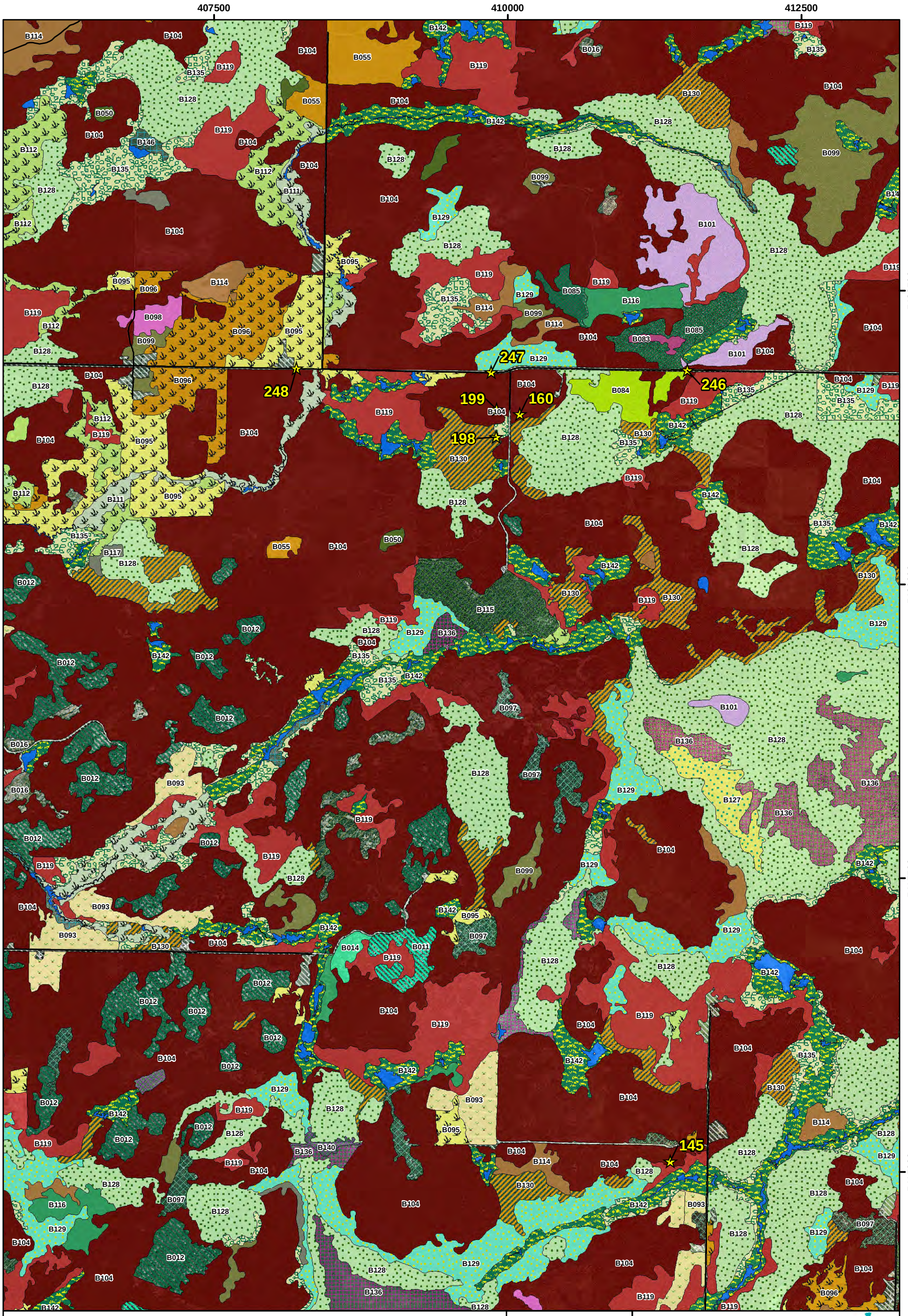

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LEGEND

- Eastern Whip-poor-will Observations (2010 to 2013)
- Roads
- Unclassified
- Agriculture
- Open Water

Thicket Swamp
- B135

Marsh
- B142

Fen
- B136
- B140
- B146

Shrub
- B095
- B096
- B111
- B112

Coniferous Swamp
- B127
- B128
- B129

Hardwood Forest
- B016
- B055
- B104
- B119
- B120
- B130

Coniferous Forest
- B011
- B012
- B014
- B049
- B050
- B083
- B084
- B085
- B097
- B098
- B099
- B101
- B114
- B115
- B116
- B117

0 0.5 1 2 3 Kilometres

NOTES:
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Datum: NAD83
Projection: UTM Zone 15N

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RAINY RIVER PROJECT

Eastern Whip-poor-will Observations by Vegetation Ecosite and 2015 Habitat Characterization Field Plots

PROJECT N^{O}: TC111504	**FIGURE: 2-4e**
SCALE: 1:30,000	DATE: January 2016

415000 417500 420000

5427500 5425000 5422500 5420000

178 177 176 179 Plot 1 173 137 Plot 2 141 Plot 3 140 136 238 172 171 175 174 168 138 Plot 4 Plot 5 167 163 165 169 170 166 164 162 161 135 Plot 6 Plot 7 130 142 129 Plot 10 Plot 8 134 Plot 11 125 126 127 Plot 9 128 133

LEGEND

- Eastern Whip-poor-will Observations (2010 to 2013)
- Vegetation Plots
- Compensation Land
- Roads
- Unclassified
- Agriculture
- Open Water
- B103
- Rock: B007
- Thicket Swamp: B135
- Marsh: B142
- Fen: B136, B139, B140, B146
- Shrub: B095, B096, B111, B112
- Coniferous Swamp: B127, B128, B129
- Hardwood Forest: B016, B055, B070, B088, B104, B119, B120, B130
- Coniferous Forest: B012, B033, B048, B049, B050, B065, B097, B098, B099, B101, B114, B115, B116, B117

NOTES:
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Datum: NAD83
Projection: UTM Zone 15N

0 0.5 1 2 3 Kilometres

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RAINY RIVER PROJECT

Eastern Whip-poor-will Observations by Vegetation Ecosite and 2015 Habitat Characterization Field Plots

PROJECT NO: TC111504	**FIGURE: 2-4f**
SCALE: 1:30,000	DATE: January 2016

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415000 417500 420000 422500 425000

5415000

5412500

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Plot 19 Plot 17 Plot 18 Plot 20 Plot 14 Plot 15 Plot 13 Plot 16 Plot 12

LEGEND

- Eastern Whip-poor-will Observations (2010 to 2013)
- Vegetation Plots
- Compensation Land
- Natural Local Study Area
- Roads
- Unclassified
- Agriculture
- Open Water
- B103

Rock
- B007

Thicket Swamp
- B135

Marsh
- B142

Fen
- B136
- B139
- B140

Coniferous Swamp
- B128
- B129

Shrub
- B095
- B096
- B111
- B112

Coniferous Forest
- B011
- B012
- B097
- B098
- B099
- B101
- B114
- B115
- B116
- B117

Hardwood Forest
- B016
- B104
- B119
- B120
- B130

0 0.5 1 2 3 4 5 Kilometres

NOTES:
-

Datum: NAD83
Projection: UTM Zone 15N

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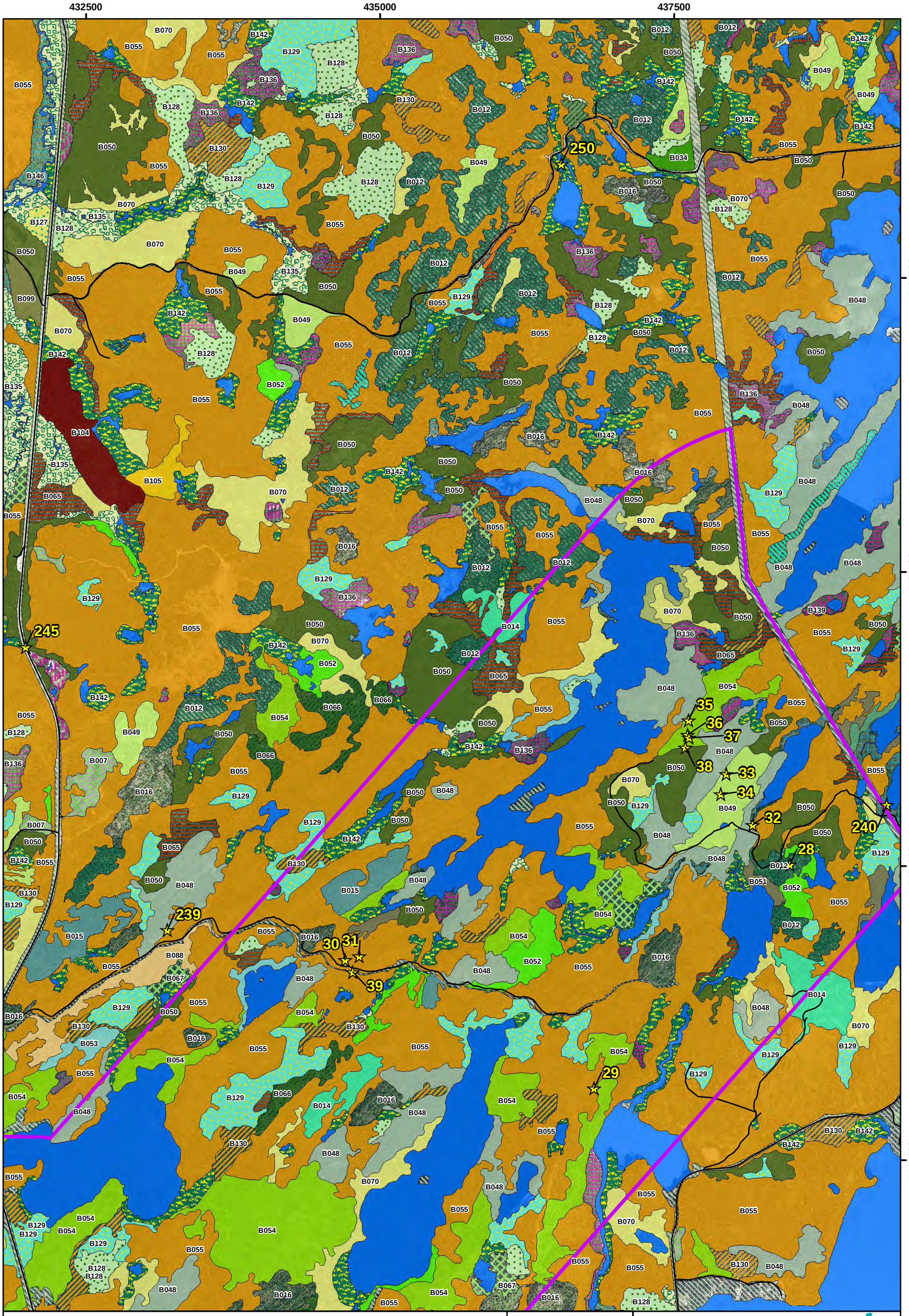
RAINY RIVER PROJECT

Eastern Whip-poor-will Observations by Vegetation Ecosite and 2015 Habitat Characterization Field Plots

PROJECT N°: TC111504	**FIGURE: 2-4g**
SCALE: 1:30,000	DATE: January 2016



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LEGEND

- Eastern Whip-poor-will Observations (2010 to 2013)
- Vegetation Plots
- Natural Local Study Area
- Roads
- Unclassified
- Open Water

Rock
- B007
- B164

Marsh
- B142

Fen
- B136
- B139
- B140
- B146

Coniferous Swamp
- B127
- B128
- B129

Hardwood Forest
- B016
- B055
- B070
- B071
- B088
- B104
- B105
- B130
- B133

Thicket Swamp
- B135

Coniferous Forest
- B011
- B012
- B014
- B015
- B034
- B035
- B048
- B049
- B050
- B051
- B052
- B053
- B054
- B064
- B065

0 0.5 1 2 3 Kilometres

NOTES:
-

Datum: NAD83
Projection: UTM Zone 15N

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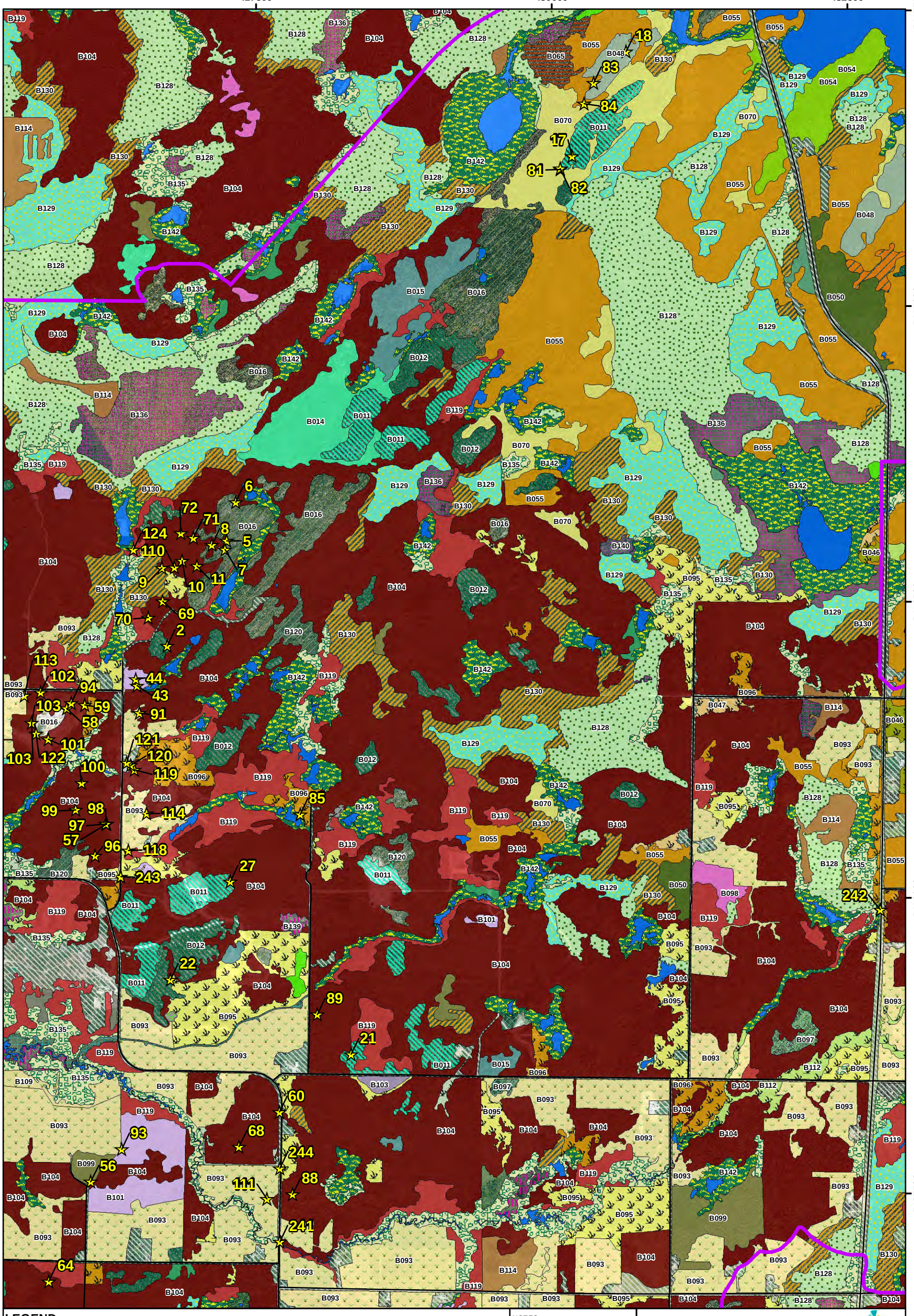
RAINY RIVER PROJECT

Eastern Whip-poor-will Observations by Vegetation Ecosite and 2015 Habitat Characterization Field Plots

PROJECT N^{o}: TC111504	**FIGURE: 2-4h**
SCALE: 1:30,000	DATE: January 2016

427500 430000 432500

5417500 5415000 5412500 5410000 5407500



Document Path: P:\EMProjects\2011\TC 111504 Rainy River\GIS\Terrestria\EWPW_Vegetation_Oct2015\MXD\All_EWPW_Veg_Filled_PortraitPG9_1.mxd

LEGEND

- Eastern Whip-poor-will Observations (2010 to 2013)
- Vegetation Plots
- Natural Local Study Area
- Roads
- Unclassified
- Agriculture
- Open Water
- B103

Rock
- B007
- B164

Marsh
- B142

Fen
- B136
- B139
- B140
- B146

Shrub
- B047
- B046
- B095
- B096
- B111
- B112

Coniferous Swamp
- B128
- B129

Hardwood Forest
- B016
- B055
- B070
- B071
- B104
- B119
- B120
- B130

Thicket Swamp
- B135

Coniferous Forest
- B011
- B012
- B014
- B015
- B048
- B049
- B050
- B052
- B054
- B065
- B067
- B068
- B097
- B098
- B099
- B101
- B114
- B115
- B116
- B117

NOTES:
-

Datum: NAD83
Projection: UTM Zone 15N

0 0.5 1 2 3 Kilometres

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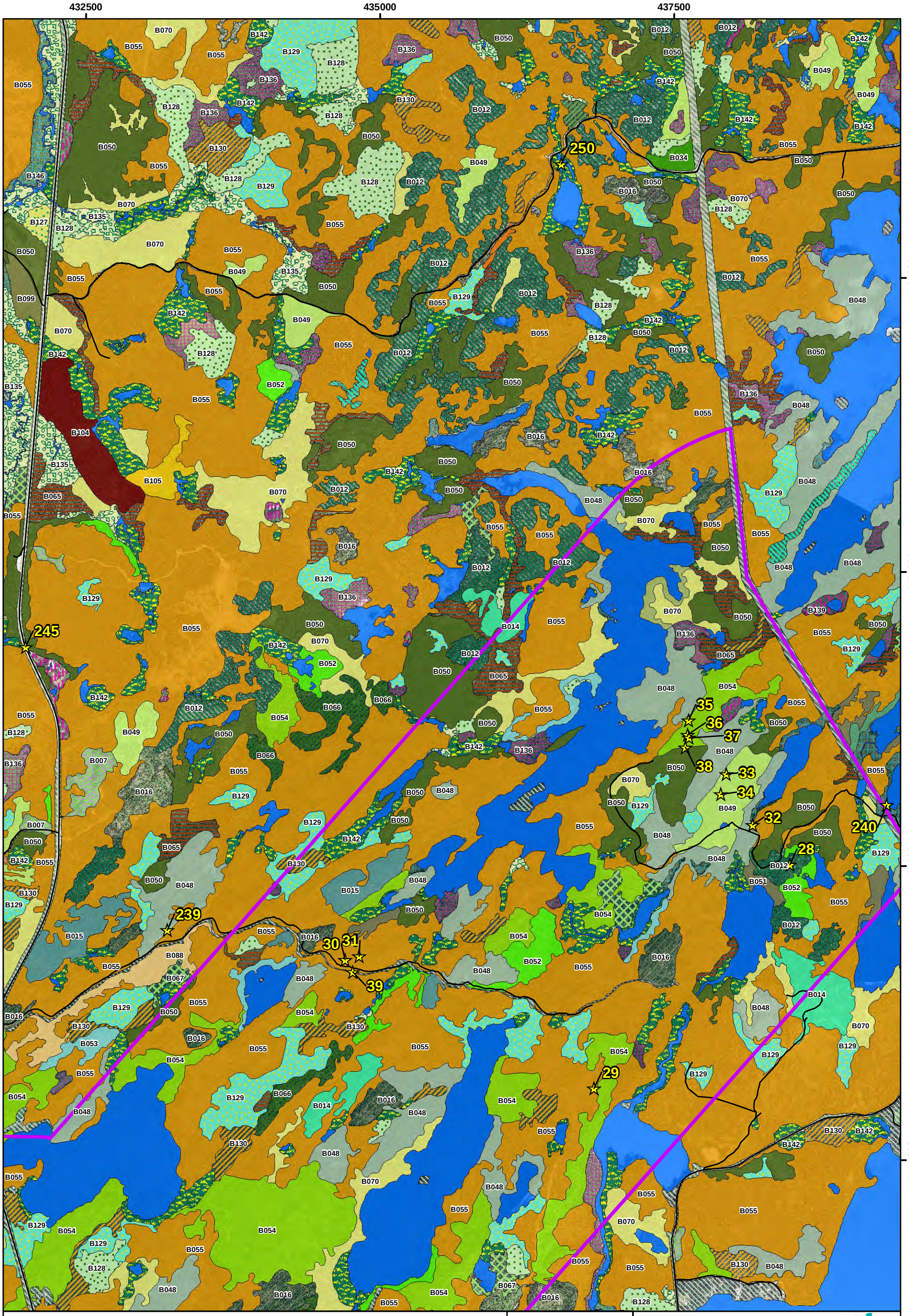
RAINY RIVER PROJECT

Eastern Whip-poor-will Observations by Vegetation Ecosite and 2015 Habitat Characterization Field Plots

PROJECT N^{o}: TC111504	**FIGURE: 2-4i**
SCALE: 1:30,000	DATE: January 2016



LEGEND

- Eastern Whip-poor-will Observations (2010 to 2013)
- Natural Local Study Area
- Roads
- Unclassified
- Open Water

Rock
- B007
- B164

Thicket Swamp
- B135

Marsh
- B142

Fen
- B136
- B139
- B140
- B146

Coniferous Swamp
- B127
- B128
- B129

Coniferous Forest
- B011
- B012
- B014
- B015
- B034
- B035
- B048
- B049
- B050
- B051
- B052
- B053
- B054
- B064
- B065
- B066
- B067
- B068
- B099

Hardwood Forest
- B016
- B055
- B070
- B071
- B088
- B104
- B105
- B130
- B133

0 0.5 1 2 3 Kilometres

NOTES:
-

Datum: NAD83
Projection: UTM Zone 15N

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RAINY RIVER PROJECT

Eastern Whip-poor-will Observations by Vegetation Ecosite and 2015 Habitat Characterization Field Plots

PROJECT N^{o}: TC111504	**FIGURE: 2-4j**
SCALE: 1:30,000	DATE: January 2016

Figure 3-1: 2015 Whip-poor-will Observations

414000 415000 416000 417000 418000 419000

5427000 5426000 5425000 5424000 5423000 5422000 5421000 5420000

MATHIEU ROAD

HWY 600

HWY 600

24/06 24/06 24/06 07/06 07/06 24/06 26/06 07/06 07/06 07/06 24/06 24/06 26/06 07/06 05/06 24/06

07/06 25/06 05/06 24/06 07/06 24/06 24/06 24/06

05/06 24/06 06/06 26/06 05/06 26/06 06/06 26/06 24/06 06/06 26/06 24/06 24/06 24/06 05/06 24/06 24/06 05/06 24/06 05/06 05/06 05/06 25/06 05/06 24/06 05/06 24/06 05/06

06/06 26/06 07/06 07/06 07/06 07/06 26/06 07/06 26/06 25/06 05/06 24/06 26/06 26/06 26/06 07/06 26/06 07/06 26/06 07/06 06/06 07/06 07/06 07/06 26/06 26/06 07/06 07/06 06/06 27/06 05/06 07/06 07/06 26/06 07/06 07/06 26/06 07/06 27/06 08/06 08/06 27/06

Map Overview

a b c d e

P:\EM\Projects\2011\TC111504 Rainy River\GIS\Terrestrial\SAR Report 2015\MXD\EWPW Estimated Location Portrait 2.mxd

LEGEND

- Whip-poor-will Survey Quadrants
- Whip-poor-will Observation - Core Use Area (Round 1)
- Whip-poor-will Observation - Core Use Area (Round 2)
- Whip-poor-will Compensation Areas
- Approximate Principal RRP Facilities
- Natural Local Study Area

Whip-poor-will Survey Locations

- No Whip-poor-will Observed
- Whip-poor-will Observed

NOTES:
- Imagery Scene from 20 July 2014 and 28 September 2015

0 0.25 0.5 1 1.5 2 2.5 Kilometres

Datum: NAD83
Projection: UTM Zone 15N

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RAINY RIVER PROJECT

2015 Whip-poor-will Observations

PROJECT N^{O}: TC111504	**FIGURE: 3-1a**
SCALE: 1:24,000	DATE: January 2016

415000 416000 417000 418000 419000 420000

5417000 5416000 5415000 5414000 5413000 5412000 5411000 5410000 5409000

HWY 600

HWY 617

HWY 600

25/06 04/06 25/06 04/06 04/06 04/06 25/06 04/06 25/06 HWY 617 04/06 26/06 26/06 25/06 04/06 25/06 05/06 25/06 05/06 05/06 25/06 05/06 25/06 05/06 05/06 25/06 05/06 25/06 05/06 25/06 05/06

05/06 25/06 HWY 600 26/06 06/06 06/06 26/06 26/06

Map Overview

a b c d e

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LEGEND

- Whip-poor-will Survey Quadrants
- Whip-poor-will Observation - Core Use Area (Round 1)
- Whip-poor-will Observation - Core Use Area (Round 2)
- Whip-poor-will Compensation Areas
- Approximate Principal RRP Facilities
- Project Site Boundary (ESA)
- Natural Local Study Area

Whip-poor-will Survey Locations

- No Whip-poor-will Observed
- Whip-poor-will Observed

0 0.25 0.5 1 1.5 2 2.5 Kilometres

NOTES:
- Imagery Scene from 20 July 2014 and 28 September 2015

Datum: NAD83
Projection: UTM Zone 15N

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RAINY RIVER PROJECT

2015 Whip-poor-will Observations

PROJECT N^{O}: TC111504	**FIGURE: 3-1b**
SCALE: 1:24,000	DATE: January 2016

421000 422000 423000 424000 425000 426000

5417000 5416000 5415000 5414000 5413000 5412000 5411000 5410000 5409000

RICHARDSON ROAD

05/06
05/06
26/06
26/06
26/06
05/06
26/06
05/06
26/06
05/06
26/06
26/06

Roen Rd.

HWY 600

Map Overview
a
b
c
d
e

P:\EM\Projects\2011\TC111504 Rainy River\GIS\Terrestrial\SAR Report 2015\MXD\EWPW Estimated Location Portrait 2.mxd

LEGEND

- Whip-poor-will Survey Quadrants
- Whip-poor-will Observation - Core Use Area (Round 1)
- Whip-poor-will Observation - Core Use Area (Round 2)
- Whip-poor-will Compensation Areas
- Approximate Principal RRP Facilities
- Project Site Boundary (ESA)
- Natural Local Study Area

Whip-poor-will Survey Locations

- No Whip-poor-will Observed
- Whip-poor-will Observed

0 0.25 0.5 1 1.5 2 2.5 Kilometres

NOTES:
- Imagery Scene from 20 July 2014 and 28 September 2015

Datum: NAD83
Projection: UTM Zone 15N

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RAINY RIVER PROJECT

2015 Whip-poor-will Observations

PROJECT N^{O}: TC111504	**FIGURE: 3-1c**
SCALE: 1:24,000	DATE: January 2016

422000 423000 424000 425000 426000 427000 428000 429000 430000 431000

5411000 5410000 5409000 5408000 5407000

Roan Rd.

HWY 600

TAIT ROAD

BARWICK ROAD

04/06
26/06

04/06
26/06

04/06
26/06

27/06

27/06

26/06

26/06

06/06

27/06

04/06

27/06

27/06

04/06

04/06
27/06

27/06

Map Overview

a

b

c

d

e

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LEGEND

- Whip-poor-will Observation - Core Use Area (Round 1)
- Whip-poor-will Observation - Core Use Area (Round 2)
- Whip-poor-will Compensation Areas
- Approximate Principal RRP Facilities
- Project Site Boundary (ESA)
- Natural Local Study Area (LSA)

Whip-poor-will Survey Locations

- No Whip-poor-will Observed
- Whip-poor-will Observed

0 0.25 0.5 1 1.5 2 2.5 Kilometres

NOTES:
- Imagery Scene from 20 July 2014 and 28 September 2015

Datum: NAD83
Projection: UTM Zone 15N

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RAINY RIVER PROJECT

2015 Whip-poor-will Observations

PROJECT N^{0}: TC111504	**FIGURE: 3-1d**
SCALE: 1:24,000	DATE: January 2016

434000 435000 436000 437000 438000 439000 440000 441000 442000 443000

5421000 5420000 5419000 5418000 5417000

05/06

Map Overview

a b c d e

Document Path: P:\EM\Projects\2011\TC111504 Rainy River\GIS\Terrestrial\SAR_Report_2015\MXD\EWPW_Estimated_Location_Landscape_2.mxd

LEGEND

- Whip-poor-will Observation - Core Use Area (Round 1)
- Whip-poor-will Observation - Core Use Area (Round 2)
- Whip-poor-will Compensation Areas
- Approximate Principal RRP Facilities
- Project Site Boundary (ESA)
- Natural Local Study Area (LSA)

Whip-poor-will Survey Locations

- No Whip-poor-will Observed
- Whip-poor-will Observed

0 0.25 0.5 1 1.5 2 2.5 Kilometres

NOTES:
- Imagery Scene from 20 July 2014 and 28 September 2015

Datum: NAD83
Projection: UTM Zone 15N

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RAINY RIVER PROJECT

2015 Whip-poor-will Observations

PROJECT N^{O}: TC111504	**FIGURE: 3-1e**
SCALE: 1:24,000	DATE: January 2016

Figure 3-2: 2010 – 2013 Whip-poor-will Observations

415000 420000 425000 430000 435000 440000

5435000 5430000 5425000 5420000 5415000 5410000 5405000 5400000 5395000

MATHIEU WEST RD
MATHIEU RD
GOHERE BAY RD
BURNT CK RD
STRACHAN RD
HWY 401 EAST RD
FISHER RD
HWY 600
HWY 615
HWY 71
HWY 617
TAIT RD
BARWICK RD
ANGUS RD
OFF LK RD
MOULTON RD
CON RD
SCHRAM RD

P:\EM\Projects\2011\TC111504 Rainy River\GIS\Terrestrial\SAR_Report_2015\MXD\WPW_Observations_2010_2013_3.mxd

LEGEND

- AMEC 2013 Whip-poor-will Observations
- AMEC 2012 Whip-poor-will Observations
- AMEC 2011 Whip-poor-will Observations
- MNR/Trent U. (CRA) 2012 Geographic Mean Centre of Telemetry Record Point Clusters
- MNR 2010 Whip-poor-will Observations
- KCB 2010 Whip-poor-will Observations
- Transmission Line
- Road
- Watercourse
- Waterbody
- Natural Local Study Area
- Whip-poor-will Compensation Areas
- Project Site Boundary (ESA)
- Approximate Principal RRP Facilities

0 1 2 4 6 8 10 Kilometres

NOTES:
- Pleiades imagery September 2015
- Road and watercouse data extracted from Land Information Ontario, MNRF.
- Base map data from Geogratis NRCan Toporama DRG 1:50k sheets.

Datum: NAD83
Projection: UTM Zone 15N

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RAINY RIVER PROJECT

2010 - 2013 Whip-poor-will Observations

PROJECT N^0: TC111504	**FIGURE: 3-2**
SCALE: 1:115,000	DATE: January 2016

Figure 3-3: Bobolink Observations in 2015

412000 414000 416000 418000 420000 422000 424000 426000 428000 430000 432000 434000

5414000 5412000 5410000 5408000 5406000 5404000 5402000

P:\EM\Projects\2011\TC111504 Rainy River\GIS\Terrestrial\SAR Report 2015\MXD\Bobolink Locations 3.mxd

LEGEND

- Survey Locations Where Bobolink Were Observed (Labelled with number of individuals, if greater than 1)
- Bobolink Compensation Areas
- Whip-poor-will Compensation Areas
- Approximate Principal RRP Facilities
- Project Site Boundary (ESA)
- Natural Local Study Area
- Road
- Watercourse
- Waterbody

0 2.5 5 10 15 Kilometres

NOTES:
- Pleiades imagery September 2015
- Road and watercourse data extracted from Land Information Ontario, MNRF

Datum: NAD83
Projection: UTM Zone 15N

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RAINY RIVER PROJECT

Bobolink Observations in 2015

PROJECT N°: TC111504 | **FIGURE: 3-3**

SCALE: 1:57,000 | DATE: January 2016

Figure 3-4: Bobolink Observations in 2010 – 2012 and 2014

405000 412500 420000 427500 435000 442500

5422500 5415000 5407500

Sifton Township Conservation Reserve

Spruce Island Provincial Park

Hwy 619

Hwy 617

Kishkakoesis River

Pinewood River

Hwy 600

Hwy 615

Hwy 747

Little Pine Lake

Boundary Lake

Muskrat Lake

Off Lake

Burditt Lake

Rainy Lake I.R. No. 17B

Pinewood Lake

Abbott Lake

2 2 2 4 4 2 3

P:\EM\Projects\2011\TC111504 Rainy River\GIS\Terrestrial\SAR Report 2015\MXD\Bobolink Obs and Hab Summary 2.mxd

LEGEND

- Transmission Line
- Road
- Permanent Watercourse
- Intermittent (Intermittent Watercourse)
- Waterbody
- Natutral Local Study Area
- Whip-poor-will Compensation Areas
- Project Site Boundary (ESA)
- Approximate Principal RRP Facilities

Bobolink Observations and Habitat Information (Labelled with number of individuals, if greater than 1)

- Bobolink Observation (AMEC 2014)
- Bobolink Observation (AMEC 2012)
- Bobolink Observation (AMEC 2011)
- Bobolink Observation (KCB 2010)
- Bobolink Habitat - (Agriculture and Cultural Meadow Areas, derived from FRI and Ecosite data)

NOTES:
- Pleiades imagery September 2015
- Roadand watercourse data extracted from Land Information Ontario, MNRF
- Base map data from Geogratis NRCan Toporama DRG 1:50k sheets.
- Habitats derived from MNR FRI data, MNR Ecosite data and conversion into Provincial ELC classes

Datum: NAD83
Projection: UTM Zone 15N

0 5 10 20 30 Kilometres

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RAINY RIVER PROJECT

Bobolink Observations in 2010 - 2012 and 2014

PROJECT N^{O}: TC111504 | **FIGURE: 3-4**

SCALE: 1:112,000 | DATE: January 2016

Figure 3-5: Other Species at Risk Observations in 2015

414000 416000 418000 420000 422000 424000 426000 428000 430000 432000 434000 436000 438000

5426000 5424000 5422000 5420000 5418000 5416000 5414000

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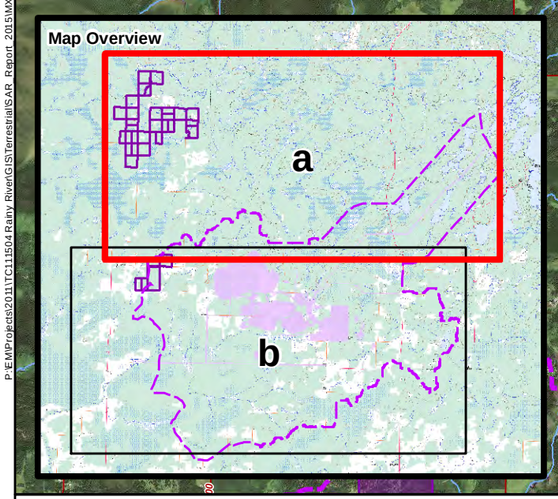

LEGEND

- Bobolink Compensation Areas
- Whip-poor-will Compensation Areas
- Approximate Principal RRP Facilities
- Project Site Boundary (ESA)
- Natural Local Study Area
- Road
- Watercourse
- Waterbody

Species at Risk Observations
(Labelled with number of individuals, if greater than 1)

- American White Pelican
- Bald Eagle
- Barn Swallow
- Canada Warbler
- Common Nighthawk
- Eastern Meadowlark
- Eastern Wood-Pewee
- Golden-winged Warbler
- Wood Thrush

0 2.5 5 10 15 Kilometres

NOTES:
- Pleiades imagery September 2015
- Road and watercourse data extracted from Land Informatio Ontario, MNRF

Datum: NAD83
Projection: UTM Zone 15N

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RAINY RIVER PROJECT

Other Species at Risk Observations in 2015

PROJECT N^{O}: TC111504 | **FIGURE: 3-5a**

SCALE: 1:65,000 | DATE: January 2016

412000 414000 416000 418000 420000 422000 424000 426000 428000 430000 432000 434000 436000

5414000 5412000 5410000 5408000 5406000 5404000 5402000

Hwy 617 Hwy 600 Hwy 600 Hwy 600 Hwy 617 Hwy 600 Hwy 600 Hwy 600 Hwy 600 Hwy 600 Hwy 617 Hwy 600 Hwy 617

Pinewood River Tait Rd Caul Rd Bartley Rd Angus Rd

4 2 4 6 10 2 2 2

P:\EM\Projects\2015\TC111504 Rainy River\GIS\Terrestrial\SAR Report_2015\MXD\Other_SAR_Observations2.mxd

Map Overview

a

b

LEGEND

- Bobolink Compensation Areas
- Whip-poor-will Compensation Areas
- Approximate Principal RRP Facilities
- Project Site Boundary (ESA)
- Natural Local Study Area
- Road
- Watercourse
- Waterbody

Species at Risk Observations
(Labelled with number of individuals, if greater than 1)

- American White Pelican
- Bald Eagle
- Barn Swallow
- Canada Warbler
- Common Nighthawk
- Eastern Meadowlark
- Eastern Wood-Pewee
- Golden-winged Warbler
- Wood Thrush

NOTES:
- Pleiades imagery September 2015
- Road and watercourse data extracted from Land Informatio Ontario, MNRF

Datum: NAD83
Projection: UTM Zone 15N

0 2.5 5 10 15 Kilometres

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RAINY RIVER PROJECT

Other Species at Risk Observations in 2015

PROJECT N°: TC111504	**FIGURE: 3-5b**
SCALE: 1:65,000	DATE: January 2016

Figure 3-6: Foraging (Open) Habitat within Select Eastern Whip-poor-will “Core” and “Home” Ranges

412000 414000 416000 418000 420000 422000

5426000 5424000 5422000 5420000 5418000 5416000 5414000 5412000

b

c

d

e

HIGHWAY 600

HIGHWAY 617

HIGHWAY 600

Document Path: P:\EWP Projects\2011\TC111504 Rainy River\GIS\Terrestrial\EWPW_Vegetation_Oct2015\MXD\Selected_EWPW_Open_Habitat_Index.mxd

LEGEND

- Map Index
- Eastern Whip-poor-will Observations
- Eastern Whip-poor-will Home Range
- Eastern Whip-poor-will Core Range
- Vegetation Plots
- Roads
- Compensation Land

NOTES:
- Imagery Scene from 20 July 2014

Datum: NAD83
Projection: UTM Zone 15N

N W E S

0 0.5 1 2 3 4 5 Kilometres

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RAINY RIVER PROJECT

Foraging (Open) Habitat within Select Eastern Whip-poor-will Core and Home Ranges

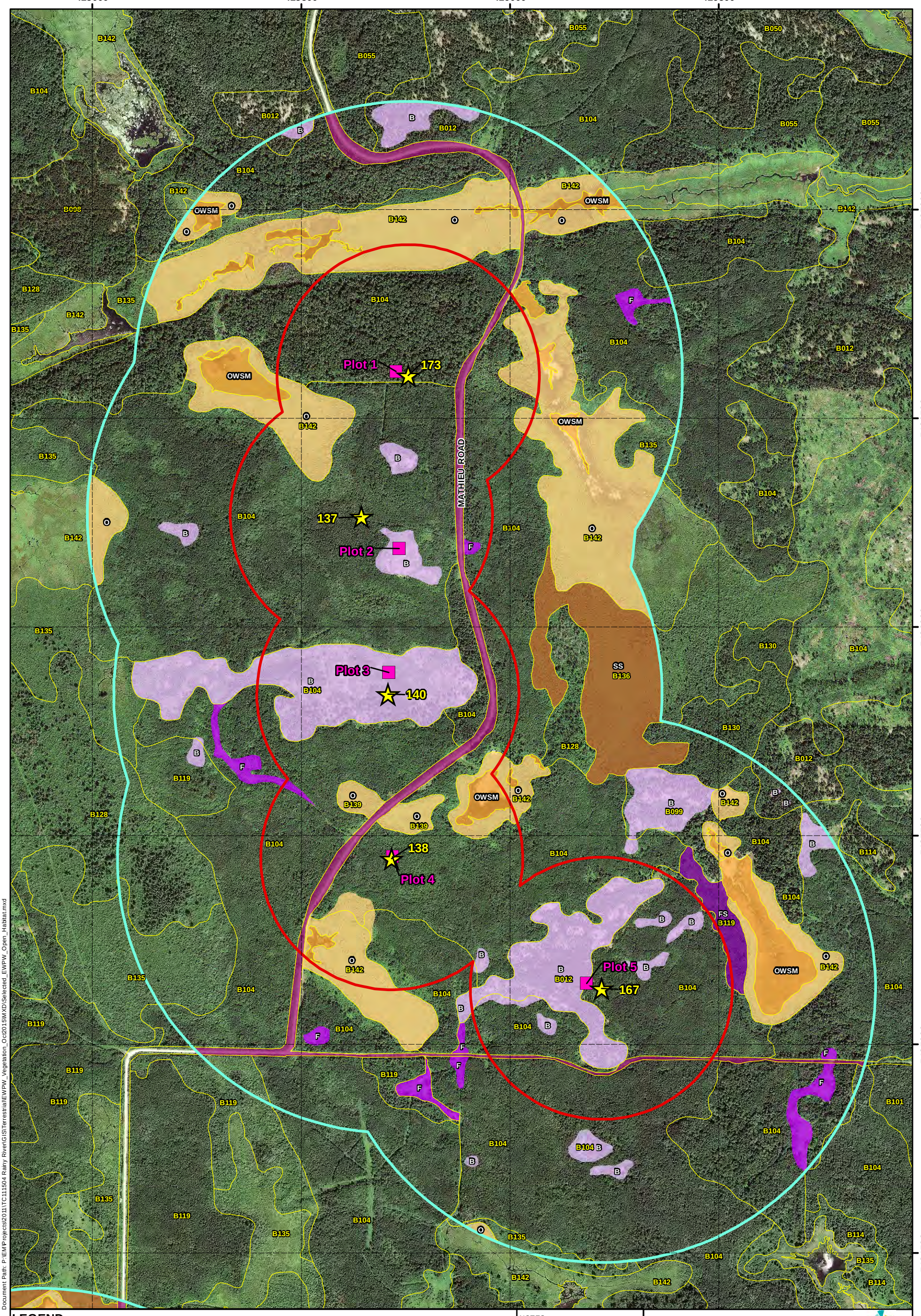
PROJECT N^{O}: TC111504	**FIGURE: 3-6a**
SCALE: 1:45,000	DATE: January 2016

415000 415500 416000 416500

5427000 5426500 5426000 5425500 5425000 5424500

Plot 1 173
Plot 2 137
Plot 3 140
Plot 4 138
Plot 5 167

MATHIEU ROAD



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LEGEND

- ☆ Eastern Whip-poor-will Observations
- Eastern Whip-poor-will Home Range
- Eastern Whip-poor-will Core Range
- Vegetation Plots
- B# FRI Vegetation

Potential Foraging (Open) Habitat

Upland Habitat
- Exposed Bedrock Communities (B)
- Fields/Gaps in Forest Canopy (F)
- Semi-open Forests (FS)
- Road Corridors

Wetland Habitat
- Open Wetlands (Meadow Marsh and Fens) (O)
- Open Water/Shallow Marsh (OWSM)
- Semi-open Swamps (SS)

NOTES:
- Imagery Scene from 20 July 2014

Datum: NAD83
Projection: UTM Zone 15N

0 0.1 0.2 0.4 0.6 0.8 1 Kilometres

N W E S

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RAINY RIVER PROJECT

Foraging (Open) Habitat within Select Eastern Whip-poor-will Core and Home Ranges

PROJECT NO: TC111504	**FIGURE: 3-6b**
SCALE: 1:8,500	DATE: January 2016

414000 414500 415000 415500

5425000 5424500 5424000 5423500 5423000 5422500

135 Plot 6

B099 B104 B119 B135 B142 O F B016 B095 B096 B112 B120 B128 B130 B114 B116 OWSM SS

0 0.1 0.2 0.4 0.6 0.8 1 Kilometres

Document Path: P:\EM\Projects\2011\TC111504 Rainy River\GIS\Terrestrial\EWPW_Vegetation_Oct2015MXD\Selected_EWPW_Open_Habitat.mxd

LEGEND

- Eastern Whip-poor-will Observations
- Eastern Whip-poor-will Home Range
- Eastern Whip-poor-will Core Range
- Vegetation Plots
- B# FRI Vegetation

Potential Foraging (Open) Habitat

Upland Habitat
- Exposed Bedrock Communities (B)
- Fields/Gaps in Forest Canopy (F)
- Road Corridors

Wetland Habitat
- Open Wetlands (Meadow Marsh and Fens) (O)
- Open Water/Shallow Marsh (OWSM)
- Semi-open Swamps (SS)

NOTES:
- Imagery Scene from 20 July 2014

Datum: NAD83
Projection: UTM Zone 15N

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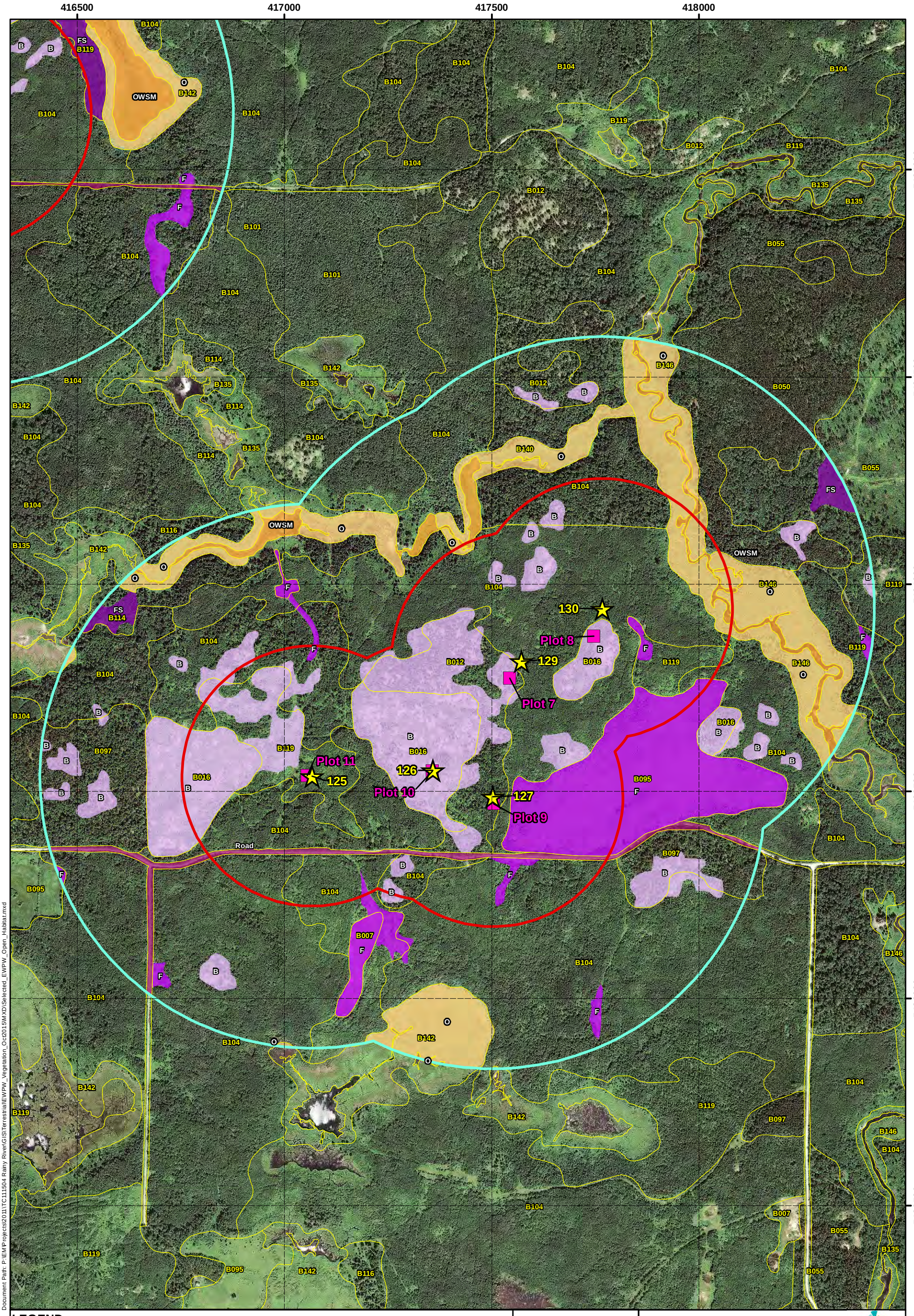
RAINY RIVER PROJECT

Foraging (Open) Habitat within Select Eastern Whip-poor-will Core and Home Ranges

PROJECT N^{O}: TC111504	**FIGURE: 3-6c**
SCALE: 1:8,500	DATE: January 2016



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LEGEND

- Eastern Whip-poor-will Observations
- Eastern Whip-poor-will Home Range
- Eastern Whip-poor-will Core Range
- Vegetation Plots
- B# FRI Vegetation

Potential Foraging (Open) Habitat

Upland Habitat

- Exposed Bedrock Communities (B)
- Fields/Gaps in Forest Canopy (F)
- Semi-open Forests (FS)
- Road Corridors

Wetland Habitat

- Open Wetlands (Meadow Marsh and Fens) (O)
- Open Water/Shallow Marsh (OWSM)

NOTES:
- Imagery Scene from 20 July 2014

Datum: NAD83
Projection: UTM Zone 15N

0 0.1 0.2 0.4 0.6 0.8 1 Kilometres

N W E S

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RAINY RIVER PROJECT

Foraging (Open) Habitat within Select Eastern Whip-poor-will Core and Home Ranges

PROJECT N^{O}: TC111504	**FIGURE: 3-6d**
SCALE: 1:8,500	DATE: January 2016

415000 415500 416000 416500

5414000 5413500 5413000 5412500 5412000 5411500

HIGHWAY 617 HIGHWAY 600 Road Road

228 Plot 17 Plot 19 53 Plot 18 45 52 Plot 20 132 Plot 15 47 Plot 14 46 Plot 13 131 Plot 16 Plot 12 49

LEGEND

- Eastern Whip-poor-will Observations
- Eastern Whip-poor-will Home Range
- Eastern Whip-poor-will Core Range
- Vegetation Plots
- B# FRI Vegetation

Potential Foraging (Open) Habitat

Upland Habitat
- Exposed Bedrock Communities (B)
- Fields/Gaps in Forest Canopy (F)
- Semi-open Forests (FS)
- Residential
- Road Corridors

Wetland Habitat
- Open Wetlands (Meadow Marsh and Fens) (O)
- Open Water/Shallow Marsh (OWSM)

NOTES:
- Imagery Scene from 20 July 2014

Datum: NAD83
Projection: UTM Zone 15N

0 0.1 0.2 0.4 0.6 0.8 1 Kilometres

N W E S

newgold™ Rainy River Project

amec foster wheeler

RAINY RIVER PROJECT

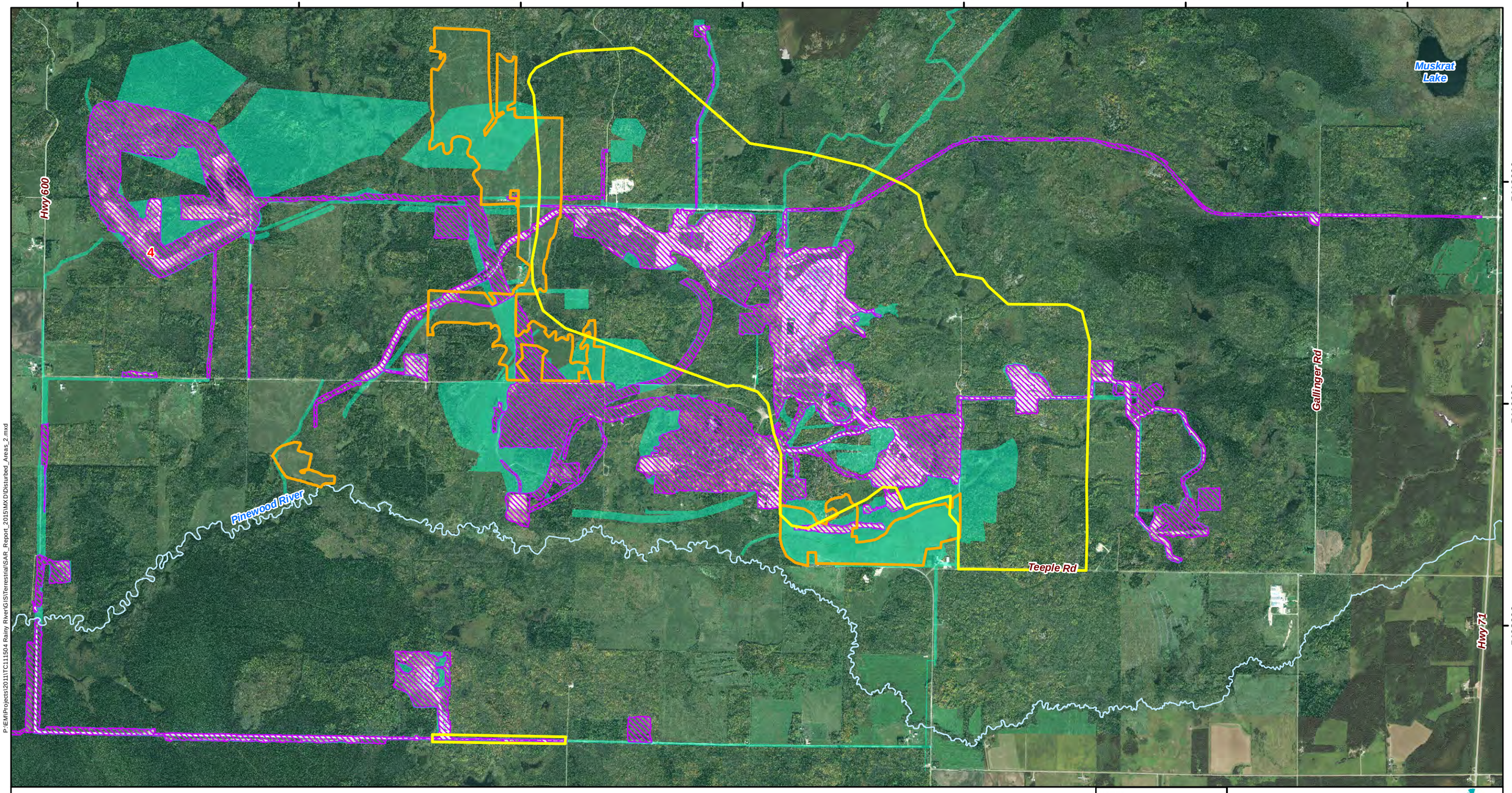
Foraging (Open) Habitat within Select Eastern Whip-poor-will Core and Home Ranges

PROJECT N°: TC111504 | **FIGURE: 3-6e**

SCALE: 1:8,500 | DATE: January 2016

Document Path: P:\EM\Projects\2011\TC111504 Rainy River\GIS\Terrestrial\EWPW_Vegetation_Oct2015MXD\Selected_EWPW_Open_Habitat.mxd

Figure 6-1: Disturbance Areas and Species at Risk Habitat



LEGEND

- Whip-poor-will Impacted Habitat (from MNRF, Oct. 14 2014)
- Bobolink Impacted Habitat (from MNRF, Oct. 14 2014)
- Disturbance Areas (as of September 28, 2015)
- Planned Clearing Areas (by end of 2015)

NOTES:
- Pleides satellite imagery scene date is Sept. 28 2015
- Road and watercourse data extracted from Land Information Ontario, MNRF

Datum: NAD83
Projection: UTM Zone 15N

0 1 2 4 6 8 Kilometres

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RAINY RIVER PROJECT

Disturbance Areas and Species at Risk Habitat

PROJECT N^{O}: TC111504	**FIGURE: 6-1**
SCALE: 1:32,900	DATE: January 2016

APPENDIX A

2015 EASTERN WHIP-POOR-WILL HABITAT CHARACTERIZATION FIELD DATASHEETS

Detailed Vegetation Survey Form – Vegetation Community

Client & Project: NG – RRP
Site #: Plot 1 Observers: IK, RH

Date: July 18
Time:
Ecosite: B088
Slope (%): Ø
Aspect:

≈ wPW 31

Easting: wpt 001
Northing:
Photos: IMG_0422

Plant Community: Mixedwood Forest.
Notes & Description:

Mid-aged forest of ABIEBAL, POPUTRE > POPUBAL, BETUPAP.
Sparse shrub cover (open understory)

Site and Terrain Characteristics (Circle)

Canopy Height	Sub-canopy	Structural Stage	Topographic Feature	
< 2 m	< 2 m	Sparse/bryoid	Lacustrine	Cliff
2-5 m	2-5 m	Grass/herb	Riverine	Talus
5-10 m	5-10 m	Shrub	Bottomland	Crevice/Cave
10-15 m	10-15 m	Young seral	(Terrace)	Alvar
15-20 m	(15-20 m)	Mid seral	Valley Slope	Rockland
(> 20 m)	> 20 m	(Mature)	Tableland	Beach/Bar
		Old-growth	Roll Upland	Sand Dune
				Bluff

Vegetation & Substrate Data (10 x 10 m)

720 Tree Canopy (~~15m~~) % 30 > 70
5-20 Tree Subcanopy (~~15m~~) % 40
Tree Shrub (<2m) % T
Low Shrub (0.5-2m) % 3
Dwarf Shrub (<0.5m) % Ø
Organic Depth (cm) Ø

Forb % 60
Graminoid % 5
Moss % 10
Surface Lichen % Ø
Arboreal Lichen % T

Rock % Ø
Soil % Ø
Litter % 90
DWD % 15
Water % Ø

Organic Type: LFH: Mor Moder Mull O: Fibric Mesic Humic
Wetland Class: Bog Fen Swamp Marsh Pond (N/A)
Upper Soil Texture: 999

Tree and Shrub Layer Percent Cover (10 x 10 m)

Species	Can	Sub	Tall	Low	Species	Can	Sub	Tall	Low
POPUBAL	5								
POPUTRE	20								
ABIEBAL	5	40							
BETUPAP		1							
CORYCOR				3					
					TOTAL				

Detailed Vegetation Survey Form – Stand Characteristics

Client & Project: NG - RRP

Site #: Plot 1 Observers: JK, RH

Prism Sweep at Plot Centre

Prism Factor

2

Species	Tally	Basal Area (Tally * Prism Factor)
ABIEBAL	𝍸 IIII	18
POPUBAL	I	2
POPUTRE	𝍸 I	12
TOTAL		32
Snags	I	2

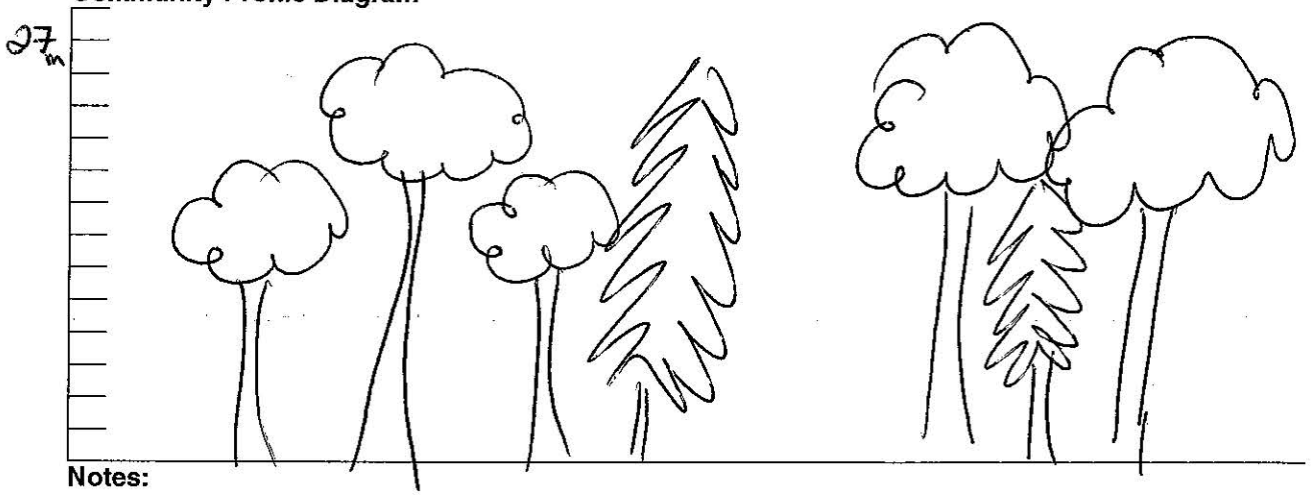
Stand Composition	BA
ABIEBAL > POPUTRE > POPUBAL	32.

Size Class Analysis	R	<10	O	10-24	R	25-50	N	>50
Standing Snags	R	<10	R	10-24	N	25-50	N	>50
Deadfall/Logs	O	<10	R	10-24	N	25-50	N	>50

Tree and Snag Data (Optional) (10 x 10 m)

Species	DBH (cm)	Height (m)	Age (yr)	Count (>10)
POPUTRE	35; 41.7	largest 27 m	≥ 70	II
ABIEBAL	12.5; 18.8;			𝍸 I
	23.1; 28.6;			
	23.6; 24.7			
Snag (POPUTRE)	31			

Community Profile Diagram



Notes:

pg 2.

Detailed Vegetation Survey Form – Plant Community

Client & Project: NG - RRP

Site #: Plot 1 Observers: IK, RH.

Ground Cover (Grasses, Sedges, Forbs, Horsetails, Ferns, Dwarf Shrubs, Mosses, Lichens)

Data collected from four 1 x 1 subplots within 10 x 10 m plot.

coll	Species	Percent Cover			
		Plot 1	Plot 2	Plot 3	Plot 4
	SANIMAR	<1			
	CORNCAN	10	2		2
	FRAGVIR	5	<1	1	
	RUBUPUB	15	5	2	5
	ARALNUD	20	5	15	2
	SYMPMAC	10	4	3	1
	PETAFRI	2	2	2	1
	MAIACAN	3	1	2	3
	STREROS	3	1	1	2
	PYROASP.	<1	<1		
	ROSAACI	<1	3		1
	RIBEHIR	<1			
	Grass sp.	<1	2	<1	1
	leaf litter	45	65	60	80
	GALIASP		3		
	POPUTRE		1		
	EQUISYL		<1		
	moss sp.		7	10	2
	MITENUD		1	2	
	ABIEBAL		<1	1	
	CORYCOR			2	
	DWD			15	5
	~~ASARCAN~~				
	VIOL sp.				1
	POPUBAL				1

Additional Species Outside of Plots
CLINBOR
TRIEBOR
ASARCAN
ACTA sp.

Species Collection and Identification

Sample #	Species & Habitat Description	Density, Count, Phenology	Photos	Identified By:	Final ID

Notes:

Detailed Vegetation Survey Form – Vegetation Community

Client & Project: NG-RRP
Site #: Plot 2 Observers: IK, RH

Date: July 18
Time:
Ecosite: B088
Slope (%): 5%.
Aspect: N

Easting: wpt 003 ≈ WPW 32
Northing:
Photos: IMG-0434 @WPW 32
0446 @ wpt 003.

Plant Community: Rocky outcrop.
Notes & Description:

Open rocky outcrop w stunted coniferous trees (PICEGLA) within young deciduous forest.

Site and Terrain Characteristics (Circle)

Canopy Height	Sub-canopy	Structural Stage	Topographic Feature	
< 2 m	< 2 m	Sparse/bryoid	Lacustrine	Cliff
2-5 m	2-5 m	Grass/herb	Riverine	Talus
5-10 m	(5-10 m)	(Shrub)	Bottomland	Crevice/Cave
10-15 m	10-15 m	Young seral	Terrace	Alvar
15-20 m	15-20 m	Mid seral	Valley Slope	Rockland
> 20 m	> 20 m	Mature	Tableland	Beach/Bar
		Old-growth	Roll Upland	Sand Dune
				Bluff

Vegetation & Substrate Data (10 x 10 m)

Tree Canopy (>5m) %	Ø	Forb %	35	Rock %	45
Tree Subcanopy (>5m) %	2	Graminoid %	5	Soil %	Ø
Tree Shrub (<2m) %	2	Moss %	5	Litter %	2
Low Shrub (0.5-2m) %	5	Surface Lichen %	15	DWD %	2
Dwarf Shrub (<0.5m) %	30	Arboreal Lichen %	Ø	Water %	Ø
Organic Depth (cm)	Ø				

Organic Type: LFH: Mor Moder Mull O: Fibric Mesic Humic
Wetland Class: Bog Fen Swamp Marsh Pond (N/A) Upper Soil Texture: 999

Tree and Shrub Layer Percent Cover (10 x 10 m)

Species	Can	Sub	Tall	Low	Species	Can	Sub	Tall	Low
PICEGLA		1	5						
					TOTAL				

pg 1

Detailed Vegetation Survey Form – Stand Characteristics

Client & Project: NG - RRP

Site #: Plot 2 Observers: IK, RH

Prism Sweep at Plot Centre

Prism Factor

2

Species	Tally	Basal Area (Tally * Prism Factor)
TOTAL		
Snags		

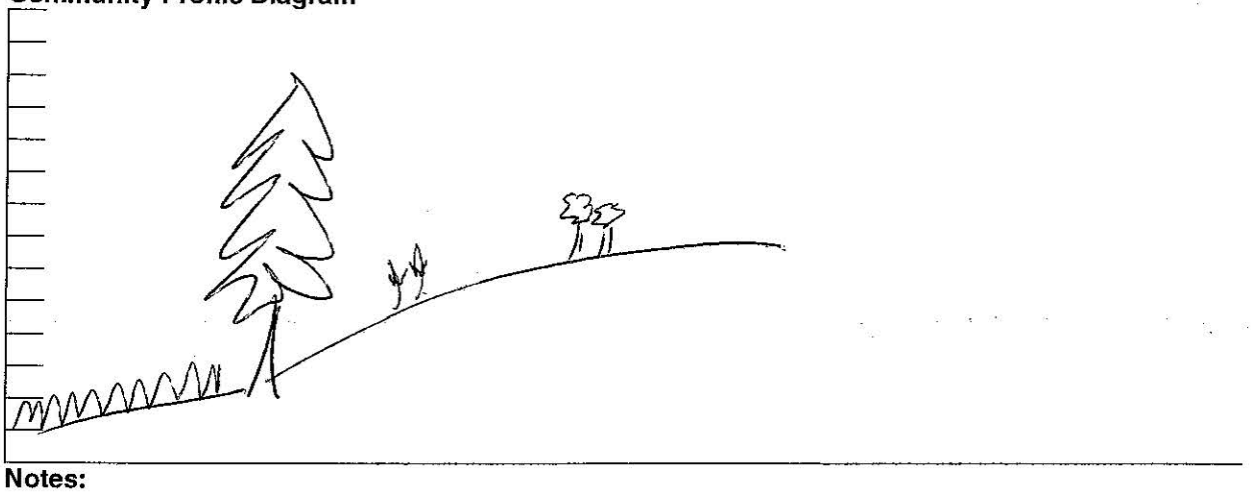
Stand Composition	BA

Size Class Analysis	R	**<10**	R	**10-24**			**25-50**			**>50**
Standing Snags	N	**<10**	N	**10-24**			**25-50**			**>50**
Deadfall/Logs	R	**<10**	N	**10-24**			**25-50**			**>50**

Tree and Snag Data (Optional) (10 x 10 m)

Species	DBH (cm)	Height (m)	Age (yr)	Count (>10)
PICEGLA.	16	7 m.		1

Community Profile Diagram



Notes:

Detailed Vegetation Survey Form – Plant Community

Client & Project: NG - RRP

Site #: Plot 2 Observers: IK, RH

Ground Cover (Grasses, Sedges, Forbs, Horsetails, Ferns, Dwarf Shrubs, Mosses, Lichens)

Data collected from four 1 x 1 subplots within 10 x 10 m plot.

coll	Species	Percent Cover			
		Plot 1	Plot 2	Plot 3	Plot 4
	VACCANG	60	10	80	50
	MELALIN	2	<1	3	
	AMEL sp.	5		15	
	lichen	20	25	15	10
	MAIACAN	2	<1	2	1
	Grass sp.	1			<1
	moss sp.	10	10	5	
	rock	15	50	Ø	45
	RUBUIDA		1		
	APOCCAN		5		
	VIOL sp.		1		
	BROHCIL	1	1	1	
	AGROSCA			1	
	DIERLON			1	1

Additional Species Outside of Plots
PTERAQU
PINUSTR <0.5m
EPILANG
ACHIMIL
ALNUVIR
Salix sp.
ARALHIS
AQUICAN
CORYSEM
HIER sp.
DICHXAN
DANTSPI

Species Collection and Identification

Sample #	Species & Habitat Description	Density, Count, Phenology	Photos	Identified By:	Final ID

Notes:

Detailed Vegetation Survey Form – Vegetation Community

Client & Project: N6-RRP

Site #: Plot 3 Observers: IK, RH

Date: July 18

Time:

Ecosite: B049

Slope (%): 4.5

Aspect: E

Easting: wpt 010 ± WPW09

Northing:

Photos: IMG_0449

Plant Community: Rocky outcrop.

Notes & Description:

Bedrock outcrop mostly covered by grass & forb & stunted trees, surrounded by mixedwood forest.

Site and Terrain Characteristics (Circle)

Canopy Height	Sub-canopy	Structural Stage	Topographic Feature	
(< 2 m)	(< 2 m)	Sparse/bryoid	Lacustrine	Cliff
2-5 m	(2-5 m)	Grass/herb	Riverine	Talus
5-10 m	5-10 m	(Shrub)	Bottomland	Crevice/Cave
10-15 m	10-15 m	Young seral	Terrace	Alvar
15-20 m	15-20 m	Mid seral	Valley Slope	(Rockland)
> 20 m	> 20 m	Mature	Tableland	Beach/Bar
		Old-growth	Roll Upland	Sand Dune
				Bluff

Vegetation & Substrate Data (10 x 10 m)

Tree Canopy (>5m) %	Ø	Forb %	30	Rock %	20
Tree Subcanopy (>5m) %	Ø	Graminoid %	30	Soil %	Ø
Tree Shrub (<2m) %	5	Moss %	10	Litter %	5
Low Shrub (0.5-2m) %	10	Surface Lichen %	5	DWD %	5
Dwarf Shrub (<0.5m) %	20	Arboreal Lichen %	Ø	Water %	Ø
Organic Depth (cm)	Ø				

Organic Type: LFH: Mor Moder Mull O: Fibric Mesic Humic

Wetland Class: Bog Fen Swamp Marsh Pond (N/A) Upper Soil Texture: 999

Tree and Shrub Layer Percent Cover (10 x 10 m)

Species	Can	Sub	Tall	Low	Species	Can	Sub	Tall	Low
POPUTRE			5						
SALI sp.			5						
AMEL sp.			10						
					TOTAL				

pg 1.

Detailed Vegetation Survey Form – Stand Characteristics

Client & Project: NG-RRP

Site #: Plot 3 Observers: IK, RH

Prism Sweep at Plot Centre

Prism Factor: 2

Species	Tally	Basal Area (Tally * Prism Factor)
TOTAL		
Snags		

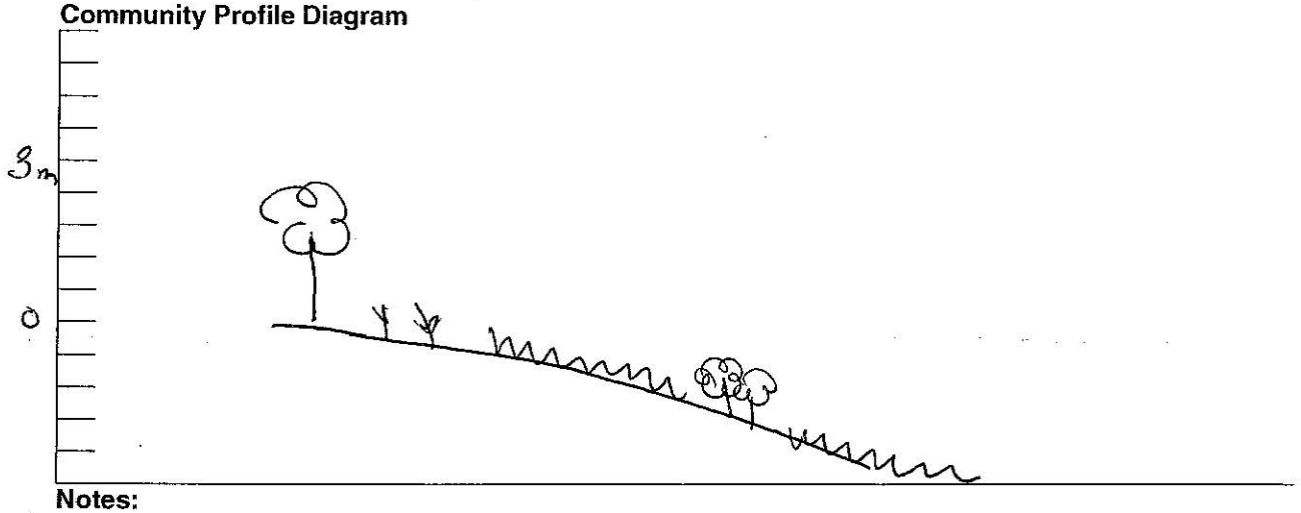
Stand Composition	BA

Size Class Analysis	R	<10		10-24		25-50		>50	
Standing Snags	R	<10		10-24		25-50		>50	
Deadfall/Logs	R	<10		10-24		25-50		>50	

Tree and Snag Data (Optional) (10 x 10 m)

Species	DBH (cm)	Height (m)	Age (yr)	Count
POPUTRE	all <10cm	3m.		

Community Profile Diagram



Notes:

pg2

Detailed Vegetation Survey Form – Plant Community

Client & Project: NG-RRP

Site #: Plot 3 Observers: IK, RH

Ground Cover (Grasses, Sedges, Forbs, Horsetails, Ferns, Dwarf Shrubs, Mosses, Lichens)

Data collected from four 1 x 1 subplots within 10 x 10 m plot.

coll	Species	Percent Cover				Additional Species Outside of Plots
		Plot 1	Plot 2	Plot 3	Plot 4	
	VACCANG	5	8	15	7	TRIFPRA
	SYMPMAC	2	10	10	10	PINUBAN
	AMEL sp.	2		3	3	SYMP sp.
← HIERUMB (?)	HIER sp.	1	2			CARETEN
	moss	30	1			
	MELALIN	1				
	RUBUIDA	<1				
	ANTENEG	8				
	DANTSPI	75	70		55	
	ACHIMIL	<1	2	1		
	FRAGVIR	3	6	3	2	
	rock	3			8	
	lichen	1				
	LATH sp.		3	5	3	
	MAIACAN		2	<1	1	
	SOLIJUN		2		2	
	TRIEBOR		<1	<1		
	DWD		2			
	PTERAQU			55		
	DIERLON			20	5	
	CAREPRO			1		
	VACCMYR			15		
	CLINBOR			1		
	CORNCAN			1		
	CORYCOR			5		
	ROSAACI			1		
	ARALNUD			1		
	APOCCAN				1	
	RUBUPUB				1	

Species Collection and Identification

Sample #	Species & Habitat Description	Density, Count, Phenology	Photos	Identified By:	Final ID

Notes:

pg3

Detailed Vegetation Survey Form – Vegetation Community

Client & Project: NG - RRP
Site #: Plot 4 Observers: IK, RH

Date: July 18
Time:
Ecosite: B088
Slope (%):
Aspect: Ø

Easting: wpt 011 ± WAW 37.
Northing:
Photos: IMG_0460

Plant Community: Deciduous forest.
Notes & Description:

Young. deciduous stand of POPUTRE w abundant alder in understory.

Site and Terrain Characteristics (Circle)

Canopy Height	Sub-canopy	Structural Stage	Topographic Feature	
< 2 m	< 2 m	Sparse/bryoid	Lacustrine	Cliff
2-5 m	2-5 m	Grass/herb	Riverine	Talus
5-10 m	(6-10 m)	Shrub	(Bottomland)	Crevice/Cave
(10-15 m)	10-15 m	(Young seral)	Terrace	Alvar
15-20 m	15-20 m	Mid seral	Valley Slope	Rockland
> 20 m	> 20 m	Mature	Tableland	Beach/Bar
		Old-growth	Roll Upland	Sand Dune
				Bluff

Vegetation & Substrate Data (10 x 10 m)

10-14m Tree Canopy (~~>5m~~) %: 10
8-10m Tree Subcanopy (>5m) %: 50
2-5m Tree Shrub (<2m) %: 25
Low Shrub (0.5-2m) %: 10
Dwarf Shrub (<0.5m) %: Ø
Organic Depth (cm): Ø

Forb %: 60
Graminoid %: 2
Moss %: 3
Surface Lichen %: Ø
Arboreal Lichen %: T

Rock %: Ø
Soil %: Ø
Litter %: 80
DWD %: 5
Water %: Ø

Organic Type: LFH: Mor Moder Mull O: Fibric Mesic Humic
Wetland Class: Bog Fen Swamp Marsh Pond (N/A)
Upper Soil Texture: 999

Tree and Shrub Layer Percent Cover (10 x 10 m)

Species	Can	Sub	Tall	Low	Species	Can	Sub	Tall	Low
POPUTRE	10	30	5						
ALNUINC		20	20						
BETUPAP.									
CORYCOR				10					
					TOTAL				

Detailed Vegetation Survey Form – Stand Characteristics

Client & Project: NG – RRP

Site #: Plot 24 Observers: IK, RH.

Prism Sweep at Plot Centre

Prism Factor

2

Species	Tally	Basal Area (Tally * Prism Factor)
ALNUVIR	III	6
POPUTRE	III	6
TOTAL		12
Snags		

Stand Composition	BA
POPUTRE, ALNUVIR.	12

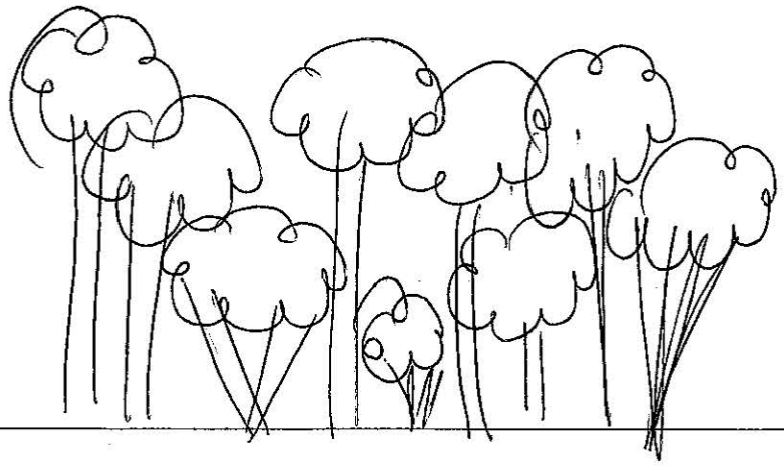
Size Class Analysis	A	<10	O	10-24	N	25-50	N	>50
Standing Snags	N	<10	N	10-24	N	25-50	N	>50
Deadfall/Logs	R	<10	N	10-24	N	25-50	N	>50

Tree and Snag Data (Optional) (10 x 10 m)

Species	DBH (cm)	Height (m)	Age (yr)	Count
POPUTRE	14.3	14		

Community Profile Diagram

14m



Notes:

pg 2.

Detailed Vegetation Survey Form – Plant Community

Client & Project: NG - RRP

Site #: Plot 4 Observers: IK, RH

Ground Cover (Grasses, Sedges, Forbs, Horsetails, Ferns, Dwarf Shrubs, Mosses, Lichens)

Data collected from four 1 x 1 subplots within 10 x 10 m plot.

coll	Species	Percent Cover				Additional Species Outside of Plots
		Plot 1	Plot 2	Plot 3	Plot 4	
	CAREGRA.	2	2	1	1	ACTA sp.
	SYMPMAC	5	5	10	5	MERTPAN
	ARALNUD	2	5	3		~~DRYOCAR~~
	RUBUPUB	8	10	6	10	VIBERAF
	FRAGVIR	1		<1	2	
	EQUISYL	1		1		
	COPTTRI	1	2	3		
	GALITRI	1				
	MAIACAN	<1	2	1	1	
	RUBUIDA	1				
	AMEL sp.	3	2			
	PYROASP	1				
	RIBEAME	<1				
	litter	35	15	50	16	
	CORYCOR	1	5			
	RIBEHIR		5	3	1	
	PRUNVUL		<1			
	SANIMAR		1			
	RIBETRI		1			
	GALITRI		<1			
	ROSAACI		1			
	moss		3			
	DRYOCAR			1	10	
	GALIASP			1		
	PETAFRI			1	1	
	PYROASP			1		
	TRILCER			1		
	DWD			4	3	
	Glyceria sp.				60	

Species Collection and Identification

Sample #	Species & Habitat Description	Density, Count, Phenology	Photos	Identified By:	Final ID

Notes:

pg 3

Detailed Vegetation Survey Form – Vegetation Community

Client & Project: NG - RRP
Site #: Plot 5 Observers: IK, RH

Date: July 19
Time:
Ecosite: unclassified.
Slope (%): 3%
Aspect: S

Easting: wpt 013 & WPW49
Northing:
Photos: IMG_0481

Plant Community: Rocky opening in forest.
Notes & Description:

Mixedwood forest w/ lrg gaps in canopy above exposed bedrock patches.

Site and Terrain Characteristics (Circle)

Canopy Height	Sub-canopy	Structural Stage	Topographic Feature	
< 2 m	< 2 m	Sparse/bryoid	Lacustrine	Cliff
2-5 m	2-5 m	Grass/herb	Riverine	Talus
5-10 m	(5-10 m)	(Shrub)	Bottomland	Crevice/Cave
(10-15 m)	10-15 m	Young seral	Terrace	Alvar
15-20 m	15-20 m	Mid seral	Valley Slope	(Rockland)
> 20 m	> 20 m	Mature	Tableland	Beach/Bar
		Old-growth	Roll Upland	Sand Dune
				Bluff

Vegetation & Substrate Data (10 x 10 m)

>10 Tree Canopy (~~>5m~~) %	2	Forb %	25	Rock %	15
5-10 Tree Subcanopy (~~>5m~~) %	35	Graminoid %	5	Soil %	0
Tree Shrub (<2m) %		Moss %	5	Litter %	30
Low Shrub (0.5-2m) %	5	Surface Lichen %	20	DWD %	1
Dwarf Shrub (<0.5m) %	25	Arboreal Lichen %	T	Water %	0
Organic Depth (cm)	0				

Organic Type: LFH: Mor Moder Mull O: Fibric Mesic Humic
Wetland Class: Bog Fen Swamp Marsh Pond (N/A) Upper Soil Texture:

Tree and Shrub Layer Percent Cover (10 x 10 m)

Species	Can	Sub	Tall	Low	Species	Can	Sub	Tall	Low
PINUBAN		35							
BETUPAP		2							
POPUTRE	2								
AMEL sp.			2						
ALNUVIR/INC			3						
PRUNVIR			1						
					TOTAL				

Detailed Vegetation Survey Form – Stand Characteristics

Client & Project: NG - RRP

Site #: Plot 5 Observers: IK, RH

Prism Sweep at Plot Centre

Prism Factor

2

Species	Tally	Basal Area (Tally * Prism Factor)
PINUBAN	III	6
TOTAL		6
Snags		

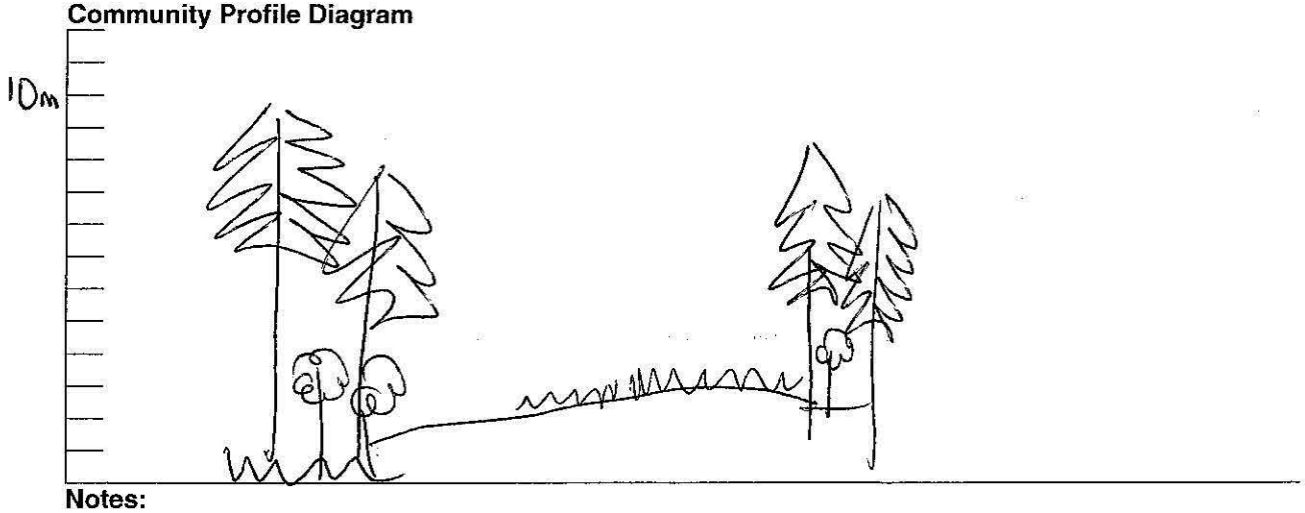
Stand Composition	BA
PINUBAN	6

Size Class Analysis	O	<10	R	10-24		25-50		>50
Standing Snags	R	<10	N	10-24		25-50		>50
Deadfall/Logs	N	<10	N	10-24		25-50		>50

Tree and Snag Data (Optional) (10 x 10 m)

Species	DBH (cm)	Height (m)	Age (yr)	Count
PINUBAN	12.1 ; 11 ; 11.8 ; 10.5 ; 10.7 ; 10.2	10m	25 - 30 y/o.	

Community Profile Diagram



Notes:

pg2

Detailed Vegetation Survey Form – Plant Community

Client & Project: NG--RRP

Site #: Plot 5 Observers: IK, RH

Ground Cover (Grasses, Sedges, Forbs, Horsetails, Ferns, Dwarf Shrubs, Mosses, Lichens)

Data collected from four 1 x 1 subplots within 10 x 10 m plot.

coll	Species	Percent Cover				Additional Species Outside of Plots
		Plot 1	Plot 2	Plot 3	Plot 4	
	VACCANG	25	20	3	5	HIER sp. CAN
	MAIACAN	3	2	2	5	ARALHIS
	MELALIN	2		1		FRAGVIR
	DANTSPI	<1	5		3	ROSAACI
	lichen	75	15		2	LOTUCOR
	rock	15				BROMCIL
	moss	5	50			
	PTERAQUI		2	30	15	
	AMEL sp.		7	1	2	
	DICHXAN		1	2		
	DIERLON		5	10	10	
	RUBUPUB		3			
	ANEMQUI		1			
	DWD		5			
	ALNUCRI			5		
	ARALNUD			20	5	
	SYMPMAC			5	3	
	CORNCAN			10	3	
	CLINBOR			3		
	litter			80	80	
	PRUNVIR			3		
	LATH sp				1	
	VACCMYR				15	
	GAULPRO				<1	

Species Collection and Identification

Sample #	Species & Habitat Description	Density, Count, Phenology	Photos	Identified By:	Final ID

Notes:

PG 3

Detailed Vegetation Survey Form – Vegetation Community

Client & Project: NG-RRP
Site #: Plot 6 Observers: IK, RH.

Date: July 19
Time:
Ecosite: B088
Slope (%): Ø
Aspect:

Easting: wpt 14 ~WPW40
Northing:
Photos: IMG_0495

Plant Community: ~~Young~~ Deciduous forest.
Notes & Description:

Young trembling aspen stand.

Site and Terrain Characteristics (Circle)

Canopy Height	Sub-canopy	Structural Stage	Topographic Feature	
< 2 m	< 2 m	Sparse/bryoid	Lacustrine	Cliff
2-5 m	2-5 m	Grass/herb	Riverine	Talus
5-10 m	5-10 m	Shrub	Bottomland	Crevice/Cave
10-15 m	10-15 m	Young seral	Terrace	Alvar
15-20 m	15-20 m	Mid seral	Valley Slope	Rockland
> 20 m	> 20 m	Mature	Tableland	Beach/Bar
		Old-growth	Roll Upland	Sand Dune
				Bluff

Vegetation & Substrate Data (10 x 10 m)

10-15m Tree Canopy ~~(>5m)~~ %: 15
5-10m Tree Subcanopy ~~(>5m)~~ %: 40
2-5m Tree Shrub ~~(<2m)~~ %: 30
Low Shrub (0.5-2m) %: 20
Dwarf Shrub (<0.5m) %: 5
Organic Depth (cm): Ø

Forb %: 75
Graminoid %: 5
Moss %: 2
Surface Lichen %: Ø
Arboreal Lichen %: Ø

Rock %: Ø
Soil %: Ø
Litter %: 80
DWD %: 5
Water %: Ø

Organic Type: LFH: Mor Moder Mull O: Fibric Mesic Humic
Wetland Class: Bog Fen Swamp Marsh Pond N/A
Upper Soil Texture: 999

Tree and Shrub Layer Percent Cover (10 x 10 m)

Species	Can	Sub	Tall	Low	Species	Can	Sub	Tall	Low
POPUTRE	15	40	5						
~~SAMPYRSPEC~~			~~500~~						
VIBURAF			7						
AMEL sp.			10						
~~BCORYCOR~~			30						
SALI sp.			5						
CORNSTO			5						
PRUNVIR			1		TOTAL				

pg 1

Detailed Vegetation Survey Form – Stand Characteristics

Client & Project: NG – RRP

Site #: Plot 6 Observers: IK, RH

Prism Sweep at Plot Centre

Prism Factor

2

Species	Tally	Basal Area (Tally * Prism Factor)
POPUTRE ++++ ||	11.4; 12.3; 11.4; 12.3; 10.1; 11; 11.1	14
TOTAL		28
Snags		

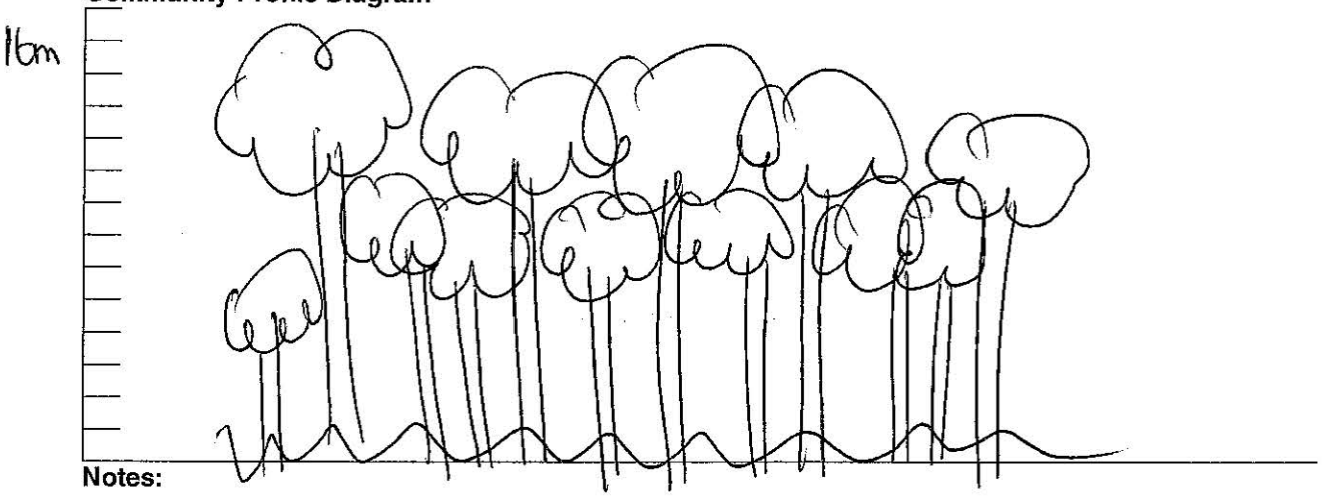
Stand Composition	BA
POPUTRE	28

Size Class Analysis	A	<10	R	10-24		25-50		>50
Standing Snags	–	<10	–	10-24		25-50		>50
Deadfall/Logs	R	<10	–	10-24		25-50		>50

Tree and Snag Data (Optional) (10 x 10 m)

Species	DBH (cm)	Height (m)	Age (yr)	Count
POPUTRE	11.4; 11.1	16m		
	10.1; 11;			
	11.4; 12.3			

Community Profile Diagram



Notes:

Detailed Vegetation Survey Form – Plant Community

Client & Project: NG – RRP

Site #: Plot 6 Observers: IK, RH

Ground Cover (Grasses, Sedges, Forbs, Horsetails, Ferns, Dwarf Shrubs, Mosses, Lichens)

Data collected from four 1 x 1 subplots within 10 x 10 m plot.

coll	Species	Percent Cover				Additional Species Outside of Plots
		Plot 1	Plot 2	Plot 3	Plot 4	
	SANIMAR	3	7	2	3	OSMOCLA
	ARALNUD	3	5	7	3	VIOL sp.
	ROSAACI	2				IMPECAP.
	CORNCAN	2	1		2	LYSOCIL
	DIERLON	30	7		70	ACTA sp.
	Grass sp.	3	2	7	3	PTERAQU
	FRAGVIR	2	2	3	2	LATH sp.
	SYMPMAC	6	5	25		COPTTRI
	AQUICAN	2	1			ANEMCAN
	CORYCOR	2	7		3	TRIFRA.
	PRUNVIR	3				AMPHBRA.
	VIBURAF	3				
	RUBUPUB	5	2	5	4	
	PETAFRI	2	1			
	TARAOFF	1				
	CARECAS	1				
	MAIACAN	1	1	1	2	
	litter	70	80	80	70	
	TRILCER		1			
	GALI ASP		1		1	
	SYMPLAT		1			
	LACT sp.		2			
	EQUISYL		<1			
	PYROASA		1			
	VACCANG			2		
	LONICAN			1		
	BOTRVIR			1		
	CORNSTO			2	3	
	moss			2.		
	VACCANG				5	
	PYROASA				1	
	ROSAACI				1	
	VICIA sp.				1	
	PWD				2.	

Species Collection and Identification

Sample #	Species & Habitat Description	Density, Count, Phenology	Photos	Identified By:	Final ID

Notes:

pg 3

Detailed Vegetation Survey Form – Vegetation Community

Client & Project: NG – RRP
Site #: Plot 7 Observers: IK, RH

Date: July 19
Time:
Ecosite: B055
Slope (%): 14°
Aspect: W

Easting: Wpt 16 ≈ WPW18
Northing:
Photos: IMG_0511 – 13

Plant Community: Rocky outcrop in mixedwood
Notes & Description:

Rocky outcrop w low & dwarf shrub within deciduous forest; plot surrounded by PINUSTR, PICEGLA, BETUPAP

Site and Terrain Characteristics (Circle)

Canopy Height	Sub-canopy	Structural Stage	Topographic Feature	
< 2 m	< 2 m	Sparse/bryoid	Lacustrine	Cliff
2-5 m	2-5 m	Grass/herb	Riverine	Talus
5-10 m	(5-10 m)	(Shrub)	Bottomland	Crevice/Cave
(10-15 m)	10-15 m	Young seral	Terrace	Alvar
15-20 m	15-20 m	Mid seral	Valley Slope	(Rockland)
> 20 m	> 20 m	(Mature)	Tableland	Beach/Bar
		Old-growth	Roll Upland	Sand Dune
				Bluff

Vegetation & Substrate Data (10 x 10 m)

7-10 Tree Canopy ~~(>5m)~~ %	10	Forb %	10	Rock %	50
5-7 Tree Subcanopy ~~(>5m)~~ %	15	Graminoid %	10	Soil %	Ø
0-5 Tree Shrub ~~(<2m)~~ %	10	Moss %	5	Litter %	10
Low Shrub (0.5-2m) %	20	Surface Lichen %	20	DWD %	5
Dwarf Shrub (<0.5m) %	10	Arboreal Lichen %	T	Water %	Ø
Organic Depth (cm)	Ø				

Organic Type: LFH: Mor Moder Mull O: Fibric Mesic Humic
Wetland Class: Bog Fen Swamp Marsh Pond (N/A) Upper Soil Texture: 999

Tree and Shrub Layer Percent Cover (10 x 10 m)

Species	Can	Sub	Tall	Low	Species	Can	Sub	Tall	Low
PINUSTR	10	5		5					
ACERUB.			5	5					
BETUPAP		5	5	5					
PICEGLA	1	5							
CORYCOR.				5					
					TOTAL				

Detailed Vegetation Survey Form – Stand Characteristics

Client & Project: NG-RRP

Site #: Plot 7 Observers: IK, RH

Prism Sweep at Plot Centre

Prism Factor: 2

Species	Tally	Basal Area (Tally * Prism Factor)
TOTAL		
Snags		

Stand Composition	BA

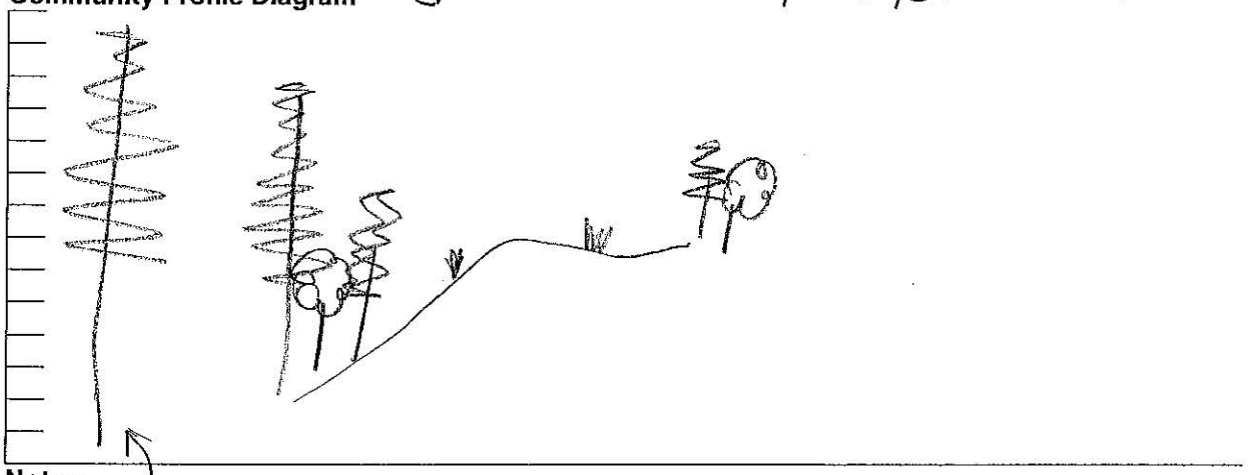
Size Class Analysis	R	<10	R	10-24		25-50		>50
Standing Snags	N	<10	N	10-24		25-50		>50
Deadfall/Logs	R	<10	R	10-24		25-50		>50

Tree and Snag Data (Optional) (10 x 10 m)

Species	DBH (cm)	Height (m)	Age (yr)	Count
PINUSTR	15.5 ; 17.5	10 m		
PINUSTR	43	16m.	≥75 yo	

just outside plot ← PINUSTR

Community Profile Diagram just out: 43 DBH, ≥75 yo, PINUSTR.



Notes:

Detailed Vegetation Survey Form – Plant Community

Client & Project: NG-RRP

Site #: Plot 7 Observers: IK, RH

Ground Cover (Grasses, Sedges, Forbs, Horsetails, Ferns, Dwarf Shrubs, Mosses, Lichens)

Data collected from four 1 x 1 subplots within 10 x 10 m plot.

coll	Species	Percent Cover				Additional Species Outside of Plots
		Plot 1	Plot 2	Plot 3	Plot 4	
	RUBUPA	5	3		8	~~CORYSEM~~
	VACCANG	25				~~WOODILV~~
	DANTSPI	5	3	5	10	orchid sp.
	DICHKAN	3				ELYMREP.
	AGROSCA	2				
	ROSAACI	3				
	MELALIN	1	1			
	MAIACAN	2	3	2	1	
	ACER RUB	1	2		1	
	DICH sp.	1		2		
	moss	25	5	25	7	
	lichen	15	1	50	30	
	rock	5	6	25	50	
	litter	9	3			
	PTERAQU		30			
	VACCMYR		10			
	ARALNUD		7			
	SYMPMAC		25			
	DIERLON		7			
	DWD		10			
	AMEL sp		3			
	WOODILV			4		
	CAREPRO				1	
	POTEREC				2	
	CORYSEM				1	
	FRAGVIR				1	

Species Collection and Identification

Sample #	Species & Habitat Description	Density, Count, Phenology	Photos	Identified By:	Final ID

Notes:

pg 3

Detailed Vegetation Survey Form – Vegetation Community

Client & Project: NG-RRP
Site #: Plot 8 Observers: IK, RH

Date: July 19
Time:
Ecosite: B055
Slope (%): 10
Aspect: N

Easting: wpt 017 ± WPW19
Northing:
Photos: IMG_0513?

Plant Community: Rocky outcrop in deciduous forest.
Notes & Description:

Rocky outcrop –
surrounding forest: PICEGLA, BETUPAP
main forest community mostly POPUTRE

Site and Terrain Characteristics (Circle)

Canopy Height	Sub-canopy	Structural Stage	Topographic Feature	
< 2 m	< 2 m	Sparse/bryoid	Lacustrine	Cliff
2-5 m	2-5 m	Grass/herb	Riverine	Talus
5-10 m	5-10 m	Shrub	Bottomland	Crevice/Cave
10-15 m	10-15 m	Young seral	Terrace	Alvar
15-20 m	15-20 m	Mid seral	Valley Slope	Rockland
> 20 m	> 20 m	Mature	Tableland	~~Beach/Bar~~
		Old-growth	Roll Upland	Sand Dune
				Bluff

Vegetation & Substrate Data (10 x 10 m)

12 m	Tree Canopy ~~(>5m)~~ %	7	Forb %	10	Rock %	10
5-12	Tree Subcanopy ~~(>5m)~~ %	10	Graminoid %	20	Soil %	0
2-5	Tree Shrub ~~(<2m)~~ %	10	Moss %	10	Litter %	5
	Low Shrub (0.5-2m) %	15	Surface Lichen %	10	DWD %	6
	Dwarf Shrub (<0.5m) %	20	Arboreal Lichen %	T	Water %	0
	Organic Depth (cm)	0				

Organic Type: LFH: Mor Moder Mull O: Fibric Mesic Humic
Wetland Class: Bog Fen Swamp Marsh Pond (N/A) Upper Soil Texture: 999

Tree and Shrub Layer Percent Cover (10 x 10 m)

Species	Can	Sub	Tall	Low	Species	Can	Sub	Tall	Low
PICEGLA		2	2	3					
ACERUB	5	2	1	2					
BETUPAP	2	5							
ANEL sp.			2	3					
Salix sp.			2	3					
PINURUB	1								
					TOTAL				

pg 1

Detailed Vegetation Survey Form – Stand Characteristics

Client & Project: Plot 8
Site #: NG-RRP Observers: IK, RH

Prism Sweep at Plot Centre
Prism Factor
2

Species	Tally	Basal Area (Tally * Prism Factor)
TOTAL		
Snags		

Stand Composition	BA

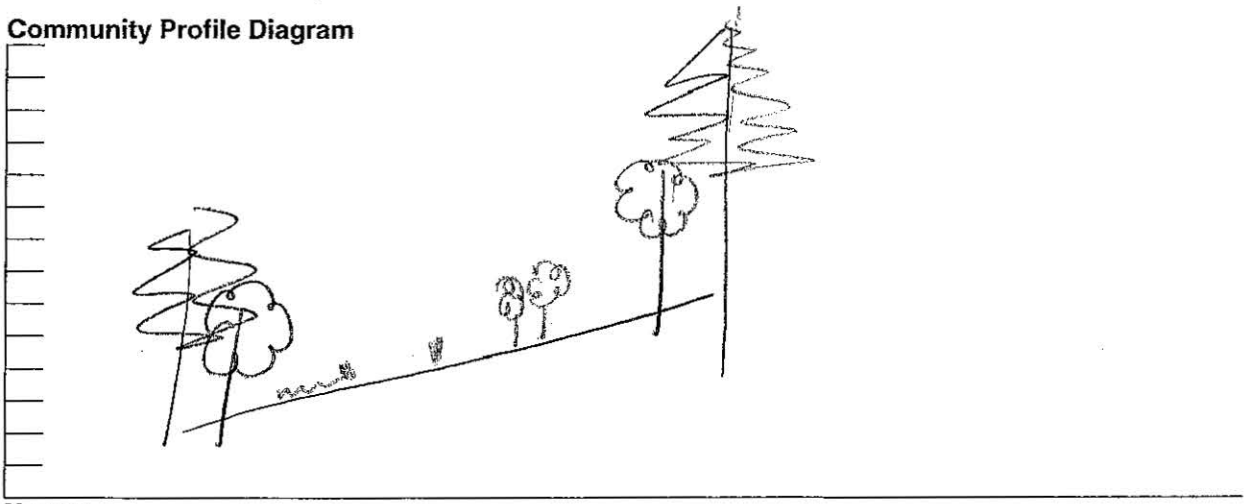
Size Class Analysis	R	<10	R	10-24		25-50		>50
Standing Snags	R	<10	—	10-24		25-50		>50
Deadfall/Logs	R	<10	R	10-24		25-50		>50

Tree and Snag Data (Optional) (10 x 10 m)

Species	DBH (cm)	Height (m)	Age (yr)	Count

Community Profile Diagram

12m



Notes:

Detailed Vegetation Survey Form – Plant Community

Client & Project: NG-RRP

Site #: Plot 8 Observers: IK, RH

Ground Cover (Grasses, Sedges, Forbs, Horsetails, Ferns, Dwarf Shrubs, Mosses, Lichens)

Data collected from four 1 x 1 subplots within 10 x 10 m plot.

coll	Species	Percent Cover				Additional Species Outside of Plots
		Plot 1	Plot 2	Plot 3	Plot 4	
	POLYCIL	1			1	ACTA sp.
	DIANSPI	20	7			PINUSTR (GC)
	AGROSCA	2				CORNCAN
	ACERRUB	2		<1	10	BROMCIL
	AMEL sp.	5	3		3	PTERAQU
	MAIACAN	5	10		8	VIBURAF
	CAREPRO	1	1	5		
	VACCANG	20	60			
	moss	15	40	15	5	
	lichen	3	2	0	1	
	rock	5	3	2	3	
	DWD	1		10	7	
	litter	4	2	3		
	TRIEBOR		2			
	MELALIN		1			
	Grass sp.		1	1	3	
	VACCMYR			70	3	
	DIERLON			3	20	
	SYMPMAC			3		
	ARALNUD			3		
	RIBEGLA				7	
	DRYOXAR				3	
	ARALHIS				1	
	RUBUIDA				5	
	FRAGVIR				2	

Species Collection and Identification

Sample #	Species & Habitat Description	Density, Count, Phenology	Photos	Identified By:	Final ID

Notes:

pg 3

Detailed Vegetation Survey Form – Vegetation Community

Client & Project: NG-RRP
Site #: Plot 9 Observers: IK, RH

Date: July 20
Time:
Ecosite: B055/B088
Slope (%):
Aspect: Ø

Easting: wpt 18 & WPW43.
Northing:
Photos: IMG_0526

Plant Community: Deciduous Forest
Notes & Description:

Young POPUTRE stand w BETUPAP
Understory somewhat open w abundant open litter cover on ground

Site and Terrain Characteristics (Circle)

Canopy Height	Sub-canopy	Structural Stage	Topographic Feature	
< 2 m	< 2 m	Sparse/bryoid	Lacustrine	Cliff
2-5 m	2-5 m	Grass/herb	Riverine	Talus
5-10 m	5-10 m	Shrub	Bottomland	Crevice/Cave
10-15 m	10-15 m	(Young seral)	(Terrace)	Alvar
(15-20 m)	15-20 m	Mid seral	Valley Slope	Rockland
> 20 m	> 20 m	Mature	Tableland	Beach/Bar
		Old-growth	Roll Upland	Sand Dune
				Bluff

Vegetation & Substrate Data (10 x 10 m)

16-18 Tree Canopy ~~(>5m)~~ %: 65
5-16 Tree Subcanopy ~~(>5m)~~ %: 40
2-5 Tree Shrub ~~(<2m)~~ %: 5
Low Shrub (0.5-2m) %: 20
Dwarf Shrub (<0.5m) %: 2
Organic Depth (cm): Ø

Forb %: 50
Graminoid %: 3
Moss %: 3
Surface Lichen %: Ø
Arboreal Lichen %: T

Rock %: Ø
Soil %: Ø
Litter %: 90
DWD %: 7
Water %: Ø

Organic Type: LFH: Mor Moder Mull O: Fibric Mesic Humic
Wetland Class: Bog Fen Swamp Marsh Pond (N/A)
Upper Soil Texture: 999

Tree and Shrub Layer Percent Cover (10 x 10 m)

Species	Can	Sub	Tall	Low	Species	Can	Sub	Tall	Low
POPUTRE	50	30			AMELsp.			2	5
BETUPAP	20	5							
CORYCOR			20	20					
ACERSPI		3	5	15					
VIBURAF			1	4					
ACERRUB	5	3		5					
ABIEBA		3	1	1					
CORNSTO				10	TOTAL				

Detailed Vegetation Survey Form – Stand Characteristics

Client & Project: NG -RRP
Site #: Plot 9 Observers: IK, RH

Prism Sweep at Plot Centre
Prism Factor
2

Species	Tally	Basal Area (Tally * Prism Factor)
POPUTRE	~~IIII~~	10
BETUPAP	IIII	8
ACERRUB	I	2
ABIEBAL	I	2
TOTAL		22
Snags		

Stand Composition	BA
POPUTRE > BETUPAP > ACERRUB > ABIEBAL	22

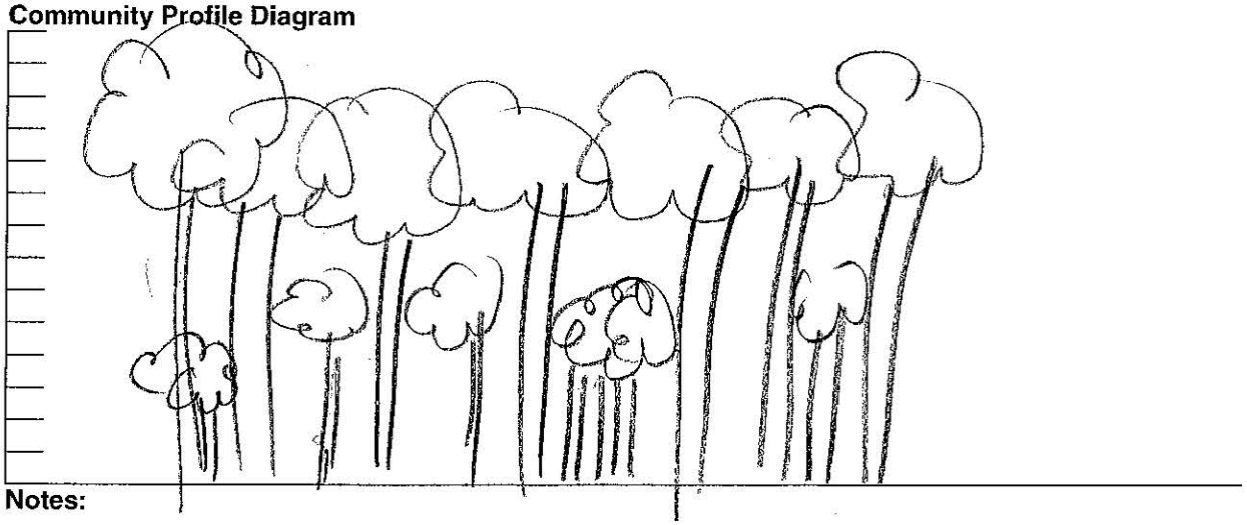
Size Class Analysis	A	<10	A	10-24		25-50		>50
Standing Snags	R	<10	R	10-24		25-50		>50
Deadfall/Logs	0	<10	R	10-24		25-50		>50

Tree and Snag Data (Optional) (10 x 10 m)

Species	DBH (cm)	Height (m)	Age (yr)	Count (>10)
ACERRUB	10.4; 13.1			II
BETUPAP	18; 19.5; 19.2			~~IIII~~ I
	20; 24.3			
"	25.6	16m	>85y.	
POPUTRE	12.9; 10.2;			
	10.3			

Community Profile Diagram

16m



Notes:

pg2.

Detailed Vegetation Survey Form – Plant Community

Client & Project: NG-RRP

Site #: Plot 9 Observers: IK, RH

Ground Cover (Grasses, Sedges, Forbs, Horsetails, Ferns, Dwarf Shrubs, Mosses, Lichens)

Data collected from four 1 x 1 subplots within 10 x 10 m plot.

coll	Species	Percent Cover				Additional Species Outside of Plots
		Plot 1	Plot 2	Plot 3	Plot 4	
	AMELsp.	5				LYCOCLA
	SYMPNAC	7	5	3	5	PTERAQU
	STREROS	3	2	2	3	ROSA ACI
	TRIEBOR	1				RHAMALN
	ACERRUB	2	1	1		
	RUBUPUB	3	3		3	
	CORYCOR	3				
	GALIBOR	1	1	2		
	MAIACAN	2	3		2	
	ARALNUD	3	5		2	
	VIOL sp.	1	2		1	
	ACTA sp.	2				
	grass sp.	1	<1	1	2	
	LATH sp.	1				
	HEPAANE	1	2	3	2	
	litter	95	90	95	90	
	moss	2			1	
	DWD	1	2	2	1	
	LONICAN		3			
	UVUL GRA		2	3	2	
	AQUICAN		1			
	VIBURAF			3	2	
	CORNSTO			2	2	
	SANIMAR			2	2	
	CLINBOR			1		
	PRENsp			1		
	OSMOCLA				1	
	GALIASP				2	
	FRAGVIR				1	

Species Collection and Identification

Sample #	Species & Habitat Description	Density, Count, Phenology	Photos	Identified By:	Final ID

Notes:

pg 3

Detailed Vegetation Survey Form – Vegetation Community

Client & Project: NG-RRP
Site #: Plot 10 Observers: IK, RH

Date: July 20
Time:
Ecosite: B055
Slope (%): 2%
Aspect: E

Easting: wpt 019 & WPW16
Northing:
Photos: IMG_0536

Plant Community: Rocky outcrop in mixedwood forest.
Notes & Description:

Rocky outcrop.
Surrounding forest: PICEGLA, BETUPAP, PINUBAN, POPUTRE, PICEMAR, PINUSTR & PICEGLA.

Site and Terrain Characteristics (Circle)

Canopy Height	Sub-canopy	Structural Stage	Topographic Feature	
< 2 m	< 2 m	Sparse/bryoid	Lacustrine	Cliff
2-5 m	2-5 m	Grass/herb	Riverine	Talus
(5-10 m)	(5-10 m)	(Shrub)	Bottomland	Crevice/Cave
10-15 m	10-15 m	Young seral	Terrace	(Alvar)
15-20 m	15-20 m	Mid seral	Valley Slope	(Rockland)
> 20 m	> 20 m	Mature	Tableland	Beach/Bar
		Old-growth	Roll Upland	Sand Dune
				Bluff

Vegetation & Substrate Data (10 x 10 m)

8-10m Tree Canopy ~~(>5m)~~ %	10	Forb %	3	Rock %	50
5-8m Tree Subcanopy ~~(>5m)~~ %	5	Graminoid %	10	Soil %	0
2-5m Tree Shrub ~~(<2m)~~ %	3	Moss %	5	Litter %	1
Low Shrub (0.5-2m) %	15	Surface Lichen %	40	DWD %	2
Dwarf Shrub (<0.5m) %	20	Arboreal Lichen %	~~0~~	Water %	0
Organic Depth (cm)	0				

Organic Type: LFH: Mor Moder Mull O: Fibric Mesic Humic
Wetland Class: Bog Fen Swamp Marsh Pond N/A Upper Soil Texture: 999

Tree and Shrub Layer Percent Cover (10 x 10 m)

Species	Can	Sub	Tall	Low	Species	Can	Sub	Tall	Low
PICEGLA			1	1					
BETUPAP	5								
ANEL sp.			1	6					
PINUBAN			1	2					
ACERRUB.				3					
POPUTRE	5	5							
PINUSTR				2					
					TOTAL				

pg 1

Detailed Vegetation Survey Form – Stand Characteristics

Client & Project: NG-RRP

Site #: Plot 10 Observers: IK, BH.

Prism Sweep at Plot Centre

Prism Factor: 2

Species	Tally	Basal Area (Tally * Prism Factor)
TOTAL		
Snags		

Stand Composition	BA

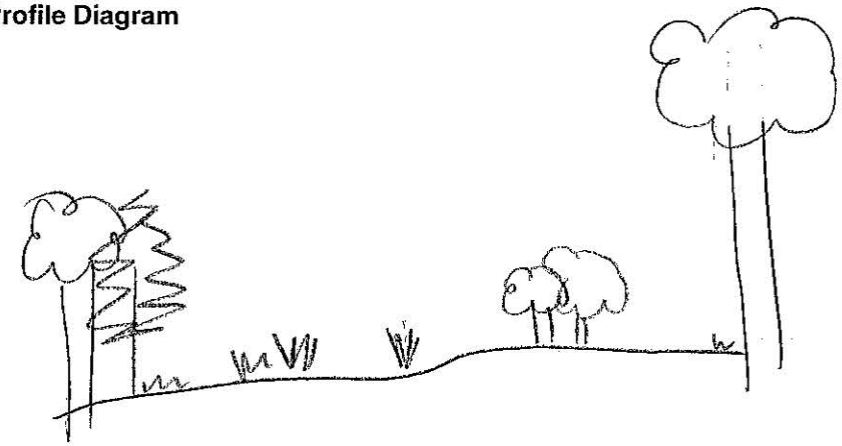
Size Class Analysis	R	<10	R	10-24		25-50		>50
Standing Snags	N	<10	N	10-24		25-50		>50
Deadfall/Logs	R	<10	R	10-24		25-50		>50

Tree and Snag Data (Optional) (10 x 10 m)

Species	DBH (cm)	Height (m)	Age (yr)	Count
BETUPAP	10			
POPUTRE	10	10		

Community Profile Diagram

10m



Notes:

pg 2.

Detailed Vegetation Survey Form – Plant Community

Client & Project: NG-RRP.
Site #: Plot 10 Observers: IK, RH

Ground Cover (Grasses, Sedges, Forbs, Horsetails, Ferns, Dwarf Shrubs, Mosses, Lichens)

Data collected from four 1 x 1 subplots within 10 x 10 m plot.

coll	Species	Percent Cover				Additional Species Outside of Plots
		Plot 1	Plot 2	Plot 3	Plot 4	
	DANTSPI	15		5	3	
	MELALIN	1				
	DIERLON	5		5		
	VACCANG	2	80	10	2	
	rock	60		40	15	
	lichen	18		50	80	
	moss			10	2	
	liter	3				
	PTERAQU		5			
	ARALNUD		3			
	AMEL sp.		12	10		
	MAIACAN			2	1	
	AGROSCA				1	
	RUBUIDA				1	
	VACCMYR				2	
	HIER sp.				1	
	ACERUB				<1	
	DICHXAN				3	
	Brit soldier lichen				<1	

Species Collection and Identification

Sample #	Species & Habitat Description	Density, Count, Phenology	Photos	Identified By:	Final ID

Notes:

pg 5

Detailed Vegetation Survey Form – Vegetation Community

Client & Project: NG-RRP
Site #: Plot 11 Observers: IK, RH

Date: July 20
Time:
Ecosite: B055
Slope (%):
Aspect: Ø

Easting: wpt 20 ≈ WPW41
Northing:
Photos:

Plant Community: Deciduous forest
Notes & Description:

Young stand POPUBAL >> FRAXNIG.

Site and Terrain Characteristics (Circle)

Canopy Height	Sub-canopy	Structural Stage	Topographic Feature	
< 2 m	< 2 m	Sparse/bryoid	Lacustrine	Cliff
2-5 m	2-5 m	Grass/herb	Riverine	Talus
(5-10 m)	(5-10 m)	Shrub	(Bottomland)	Crevice/Cave
10-15 m	10-15 m	(Young seral)	Terrace	Alvar
15-20 m	15-20 m	Mid seral	Valley Slope	Rockland
> 20 m	> 20 m	Mature	Tableland	Beach/Bar
		Old-growth	Roll Upland	Sand Dune
				Bluff

Vegetation & Substrate Data (10 x 10 m)

8-10 Tree Canopy ~~(>5m) %~~	60	Forb %	60	Rock %	Ø
5-8 Tree Subcanopy ~~(>5m) %~~	45	Graminoid %	2	Soil %	Ø
2-5 Tree Shrub ~~(<2m)~~ %	15	Moss %	3	Litter %	70
Low Shrub (0.5-2m) %	3	Surface Lichen %	Ø	DWD %	7
Dwarf Shrub (<0.5m) %	Ø	Arboreal Lichen %	T	Water %	Ø
Organic Depth (cm)	Ø				

Organic Type: LFH: Mor Moder Mull O: Fibric Mesic Humic
Wetland Class: Bog Fen Swamp Marsh Pond N/A Upper Soil Texture: 999

Tree and Shrub Layer Percent Cover (10 x 10 m)

Species	Can	Sub	Tall	Low	Species	Can	Sub	Tall	Low
POPUBAL	60	20	5						
ALNUINC		10	8	2					
FRAXNIG	10	15	4	1					
					TOTAL				

pg 1

Detailed Vegetation Survey Form – Stand Characteristics

Client & Project: NG-RRP

Site #: Plot 11 Observers: IK, RH

Prism Sweep at Plot Centre

Prism Factor

2

Species	Tally	Basal Area (Tally * Prism Factor)
POPUBAL	~~HH~~	10
FRAXNIG	1	2
TOTAL		12
Snags		

Stand Composition	BA
POPUBAL >> FRAXNIG	12

Size Class Analysis	A	<10	10-24	25-50	>50
Standing Snags	~~A~~	<10	10-24	25-50	>50
Deadfall/Logs	0	<10	10-24	25-50	>50

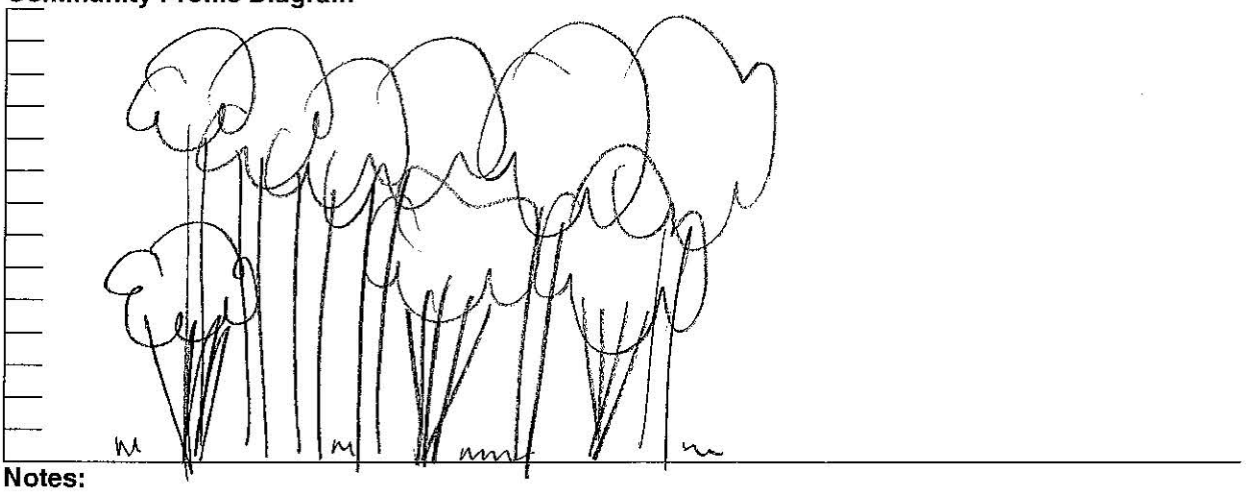
Tree and Snag Data (Optional) (10 x 10 m)

none >10cm DBH

Species	DBH (cm)	Height (m)	Age (yr)	Count

Community Profile Diagram

10m



Notes:

pg 2

Detailed Vegetation Survey Form – Plant Community

Client & Project: NG-RRP

Site #: Plot 11 Observers: IK, RH

Ground Cover (Grasses, Sedges, Forbs, Horsetails, Ferns, Dwarf Shrubs, Mosses, Lichens)

Data collected from four 1 x 1 subplots within 10 x 10 m plot.

coll	Species	Percent Cover				Additional Species Outside of Plots
		Plot 1	Plot 2	Plot 3	Plot 4	
	AQUICAN	2	1			RIBEHIR
	RUBUIDA	5				VIBURAF
	RUBUPUB	3	3	8	5	PRENsp.
	UVULGRA	4	7	2	2	PETAFRI
	SYMPMAC	2		5		LONICAN
	ARALNUD	1	1	3	3	ABIEBAL
	ATHYFIL	10				BROMCIL
	FRAGVIR	2	2	1		MATSTR
	EQUISYL	1				TRILCER
	GALTRI	1				VIBUTRI
	MAIACAN	1	1	2	1	
	OSMOCLA	1	1		1	
	Grass sp.	1	1			
	RIBETRI	1				
	litter	80	80	70	70	
	GALIBOR		1		1	
	RIBEGLA		2		1	
	EQUIPRA		1			
	SANIMAR		1	1	2	
	MITENUD		2	2	1	
	moss		3	10		
	DWD		3	10	15	
	ASARCAN			3	1	
	ACERSPI			5	2	
	STREROS			2	1	
	ROSAAC1				3	
	ACTA sp				1	
	PRUNVIR				2	
	ILEXVER				1	

Species Collection and Identification

Sample #	Species & Habitat Description	Density, Count, Phenology	Photos	Identified By:	Final ID

Notes:

pg 3

Detailed Vegetation Survey Form – Vegetation Community

Client & Project: NG-RRP
Site #: Plot 12 Observers: IK, RH

Date: July 21
Time:
Ecosite: B088
Slope (%): 2
Aspect: N

Easting: wpt 01 & WPW06
Northing:
Photos: IMG-0572 (058)

Plant Community: Rocky outcrop
Notes & Description:

Rocky outcrop & conifer trees w/in larger deciduous fores.
POPUTRE, BETUPAP, PINUBAN, PICEGLA.

Site and Terrain Characteristics (Circle)

Canopy Height	Sub-canopy	Structural Stage	Topographic Feature	
< 2 m	< 2 m	Sparse/bryoid	Lacustrine	Cliff
2-5 m	2-5 m	Grass/herb	Riverine	Talus
(5-10 m)	(5-10 m)	(Shrub)	Bottomland	Crevice/Cave
10-15 m	10-15 m	Young seral	Terrace	Alvar
15-20 m	15-20 m	Mid seral	Valley Slope	(Rockland)
> 20 m	> 20 m	Mature	Tableland	Beach/Bar
		Old-growth	Roll Upland	Sand Dune
				Bluff

Vegetation & Substrate Data (10 x 10 m)

9m	Tree Canopy ~~(>5m)~~ %	5	Forb %	10	Rock %	55
5-8	Tree Subcanopy ~~(>5m)~~ %	Ø	Graminoid %	10	Soil %	Ø
2-5	Tree Shrub ~~(<2m)~~ %	5	Moss %	5	Litter %	5
	Low Shrub (0.5-2m) %	15	Surface Lichen %	20	DWD %	1
	Dwarf Shrub (<0.5m) %	10	Arboreal Lichen %	Ø	Water %	Ø
	Organic Depth (cm)	Ø				

Organic Type: LFH: Mor Moder Mull O: Fibric Mesic Humic
Wetland Class: Bog Fen Swamp Marsh Pond (N/A) Upper Soil Texture: 999

Tree and Shrub Layer Percent Cover (10 x 10 m)

Species	Can	Sub	Tall	Low	Species	Can	Sub	Tall	Low
PICEGLA	5								
AMELSP				7					
CORYCOR				2					
PRUNVIR			5	8					
RUBUIDA				3					
VIBURAF				1					
					TOTAL				

Pg 1

Detailed Vegetation Survey Form – Stand Characteristics

Client & Project: NG – RRP
Site #: Plot 12 Observers: IK, BH

Prism Sweep at Plot Centre
Prism Factor
2

Species	Tally	Basal Area (Tally * Prism Factor)
TOTAL		
Snags		

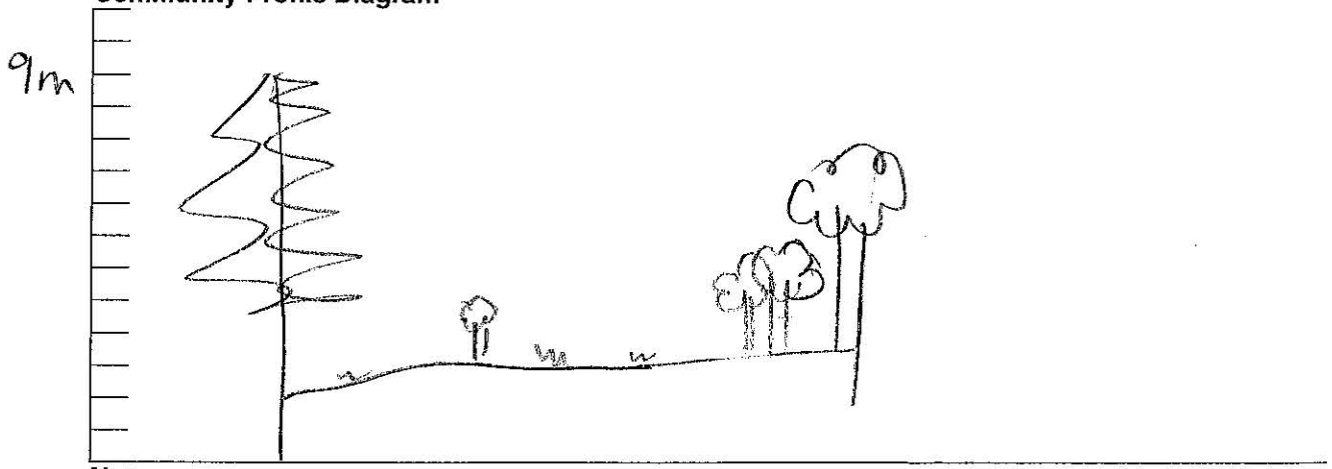
Stand Composition	BA

Size Class Analysis	R	<10	R	10-24		25-50		>50
Standing Snags	—	<10	—	10-24		25-50		>50
Deadfall/Logs	R	<10	—	10-24		25-50		>50

Tree and Snag Data (Optional) (10 x 10 m)

Species	DBH (cm)	Height (m)	Age (yr)	Count (>10)
PICEGLA	11.7	9m		1

Community Profile Diagram



Notes:

pg 2

Detailed Vegetation Survey Form – Plant Community

Client & Project: NG-RRP
Site #: Plot 12 Observers: IK, RH

Ground Cover (Grasses, Sedges, Forbs, Horsetails, Ferns, Dwarf Shrubs, Mosses, Lichens)

Data collected from four 1 x 1 subplots within 10 x 10 m plot.

coll	Species	Percent Cover				Additional Species Outside of Plots
		Plot 1	Plot 2	Plot 3	Plot 4	
	CARETEN	1				DANTSPI
	BROMINE	1		1		~~RIBEHIR~~
	RUBUIDA	5		3	5	
	ELYMREP	1		1		
	VACCANG	45			1	
	LATH sp.	1		<1		
	SYMPMAC	7		1		
	FRAGVIR	10		6	3	
	HALEDEF	1				
	LYSITHI	1		4		
	GEOCLIV	1		2	1	
	HIER sp.	<1				
	ANEL sp.	1		5	8	
	ACHIMIL	1			1	
	POLYCIL	1				
	VIOL sp.	1				
	MAIACAN	1			1	
	TRIFPRA	5				
	Grass sp.	00			3	
	PHLEPRA	1	5	2		
	rock		70	15	10	
	lichen		25	0	5	
	moss		5	8	3	
	PTERAQU			8	7	
	DIERLON			3	10	
	AQUICAN			1		
	SOLICAN			<1		
	Vetch sp.			0		
	ASARCAN			1		
	litter			2	5	
	RIBEHIR				0	
	ARALNUD				5	
	VIBURAF				10	

Species Collection and Identification

Sample #	Species & Habitat Description	Density, Count, Phenology	Photos	Identified By:	Final ID

Notes:

pg 3

Detailed Vegetation Survey Form – Vegetation Community

Client & Project: NG-RRP
Site #: Plot 13 Observers: IK, RH

Date: July 21
Time:
Ecosite: B088
Slope (%): Ø
Aspect: Ø

Easting: Wpt 22 ≈ WPW4
Northing:
Photos: IMG_0585

Plant Community: Mixedwood forest
Notes & Description:

Mid-aged ABIEBAL, POPUBAL > POPUTRE
Somewhat moist?

Site and Terrain Characteristics (Circle)

Canopy Height	Sub-canopy	Structural Stage	Topographic Feature	
< 2 m	< 2 m	Sparse/bryoid	Lacustrine	Cliff
2-5 m	2-5 m	Grass/herb	Riverine	Talus
5-10 m	(5-10 m)	Shrub	(Bottomland)	Crevice/Cave
(10-15 m)	10-15 m	(Young seral)	Terrace	Alvar
15-20 m	15-20 m	Mid seral	Valley Slope	Rockland
> 20 m	> 20 m	Mature	Tableland	Beach/Bar
		Old-growth	Roll Upland	Sand Dune
				Bluff

Vegetation & Substrate Data (10 x 10 m)

12-14 Tree Canopy ~~(>5m)~~ %	10	Forb %	70	Rock %	Ø
5-12 Tree Subcanopy ~~(>5m)~~ %	50	Graminoid %	3	Soil %	Ø
2-5 Tree Shrub ~~(<2m)~~ %	15	Moss %	5	Litter %	40
Low Shrub (0.5-2m) %	10	Surface Lichen %	Ø	DWD %	15
Dwarf Shrub (<0.5m) %	Ø	Arboreal Lichen %	T	Water %	Ø
Organic Depth (cm)	Ø				

Organic Type: LFH: Mor Moder Mull O: Fibric Mesic Humic
Wetland Class: Bog Fen Swamp Marsh Pond (N/A) Upper Soil Texture: 999

Tree and Shrub Layer Percent Cover (10 x 10 m)

Species	Can	Sub	Tall	Low	Species	Can	Sub	Tall	Low
ABIEBAL	7	5							
POPUBAL	3	40	5						
ALNUCRI			15	5					
POPUTRE	2								
PRUNVIR			2	3					
					TOTAL				

pg 1

Detailed Vegetation Survey Form – Stand Characteristics

Client & Project: NG-RRP

Site #: Plot 13 Observers: IK, RH

Prism Sweep at Plot Centre

Prism Factor

2

Species	Tally	Basal Area (Tally * Prism Factor)
POPUTRE	II	4
ABIEBAL	II	4
POPUBAL	IIII	8
TOTAL		16
Snags		

Stand Composition	BA
POPUBAL > ABIEBAL = POPUTRE	16

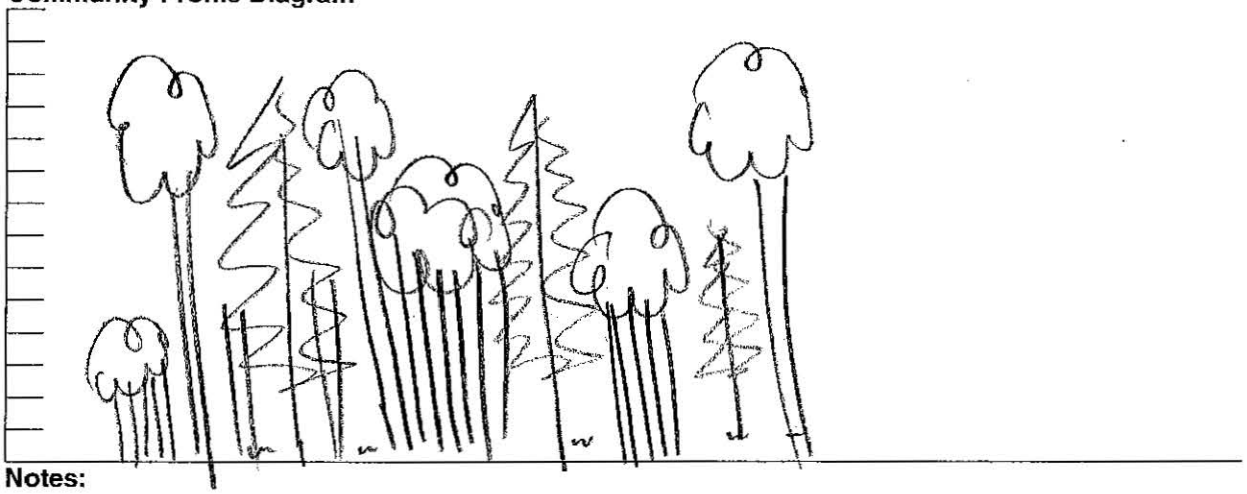
Size Class Analysis	A	<10	R	10-24	R	25-50			>50
Standing Snags	R	<10	R	10-24	—	25-50			>50
Deadfall/Logs	0	<10	R	10-24	—	25-50			>50

Tree and Snag Data (Optional) (10 x 10 m)

Species	DBH (cm)	Height (m)	Age (yr)	Count
POPUTRE	11.5			
POPUBAL	12.8			
ABIEBAL	20.5; 28.1			

Community Profile Diagram

14m



Notes:

pg 2

Detailed Vegetation Survey Form – Plant Community

Client & Project: NG-RRP

Site #: Plot 13 Observers: IK, RH

Ground Cover (Grasses, Sedges, Forbs, Horsetails, Ferns, Dwarf Shrubs, Mosses, Lichens)

Data collected from four 1 x 1 subplots within 10 x 10 m plot.

coll	Species	Percent Cover				Additional Species Outside of Plots
		Plot 1	Plot 2	Plot 3	Plot 4	
	ARALNUD	5	2	3	5	~~BOTRVIR~~
	GALIASP	2				ANEMQUI
	MITENUD	3	1	2		ASARCAN
	RUBUPUB	3	1	3	15	LYSITHI
	SYMPMAC	2		2	3	RUBUIDA
	FRAGVIR	2	5	3	3	IMPECAP
	PETAFRI	1			3	DRYOCAR
	AQUICAN	2		1		MERTPAN
	HALEDEL	1				ACTA sp.
	SOLIGIG	2	2			RIBETRI
	LACT sp.	1	2		3	CORNSTO
	STREROS	2		2		ROSAACI
	GALIBOR	1				TRILCER
	PRENsp.	1				CYPRipedium sp.
	EQUIPRA	1	1		2	Rhizomnrum sp
	CORNSTO	3				VIBUNUD
	ALNUINC	4				
	Grass sp.	2	1	1	5	
	MOSS	3		15	5	
	DWD	3	1	8	10	
	litter	60	50	75	40	
	CAREGRA		20		1	
	PRUNVUL		3			
	SANIMAR		10			
	GALIBOR		1			
	GEUMALE		2			
	BROMCIL		1		1	
	Vetch sp.		1			
	PRUNVIR		3			
	ABIEBAL		1			
	TARAOFF		1			
	TRIFPRA		1			
	RIBEHIR			3		
	RIBEGLA			3		
	CORNCAN			2		
	RHAMALN			5	3	

Species Collection and Identification

Sample #	Species & Habitat Description	Density, Count, Phenology	Photos	Identified By:	Final ID
		GALITRI	1		
		ACERRUB	1		
		CIRS sp.		1	
		UVULGRA		2	
		BOTRVIR		1	
		SYMP sp.		2	
		CICUMAC		3	

Notes:

Detailed Vegetation Survey Form – Vegetation Community

Client & Project: NG-RRP
Site #: Plot 14 Observers: IK, RH

Date: July 21
Time:
Ecosite: B088
Slope (%): 1
Aspect: N

Easting: Wpt 023 ≈ WPW03
Northing:
Photos: ING_0601

Plant Community: Rocky outcrop
Notes & Description:

Rocky outcrop in mostly deciduous forest; Outcrop surrounded by conifer trees. PINUBAN, PINUSTR, PICEGLA, BETUPAP.

Site and Terrain Characteristics (Circle)

Canopy Height	Sub-canopy	Structural Stage	Topographic Feature	
< 2 m	< 2 m	Sparse/bryoid	Lacustrine	Cliff
2-5 m	2-5 m	Grass/herb	Riverine	Talus
5-10 m	5-10 m	Shrub	Bottomland	Crevice/Cave
10-15 m	(10-15 m)	Young seral	Terrace	Alvar
(15-20 m)	15-20 m	Mid seral	Valley Slope	(Rockland)
> 20 m	> 20 m	(Mature)	Tableland	Beach/Bar
		Old-growth	Roll Upland	Sand Dune
				Bluff

Vegetation & Substrate Data (10 x 10 m)

15-18 Tree Canopy ~~(>5m)~~ %	8	Forb %	7	Rock %	10
5-15 Tree Subcanopy ~~(>5m)~~ %	15	Graminoid %	15	Soil %	0
2-5 Tree Shrub ~~(<2m)~~ %	2	Moss %	5	Litter %	5
Low Shrub (0.5-2m) %	10	Surface Lichen %	40	DWD %	2
Dwarf Shrub (<0.5m) %	20	Arboreal Lichen %	0	Water %	0
Organic Depth (cm)	0				

Organic Type: LFH: Mor Moder Mull O: Fibric Mesic Humic
Wetland Class: Bog Fen Swamp Marsh Pond (N/A) Upper Soil Texture: 999

Tree and Shrub Layer Percent Cover (10 x 10 m)

Species	Can	Sub	Tall	Low	Species	Can	Sub	Tall	Low
PINUBAN		15	1	1					
PINUSTR	8								
AMEL sp.				3					
					TOTAL				

pg 1

Detailed Vegetation Survey Form – Stand Characteristics

Client & Project: NG-RRP
Site #: Plot 14 Observers: IK, BH

Prism Sweep at Plot Centre
Prism Factor
2

Species	Tally	Basal Area (Tally * Prism Factor)
PINUSTR	I	2
PINUBAN	III	6
TOTAL		8
Snags		

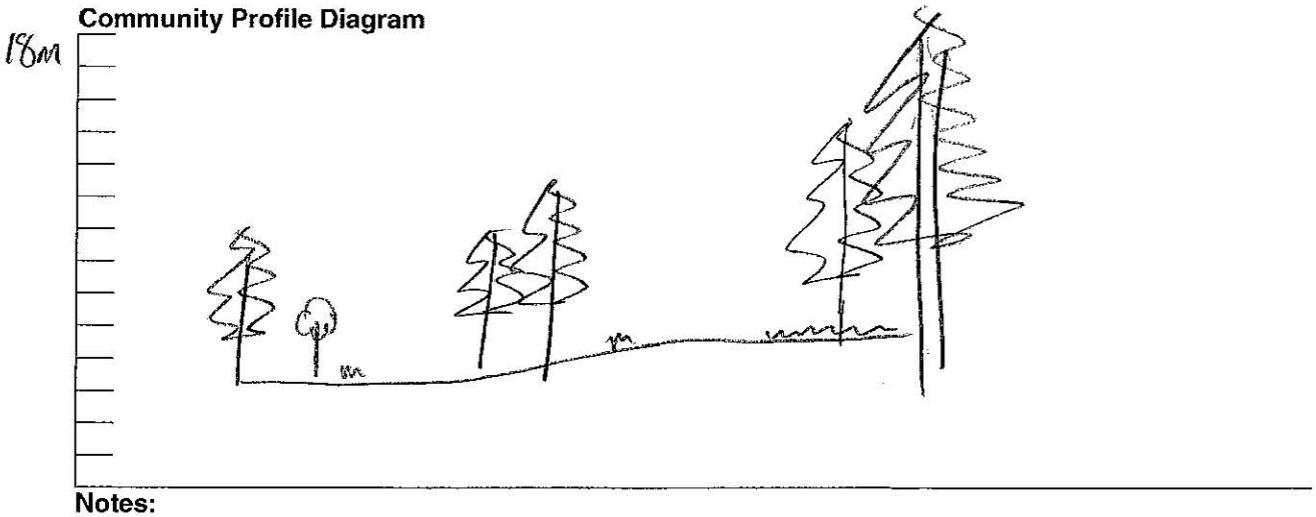
Stand Composition	BA
PINUBAN > PINUSTR	8

Size Class Analysis	O	<10	R	10-24	N	25-50	R	>50
Standing Snags	N	<10	N	10-24	N	25-50	N	>50
Deadfall/Logs	R	<10	N	10-24	N	25-50	N	>50

Tree and Snag Data (Optional) (10 x 10 m)

Species	DBH (cm)	Height (m)	Age (yr)	Count (>10)
PINUBAN	15.7; 13.5; 12;			~~IIII~~ I
	15.4; 12; 12.1			
PINUSTR.	57.2	18m	>80 yo	1

Community Profile Diagram



Notes:

pg 2.

Detailed Vegetation Survey Form – Plant Community

Client & Project: NGRRP

Site #: Plot 14 Observers: IK, BH

Ground Cover (Grasses, Sedges, Forbs, Horsetails, Ferns, Dwarf Shrubs, Mosses, Lichens)

Data collected from four 1 x 1 subplots within 10 x 10 m plot.

coll	Species	Percent Cover				Additional Species Outside of Plots
		Plot 1	Plot 2	Plot 3	Plot 4	
	ELYMREP	1			1	ROSAACI
	DANTSPI	3		2	3	AMEL_sp.
	DIERLON	10		2	7	LATH sp.
	VACCANG	15	70			
	MAIACAN	2	5	1	2	
	ANTENEG	2				
	PICEGLA	1		1		
	DICHXAN	2	2			
	rock	5		25	3	
	lichen	10	5	15	10	
	litter	10		15	20	
	moss	8	15	15	20	
	SYMPMAC		4			
	Vetch		1			
	FRAGVIR		2			
	EPILANG		2			
	BROMINE		2			
	DWD		3			
	ARCTUVA			10		
	VACCMYR			1	50	
	RUBIIDA			1		
	APOCCAN				2	

Species Collection and Identification

Sample #	Species & Habitat Description	Density, Count, Phenology	Photos	Identified By:	Final ID

Notes:

pg 3

Detailed Vegetation Survey Form – Vegetation Community

Client & Project: NG-RRP
Site #: Plot 15 Observers: IK, RH

Date: July 21
Time:
Ecosite: B088
Slope (%):
Aspect: Ø

Easting: wpt 24 & WPW55
Northing:
Photos: IMG_0610-11

Plant Community: Mixedwood forest
Notes & Description:

Young mixedwood forest w abund. <10 DBH.
POPUTRE, ABIEBAL, PICEGLA, POPUBAL, FRAXNIG.

Site and Terrain Characteristics (Circle)

Canopy Height	Sub-canopy	Structural Stage	Topographic Feature	
< 2 m	< 2 m	Sparse/bryoid	Lacustrine	Cliff
2-5 m	2-5 m	Grass/herb	Riverine	Talus
5-10 m	(5-10 m)	Shrub	Bottomland	Crevice/Cave
(10-15 m)	10-15 m	(Young seral)	(Terrace)	Alvar
15-20 m	15-20 m	(Mid seral)	Valley Slope	Rockland
> 20 m	> 20 m	Mature	Tableland	Beach/Bar
		Old-growth	Roll Upland	Sand Dune
				Bluff

Vegetation & Substrate Data (10 x 10 m)

12-15 Tree Canopy ~~(>5m)~~ %	15	Forb %	60	Rock %	Ø
5-12 Tree Subcanopy ~~(>5m)~~ %	25	Graminoid %	8	Soil %	Ø
2-5 Tree Shrub ~~(<2m)~~ %	30	Moss %	15	Litter %	60
Low Shrub (0.5-2m) %	10	Surface Lichen %	Ø	DWD %	5
Dwarf Shrub (<0.5m) %	Ø	Arboreal Lichen %	T	Water %	Ø
Organic Depth (cm)	Ø				

Organic Type: LFH: Mor Moder Mull O: Fibric Mesic Humic
Wetland Class: Bog Fen Swamp Marsh Pond (N/A) Upper Soil Texture: 999

Tree and Shrub Layer Percent Cover (10 x 10 m)

Species	Can	Sub	Tall	Low	Species	Can	Sub	Tall	Low
ABIEBAL	5								
POPUBAL		5	20						
POPUTRE	7	10							
ALNUINC		5	15	5					
FRAXNIG		2	2						
AMELsp.			2	5					
SALI sp.		2							
					TOTAL				

Detailed Vegetation Survey Form – Stand Characteristics

Client & Project: NG-IRRP

Site #: Plot 15 Observers: IK, BH

Prism Sweep at Plot Centre

Prism Factor: 2

Species	Tally	Basal Area (Tally * Prism Factor)
ABIEBAL	1	2
POPUBAL	11	4
TOTAL		6
Snags		

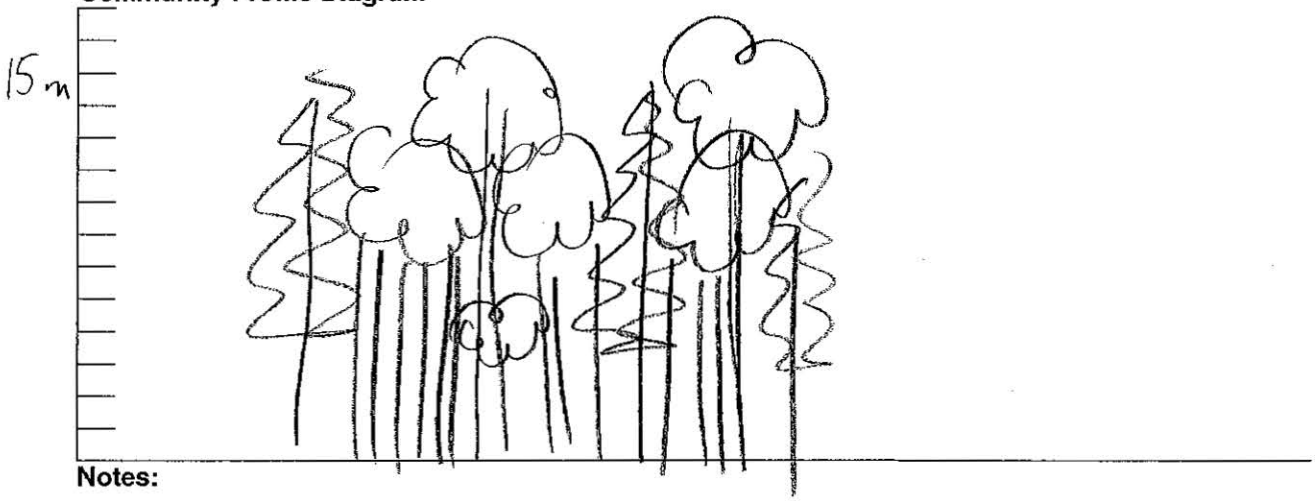
Stand Composition	BA
POPUBAL > ABIEBAL	6

Size Class Analysis	A	<10	R	10-24			25-50		>50
Standing Snags	N	<10	N	10-24			25-50		>50
Deadfall/Logs	O	<10	R	10-24			25-50		>50

Tree and Snag Data (Optional) (10 x 10 m)

Species	DBH (cm)	Height (m)	Age (yr)	Count (>10)
ABIEBAL	22.9	15m		1
POPUTRE	10.3; 10.7			2
POPUBAL	11.8; 12			2

Community Profile Diagram



Notes:

pg 2.

Detailed Vegetation Survey Form – Plant Community

Client & Project: RRP

Site #: Plot 15 Observers: IK, RH

Ground Cover (Grasses, Sedges, Forbs, Horsetails, Ferns, Dwarf Shrubs, Mosses, Lichens)

Data collected from four 1 x 1 subplots within 10 x 10 m plot.

coll	Species	Percent Cover				Additional Species Outside of Plots
		Plot 1	Plot 2	Plot 3	Plot 4	
	SYMPMAC	15	25			SOLIGIG
	TRILCER	2				~~LACT sp.~~
	BOTRVIR	3			1	EQUISYL
	FRAGVIR	20	8	1	2	DRYOCAR
	Vetch sp.	1				RIBETRI
	MAIACAN	2				BROMCIL
	CORNSTO	3		2	20	LINNBOR
	litter	70	30	70	65	AQUICAN
	DWD	10	1	2	1	
	moss	7	5	5	5	
	RUBUIDA	2				
	ALNUING	3		1		
	HALEDEF	1				
	PRUNVUL		3	2		
	SYMPLAE		2		1	
	RUBUPUB		8	30	45	
	CAREGRAC		12			
	EQUIPRA		1	1		
	RIBEHIR		3			
	SANIMAR		1			
	CORNCAN		1			
	PETAFRI		1			
	PETASAG		1			
graminoid →	Grass sp.		10	5		
	CYPR sp			5		
	ROSAACI			2		
	GALIASP			1		
	GEUMALE			1		
	LACT sp			1		
	ARALNUD				4	
	LONICAN				3	

Species Collection and Identification

Sample #	Species & Habitat Description	Density, Count, Phenology	Photos	Identified By:	Final ID

Notes:

Detailed Vegetation Survey Form – Vegetation Community

Client & Project: NG-RRP
Site #: Plot 16 Observers: IK, BH

Date: July 01
Time:
Ecosite: B088
Slope (%): Ø
Aspect:

Easting:
Northing:
Photos: IMG_617

Plant Community: Open Mixedwood Forest
Notes & Description:

Small open meadow in sparse-canopy mixedwood forest.

Site and Terrain Characteristics (Circle)

Canopy Height	Sub-canopy	Structural Stage	Topographic Feature	
< 2 m	< 2 m	Sparse/bryoid	Lacustrine	Cliff
2-5 m	2-5 m	Grass/herb	Riverine	Talus
5-10 m	(5-10 m)	Shrub	Bottomland	Crevice/Cave
(10-15 m)	10-15 m	Young seral	(Terrace)	Alvar
15-20 m	15-20 m	(Mid seral)	Valley Slope	Rockland
> 20 m	> 20 m	Mature	Tableland	Beach/Bar
		Old-growth	Roll Upland	Sand Dune
				Bluff

Vegetation & Substrate Data (10 x 10 m)

10-14 Tree Canopy ~~(>5m)~~ %: 20
5-10 Tree Subcanopy ~~(>5m)~~ %: 15
2-5 Tree Shrub ~~(<2m)~~ %: 25
Low Shrub (0.5-2m) %: 10
Dwarf Shrub (<0.5m) %: Ø
Organic Depth (cm): Ø

Forb %: 40
Graminoid %: 40
Moss %: 3
Surface Lichen %: Ø
Arboreal Lichen %: Ø

Rock %: 4
Soil %: Ø
Litter %: 25
DWD %: 5
Water %: Ø

Organic Type: LFH: Mor Moder Mull O: Fibric Mesic Humic
Wetland Class: Bog Fen Swamp Marsh Pond (N/A)
Upper Soil Texture: 999

Tree and Shrub Layer Percent Cover (10 x 10 m)

Species	Can	Sub	Tall	Low	Species	Can	Sub	Tall	Low
POPUTRE	17	5							
PICEGLA			15	5.					
LARILAR	3	7	8	3					
SALI sp.			1	2					
PRUNVIR			4	4					
					TOTAL				

Detailed Vegetation Survey Form – Stand Characteristics

Client & Project: NG-RRP
Site #: Plot 16 Observers: IK, BH

Prism Sweep at Plot Centre
Prism Factor
2

Species	Tally	Basal Area (Tally * Prism Factor)
POPUTRE	||| 1	12
TOTAL		
Snags		

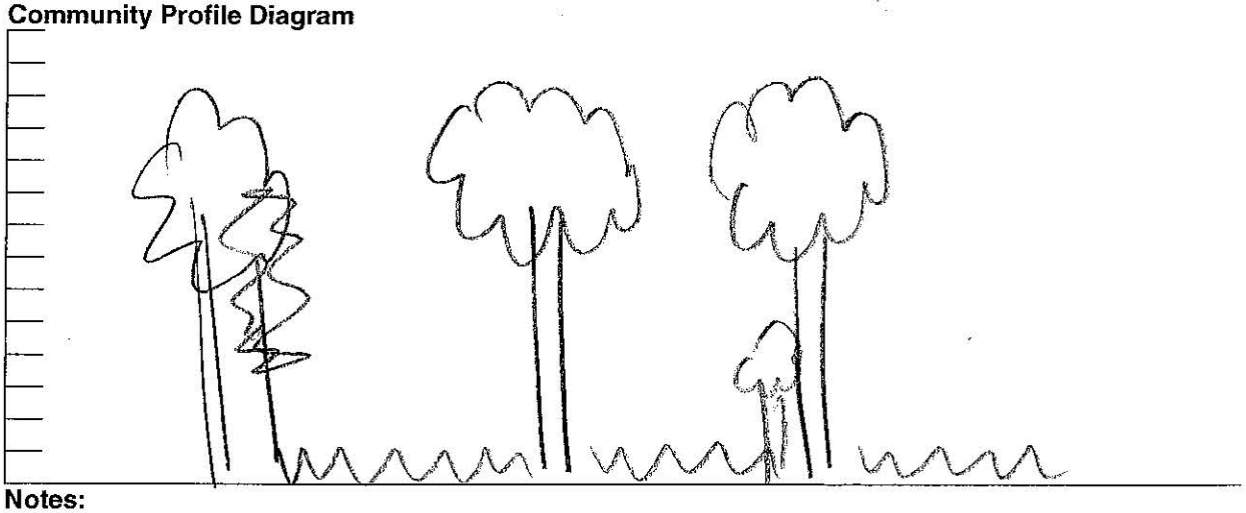
Stand Composition	BA
POPUTRE	12

Size Class Analysis	O	**<10**	O	**10-24**			**25-50**			**>50**	
Standing Snags	N	**<10**	R	**10-24**			**25-50**			**>50**	
Deadfall/Logs	R	**<10**	R	**10-24**			**25-50**			**>50**	

Tree and Snag Data (Optional) (10 x 10 m)

Species	DBH (cm)	Height (m)	Age (yr)	Count
POPUTRE	21.7; 18.1;			
	14.4; 15.3;			
	15.3; 17.6			
11	22.9	14m	≥55y0	
LARILAR	11.2			

Community Profile Diagram



Notes:

pg 2

Detailed Vegetation Survey Form – Plant Community

Client & Project: RRP

Site #: Plot 16 Observers: IK, BH

Ground Cover (Grasses, Sedges, Forbs, Horsetails, Ferns, Dwarf Shrubs, Mosses, Lichens)

Data collected from four 1 x 1 subplots within 10 x 10 m plot.

coll	Species	Percent Cover				Additional Species Outside of Plots
		Plot 1	Plot 2	Plot 3	Plot 4	
	PHLEPRA	2	2		2	ANEMQUI
	TRIFPRA	5				LATH sp.
	CHRYLEU	3	1	2		BROMCIL
	AGROGIG	2	2	3	3	LYSITHI
	FRAGVIR	20	8	15	10	
	GEUMALE	2		1		
	APOCCAN	0			3	
	SOLICAN	3				
	ACHIMIL	4	2	10	3	
	CAREGRA	3	6	4		
	PRUNVUL	1				
	CARECAS	0	2	2	3	
	VIOL sp	0		1		
	SOLIHIS	1		1		
	SYMPsp.	3	2	1		
	Grass sp.	5		7		
	litter	15	30	35	50	
	GALIBOR	1	1	2	3	
	SYMPNOV		3			
	PICEGLA		7	4		
	SANIMAR		2	3	7	
	GEOCLAV		2	1		
	SYMPLAT		2			
	RHAMALN		05	3		
	ELYMREP		2			
	moss		3		1	
	CASTCOC			1		
	ROSAAC1			0		
	TRIFPRA			5	5	
	RUBUPUB			5	2	
	SYMPMAC			5	3	
	AMEL-sp			4	1	
	DWD			1	8	
	Vetch sp.				3	
	TARA OFF				1	
	ANAPMAR				4	

Species Collection and Identification

Sample #	Species & Habitat Description	Density, Count, Phenology	Photos	Identified By:	Final ID

Notes:

Detailed Vegetation Survey Form – Vegetation Community

Client & Project: NG-RRP
Site #: Plot 17 Observers: IK, BH

Date: July 21
Time:
Ecosite: unclassified
Slope (%): Ø
Aspect:

Easting: wpt 26 ≈ WPW26
Northing:
Photos: IMG_0623

Plant Community: Rocky outcrop
Notes & Description:

Rocky outcrop.
Surrounding trees inc: BETUPAP, PICEGLA, THUJOCC, PINUBAN.

Site and Terrain Characteristics (Circle)

Canopy Height	Sub-canopy	Structural Stage	Topographic Feature	
< 2 m	< 2 m	Sparse/bryoid	Lacustrine	Cliff
(2-5 m)	(2-5 m)	Grass/herb	Riverine	Talus
5-10 m	5-10 m	Shrub	Bottomland	(Crevice/Cave)
10-15 m	10-15 m	(Young seral)	Terrace	Alvar
15-20 m	15-20 m	Mid seral	Valley Slope	(Rockland)
> 20 m	> 20 m	Mature	Tableland	Beach/Bar
		Old-growth	Roll Upland	Sand Dune
				Bluff

Vegetation & Substrate Data (10 x 10 m)

Tree Canopy (>5m) %	Ø	Forb %	10	Rock %	70
Tree Subcanopy (>5m) %	Ø	Graminoid %	15	Soil %	Ø
2-4 m Tree Shrub ~~(<2m)~~ %	10	Moss %	10	Litter %	5
Low Shrub (0.5-2m) %	10	Surface Lichen %	50	DWD %	Ø
Dwarf Shrub (<0.5m) %	20	Arboreal Lichen %	Ø	Water %	Ø
Organic Depth (cm)	Ø				

Organic Type: LFH: Mor Moder Mull O: Fibric Mesic Humic
Wetland Class: Bog Fen Swamp Marsh Pond (N/A) Upper Soil Texture: 999

Tree and Shrub Layer Percent Cover (10 x 10 m)

Species	Can	Sub	Tall	Low	Species	Can	Sub	Tall	Low
PINUBAN			7	1					
SALI sp.			3	2					
AMEL sp.				3					
					TOTAL				

Pg 1

Detailed Vegetation Survey Form – Stand Characteristics

Client & Project: NG-RRP

Site #: Plot 17 Observers: IK, BH

Prism Sweep at Plot Centre

Prism Factor

2

Species	Tally	Basal Area (Tally * Prism Factor)
TOTAL		
Snags		

Stand Composition	BA

Size Class Analysis	O	<10	10-24	25-50	>50
Standing Snags	R	<10	10-24	25-50	>50
Deadfall/Logs	N	<10	10-24	25-50	>50

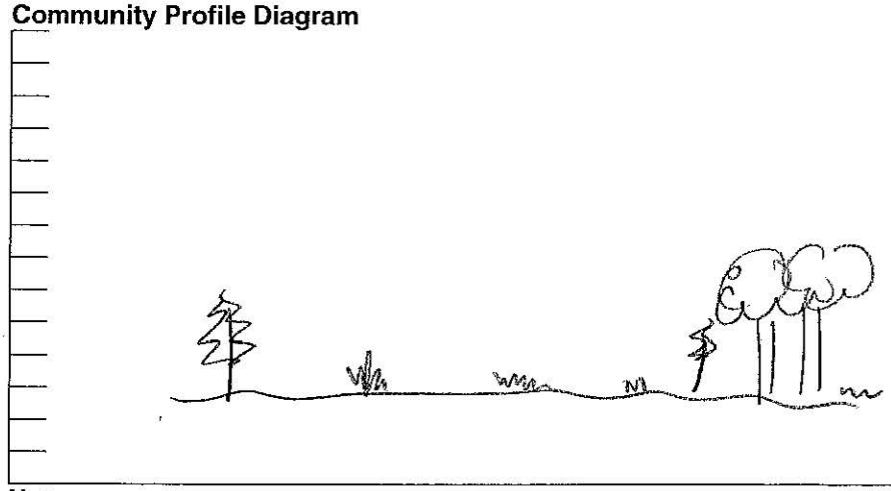
Tree and Snag Data (Optional) (10 x 10 m)

none >10 cm DBH

Species	DBH (cm)	Height (m)	Age (yr)	Count

Community Profile Diagram

4m



Notes:

pg 2

Detailed Vegetation Survey Form – Plant Community

Client & Project: NG-RRP

Site #: Plot 17 Observers: IK, BH

Ground Cover (Grasses, Sedges, Forbs, Horsetails, Ferns, Dwarf Shrubs, Mosses, Lichens)

Data collected from four 1 x 1 subplots within 10 x 10 m plot.

coll	Species	Percent Cover				Additional Species Outside of Plots
		Plot 1	Plot 2	Plot 3	Plot 4	
	FRAGVIR	4			2	CORNCAN
	RUBUIDA	10				SOLI JUN
	DANTSPI	3			2	POLYCIL
	DICHXAN	2				ELYMREP
	lichen	70	25	2	60	HIER sp.
	rock	15	45		40	BROMCIL
	moss	20	25	30	5	MELALIN.
	DIERLON		10	5		
	MAIACAN		2	1		
	AGROGIG		3	1		
	SYMPMAC			3		
	VIOL sp.			6		
	TRIEBOR			1		
	Grass sp.			1		
	VACCANG		15	80		
	LYCODEN			1		
	CORYSEM				1	
	AGROSCA				1	

Species Collection and Identification

Sample #	Species & Habitat Description	Density, Count, Phenology	Photos	Identified By:	Final ID

Notes:

pg 3

Detailed Vegetation Survey Form – Vegetation Community

Client & Project: NG – RRP
Site #: Plot 18 Observers: IK, BH

Date: July 21
Time:
Ecosite: B088
Slope (%): Ø
Aspect:

Easting: ~~mph~~ @ WPW60
Northing:
Photos: IMG_0626

Plant Community: Mixedwood forest
Notes & Description:

Opening in sparse canopy mixedwood forest:
POPUTRE, POPUBAL, PICEGLA, THUJOC, LARILAR

Site and Terrain Characteristics (Circle)

Canopy Height	Sub-canopy	Structural Stage	Topographic Feature	
< 2 m	< 2 m	Sparse/bryoid	Lacustrine	Cliff
2-5 m	2-5 m	Grass/herb	Riverine	Talus
5-10 m	(5-10 m)	Shrub	Bottomland	Crevice/Cave
~~10-15 m~~	10-15 m	Young seral	Terrace	Alvar
~~15-20 m~~	15-20 m	~~Mid seral~~	~~Valley Slope~~	Rockland
> 20 m	> 20 m	Mature	(Tableland)	Beach/Bar
		Old-growth	~~Roll Upland~~	Sand Dune
				Bluff

Vegetation & Substrate Data (10 x 10 m)

10-14	Tree Canopy ~~(>5m)~~ %	8	Forb %	25	Rock %	Ø
5-10	Tree Subcanopy ~~(>5m)~~ %	10	Graminoid %	40	Soil %	Ø
2-5	Tree Shrub ~~(<2m)~~ %	15	Moss %	40	Litter %	20
	Low Shrub (0.5-2m) %	10	Surface Lichen %	Ø	DWD %	3
	Dwarf Shrub (<0.5m) %	Ø	Arboreal Lichen %	T	Water %	Ø
	Organic Depth (cm)	Ø				

Organic Type: LFH: Mor Moder Mull O: Fibric Mesic Humic
Wetland Class: Bog Fen Swamp Marsh Pond (N/A) Upper Soil Texture: 999

Tree and Shrub Layer Percent Cover (10 x 10 m)

Species	Can	Sub	Tall	Low	Species	Can	Sub	Tall	Low
POPUTRE	5								
PICEGLA	2	8							
POPUBAL		2	2						
Salix sp.			10	5					
					TOTAL				

Detailed Vegetation Survey Form – Stand Characteristics

Client & Project: NG-RRP

Site #: Plot 18 Observers: IK, BH

Prism Sweep at Plot Centre

Prism Factor

2

Species	Tally	Basal Area (Tally * Prism Factor)
PICEGLA	1	2
TOTAL		2
Snags		

Stand Composition	BA
PICEGLA	2

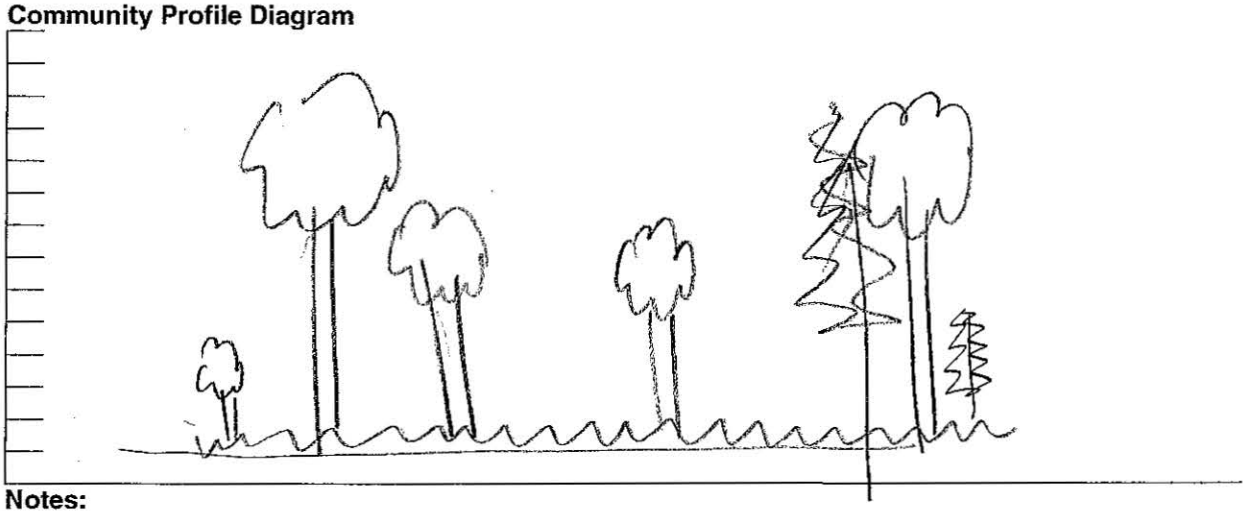
Size Class Analysis	O	<10	R	10-24		/	25-50	/	>50
Standing Snags	R	<10	N	10-24		/	25-50		>50
Deadfall/Logs	R	<10	N	10-24		/	25-50		>50

Tree and Snag Data (Optional) (10 x 10 m)

Species	DBH (cm)	Height (m)	Age (yr)	Count
POPUTRE	15.6			
PICEGLA	22			

Community Profile Diagram

14m



Notes:

Pg 2.

Detailed Vegetation Survey Form – Plant Community

Client & Project: NG-RRP

Site #: Plot 18 Observers: IK, BH

Ground Cover (Grasses, Sedges, Forbs, Horsetails, Ferns, Dwarf Shrubs, Mosses, Lichens)

Data collected from four 1 x 1 subplots within 10 x 10 m plot.

coll	Species	Percent Cover				Additional Species Outside of Plots
		Plot 1	Plot 2	Plot 3	Plot 4	
	PYRO sp.	1		3	3	ROSAAC1
	PRUNVIL	3	3	5	2	
	FRAGVIR	10	20	25	10	
	JUNC sp.	3				
	CAREGRAC	10				
	CARECAS	5	5	2	7	
	CHRYLEU	4	11	3	1	
	TRIFPRA	3	2	1		
	CYPR sp.	3				
	GEOCLAV	1	1	2	2	
	VIOL sp.	2	2	2		
	PETAFRI	2	1		7	
	EUTHGRA	3				
	AGROGIG	10	2		3	
	BROMCIL	2				
	Vetch sp.	1	1	1		
	moss	20	35	60	35	
	litter	10	15	15	15	
	grass sp.	10			5	
	LYSITHI		2			
	DIERLON		5			
	LARILAR		4			
	ACHIMIL		2	4	3	
	SYMPNOV		3			
	ANEMCAN		1	5		
arrow? ←	SYMPsp.		3			
	ALNUINC		5			
	SOLIGIG		2			
	SANIMAR		1		3	
	PHLEPRA		2		2	
	CORNSTO		5			
	THUJOCC		4	2		
	ELYMREP		1	3		
	LACT. Sp		2			
	PICEGLA			1		

Species Collection and Identification ROSAAC1 5

Sample #	Species & Habitat Description	Density, County Spp Phenology	Photos	Identified By:	Final ID
		CAREGRAm	12		
		SOLI HIS	2		
		SYMPLAT	2		
		LARILAR	1		
		RUBUPUB		3	
		SYMPCIL		5	
		TARAOFF		3	

Notes: EQUPRA 1
DWD 5

Detailed Vegetation Survey Form – Vegetation Community

Client & Project: NG-RRP
Site #: Plot 19 Observers: IK, BH

Date: July 22
Time:
Ecosite: B088
Slope (%): 3
Aspect: W

Easting: wpt 027 ± WPW52
Northing:
Photos: IMG_0628

Plant Community: Rocky outcrop
Notes & Description:

Rocky outcrop surrounded by mixedwood:
BETUPAP, PICEGLA > POPUTRE, PINUBAN

Site and Terrain Characteristics (Circle)

Canopy Height	Sub-canopy	Structural Stage	Topographic Feature	
< 2 m	< 2 m	Sparse/bryoid	Lacustrine	Cliff
2-5 m	2-5 m	Grass/herb	Riverine	Talus
(5-10 m)	(5-10 m)	Shrub	Bottomland	Crevice/Cave
10-15 m	10-15 m	(Young seral)	Terrace	Alvar
15-20 m	15-20 m	Mid seral	Valley Slope	(Rockland)
> 20 m	> 20 m	Mature	Tableland	Beach/Bar
		Old-growth	Roll Upland	Sand Dune
				Bluff

Vegetation & Substrate Data (10 x 10 m)

Tree Canopy ~~(>5m)~~ %	Ø	Forb %	5	Rock %	70
5-7 Tree Subcanopy ~~(>5m)~~ %	7	Graminoid %	10	Soil %	Ø
2-5 Tree Shrub ~~(<2m)~~ %	15	Moss %	5	Litter %	2
Low Shrub (0.5-2m) %	15	Surface Lichen %	40	DWD %	3
Dwarf Shrub (<0.5m) %	20	Arboreal Lichen %	Ø	Water %	Ø
Organic Depth (cm)	Ø				

Organic Type: LFH: Mor Moder Mull O: Fibric Mesic Humic
Wetland Class: Bog Fen Swamp Marsh Pond (N/A) Upper Soil Texture: 999

Tree and Shrub Layer Percent Cover (10 x 10 m)

Species	Can	Sub	Tall	Low	Species	Can	Sub	Tall	Low
PICEGLA		7	2	1					
AMELsp.			4	5					
BETUPAP			3						
SALI sp.			5	3					
ALNUINC.			2	8					
					TOTAL				

P91

Detailed Vegetation Survey Form – Stand Characteristics

Client & Project: NG – RRP
Site #: Plot 19 Observers: IK, BH

Prism Sweep at Plot Centre
Prism Factor
2

Species	Tally	Basal Area (Tally * Prism Factor)
TOTAL		
Snags		

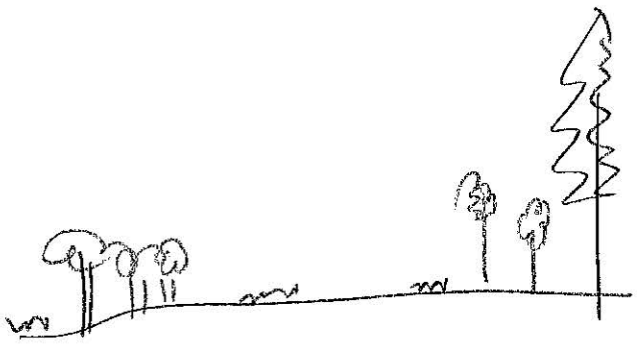
Stand Composition	BA

Size Class Analysis	O	<10	R	10-24		25-50		>50
Standing Snags	R	<10	N	10-24		25-50		>50
Deadfall/Logs	R	<10	R	10-24		25-50		>50

Tree and Snag Data (Optional) (10 x 10 m)

Species	DBH (cm)	Height (m)	Age (yr)	Count
PICEGLA	13.2	7m		

Community Profile Diagram



Notes:

pg 2

Detailed Vegetation Survey Form – Plant Community

Client & Project: NG -RRP
Site #: Plot 19 Observers: IK, BH

Ground Cover (Grasses, Sedges, Forbs, Horsetails, Ferns, Dwarf Shrubs, Mosses, Lichens)

Data collected from four 1 x 1 subplots within 10 x 10 m plot.

coll	Species	Percent Cover			
		Plot 1	Plot 2	Plot 3	Plot 4
	CORYSEM	1	2		
	VACCANG	25		20	25
	DANTSPI	3	3		
	ARALHIS	3			
	ELYMREP	1			
	HIER sp	1			
	Grass sp.	1	2	3	7
	rock	75	25	5	
	moss	2	2		1
	lichen	25	75		
	litter	1	1	30	20
	DIERLON		4	25	8
	FRAGVIR		1		
	DWD		5	3	
	EPILANG			15	
	BROMCIL			2	
	AMEL sp			3	3
	ALNUCRI			8	25
	SYMPMAC			5	5
	MAIACAN			1	
	GEOCLAV				5
	APOCCAN				5
	HIERSp				1
	LATH sp				3
	Vetch sp.				3
	PTERAQU				7
	VACCMYR				5

Additional Species Outside of Plots
LOTUCOR
ACHIMIL
DICHXAN
POLYCIL
~~LATH sp~~
APOCCAN
ARALNUD
~~PTERAQU~~
PINUBAN
VIOL sp
MELALN
SANIMAR
CORNCAN
SORBDEC

Species Collection and Identification

Sample #	Species & Habitat Description	Density, Count, Phenology	Photos	Identified By:	Final ID

Notes:

Detailed Vegetation Survey Form – Vegetation Community

Client & Project: NG -RRP
Site #: Plot 20 Observers: IK, BH

Date: July 22.
Time:
Ecosite: B088
Slope (%):
Aspect: Ø

Easting: Wpt 028 ~ WPW45
Northing:
Photos: IMG_0631

Plant Community: Aspen deciduous forest.
Notes & Description:

POPUTRE > ABIEBAL

Site and Terrain Characteristics (Circle)

Canopy Height	Sub-canopy	Structural Stage	Topographic Feature	
< 2 m	< 2 m	Sparse/bryoid	Lacustrine	Cliff
2-5 m	2-5 m	Grass/herb	Riverine	Talus
5-10 m	~~5-10 m~~	Shrub	Bottomland	Crevice/Cave
10-15 m	10-15 m	Young seral	Terrace	Alvar
15-20 m	15-20 m	Mid seral	Valley Slope	Rockland
> 20 m	> 20 m	Mature	Tableland	Beach/Bar
		Old-growth	Roll Upland	Sand Dune
				Bluff

Vegetation & Substrate Data (10 x 10 m)

Tree Canopy (>5m) %	20	Forb %	30	Rock %	Ø
5-7 Tree Subcanopy ~~(>5m)~~ %	~~40~~ 40	Graminoid %	10	Soil %	Ø
25 Tree Shrub ~~(<2m)~~ %	35	Moss %	3	Litter %	70
Low Shrub (0.5-2m) %	10	Surface Lichen %	Ø	DWD %	5
Dwarf Shrub (<0.5m) %	Ø	Arboreal Lichen %	Ø	Water %	Ø
Organic Depth (cm)	Ø				

Organic Type: LFH: Mor Moder Mull O: Fibric Mesic Humic
Wetland Class: Bog Fen Swamp Marsh Pond (N/A) Upper Soil Texture: 999

Tree and Shrub Layer Percent Cover (10 x 10 m)

Species	Can	Sub	Tall	Low	Species	Can	Sub	Tall	Low
POPUTRE	20	30	2	–					
ABIEBAL	5	10	2	–					
PRUNVIR			7						
ALNUINC			7						
AMEL sp.			5						
BETUPAP		5	–	–					
CORNSTO		–	20	10					
					TOTAL				

Detailed Vegetation Survey Form – Stand Characteristics

Client & Project: NG - RRP.
Site #: Plot 20 Observers: IK, BH

Prism Sweep at Plot Centre
Prism Factor
2.

Species	Tally	Basal Area (Tally * Prism Factor)
POPUTRE	++++ 1	12
BETUPAP	1	2
ABIEBAL	1	2
TOTAL	8	16
Snags		

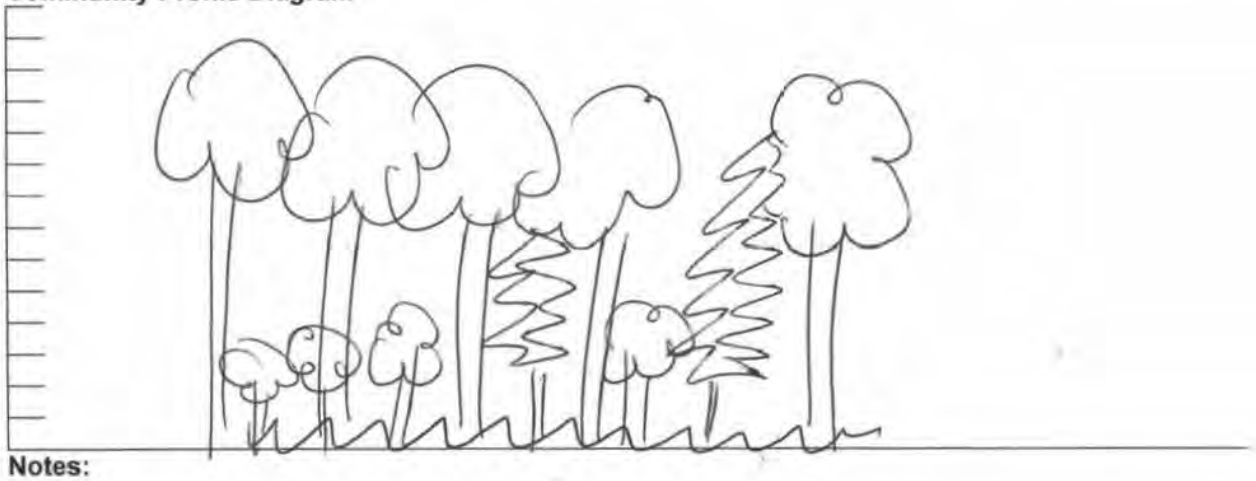
Stand Composition	BA
POPUTRE > BETUPAP = ABIEBAL.	16

Size Class Analysis	A	<10	R	10-24	N	25-50	N	>50
Standing Snags	N	<10	N	10-24	N	25-50	N	>50
Deadfall/Logs	R	<10	N	10-24	N	25-50	N	>50

Tree and Snag Data (Optional) (10 x 10 m)

Species	DBH (cm)	Height (m)	Age (yr)	Count
POPUTRE	11.4, 11.4, 12.5,	17m		5
"	11, 10.1			
ABIEBAL	10.5, 10.7, 13.5			3

Community Profile Diagram



Notes:

Detailed Vegetation Survey Form – Plant Community

Client & Project: NG–RRP

Site #: Plot 20 Observers: IK, BH

Ground Cover (Grasses, Sedges, Forbs, Horsetails, Ferns, Dwarf Shrubs, Mosses, Lichens)

Data collected from four 1 x 1 subplots within 10 x 10 m plot.

coll	Species	Percent Cover				Additional Species Outside of Plots
		Plot 1	Plot 2	Plot 3	Plot 4	
	FRAGVIR	5	4	7	10	~~CORYCOR~~
	GEUMALE	3		6		ACTA sp.
	PRUNVUL	2			2	CARECAS
	SYMPMAC	25	15	70	4	VIBUTRI
	BROMCIL	2		1		
	CORNSTO	25	8	3		
	RIBEHIR.	2			3	
	AMEL sp.	25	3			
	ROSAACI	25	3		1	
	RUBUPUB.	3		7	4	
	CORNCAN	2	2		4	
	PHLEPRA	1				
	SYMPLAT	2		2		
	PETAFRI	2	2	1		
	CIRS sp.	2				
	CAREGRA	2				
	GALIBOR	1	3	3	2	
	TRIFPRA	1				
graminoid ←	Grass sp	3	3	3	5	
	litter	50	70	00	40	
	RUBUIDA		2			
	ASARCAN		2			
	PYROASA.		4			
	SANIMAR		3	2	2	
	STREROS		2			
	MITENUD		4			
	GALIASP		2		2	
	PTERAQU		5	10	4	
	ARALNUD		3	7	5	
	TARAOFF		1		2	
	DWD		3			
	CARETRI		2			
	RUBUIDA			2	4	
	ELYMREP			2		
	VIBURAP			2		
	Velch sp.			1		

Species Collection and Identification

Sample #	Species & Habitat Description	Density, Count, Phenology	Photos	Identified By	Final ID
		DIERLON	3		
		LATH sp.	1		
		moss	3		
		BOTRVIR	1		
		SALI sp	1	2	
		PHLEPRA		2	
		VIOL sp		1	
		CORYCOR		30	
		MAIACAN		2	
		SOLIGIG		2	
		LONICAN		2	

Notes:

pg 5

APPENDIX B

PLANT SPECIES PRESENT IN EASTERN WHIP-POOR-WILL HABITAT CHARACTERIZATION PLOTS

Appendix B: Plant Species Present in each of the 20 Eastern Whip-poor-will Habitat Characterization Plots

Scientific Name	Common Name	Boreal Ecosite Community[1]																			Provincial S-Rank[2]
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
TREES																						
Abies balsamea	Balsam Fir	O								R		R		O		O					O	S5
Acer rubrum	Red Maple							R	R	O	R			R								S5
Betula papyrifera	Paper Birch	R			R	R		R	R	O	R									R	R	S5
Fraxinus nigra	Black Ash											O				R						S4
Larix laricina	American Larch																R		R			S5
Picea glauca	White Spruce		R					R	R		R		R		R		O		R	O		S5
Pinus banksiana	Jack Pine			R		O					R				O			O		R		S5
Pinus resinosa	Red Pine								R													S5
Pinus strobus	Eastern White Pine		R					O	R		R				R							S5
Populus balsamifera	Balsam Poplar	R										O		O		O			R			S5
Populus tremuloides	Trembling Aspen	O		R	O	R	O			O	R			R		O	O		O		O	S5
Thuja occidentalis	Eastern White Cedar																		R			S5
SHRUBS AND WOODY VINES																						
Acer spicatum	Mountain Maple									O		O										S5
Alnus incana	Speckled Alder					R						O		R		O			R	O	O	S5
Alnus viridis	Green Alder		R		O									O						R		S5
Amelanchier sp.	Serviceberry Species		O	O	R	O	O	R	R	R	R		R		R	O	R	R		O	R	-
Arctostaphylos uva-ursi	Bearberry														R							S5
Cornus stolonifera	Red-osier Dogwood						O			O				R		O			R		O	S5
Corylus cornuta	Beaked Hazelnut	R		R	O		O	R		O			R								R	S5
Diervilla lonicera	Northern Bush-honeysuckle		R	O		O	A	R	O		O		O		O			O	R	O	R	S5
Fallopia cilinodis	Fringed Black Bindweed								R				R					R		R		S5
Gaultheria procumbens	Teaberry					R																S5
Ilex verticillata	Black Holly											R										S5
Lonicera canadensis	American Fly-honeysuckle						R			R		R				R					R	S5
Prunus virginiana	Choke Cherry					R	R					R	R	R			R				O	S5
Rhamnus alnifolia	Alderleaf Buckthorn									R				R			R					S5
Ribes americanum	Wild Black Currant				R																	S5
Ribes glandulosum	Skunk Currant								R			R		R								S5
Ribes hirtellum	Smooth Gooseberry	R			O							R	R	R		R					R	S5
Ribes triste	Swamp Red Currant				R							R		R		R						S5
Rosa acicularis	Prickly Rose			R	R	R	R	R		R		R		R	R	R	R		R		O	S5
Rubus idaeus ssp. strigosus	Wild Red Raspberry		R	R	R			O	R		R	R	R	R	R	R		O			O	S5
Rubus pubescens	Catherinettes Berry	O		R	O	R	O			O		O		O		O	R		R		A	S5
Salix sp.	Willow Species		R	R			O		R							R	R	R	O	O	R	-
Sorbus decora	Northern Mountain-ash																			R		S5
Vaccinium angustifolium	Late Lowbush Blueberry		A	O		A	R	O	A		A		O		A			A		A		S5
Vaccinium myrtilloides	Velvetleaf Blueberry			R		R		R	R		R				O					R		S5
Viburnum nudum	Smooth Witherod													R								S5
Viburnum opulus ssp. trilobum	Highbush Cranberry											R									R	S5
Viburnum rafinesquianum	Downy Arrow-wood				R		O		R	R		R	R								R	S5
HERBACEOUS (Vascular and Non-Vascular)																						
Achillea millefolium	Common Yarrow		R	R									R				A		A	R		SNA
Actaea sp.	Baneberry Species	R			R		R		R	R		R		R							R	-
Agrostis gigantea	Redtop																O	R	A			SNA
Agrostis scabra	Rough Bentgrass		R					R	R		R							R				S5
Amphicarpaea bracteata	American Hog-peanut						R															S5
Anaphalis margaritacea	Pearly Everlasting																R					S5
Anemone americana	Round-lobed Hepatica									O												S5
Anemone canadensis	Canada Anemone						R												R			S5
Anemone quinquefolia	Wood Anemone					R								R			R					S5

Scientific Name	Common Name	Boreal Ecosite Community[1]																			Provincial S-Rank[2]
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
Antennaria neglecta	Field Pussytoes			R											R							S5
Apocynum cannabinum	Hemp Dogbane		R	R											R		R			R		S5
Aquilegia canadensis	Wild Columbine		R				R			R		R	R	R		R						S5
Aralia hispida	Bristly Sarsaparilla		R			R			R											R		S5
Aralia nudicaulis	Wild Sarsaparilla	A		R	R	O	O	R	R	O	R	O	R	O		R				R	O	S5
Asarum canadense	Canada Wild-ginger	R										R	R	R							R	S5
Athyrium filix-femina var. angustum	Lady Fern											R										S5
Botrypus virginianus	Rattlesnake Fern						R							R		R					R	S5
Bromus ciliatus	Fringed Brome		R			R			R			R		R		R	R	R	R	R	R	S5
Bromus inermis	Awnless Brome												R		R							SNA
Capnoides sempervirens	Pale Corydalis		R					R										R		R		S5
Carex castanea	Chestnut-colored Sedge						R										O		O		R	S5
Carex gracillima	Graceful Sedge				R									R		O	O		R		R	S5
Carex granularis	Meadow Sedge																		R			S5
Carex projecta	Necklace Sedge			R				R	O													S5
Carex tenera	Slender Sedge			R									R									S5
Carex trisperma	Three-seed Sedge																				R	S5
Castilleja coccinea	Scarlet Indian-paintbrush																R					S5
Chamerion angustifolium	Fireweed		R												R					O		S5?
Cicuta maculata	Spotted Water-hemlock													R								S5
Cirsium sp.	Thistle Species													R							R	-
Clintonia borealis	Blue Bead-lily	R		R		R				R												S5
Coptis trifolia	Goldthread				O		R															S5
Cornus canadensis	Bunchberry	O		R		O	R		R					R		R		R		R	O	S5
Cypripedium sp.	Lady's-slipper Species													R		R			R			-
Danthonia spicata	Poverty Oat-grass		R	A		O		O	O		O		R		O			O		O		S5
Dendrolycopodium dendroideum	Round-branched Tree-clubmoss																	R				S5
Dichanthelium sp.	Rosette Grass Species							O														-
Dichanthelium xanthophysum	Pale Panicgrass		R			R		R			R				R			R		R		S4
Dryopteris carthusiana	Spinulose Shield Fern				O				R					R		R						S5
Elymus repens	Creeping Wild-rye							R					R		R		R	R	R	R	R	SNA
Equisetum pratense	Meadow Horsetail											R		R		R			R			S5
Equisetum sylvaticum	Woodland Horsetail	R			R		R					R				R						S5
Eurybia macrophylla	Large-leaf Wood-aster	O		O	O	R	O	O	R	O		R	R	O	R	O	R	R		O	A	S5
Euthamia graminifolia	Flat-top Fragrant Goldenrod																		R			S5
Fragaria virginiana	Virginia Strawberry	O		O	R	R	O	R	R	R		R	O	O	R	A	A	O	A	R	A	S5
Galium asprellum	Rough Bedstraw	R			R		R			R				R		R					O	S5
Galium boreale	Northern Bedstraw									R		R		R			O				O	S5
Galium triflorum	Sweet-scent Bedstraw				R							R		R								S5
Geocaulon lividum	Northern Comandra												R				R		O	R		S5
Geum aleppicum	Yellow Avens													R		R	R				O	S5
Glyceria sp.	Manna Grass Species				R																	-
Halenia deflexa	Spurred Gentian												R	R		R						S5
Hieracium sp.	Hawkweed Species		R	R		R					R		R					R		R		-
Impatiens capensis	Spotted Jewel-weed						R							R								S5
Juncus sp.	Rush Species																		R			-
Lactuca sp.	Lettuce Species						R							R		R			R			-
Lathyrus sp.	Vetchling Species			R		R	R			R			R		R		R			R	R	-
Leucanthemum vulgare	Oxeye Daisy																O		O			SNA
Linnaea borealis	Twinflower															R						S5
Lotus corniculatus	Bird's-foot Trefoil					R														R		SNA
Lycopodium clavatum	Running Clubmoss									R												S5
Lysimachia ciliata	Fringed Loosestrife						R															S5
Lysimachia quadrifolia	Whorled Loosestrife												R				R					S4

Scientific Name	Common Name	Boreal Ecosite Community[1]																				Provincial S-Rank[2]
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
Maianthemum canadense	Wild-lily-of-the-valley	O	O	R	O	O	R	O	O	O	R	R	R		O	R		R		R	R	S5
Matteuccia struthiopteris	Ostrich Fern											R										S5
Melampyrum lineare	American Cow-wheat		O	R		R		R	R		R							R		R		S4S5
Mertensia paniculata	Tall Bluebells				R									R								S5
Mitella nuda	Naked Bishop's-cap	R										O		R							R	S5
Osmunda claytoniana	Interrupted Fern						R			R		R										S5
Petasites frigidus var. palmatus	Palmate Coltsfoot	O			R		R					R		R		R			O		O	S5
Petasites frigidus var. sagittatus	Arrow-leaved Coltsfoot															R						S4?
Phleum pratense	Meadow Timothy												O				R		O		R	SNA
Potentilla recta	Sulphur Cinquefoil							R														SNA
Prenanthes sp.	Rattlesnake-root Species									R		R		R								-
Prunella vulgaris ssp. lanceolata	Self-heal				R									R		R	R		O		R	S5
Pteridium aquilinum	Bracken Fern		R	O		O	R	O	R	R	R		O							R	O	S5
Pyrola asarifolia	Pink Pyrola	R			R		R														R	S5
Pyrola sp.	Pyrola Species																		R			-
Sanicula marilandica	Black Snakeroot	R			R		O			R		R		O		R	O		O	R	O	S5
Solidago canadensis var. canadensis	Canada Goldenrod												R				R					S5
Solidago gigantea	Smooth Goldenrod													R		R			O		R	S5
Solidago hispida	Hairy Goldenrod																R		R			S5
Solidago juncea	Early Goldenrod			R														R				S5
Streptopus lanceolatus	Rose Twisted-stalk	O								O		R		R							R	S5?
Symphyotrichum ciliolatum	Lindley's Aster																		R			S5
Symphyotrichum lateriflorum	Starved Aster						R									R	R		R		O	S5
Symphyotrichum novae-angliae	New England Aster																R		R			S5
Symphyotrichum sp.	Aster Species			R										R			O		R			-
Taraxacum officinale	Brown-seed Dandelion						R							R			R		R		R	SNA
Trientalis borealis	Northern Starflower	R		R					R	R								R				S5
Trifolium pratense	Red Clover			R			R						R	R			O		O		R	SNA
Trillium cernuum	Nodding Trillium				R		R					R		R		R						S5
Uvularia grandiflora	Large-flowered Bellwort									O		R		R								S5
Vicia sp.	Vetch Species												R	R	R	R	R		R	R	R	-
Viola sp.	Violet Species		R				R			R			R				R	R	O	R	R	-
Woodsia ilvensis	Rusty Woodsia							R														S5
Species Richness																						
Canopy		3	0	0	1	1	1	2	3	2	2	2	1	3	1	2	2	0	2	0	2	-
Sub-canopy		2	1	0	3	2	1	3	3	4	1	3	0	2	1	5	3	0	2	1	3	-
Understory (0.5-2 m)		2	3	3	3	4	7	2	4	5	3	3	1	3	1	4	4	2	2	5	6	-
Groundcover (<0.5 m)		22	22	29	28	25	37	25	28	31	17	37	32	50	21	35	38	24	40	35	43	-
TOTAL		23	23	31	31	28	40	26	30	33	19	38	33	53	22	40	39	24	43	36	49	-

Notes:

[1] Species abundance by Boreal Ecosite polygon:
R = Rare
O = Occasional
A = Abundant
D = Dominant; where abundance is variable between vegetation layers, the greater abundance code is presented

[2] Provincial S-RANK:
S1 = Critically Imperiled
S2 = Imperiled
S3 = Vulnerable
S4 = Apparently Secure
S5 = Secure
S? = Not Ranked Yet: if follow a rank, Rank Uncertain
SNR = Unranked
SNA = Not Applicable

APPENDIX C

EASTERN WHIP-POOR-WILL HABITAT CHARACTERIZATION PHOTO RECORD

Appendix C: Eastern Whip-poor-will Habitat Characterization Photo Record

Photo 1: Plot 1 – Mid-aged forest of balsam fir and trembling aspen, with balsam poplar and white birch; open understory – Boreal Ecosite B104 (Fresh, Silty to Fine Loamy: Aspen – Birch Hardwood)

Photo 2: Plot 2 – Open rocky outcrop with rare stunted coniferous trees within a young deciduous forest – Boreal Ecosite B104 (Fresh, Silty to Fine Loamy: Aspen – Birch Hardwood)

Photo 3: Plot 3 – Bedrock outcrop mostly covered by grass and forb species, with stunted trees, and surrounded by coniferous / mixed wood forest – Boreal Ecosite B104 (Fresh, Silty to Fine Loamy: Aspen – Birch Hardwood)

Photo 4: Plot 4 – Young deciduous stand of trembling aspen and abundant speckled alder in the understory – Boreal Ecosite B104 (Fresh, Silty to Fine Loamy: Aspen – Birch Hardwood)

Photo 5: Plot 5 – Mixedwood forest w large gaps in the canopy where exposed bedrock occurs – Boreal Ecosite B104 (Fresh, Silty to Fine Loamy: Aspen – Birch Hardwood)

Photo 6: Plot 6 – Young stand of trembling aspen with moderately-dense understory – Boreal Ecosite B104 (Fresh, Silty to Fine Loamy: Aspen – Birch Hardwood)

Photo 7: Plot 7 – Rocky outcrop with low and dwarf shrubs, occurring within a larger deciduous forest; rocky outcrop surrounded by white pine, white spruce, and white birch – Boreal Ecosite B104 (Fresh, Silty to Fine Loamy: Aspen – Birch Hardwood)

Photo 8: Plot 8 – Rocky outcrop, adjacent trees include white spruce and white birch, larger surrounding forest is mainly comprised of trembling aspen – Boreal Ecosite B104 (Fresh, Silty to Fine Loamy: Aspen – Birch Hardwood)

Photo 9: Plot 9 – Young trembling aspen stand with white birch, understory somewhat open with abundant open litter (dried leaves) in the ground cover – Boreal Ecosite B104 (Fresh, Silty to Fine Loamy: Aspen – Birch Hardwood)

Photo 10: Plot 10 – Rocky outcrop surrounded by mixedwood forest – Boreal Ecosite B016 (Very Shallow, Dry to Fresh: Aspen - Birch Hardwood)

Photo 11: Plot 12 – Rocky outcrop with coniferous trees, within a larger deciduous forest – Boreal Ecosite B104 (Fresh, Silty to Fine Loamy: Aspen – Birch Hardwood)

Photo 12: Plot 13 – Mid-aged mixedwood forest of balsam fir and balsam poplar > trembling aspen, somewhat moist soils – Boreal Ecosite B119 (Moist, Fine: Aspen - Birch Hardwood)

Photo 13: Plot 14 – Rocky outcrop within a mostly deciduous forest, outcrop itself surrounded by coniferous trees – Boreal Ecosite B104 (Fresh, Silty to Fine Loamy: Aspen – Birch Hardwood)

Photo 14: Plot 15 – Young mixedwood forest with abundant trees which are less than 10 cm diameter at breast height – Boreal Ecosite B104 (Fresh, Silty to Fine Loamy: Aspen – Birch Hardwood)

Photo 15: Plot 16 – Small open meadow within a sparse-canopy mixedwood forest – Boreal Ecosite B104 (Fresh, Silty to Fine Loamy: Aspen – Birch Hardwood)

Photo 16: Plot 17 – Rocky outcrop surrounded by mixedwood forest (trembling aspen, white birch, white spruce, eastern white cedar, and jack pine) – Ecosite B116 (Moist, Fine: Spruce - Fir Conifer)

Photo 17: Opening within mixedwood forest – Boreal Ecosite B104 (Fresh, Silty to Fine Loamy: Aspen – Birch Hardwood)

Photo 18: Plot 19 – Rocky outcrop surrounded by mixedwood forest – Boreal Ecosite B104 (Fresh, Silty to Fine Loamy: Aspen – Birch Hardwood)

Photo 1919: Plot 20 – Deciduous forest, with abundant trees which are less than 10 cm diameter at breast height; trembling aspen > balsam fir – Boreal Ecosite B104 (Fresh, Silty to Fine Loamy: Aspen – Birch Hardwood)

APPENDIX D

SPECIES AT RISK TRAINING PROVIDED TO STAFF

Records of Activities

newgold

- Records of activities
  - What work, when done, where done, how done
- Blasting records
- Observations and sightings report to environmental team
- Training records

Name	Signature	Name	Signature
Brian Jeck	<Original signed by>	Mitch LePage	<Original signed by>
Kelvin Caul	<Original signed by>	Darcy Cowan	<Original signed by>
Dale Faragher	<Original signed by>	Zeke Baumgardner	<Original signed by>
Bob Hammond	<Original signed by>	Nigel Fisher	<Original signed by>
Randy Carmody	<Original signed by>	Alpon Bbson	<Original signed by>
Clarence Gibbins	<Original signed by>	Jesse Tom	<Original signed by>

Attended ESA Permit conditions review for supervisors; February 23, 2015 Marr Road

Presented by: Mark Vancook <Original signed by>

Records of Activities

- Records of activities
  - What work, when done, where done, how done
- Blasting records
- Observations and sightings report to environmental team
- Training records

Name	Signature	Name	Signature
ALLAN LOVEDAY	<Original signed by>	Charles Rounds	<Original signed by>
PAT CROSS	<Original signed by>	JACKY CALDER	<Original signed by>
DAVID BALL	<Original signed by>	Anthony Veerst	<Original signed by>
DON JERNBERG	<Original signed by>	Ricky Pollard	<Original signed by>
Jason Happy	<Original signed by>		
Duane Loveday	<Original signed by>		

Attended ESA Permit conditions review for supervisors; February 28, 2015 Marr Road
Training Provided by:

Records of Activities

- Records of activities
  - What work, when done, where done, how done
- Blasting records
- Observations and sightings report to environmental team
- Training records

Name	Signature	Name	Signature
Wythe Redsky	<Original signed by>		
ED McKay	<Original signed by>		

Attended ESA Permit conditions review for supervisors; 3 March, 2015 Marr Road

Records of Activities

- Records of activities
  - What work, when done, where done, how done
- Blasting records
- Observations and sightings report to environmental team
- Training records

Name	Signature	Name	Signature
Jeff Kreger	<Original signed by>		
Dean L	<Original signed by>		
Rob Anderson	<Original signed by>		
Stefan Szeder	<Original signed by>		
Trevor Manchester	<Original signed by>		
Jade Maynard	<Original signed by>		

Attended ESA Permit conditions review for supervisors; March 23, 2015 Teeple Road

By:

Records of Activities

- Records of activities
  - What work, when done, where done, how done
- Blasting records
- Observations and sightings report to environmental team
- Training records

Name	Signature	Name	Signature
Kevin Schram	<Original signed by>		
Judy Anderson	<Original signed by>		
C Lovgren	<Original signed by>		

Attended ESA Permit conditions review for supervisors; April 10, 2015 Marr Road

Presented by: <Original signed by>

Records of Activities

- Records of activities
  - What work, when done, where done, how done
- Blasting records
- Observations and sightings report to environmental team
- Training records

Name	Signature	Name	Signature
David Chursinoff	<Original signed by>		

Attended ESA Permit conditions review for supervisors; 18 Apr 15, 2015 Marr Road

Training Provided by: <Original signed by>

Records of Activities

- Records of activities
  - What work, when done, where done, how done
- Blasting records
- Observations and sightings report to environmental team
- Training records

Name	Signature	Name	Signature
Wyman Jenkins	<Original signed by>	LYDIA TESSIER	<Original signed by>
Matt Wawrzyszyn	<Original signed by>	Ed Gallagher	<Original signed by>
Jeremie Daigle	<Original signed by>		
TED OLSEN	<Original signed by>		
MIKE VERNIK	<Original signed by>		
Joe Laforce	<Original signed by>		

Attended ESA Permit conditions review for supervisors; April 28, 2015 Marr Road

Training Provided by: <Original signed by>

Records of Activities

- Records of activities
  - What work, when done, where done, how done
- Observations and sightings report to environmental team
- Training records

Record of OB training

Name	Signature	Name	Signature
LYDIA TESSIER	<Original signed by>	Jeremie Doiyle	<Original signed by>
Joe Laforest	<Original signed by>	Tim Olsen	<Original signed by>
MIKE VERNIK	<Original signed by>	Ed Gallagher	<Original signed by>
Wayne Jenkins	<Original signed by>		
Matt Wawrzyn	<Original signed by>		

Attended Overall Benefits Awareness training; 28 April, 2015 Marr Road
Training Provided by: <Original signed by>

Records of Activities

newgold

- Records of activities
  - What work, when done, where done, how done
- Blasting records
- Observations and sightings report to environmental team
- Training records

Name	Signature	Name	Signature
Brian Freeze	<Original signed by>		

Attended ESA Permit conditions review for supervisors; 5 May 2015 Marr Road

Training Provided by: <Original signed by>

Records of Activities

- Records of activities
  - What work, when done, where done, how done
- Blasting records
- Observations and sightings report to environmental team
- Training records

Name	Signature	Name	Signature
Kristin Lyngsteen	<Original signed by>		
Lincoln Dunn	<Original signed by>		
Dave Hall	<Original signed by>		
Peter Risojevic	<Original signed by>		
RYAN HOEL	<Original signed by>		

Attended ESA Permit conditions review for supervisors; 7 May 2015 Marr Road
Training Provided by: Mark Vancook

Records of Activities

newgold

- Records of activities
  - What work, when done, where done, how done
- Blasting records
- Observations and sightings report to environmental team
- Training records

Name	Signature	Name	Signature
Amy Shute	<Original signed by>		
Dean Crick	<Original signed by>		
Floyd Hamge	<Original signed by>		
Jason Pattison	<Original signed by>		

Attended ESA Permit conditions review for supervisors: 12 Mav 2015 Marr Road

Training Provided by: Mark Vancook <Original signed by>

Records of Activities

- Records of activities
  - What work, when done, where done, how done
- Blasting records
- Observations and sightings report to environmental team
- Training records

Name	Signature	Name	Signature
Jon Pleizier	<Original signed by>		
Izabela Kalkowski	<Original signed by>		
Maureen Cameron-MacMillan	<Original signed by>		
Carolina Lescigneur	<Original signed by>		
Nick Hewitt	<Original signed by>		

Attended ESA Permit conditions review for supervisors; 2 Jun 2015 Marr Road
Training Provided by: Mark Vancook <Original signed by>

APPENDIX E

CONDITION 5
SUPPORTING DOCUMENTATION

AIR QUALITY MONITORING STATIONS & BARN SWALLOW NEST BOXES

BARN SWALLOW NEST BOX

AIR QUALITY MONITORING STATION

ESA PROJECT SITE BOUNDARY, MNRF

MINE FOOTPRINT

0 1 2 3

Kilometers

newgold™

Rainy River Project

GIS GROUP, THUNDER BAY

94°6'0"W 94°4'0"W 94°2'0"W 94°0'0"W 93°58'0"W 93°56'0"W 93°54'0"W

48°53'0"N 48°52'0"N 48°51'0"N 48°50'0"N 48°49'0"N 48°48'0"N

5414000 5412000 5410000 5408000 5406000

Split Rock Road
Richardson Road
Marr Road
SPLIT ROCK RIVER EAST BRANCH
230 KV TRANSMISSION LINE AND 40M CORRIDOR
HIGHWAY 71
McCallum Creek
TAILINGS MANAGEMENT AREA
Muskrat Lake
FINLAND
Korpi Road
Lampi Road
Clark Creek
Eliuk Road
Georgeson Road
CONSTRUCTED WETLAND
OVERBURDEN STOCKPILE
MILL
COARSE ORE CRUSHING
DEARLOCK
ROAD CLOSURE (MTO)
WEST MINE ROCK STOCKPILE
OPEN PIT
Roen Road
LOW GRADE ORE STOCKPILE
EAST MINE ROCK STOCKPILE
Unnamed (Waste Disposal) Road
Galenger Road
White Road
Loslo Road
West Creek
Marr Creek
Pinewood River
MINE ROCK POND
Clark Creek
Teeple Road
Westra Road
Heatwole Road
HIGHWAY 600 REALIGNMENT
Tait Road
Black Hawk
HIGHWAY 600
HIGHWAY 615
Barwick Road
Caul Road
Atkinson Road

1:42,000

418000 420000 422000 424000 426000 428000 430000 432000 434000

T:\GIS\MAP DOCUMENTS\RAINY RIVER PROJECT\2016\2016-08-04 EC 2015 ANNUAL REPORT MAPS\2016-08-08 AIR MONITORING STATIONS AND BARN SWALLOW NEST BOXES (EC 2015 ANNUAL REPORT MAPS).MXD

AIR QUALITY MONITORING PROGRAM
SECOND QUARTER 2015 REPORT
RAINY RIVER PROJECT

REVISION 1

Submitted to:

New Gold Inc.
1111 Victoria Avenue East
Thunder Bay, Ontario
P7C 1B7

Submitted by:

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

February 2016

Amec Foster Wheeler Project No.: TC111504.2015.6

February 17, 2016

AMEC Project No.: TC111504.2015.6

New Gold Inc.
1111 Victoria Avenue East
Thunder Bay, Ontario
P7C 1B7

Attention: Kyle Stanfield
Director Environment & Sustainability

Dear Mr. Stanfield:

Re: Rainy River Project, Second Quarter 2015 Air Monitoring Report (Revision 1)

Amec Foster Wheeler Environment & Infrastructure, a Division of Amec Foster Wheeler Americas Limited (Amec Foster Wheeler), is pleased to submit to New Gold Inc. (New Gold) a revised summary report for the data collected in the second quarter 2015 for the air quality monitoring program initiated in 2015 at the Rainy River Project. Two air quality sampling stations were established in May 2015: one to the south of the Site near the beginning of the Highway 600 reroute on Tait Road, and one to the east of the Site on Gallinger Road. The sampling stations were operated and maintained by New Gold staff.

Should you have any questions or wish to discuss the air monitoring program, please do not hesitate to contact the undersigned.

Sincerely,

Amec Foster Wheeler Environment & Infrastructure
a Division of Amec Foster Wheeler Americas Limited

<Original signed by>

Caleb Vandenberg, P.Eng.
Air Quality Engineer

<Original signed by>

Tony van der Vooren P.Eng, Ph.D, QEP
Senior Air Quality Consultant

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Revision	Date	Revised By	Description
0	11-August-2015	Caleb Vandenberg	Drafted Report
0.1	11-August-2015	Linda Lattner	Text changes
0.2	23-September-2015	Tony van der Vooren	Text changes
1	17-February-2016	Caleb Vandenberg	Correction of dustfall values

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ACRONYMS AND ABBREVIATIONS

AAQC	Ambient Air Quality Criteria
ACFM	Actual Cubic Feet Per Minute
ASTM	American Society for Testing and Materials
CAAQS	Canadian Ambient Air Quality Standards
ICP/AES	Inductively Coupled Plasma Atomic Emission Spectroscopy
MOECC	Ministry of the Environment and Climate Change
NIST	National Institute of Standards and Technology
TSP	Total Suspended Particulate
USEPA	United States Environmental Protection Agency

1.0 INTRODUCTION

Amec Foster Wheeler Environment & Infrastructure, a Division of Amec Foster Wheeler Americas Limited (Amec Foster Wheeler), is pleased to provide a summary of the second quarter (Q2) 2015 results for the air quality monitoring program undertaken at the Rainy River Project located in Northwestern Ontario. Two sampling stations were established in May 2015: one to the south of the Site near the beginning of the Highway 600 reroute on Tait Road, and one to the east of the Site on Gallinger Road. Their locations are shown in the satellite images in Appendix A (Figures 1, 2 and 3).

New Gold Inc. (New Gold) staff operate and maintain the sampling stations. Amec Foster Wheeler provided technical guidance to New Gold field staff, communicated with the laboratory staff as required and prepared the data summary report.

2.0 ANALYTICAL AND MONITORING METHODS

2.1 TSP and Metals

The total suspended particulate (TSP) concentrations were determined using the standard gravimetric method following the reference methods approved by the United States Environmental Protection Agency (USEPA) and the Ministry of the Environment and Climate Change (MOECC) as described in its Operations Manual (MOECC, 2008). Measurement of 24-hour average TSP and metal concentrations were undertaken as this is the averaging time upon which these parameters are set under Ontario Ambient Air Quality Criteria (AAQC 2012). Sampling was performed with hi-vol samplers (brush motor and mass flow controlled). The metals and metalloids analyzed included, but were not limited to, the following: arsenic (As), cadmium (Cd), chromium (Cr), cobalt (Co), copper (Cu), iron (Fe), lead (Pb), manganese (Mn), nickel (Ni), selenium (Se), vanadium (V) and zinc (Zn).

The lowest detectable limit is 0.1 milligrams (mg) of total particulate, resulting in a method detection limit of 0.06 micrograms per cubic metre (µg/m^3; based on a typical 24-hour sample volume of 1630 m^3).

The metal concentrations were determined with the standard ICP/AES method. The method detection limits are as shown in the data sheets in Appendix B-1.

2.2 $PM_{2.5}$

The $PM_{2.5}$ concentrations were determined using the standard gravimetric method following the reference methods approved by the USEPA and the MOECC as described in its Operations Manual (MOECC, 2008) Measurement of 24-hour average $PM_{2.5}$ was undertaken to match the averaging time for the Canadian Ambient Air Quality Standard (CAAQS). Sampling was performed with PQ200 samplers.

The lowest detectable limit is 1 µg of $PM_{2.5}$, resulting in a method detection limit of 0.04 µg/m^3 (based on a typical 24-hour sample volume of 24 m^3).

2.3 Total Dustfall

The water soluble and insoluble portions of dustfall were determined using ASTM method D-1739-98 and MOECC method DF-E3043A (September 8, 1995). Standard dustfall samplers were used to measure total dustfall deposition. The dustfall jars were lined with a 4 Mil plastic bag as required in the MOECC Operations Manual (MOECC, 2008). The method detection limit for total dustfall is 0.3 g/m^2/30 days.

2.4 Passive Sampling for SO_2 and NO_2

SO_2 and NO_2 concentrations were monitored with passive sampling devices. The exposed permeation filters were analyzed using the methodology employed by the Maxxam Analytics Inc. laboratory located in Edmonton, Alberta. The methodology was developed, approved and validated by Alberta Environment with the support of the Alberta Research Council, the Clean Air Strategic Alliance of Alberta, and the National Research Council of Canada.

Since the sample uptake is dependent on temperature, relative humidity and wind speed, the analytical results are adjusted for these meteorological parameters measured during the exposure period (monthly averages). The required meteorological data from the onsite weather station is provided by New Gold to Maxxam Analytics with each sample submission. The method detection limit is in the order of 0.1 parts per billion (ppb) for both SO_2 and NO_2. Validation tests conducted in Alberta show that results from passive sampling are typically within 10% of those obtained from sampling with continuous analyzers for 30-day exposure periods.

Since there are no MOECC guidelines for monthly concentrations of SO_2 and NO_2 obtained from passive sampling, the data will only be used for screening purposes and potentially for comparison with dispersion modelling results. For NO_2 the monthly results were compared to the MOECC AAQC for 24-hour converted to a 30-day average (78 ug/m^3). For SO2, the results were compared against the 30-day Alberta Ambient Air Quality Objectives (2013) of 30 ug/m^3.

2.5 Field Operations

2.5.1 HiVol Samplers

The two sites were visited once every six days to recover the exposed filter and install a pre-weighed filter for the subsequent sample in order to meet the requirements of the 1 in 6 day sampling schedule. Additional visits were made to resolve instrumentation issues and perform flow calibration checks and preventative maintenance.

Amec Foster Wheeler staff performed the original calibrations on the hi-vol samplers on 25 May 2015 using a BGI direct reading hivol electronic flow calibrator. The flows were set at 40 acfm for each station; the samplers are mass flow controlled. The electronic BGI flow calibrator was sent to the manufacturer for re-certification to National Institute of Standards and Technology (NIST) traceability in September 2014. New Gold staff recalibrated the SW HiVol on 30 June 2015 using the same calibrator and under the guidance of Amec Foster Wheeler staff after a pump was replaced. The overall uncertainty of the calibrator was determined to be 0.60% (ambient temperature, barometric pressure and flow), with an average error of -1.21% in the flow at standard conditions (Q_s) relative to the USEPA standard.

2.5.2 PQ200 Samplers

The stations were visited once every six days to recover the exposed filter and install a pre-weighed filter for the subsequent sample in order to meet the requirements of the 1 in 6 day sampling schedule. The PQ200 supplier performed the original calibrations on 20 May 2015 and the flow was checked using an electronic BGI flow calibrator by Amec Foster Wheeler staff on 26 May 2015 after the instruments had been installed.

2.5.3 Dustfall Samplers

The dustfall samplers were changed every month, as required.

2.5.4 Passive Samplers

The permeation filters in the passive samplers were changed every month, as required.

3.0 RESULTS

The results for the Q2 2015 sampling program are presented in Appendix B-1 for the hivol data, Appendix B-2 for the dustfall data and Appendix B-3 for the passive SO_2 and NO_2 data. By convention, all hivol results below the analytical detection limit were reported at half the detection limit.

For comparison purposes, the MOECC AAQC and CAAQS values are presented, where available.

A summary of the statistical analyses for Q2 for the TSP particulate concentrations is presented in Table 1 below. During the quarter, the 1 in 6 day hivol sampling schedule comprised a possible total of 6 sampling days between 28 May and 30 June 2015.

A summary of the statistical analyses for Q2 2015 for the total dustfall data is presented below in Table 2. A summary of the statistical analysis for the second quarter of 2015 for the passive SO_2 and NO_2 results is presented in Table 3.

3.1 Total Suspended Particulates and Metals

At the both the Tait Road and Gallinger Road stations, six valid samples were collected in Q2 2015, resulting in 100% valid data.

For the quarter, the arithmetic mean TSP concentrations were comparable, with the Tait Road station averaging 36.7 µg/m^3 and the Gallinger Road station averaging 34.5 µg/m^3. For values below the detection limit, by convention they are substituted with a value of 1.5 µg/m^3, which is half of the detection limit. The maximum 24-hour concentration for TSP was 85.2 µg/m^3 at the Tait Road station (28 May 2015), and 84.3 µg/m^3 at the Gallinger Road station (28 May 2015). Both values are lower than the 24-hour AAQC TSP level of 120 µg/m^3.

In the quarter, the 24-hour metal concentrations were all well below the applicable O.Reg.419/05 Schedule 3 standards and AAQCs. For three metals (As, Se, and V), statistics were not reported as more than 50% of the results were below the method detection limit.

Table 1: Summary Statistics for Q2 2015 for TSP Data

Statistic	Q2	
	Tait Road (SW)	Gallinger Road (NE)
Geometric mean (µg/m^3)	31.9	28.9
Arithmetic mean (µg/m^3)	36.7	34.5
Maximum 24 hour (µg/m^3)	85.2 (28 May)	84.3 (28 May)
90th percentile	62.8	28.9
95th percentile	74.0	34.5
24-hour AAQC	120	120
No. of valid samples	6	6
% valid data	100	100
No. samples > AAQC (particulate)	0	0
No. samples > AAQC (metals)	0	0
No. samples > AAQC (elements)	0	0

3.2 $PM_{2.5}$

At the Tait Raid station, six samples were collected resulting in 100% valid data.

For the Gallinger Road station, the $PM_{2.5}$ sample for 26 June 2015 was invalid due to a runtime error resulting in the collected volume exceeding MOECC criterion. The invalid sample resulted in 83% valid data for the quarter for that instrument.

The arithmetic mean $PM_{2.5}$ concentrations for Q2 2015 were comparable with the Tait Road station averaging 8.98 µg/m^3 and the Gallinger Road station averaging 8.58 µg/m^3. For values below the detection limit, by convention they are substituted with a value of 0.5 µg/m^3, which is half of the detection limit. The maximum 24- hour concentration for $PM_{2.5}$ was 24.1 µg/m^3 at the Tait Road station (8 June), and 21.0 µg/m^3 at the Gallinger Road station (8 June). Both values are lower than the $PM_{2.5}$ AAQC of 30 µg/m^3 and the CAAQS of 28 µg/m^3.

The Q2 $PM_{2.5}$ data is summarized in Table 2.

Table 2: Summary Statistics for Q2 2015 for $PM_{2.5}$ Data

Statistic	Q2	
	Tait Road (SW)	Gallinger Road (NE)
Geometric mean (µg/m^3)	7.15	6.75
Arithmetic mean (µg/m^3)	8.98	8.58
Maximum 24 hour (µg/m^3)	24.1	21.0
90th percentile	16.9	16.2
95th percentile	20.5	18.6
24-hour CAAQS	28	28
No. of valid samples	6	5
% valid data	100%	83%
No. samples > CAAQS	0	0

3.3 Total Dustfall

One valid dustfall sample was collected at each station each month for dustfall during Q2 2015; each dustfall jar was exposed for 31 days. There were no exceedances of the AAQC for dustfall. A summary of the results is presented in Table 3.

The monthly results are shown in Appendix B-2.

Table 3: Summary Statistics for Q2 2015 Total Dustfall Data

Statistic	Tait Road (SW)	Gallinger Road (NE)
Mean (g/m^2/30d)[1]	4.47	1.3
30-day AAQC	7	7
No. > AAQC	0	0
No. valid samples	1	1
% Valid data	100	100

N/A: No applicable criteria

[1]Only one sample taken at each station

3.4 Passive SO_2 and NO_2

In Q2 2015, one valid sample was collected at each station for each of SO_2 and NO_2.

There are no MOECC standards, guidelines or AAQCs for SO_2 and NO_2 data obtained from passive samplers for the 30-day averaging period.

The 30-day average SO2 and NO2 concentrations measured allow for future analysis of trends in the ambient concentrations, to identify any notable increases, and for comparison with dispersion modelling results. For NO2 the monthly results were compared to the MOECC AAQC for 24-hour converted to a 30-day average (78 µg/m3), which is equal to the Ontario 24-hour average AAQC converted to a 30-day averaging period using the methodology outlined in the *Procedure for Preparing and Emission Summary and Dispersion Modelling Report* (MOECC 2009). For SO2, the results were compared against the Alberta Ambient Air Quality Objectives (2013) of 30 µg/m3.

Table 4: Summary Statistics for Q2 2015 for Passive SO_2 and NO_2 Data

	Tait Road (SW)		Gallinger Road (NE)	
Statistic	**SO_2**	**NO_2**	**SO_2**	**NO_2**
Mean	1 µg/m^3 (0.4 ppb)	<0.2 µg/m^3 (<0.1 ppb)	<0.3 µg/m^3 (<0.1 ppb)	<0.2 µg/m^3 (<0.1 ppb)
Maximum	1 µg/m^3 (0.4 ppb)	<0.2 µg/m^3 (<0.1 ppb)	<0.3 µg/m^3 (<0.1 ppb)	<0.2 µg/m^3 (<0.1 ppb)
AAQC 24-hr converted to 30-day	N/A	78 µg/m^3	N/A	78 µg/m^3
Alberta Ambient Air Quality Objectives 2013	30 µg/m^3	N/A	30 µg/m^3	N/A
No. valid samples	1	1	1	1
% Valid data	100	100	100	100

N/A: No applicable criteria

4.0 CONCLUSIONS

Two ambient air quality monitoring stations were installed and commissioned in May 2015 at the Rainy River Project.

The following samples were collected in Q2 2015:

- Six valid TSP samples were collected at each of the two monitoring stations (100% valid data), with metal analyses performed on each of the TSP filters;
- Six valid $PM_{2.5}$ samples were collected at the Tait Road site (100% valid data); and five at the Gallinger Road site (83% valid data);
- One valid dustfall sample was collected at each of the two stations; and
- One valid passive sample for each of SO_2 and NO_2.

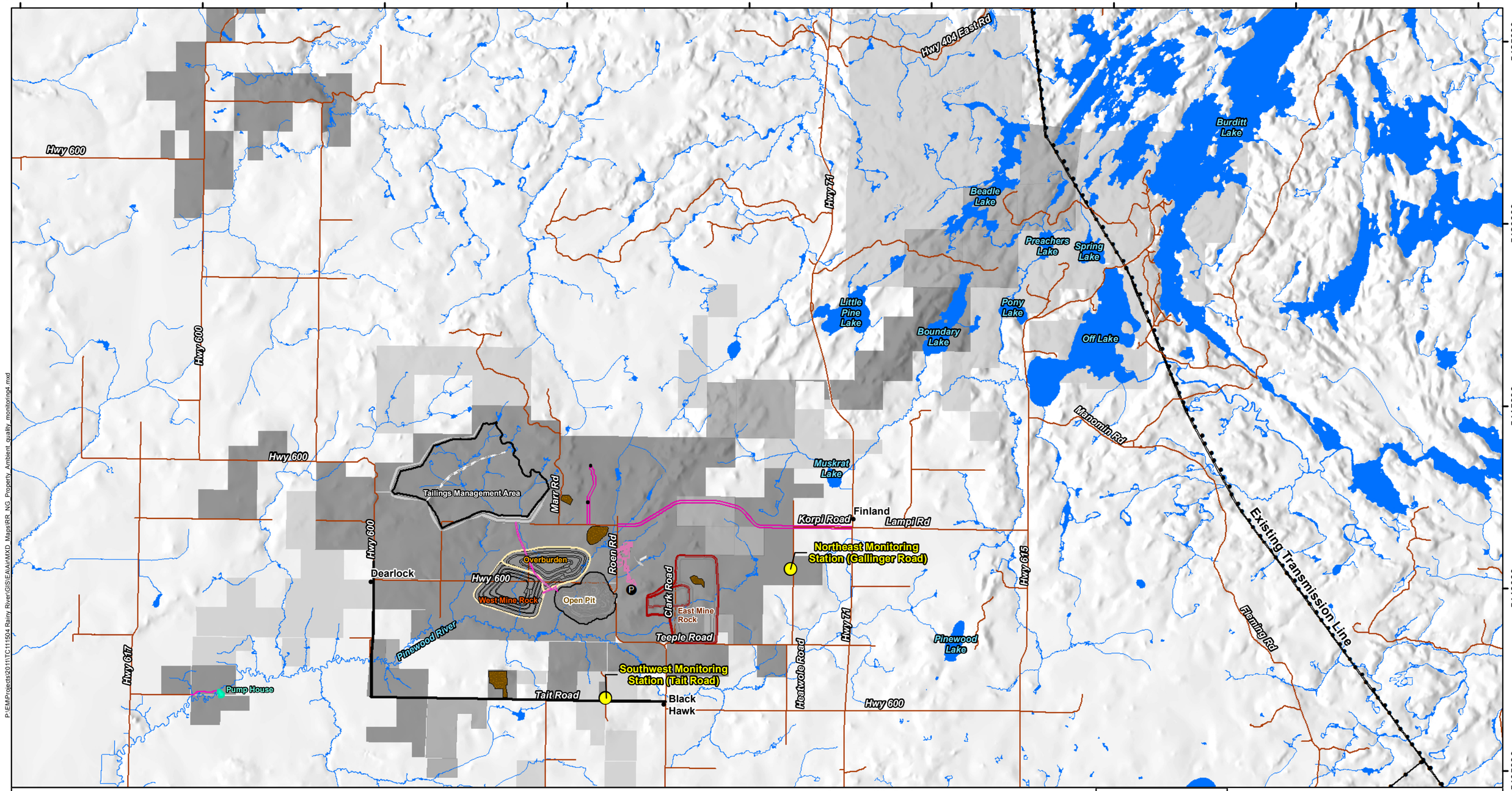
There were no measured exceedences of MOECC air quality standards, guidelines, or AAQCs, nor were there any exceedances of the Federal CAAQS for $PM_{2.5}$ or other established criteria. All air quality parameters were well below corresponding limits.

5.0 REFERENCES

Ministry of the Environment. 2008. Operations Manual for Air Quality Monitoring in Ontario.

APPENDIX A

SATELLITE IMAGES OF THE AIR SAMPLING STATION LOCATIONS



LEGEND

- Ambient Air Quality Monitoring Stations
- New Gold - Rainy River Property Boundary
- New Gold Unpatented Claim (Applied to bring to lease) Acquisition in Progress
- New Gold Lands with No Current Access Control

Proposed Site Features

- Underground Portal
- Open Pit
- Plant Site / Ancillary Facilities
- Explosives Facilities
- Overburden / West Mine Rock Stockpile
- Ore / East Mine Rock Stockpile
- Proposed Pump House
- Tailings Management Area
- Aggregate Pit / Quarry
- Site Roads
- Roads
- Existing Transmission Line
- First Nation Land

0 2 4 8 12 16 20 Kilometres

NOTES:
- Road and Utility data and topographic data extracted from Land Information Ontario, Ontario Road Network, MNR Queen's Printer for Ontario, 2011-2012
- Land tenure information and parcels provided by NewGold, June 9, 2015

Datum: NAD83
Projection: UTM Zone 15N

newgold™ Rainy River Project

amec foster wheeler

RAINY RIVER PROJECT

Ambient Air Monitoring Stations

PROJECT N°: TC111504 | **FIGURE: 1**

SCALE: 1:100,000 | DATE: August 2015

425950
426000
426050
426100
426150
426200
5407000
5406950
5406900
69 m
TAIT ROAD
P:\EM\Projects\2011\TC111504 Rainy River\GIS\EA\Air\MXD_Maps\RR_NG_Ambient_quality_monitoring_stationTait.mxd

LEGEND

- Southwest Monitoring Station (Tait Road)
- Highway Re-alignment

0 10 20 40 60 80 100 Meters

Notes:
- Aerial imagery provided by RRR Plieades imagery (August 2014).

Datum & Projection:
NAD 1983 UTM Zone 15N

N
W E
S

newgold™ Rainy River Project
amec foster wheeler

RAINY RIVER PROJECT

Ambient Air Monitoring
Southwest Monitoring Station

PROJECT N°: TC111504 | **FIGURE: 2**

SCALE: 1:700 | DATE: August 2015

P:\EM\Projects\2011\TC111504 Rainy River\GIS\EA\MXD_Maps\RR_NG_Ambient quality_monitoring_station_Gallinger.mxd

LEGEND

- Northeast Monitoring Station (Gallinger Road)
- Gallinger Road

0 10 20 40 60 80 100 Meters

Notes:
- Aerial imagery provided by RRR Plieades imagery (August 2014).

Datum & Projection: NAD 1983 UTM Zone 15N

N W E S

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RAINY RIVER PROJECT

Ambient Air Monitoring
Northeast Monitoring Station

PROJECT N°: TC111504	**FIGURE: 3**
SCALE: 1:700	DATE: August 2015

APPENDIX B

Appendix B-1: TSP Sampling Results

Appendix B-2: Total Dustfall Sampling Results

Appendix B-3: SO_2 AND NO_2 Passive Sampling Results

APPENDIX B-1

TSP SAMPLING RESULTS

Southwest Tait Road Monitoring Results for TSP and Metals (Second Quarter 2015)

(results expresed in µg/m^3)

Date	TSP	PM2.5	As*	Cd	Cr	Co	Cu	Fe	Pb	Mn	Ni	Se*	V*	Zn
May 28, 2015	85.2	9.74	0.00044	0.0000758	0.00614	0.000176	0.163	0.272	0.000617	0.0120	0.00129	0.00044	0.00056	0.00952
June 2, 2015	23.4	5.58	0.00045	0.0000779	0.0054	0.000129	0.0974	0.201	0.00120	0.00734	0.000890	0.00045	0.00058	0.04268
June 8, 2015	40.5	24.1	0.00043	0.000169	0.0053	0.0000971	0.323	0.103	0.000977	0.0359	0.000779	0.00043	0.00056	0.02813
June 14, 2015	21.7	5.41	0.00043	0.0000374	0.0092	0.000118	0.496	0.178	0.000557	0.00695	0.000689	0.00043	0.00055	0.00664
June 20, 2015	22.0	3.25	0.00043	0.0000168	0.0081	0.0000919	0.573	0.101	0.000181	0.00294	0.000552	0.00043	0.00056	0.00428
June 26, 2015	27.4	5.83	0.00043	0.0000540	0.011	0.000318	0.124	0.441	0.000397	0.01136	0.00129	0.00043	0.00056	0.01012
Geometric mean	31.9	7.15	N/R	0.000057	0.0072	0.00014	0.238	0.188	0.000554	0.00950	0.00087	N/R	N/R	0.0122
Arithmetic mean	36.7	8.98	N/R	0.000072	0.0074	0.00015	0.296	0.216	0.000655	0.0128	0.00092	N/R	N/R	0.0169
Max. concentration	85.2	24.1	N/R	0.00017	0.011	0.00032	0.573	0.441	0.00120	0.03592	0.0013	N/R	N/R	0.04268
Min. concentration	21.7	3.25	N/R	0.000017	0.0053	0.000092	0.097	0.101	0.000181	0.00294	0.00055	N/R	N/R	0.00428
90th percentile	62.8	16.9	N/R	0.00012	0.010	0.00025	0.534	0.357	0.00109	0.0240	0.0013	N/R	N/R	0.0354
95th percentile	74.0	20.5	N/R	0.00015	0.010	0.00028	0.554	0.399	0.00115	0.0299	0.0013	N/R	N/R	0.0390
CAAQS	N/A	28	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
No. > CAAQS value**	0	0	0	0	0	0	0	0	0	0	0	0	0	0
AAQC (24 h)	120	30	0.3	0.025	0.5	0.1	50	4	0.5	0.4	0.2	10	2	120
No. > AAQC (24 h)	0	0	0	0	0	0	0	0	0	0	0	0	0	0
No. of valid samples	6	6	6	6	6	6	6	6	6	6	6	6	6	6
No. samples < mdl	0	0	6	0	0	0	0	0	0	0	0	6	6	0
Detection limit (µg)	1	1	1.4	0.0090	1.4	0.0077	3.4	17	0.081	0.44	0.10	1.4	1.8	1.4
Half detection limit (µg)	0.5	0.5	0.7	0.0045	0.7	0.00385	1.7	8.5	0.0405	0.22	0.05	0.7	0.9	0.7
% < detection limit	0	0	100	0	0	0	0	0	0	0	0	100	100	0
% valid data	100	100	100	100	100	100	100	100	100	100	100	100	100	100

Notes:

N/R: Statisics not reported due to high % of values <detedciton limit

N/A: Not applicable

INV: Invalid Sample

*Arsenic, Selenium, and Vanadium concentrations were below detection limit and as such were reported at 1/2 the detection limit

**Canadian Ambient Air Quality Standard, 24-hour standard

Northeast Gallinger Road Monitoring Results for TSP and Metals (Second Quarter 2015)

(results expresed in µg/m^3)

Date	TSP	PM2.5	As*	Cd	Cr	Co	Cu	Fe	Pb	Mn	Ni	Se*	V*	Zn
May 28, 2015	84.3	8.95	0.00044	0.000052	0.0045	0.0000912	0.213	0.133	0.000430	0.00881	0.00106	0.00044	0.00057	0.00824
June 2, 2015	27.9	5.20	0.00041	0.000140	0.0052	0.000317	0.335	0.658	0.00559	0.01083	0.00207	0.00041	0.00052	0.31219
June 8, 2015	34.3	21.0	0.00043	0.000122	0.0045	0.0000927	0.185	0.0829	0.000694	0.03015	0.000749	0.00043	0.00055	0.02149
June 14, 2015	21.9	4.79	0.00042	0.0000372	0.0087	0.0000994	0.193	0.145	0.000578	0.00627	0.000621	0.00042	0.00054	0.00663
June 20, 2015	12.8	3.00	0.00043	0.0000135	0.0074	0.0000431	0.225	0.0350	0.000236	0.00202	0.000522	0.00043	0.00055	0.00565
June 26, 2015	25.5	INV	0.00044	0.0000244	0.0080	0.000105	0.241	0.0946	0.000198	0.00352	0.000661	0.00044	0.00057	0.00864
Geometric mean	28.9	6.75	N/R	0.000047	0.0061	0.00010	0.228	0.123	0.000596	0.00710	0.00084	N/R	N/R	0.0162
Arithmetic mean	34.5	8.58	N/R	0.000065	0.0064	0.00012	0.232	0.191	0.00129	0.0103	0.00095	N/R	N/R	0.0605
Max. concentration	84.3	21.0	N/R	0.00014	0.0087	0.00032	0.335	0.658	0.00559	0.03015	0.00207	N/R	N/R	0.31219
Min. concentration	12.8	3.00	N/R	0.000014	0.0045	0.000043	0.185	0.0350	0.000198	0.00202	0.00052	N/R	N/R	0.00565
90th percentile	59.3	16.2	N/R	0.00013	0.0084	0.00021	0.288	0.402	0.00314	0.0205	0.0016	N/R	N/R	0.167
95th percentile	71.8	18.6	N/R	0.00014	0.0086	0.00026	0.312	0.530	0.00436	0.0253	0.0018	N/R	N/R	0.240
CAAQS	N/A	28	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
No. > CAAQS value**	0	0	0	0	0	0	0	0	0	0	0	0	0	0
AAQC	120	30	0.3	0.025	0.5	0.1	50	4	0.5	0.4	0.2	10	2	120
No. > AAQC	0	0	0	0	0	0	0	0	0	0	0	0	0	0
No. of valid samples	6	5	6	6	6	6	6	6	6	6	6	6	6	6
No. samples < mdl	0	0	6	0	0	0	0	0	0	0	0	6	6	0
Detection limit (µg)	1	1	1.4	0.0090	1.4	0.0077	3.4	17	0.081	0.44	0.10	1.4	1.8	1.4
Half detection limit (µg)	0.5	0.5	0.7	0.0045	0.7	0.00385	1.7	8.5	0.0405	0.22	0.05	0.7	0.9	0.7
% < detection limit	0	0	100	0	0	0	0	0	0	0	0	100	100	0
% valid data	100	83	100	100	100	100	100	100	100	100	100	100	100	100

Notes:

N/R: Statisics not reported due to high % of values <detedciton limit

N/A: Not applicable

INV: Invalid Sample

*Arsenic, Selenium, and Vanadium concentrations were below detection limit and as such were reported at 1/2 the detection limit

**Canadian Ambient Air Quality Standard, 24-hour standard

APPENDIX B-2

TOTAL DUSTFALL SAMPLING RESULTS

Tait Road Monitoring Results for Dustfall (Second Quarter 2015)
(results expresed in g/m^2/30days)

Month	No. Exposure Days	Dustfall (insoluble)	Dustfall (soluble)*	Dustfall (total)
April	N/A	N/A	N/A	N/A
May	N/A	N/A	N/A	N/A
June	31	4.47	0.15	4.47

Arithmetic mean	4.47
Max. concentration	4.47
Min. concentration	4.47
AAQC	7
No. > AAQC value**	0
No. of valid samples	1
% Valid data	100
No. samples < mdl	0
Detection limit	0.3
Half detection limit	0.15

Notes:
N/R: Statisics not reported due to high % of values <detedciton limit
N/A: Not applicable
INV: Invalid Sample
*All soluble dustfall results were below the detection limit and as such were report as 1/2 of the detection limit
**Ontario Ambient Air Quality Criteria, 30-day standard

Gallinger Road Monitoring Results for Dustfall (Second Quarter 2015)
(results expresed in g/m^2/30days)

Month	No. Exposure Days	Dustfall (insoluble)	Dustfall (soluble)*	Dustfall (total)
April	N/A	N/A	N/A	N/A
May	N/A	N/A	N/A	N/A
June	31	1.1	0.15	1.3

Arithmetic mean	1.26
Max. concentration	1.26
Min. concentration	1.26
AAQC	7
No. > AAQC value**	0
No. of valid samples	1
% Valid data	100
No. samples < mdl	0
Detection limit	0.3
Half detection limit	0.15

Notes:
N/R: Statisics not reported due to high % of values <detedciton limit
N/A: Not applicable
INV: Invalid Sample
*All soluble dustfall results were below the detection limit and as such were report as 1/2 of the detection limit
**Ontario Ambient Air Quality Criteria, 30-day standard

APPENDIX B-3

SO_2 AND NO_2 PASSIVE SAMPLING RESULTS

Monitoring Results for Passive SO_2 and NO_2 (Second Quarter 2015)

	Tait Road		Gallinger Road	
Month	**SO_2**	**NO_2**	**SO_2**	**NO_2**
April	N/A	N/A	N/A	N/A
May	N/A	N/A	N/A	N/A
June	1 µg/m3 (0.4 ppb)	<0.2 µg/m3 (<0.1 ppb)	<0.3 µg/m3 (<0.1 ppb)	<0.2 µg/m3 (<0.1 ppb)

Arithmetic mean	N/A	N/A	N/A	N/A
Max. concentration	N/A	N/A	N/A	N/A
Min. concentration	N/A	N/A	N/A	N/A
AAQC* 24-hr converted to 30-day	N/A	78 µg/m^3	N/A	78 µg/m^3
Alberta Ambient Air Quality Objectives 2013	30 µg/m^3	N/A	30 µg/m^3	N/A
No. of valid samples	3	3	3	3
No. samples < mdl	0	0	0	0
Detection limit	0.1	0.1	0.1	0.1
Half detection limit	0.05	0.05	0.05	0.05

Notes:

All results reported by the lab in parts per billion (ppb) and are converted to µg/m3 assuming 101.23kPA and 25C

N/R: Statisics not reported due to high % of values <detedciton limit

N/A: Not applicable

INV: Invalid Sample

*Ontario Ambient Air Quality Criteria

AIR QUALITY MONITORING PROGRAM
THIRD QUARTER 2015 REPORT
RAINY RIVER PROJECT

REVISION 1

Submitted to:

New Gold Inc.
1111 Victoria Avenue East
Thunder Bay, Ontario
P7C 1B7

Submitted by:

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

February 2016

Amec Foster Wheeler Project No.: TC111504.2015.6

February 17, 2016

Amec Foster Wheeler Project No.: TC111504.2015.6

New Gold Inc.
1111 Victoria Avenue East
Thunder Bay, Ontario
P7C 1B7

Attention: Kyle Stanfield
Director Environment & Sustainability

Dear Mr. Stanfield:

Re: Rainy River Project, Third Quarter 2015 Air Monitoring Report (Revision 1)

Amec Foster Wheeler Environment & Infrastructure, a Division of Amec Foster Wheeler Americas Limited (Amec Foster Wheeler), is pleased to submit to New Gold Inc. (New Gold) a revised summary report for the data collected in the third quarter 2015 for the air quality monitoring program initiated in 2015 at the Rainy River Project. Two air quality sampling stations were established in May 2015: one to the south of the Site near the beginning of the Highway 600 reroute on Tait Road, and one to the east of the Site on Gallinger Road. The sampling stations were operated and maintained by New Gold staff.

Should you have any questions or wish to discuss the air monitoring program, please do not hesitate to contact the undersigned.

Sincerely,

Amec Foster Wheeler Environment & Infrastructure
a Division of Amec Foster Wheeler Americas Limited

<Original signed by>

Caleb Vandenberg, P.Eng.
Air Quality Engineer

<Original signed by>

Tony van der Vooren P.Eng, Ph.D, QEP
Senior Air Quality Consultant

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Revision	Date	Revised By	Description
0	13-November-2015	Caleb Vandenberg	Drafted Report
0.1	13-November-2015	Thy-Thuy-Trang Nguyen	Text changes
0.2	4-December-2015	Tony van der Vooren	Text changes
1	17-February-2016	Caleb Vandenberg	Correction of dustfall values/dates

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Appendix B-3 SO_2 and NO_2 Passive Sampling Results

ACRONYMS AND ABBREVIATIONS

AAQC	Ambient Air Quality Criteria
ACFM	Actual Cubic Feet Per Minute
ASTM	American Society for Testing and Materials
CAAQS	Canadian Ambient Air Quality Standards
ICP/AES	Inductively Coupled Plasma Atomic Emission Spectroscopy
MOECC	Ministry of the Environment and Climate Change
NIST	National Institute of Standards and Technology
TSP	Total Suspended Particulate
USEPA	United States Environmental Protection Agency

1.0 INTRODUCTION

Amec Foster Wheeler Environment & Infrastructure, a Division of Amec Foster Wheeler Americas Limited (Amec Foster Wheeler), is pleased to provide a summary of the third quarter (Q3) 2015 results for the air quality monitoring program undertaken at the Rainy River Project located in northwestern Ontario. Two sampling stations were established in May 2015: one to the south of the Site near the beginning of the Highway 600 reroute on Tait Road, and one to the east of the Site on Gallinger Road. Their locations are shown in the satellite images in Appendix A (Figures 1, 2 and 3).

New Gold Inc. (New Gold) staff operate and maintain the sampling stations. Amec Foster Wheeler provided technical guidance to New Gold field staff, communicated with the laboratory staff as required and prepared the data summary report.

2.0 ANALYTICAL AND MONITORING METHODS

2.1 TSP and Metals

The total suspended particulate (TSP) concentrations were determined using the standard gravimetric method following the reference methods approved by the United States Environmental Protection Agency (USEPA) and the Ontario Ministry of the Environment and Climate Change (MOECC) as described in its Operations Manual (MOECC, 2008). Measurements of 24-hour average TSP and metal concentrations were undertaken as this is the averaging time upon which these parameters are set under Ontario Ambient Air Quality Criteria (AAQC 2012). Sampling was performed with hi-vol samplers (brush motor and mass flow controlled). The metals and metalloids analyzed included, but were not limited to, the following: arsenic (As), cadmium (Cd), chromium (Cr), cobalt (Co), copper (Cu), iron (Fe), lead (Pb), manganese (Mn), nickel (Ni), selenium (Se), vanadium (V) and zinc (Zn).

The lowest detectable limit is 0.1 milligrams (mg) of total particulate, resulting in a method detection limit of 0.06 micrograms per cubic metre (µg/m^3; based on a typical 24-hour sample volume of 1630 m^3).

The metal concentrations were determined with the standard ICP/AES method. The method detection limits are as shown in the data sheets in Appendix B-1.

2.2 $PM_{2.5}$

The $PM_{2.5}$ concentrations were determined using the standard gravimetric method following the reference methods approved by the USEPA and the MOECC as described in its Operations Manual (MOECC, 2008). Measurement of 24-hour average $PM_{2.5}$ was undertaken to match the averaging time for the Canadian Ambient Air Quality Standard (CAAQS). Sampling was performed with PQ200 samplers.

The lowest detectable limit is 1 µg of $PM_{2.5}$, resulting in a method detection limit of 0.04 µg/m^3 (based on a typical 24-hour sample volume of 24 m^3).

2.3 Total Dustfall

The water soluble and insoluble portions of dustfall were determined using ASTM method D-1739-98 and MOECC method DF-E3043A (September 8, 1995). Standard dustfall samplers were used to measure total dustfall deposition. The dustfall jars were lined with a 4 Mil plastic bag as required in the MOECC Operations Manual (MOECC, 2008). The method detection limit for total dustfall is usually 0.3 g/m^2/30 days.

2.4 Passive Sampling for SO_2 and NO_2

SO_2 and NO_2 concentrations were monitored with passive sampling devices. The exposed permeation filters were analyzed using the methodology employed by the Maxxam Analytics Inc. laboratory located in Edmonton, Alberta. The methodology was developed, approved and validated by Alberta Environment with the support of the Alberta Research Council, the Clean Air Strategic Alliance of Alberta, and the National Research Council of Canada.

Since the sample uptake is dependent on temperature, relative humidity and wind speed, the analytical results are adjusted for these meteorological parameters measured during the exposure period (monthly averages). The required meteorological data are taken from the Environment Canada Fort Frances meteorological station (Climate ID 6022474) by Maxxam Analytics to use with each sample submission. The method detection limit is in the order of 0.1 parts per billion (ppb) for both SO_2 and NO_2. Validation tests conducted in Alberta show that results from passive sampling are typically within 10% of those obtained from sampling with continuous analyzers for 30-day exposure periods.

Since there are no MOECC guidelines for monthly concentrations of SO_2 and NO_2 obtained from passive sampling, the data will only be used for screening purposes and potentially for comparison with dispersion modelling results. For NO_2, the monthly results were compared to the MOECC AAQC for 24-hour converted to a 30-day average (78 ug/m^3). For SO_2, the results were compared against the 30-day Alberta Ambient Air Quality Objectives (2013) of 30 ug/m^3.

2.5 Field Operations

2.5.1 Hi-Vol Samplers

The two sites were visited once every six days to recover the exposed filter and install a pre-weighed filter for the subsequent sample in order to meet the requirements of the 1 in 6 day sampling schedule. Additional visits were made to resolve instrumentation issues and perform flow calibration checks and preventative maintenance.

Amec Foster Wheeler staff performed the original calibrations on the hi-vol samplers on 25 May 2015 using a BGI direct reading hivol electronic flow calibrator. The flows were set at 40 acfm for each station; the samplers are mass flow controlled. The electronic BGI flow calibrator was sent to the manufacturer for re-certification to National Institute of Standards and Technology (NIST) traceability in September 2014. New Gold staff recalibrated the SW HiVol on 30 June 2015 using the same calibrator and under the guidance of Amec Foster Wheeler staff after a pump was replaced. The overall uncertainty of the calibrator was determined to be 0.60% (ambient temperature, barometric pressure and flow), with an average error of -1.21% in the flow at standard conditions (Q_s) relative to the USEPA standard.

2.5.2 PQ200 Samplers

The stations were visited once every six days to recover the exposed filter and install a pre-weighed filter for the subsequent sample in order to meet the requirements of the 1 in 6 day sampling schedule. The PQ200 supplier performed the original calibrations on 20 May 2015 and the flow, temperature, and barometric pressure were checked using an electronic BGI flow calibrator by Amec Foster Wheeler staff on 26 May 2015 after the instruments had been installed.

2.5.3 Dustfall Samplers

The dustfall samplers were changed every month, as required.

2.5.4 Passive Samplers

The permeation filters in the passive samplers were changed every month, as required.

3.0 RESULTS

The results for the Q3 2015 sampling program are presented in Appendix B-1 for the hi-vol data, Appendix B-2 for the dustfall data and Appendix B-3 for the passive SO_2 and NO_2 data. By convention, all hi-vol results below the analytical detection limit were reported at half the detection limit.

For comparison purposes, the MOECC AAQC and CAAQS values are presented, where available.

A summary of the statistical analyses for Q3 for the TSP concentrations is presented in Table 1 below. During the quarter, the 1 in 6 day hi-vol sampling schedule comprised a possible total of 16 sampling days between 1 July and 30 September 2015.

A summary of the statistical analyses for Q3 2015 for the total dustfall data is presented below in Table 2. A summary of the statistical analysis for the third quarter of 2015 for the passive SO_2 and NO_2 results is presented in Table 3.

3.1 Total Suspended Particulates and Metals

At the both the Tait Road and Gallinger Road stations, sixteen valid samples were collected in Q3 2015, resulting in 100% valid data.

For the quarter, the arithmetic mean TSP concentrations were comparable, with the Tait Road station averaging 22.5 µg/m^3 and the Gallinger Road station averaging 29.5 µg/m^3. For values below the detection limit, by convention they are substituted with half of the detection limit. The maximum 24-hour concentration for TSP was 48.2 µg/m^3 at the Tait Road station (18 September 2015), and 136.3 µg/m^3 at the Gallinger Road station (30 September 2015). The 30 September 2015 concentration measured at the Gallinger Road station was the only exceedance of the 24-hour TSP AAQC (120 µg/m^3) in the third quarter; New Gold field staff noted increased truck traffic on Gallinger Road during this time due to construction on the East Access Road which may have influenced concentrations.

In the quarter, the 24-hour metal concentrations were all well below the applicable O.Reg.419/05 Schedule 3 standards and AAQCs. For three metals (As, Se, and V), statistics were not reported as more than 50% of the results were below the method detection limit.

Table 1: Summary Statistics for Q3 2015 for TSP Data

Statistic	Q3	
	Tait Road (SW)	Gallinger Road (NE)
Geometric mean (µg/m^3)	19.1	21.8
Arithmetic mean (µg/m^3)	22.5	29.5
Maximum 24 hour (µg/m^3)	48.2 (18 Sept.)	136.3 (30 Sept.)
90th percentile	38.1	42.1
95th percentile	41.8	68.4
24-hour AAQC	120	120
No. of valid samples	16	16
% valid data	100	100
No. samples > AAQC (particulate)	0	1
No. samples > AAQC (metals)	0	0
No. samples > AAQC (elements)	0	0

3.2 $PM_{2.5}$

At the Tait Raid station, sixteen samples were collected resulting in 100% valid data.

The arithmetic mean $PM_{2.5}$ concentrations for Q3 2015 were comparable with the Tait Road station averaging 4.55 µg/m^3 and the Gallinger Road station averaging 4.60 µg/m^3. For values below the detection limit, by convention they are substituted with a concentration representing half of the detection limit. The maximum 24-hour concentration for $PM_{2.5}$ was 15.3 µg/m^3 at the Tait Road station (31 August), and 15.0 µg/m^3 at the Gallinger Road station (31 August). Both values are lower than the $PM_{2.5}$ AAQC of 30 µg/m^3 and the CAAQS of 28 µg/m^3.

The Q3 $PM_{2.5}$ data is summarized in Table 2.

Table 2: Summary Statistics for Q3 2015 for $PM_{2.5}$ Data

Statistic	Q3	
	Tait Road (SW)	Gallinger Road (NE)
Geometric mean (µg/m^3)	3.07	3.19
Arithmetic mean (µg/m^3)	4.55	4.60
Maximum 24 hour (µg/m^3)	15.3 (31 Aug.)	15.0 (31 Aug.)
90th percentile	10.6	10.3
95th percentile	13.7	13.4
24-hour CAAQS	28	28
No. of valid samples	16	16
% valid data	100%	100%
No. samples > CAAQS	0	0

3.3 Total Dustfall

One sample was collected at each station each month for dustfall during Q3 2015; each dustfall jar was exposed for approximately 30-days to coincide with each calendar month in the quarter. The July dustfall results at both stations were invalidated due to algae growth. There was an exceedance of the dustfall AAQC in August and September at the Gallinger Road station which may have been influenced by increased truck traffic on Gallinger Road due to construction on the East Access Road. A summary of the results is presented in Table 3.

The monthly results are shown in Appendix B-2.

Table 3: Summary Statistics for Q3 2015 Total Dustfall Data

Statistic	Tait Road (SW)	Gallinger Road (NE)
Mean (g/m^2/30d)	4.1	13.1
30-day AAQC	7	7
No. > AAQC	0	2
No. valid samples	3	3
% Valid data	66.6	66.6

N/A: No applicable criteria

3.4 Passive SO_2 and NO_2

In Q3 2015, three (3) valid samples were collected at each station for each of SO_2 and NO_2.

There are no MOECC standards, guidelines or AAQCs for SO_2 and NO_2 data obtained from passive samplers for the 30-day averaging period.

The 30-day average SO_2 and NO_2 concentrations measured allow for future analysis of trends in the ambient concentrations, to identify any notable increases, and for comparison with dispersion modelling results. For NO_2 the monthly results were compared to the MOECC AAQC for 24-hour converted to a 30-day average (78 µg/m^3), which is equal to the Ontario 24-hour average AAQC converted to a 30-day averaging period using the methodology outlined in the *Procedure for Preparing and Emission Summary and Dispersion Modelling Report* (MOECC 2009). For SO_2, the results were compared against the Alberta Ambient Air Quality Objectives (2013) of 30 µg/m^3.

Table 4: Summary Statistics for Q3 2015 for Passive SO_2 and NO_2 Data

	Tait Road (SW)		Gallinger Road (NE)	
Statistic	**SO_2**	**NO_2**	**SO_2**	**NO_2**
Mean	<0.1 µg/m^3 (<0.05 ppb)	<0.6 µg/m^3 (<0.3 ppb)	<0.2 µg/m^3 (<0.07 ppb)	<0.4 µg/m^3 (<0.2 ppb)
Maximum	<0.1 µg/m^3 (<0.05 ppb)	<0.8 µg/m^3 (<0.4 ppb)	0.3 µg/m^3 (0.1 ppb)	<0.8 µg/m^3 (<0.4 ppb)
AAQC 24-hr converted to 30-day	N/A	78 µg/m^3	N/A	78 µg/m^3
Alberta Ambient Air Quality Objectives 2013	30 µg/m^3	N/A	30 µg/m^3	N/A
No. valid samples	3	3	3	3
% Valid data	100	100	100	100

N/A: No applicable criteria

4.0 CONCLUSIONS

Two ambient air quality monitoring stations were installed and commissioned in May 2015 at the Rainy River Project.

The following samples were collected in Q3 2015:

- Sixteen (16) valid TSP samples were collected at each of the two monitoring stations (100% valid data), with metal analyses performed on each of the TSP filters;
    - One (1) exceedance of the Ontario AAQC for TSP was measured on 30 September 2015 at the Gallinger Road station which may have been influenced by increased truck traffic on Gallinger Road due to construction on the East Access Road.
- Sixteen (16) valid $PM_{2.5}$ samples were collected at each of the two monitoring stations (100% valid data);
- Two (2) valid dustfall samples were collected at each of the two stations with the July samples being invalidated due to algae growth;
    - Two (2) exceedances of the Ontario AAQC for dustfall were measured in August and September at the Gallinger Road station which may have been influenced by increased truck traffic on Gallinger Road due to construction on the East Access Road; and
- Three (3) valid passive samples for each of SO_2 and NO_2 at each of the two stations.

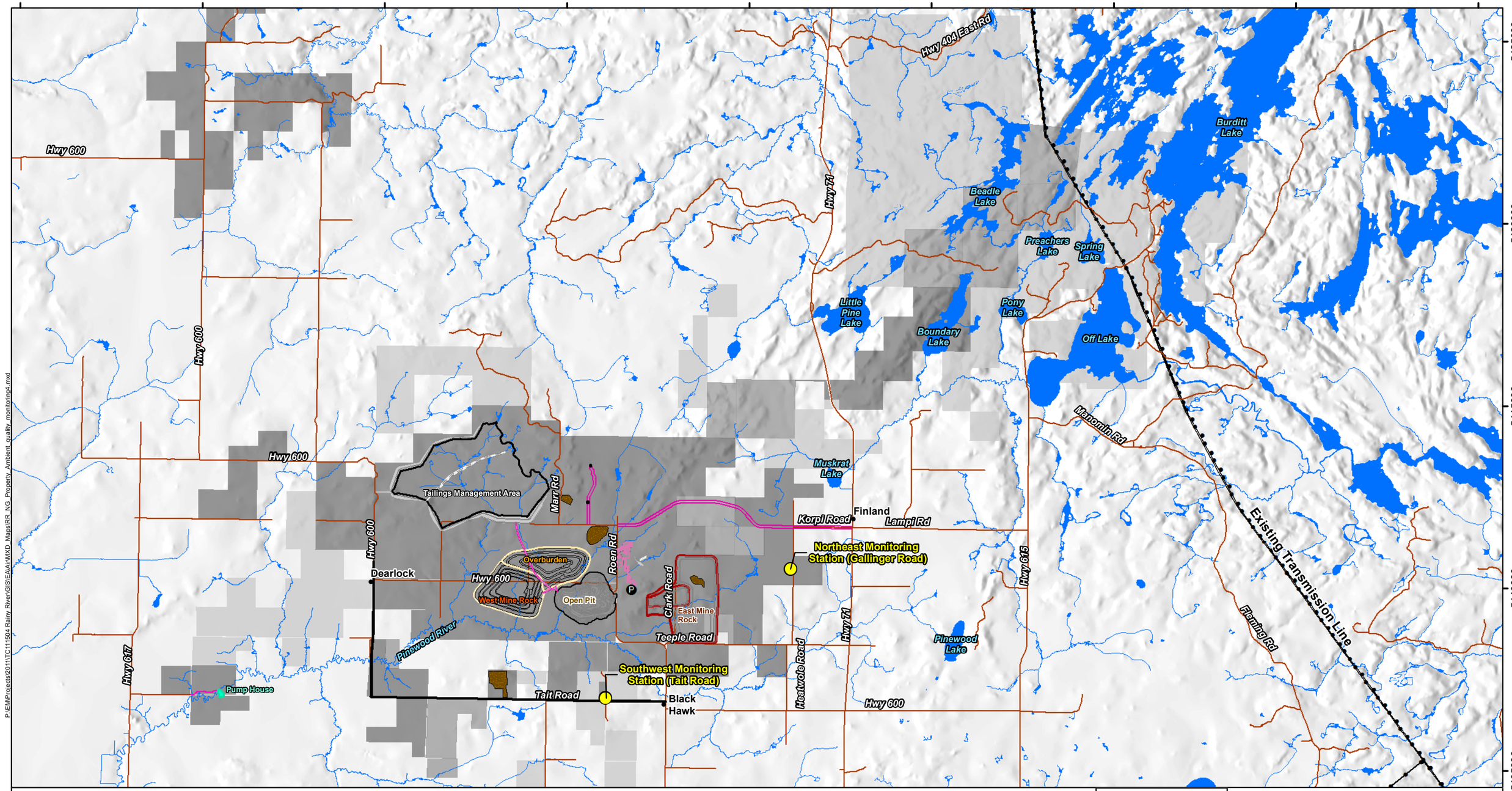
There was one (1) TSP exceedance and two (2) dustfall exceedances of the MOECC AAQC measured in Q3. There were no measured exceedances of other MOECC air quality standards, guidelines, or AAQCs, nor were there any exceedances of the Federal CAAQS for $PM_{2.5}$ or other established criteria.

5.0 REFERENCES

Ministry of the Environment. 2008. Operations Manual for Air Quality Monitoring in Ontario.

APPENDIX A

SATELLITE IMAGES OF THE AIR SAMPLING STATION LOCATIONS



LEGEND

- Ambient Air Quality Monitoring Stations
- New Gold - Rainy River Property Boundary
- New Gold Unpatented Claim (Applied to bring to lease) Acquisition in Progress
- New Gold Lands with No Current Access Control

Proposed Site Features

- Underground Portal
- Open Pit
- Plant Site / Ancillary Facilities
- Explosives Facilities
- Overburden / West Mine Rock Stockpile
- Ore / East Mine Rock Stockpile
- Proposed Pump House
- Tailings Management Area
- Aggregate Pit / Quarry
- Site Roads
- Roads
- Existing Transmission Line
- First Nation Land

0 2 4 8 12 16 20 Kilometres

NOTES:
- Road and Utility data and topographic data extracted from Land Information Ontario, Ontario Road Network, MNR Queen's Printer for Ontario, 2011-2012
- Land tenure information and parcels provided by NewGold, June 9, 2015

Datum: NAD83
Projection: UTM Zone 15N

newgold™ Rainy River Project

amec foster wheeler

RAINY RIVER PROJECT

Ambient Air Monitoring Stations

PROJECT N°: TC111504 | **FIGURE: 1**

SCALE: 1:100,000 | DATE: August 2015

425950
426000
426050
426100
426150
426200
5407000
5406950
5406900
69 m
TAIT ROAD
P:\EM\Projects\2011\TC111504 Rainy River\GIS\EA\Air\MXD_Maps\RR_NG_Ambient_quality_monitoring_stationTait.mxd

LEGEND

- Southwest Monitoring Station (Tait Road)
- Highway Re-alignment

0 10 20 40 60 80 100 Meters

Notes:
- Aerial imagery provided by RRR Plieades imagery (August 2014).

Datum & Projection:
NAD 1983 UTM Zone 15N

N
W E
S

newgold™ Rainy River Project
amec foster wheeler

RAINY RIVER PROJECT

Ambient Air Monitoring
Southwest Monitoring Station

PROJECT N°: TC111504 | **FIGURE: 2**

SCALE: 1:700 | DATE: August 2015

P:\EM\Projects\2011\TC111504 Rainy River\GIS\EA\MXD_Maps\RR_NG_Ambient quality_monitoring_station_Gallinger.mxd

LEGEND

- Northeast Monitoring Station (Gallinger Road)
- Gallinger Road

0 10 20 40 60 80 100 Meters

Notes:
- Aerial imagery provided by RRR Plieades imagery (August 2014).

Datum & Projection: NAD 1983 UTM Zone 15N

N W E S

newgold™ Rainy River Project — amec foster wheeler

RAINY RIVER PROJECT

Ambient Air Monitoring
Northeast Monitoring Station

PROJECT N°: TC111504	**FIGURE: 3**
SCALE: 1:700	DATE: August 2015

APPENDIX B

Appendix B-1: TSP Sampling Results

Appendix B-2: Total Dustfall Sampling Results

Appendix B-3: SO_2 AND NO_2 Passive Sampling Results

APPENDIX B-1

TSP SAMPLING RESULTS

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Southwest Tait Road Monitoring Results for TSP and Metals (Third Quarter 2015)
(results expresed in µg/m^3)

Date	TSP	PM2.5	As*	Cd	Cr	Co	Cu	Fe	Pb	Mn	Ni	Se*	V*	Zn
July 2, 2015	39.6	13.10	0.00042	0.0000832	0.0087	0.000345	0.0568	0.421	0.00091	0.01436	0.001321	0.00042	0.00054	0.02063
July 8, 2015	17.7	3.5	0.00044	0.000046	0.0110	0.0001523	0.074	0.232	0.000733	0.0090	0.000877	0.00044	0.00056	0.01003
July 14, 2015	22.9	8.15	0.00044	0.0000366	0.0106	0.000078	0.059	0.089	0.000324	0.00335	0.000637	0.00044	0.00056	0.00962
July 20, 2015	15.9	2.66	0.00043	0.0000195	0.0107	0.0001488	0.045	0.179	0.000306	0.00573	0.000777	0.00043	0.00055	0.00863
July 26, 2015	23.6	5.28	0.00042	0.0000543	0.011	0.000183	0.075	0.294	0.000754	0.01675	0.00109	0.00042	0.00053	0.00689
August 1, 2015	26.3	2.95	0.00046	0.0000437	0.0101	0.000338	0.0402	0.452	0.00039	0.01421	0.001173	0.00046	0.00059	0.00586
August 7, 2015	11.5	5.6	0.00045	0.000043	0.0116	0.0001317	0.097	0.089	0.000700	0.0043	0.000668	0.00045	0.00057	0.01120
August 13, 2015	27.2	6.40	0.00045	0.0000424	0.0035	0.000251	0.089	0.384	0.000469	0.01520	0.000782	0.00045	0.00057	0.00833
August 19, 2015	7.4	1.00	0.00042	0.0000182	0.0028	0.0000631	0.120	0.077	0.000223	0.00265	0.000522	0.00042	0.00055	0.00583
August 25, 2015	7.5	0.75	0.00043	0.0000214	0.002	0.000046	0.102	0.036	0.000139	0.00177	0.00047	0.00043	0.00055	0.00630
August 31, 2015	36.7	15.34	0.00043	0.0001119	0.003	0.000240	0.057	0.369	0.001317	0.01734	0.00071	0.00043	0.00056	0.01467
September 6, 2015	10.0	1.87	0.00043	0.0000753	0.0025	0.000097	0.0480	0.052	0.00037	0.00279	0.000576	0.00043	0.00055	0.00717
September 12, 2015	25.7	2.1	0.00043	0.000038	0.0031	0.0002414	0.055	0.328	0.000488	0.0248	0.000852	0.00043	0.00055	0.00625
September 18, 2015	48.2	1.12	0.00046	0.0000281	0.0041	0.000431	0.082	0.496	0.000496	0.01798	0.001146	0.00046	0.00059	0.00775
September 24, 2015	7.8	1.33	0.00043	0.0000219	0.0035	0.0000513	0.140	0.046	0.000307	0.00176	0.000502	0.00043	0.00056	0.00552
September 30, 2015	32.7	1.70	0.00044	0.0000366	0.004	0.000262	0.151	0.398	0.000541	0.01766	0.00108	0.00044	0.00057	0.00743

Geometric mean	19.1	3.07	N/R	0.000039	0.0052	0.00016	0.075	0.179	0.000459	0.00759	0.00078	N/R	N/R	0.0083
Arithmetic mean	22.5	4.55	N/R	0.000045	0.0063	0.00019	0.081	0.246	0.000529	0.0106	0.00082	N/R	N/R	0.0089
Max. concentration	48.2	15.3	N/R	0.00011	0.012	0.00043	0.151	0.496	0.00132	0.02481	0.0013	N/R	N/R	0.02063
Min. concentration	7.4	0.75	N/R	0.000018	0.0023	0.000046	0.040	0.036	0.000139	0.00176	0.00047	N/R	N/R	0.00552
90th percentile	38.1	10.6	N/R	0.00008	0.011	0.00034	0.130	0.436	0.00083	0.0178	0.0012	N/R	N/R	0.0129
95th percentile	41.8	13.7	N/R	0.00009	0.011	0.00037	0.143	0.463	0.00101	0.0197	0.0012	N/R	N/R	0.0162
CAAQS	N/A	28	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
No. > CAAQS value**	0	0	0	0	0	0	0	0	0	0	0	0	0	0
AAQC (24 h)	120	30	0.3	0.025	0.5	0.1	50	4	0.5	0.4	0.2	10	2	120
No. > AAQC (24 h)	0	0	0	0	0	0	0	0	0	0	0	0	0	0
No. of valid samples	16	16	16	16	16	16	16	16	16	16	16	16	16	16
No. samples < mdl	0	0	15	0	0	0	0	0	0	0	0	15	15	0
Detection limit (µg)	1	1	1.4	0.0090	1.4	0.0077	3.4	17	0.081	0.44	0.10	1.4	1.8	1.4
Half detection limit (µg)	0.5	0.5	0.7	0.0045	0.7	0.00385	1.7	8.5	0.0405	0.22	0.05	0.7	0.9	0.7
% < detection limit	0	0	94	0	0	0	0	0	0	0	0	94	94	0
% valid data	100	100	100	100	100	100	100	100	100	100	100	100	100	100

Notes:

N/R: Statisics not reported due to high % of values <detedciton limit

N/A: Not applicable

INV: Invalid Sample

*Arsenic, Selenium, and Vanadium concentrations were below detection limit and as such were reported at 1/2 the detection limit

**Canadian Ambient Air Quality Standard, 24-hour standard

amec foster wheeler

Northeast Gallinger Road Monitoring Results for TSP and Metals (Third Quarter 2015)
(results expresed in µg/m^3)

Date	TSP	PM2.5	As*	Cd	Cr	Co	Cu	Fe	Pb	Mn	Ni	Se*	V*	Zn
July 2, 2015	33.5	12.81	0.00043	0.000073	0.0079	0.000148	0.152	0.204	0.00058	0.00870	0.00078	0.00043	0.00056	0.01416
July 8, 2015	26.9	3.7	0.00045	0.000042	0.0087	0.0000719	0.182	0.0855	0.000502	0.00534	0.000700	0.00045	0.00058	0.00810
July 14, 2015	25.1	7.69	0.00046	0.0000329	0.0098	0.0000620	0.352	0.029	0.000172	0.00268	0.001234	0.00046	0.00059	0.01880
July 20, 2015	14.4	2.83	0.00043	0.0000197	0.0087	0.0000509	0.116	0.0458	0.000181	0.00214	0.000880	0.00043	0.00055	0.00678
July 26, 2015	19.1	4.82	0.00042	0.0000297	0.0093	0.000098	0.290	0.1418	0.000733	0.00703	0.000607	0.00042	0.00054	0.00769
August 1, 2015	45.8	3.58	0.00043	0.000016	0.0097	0.000534	0.162	0.805	0.00048	0.01868	0.00155	0.00043	0.00172	0.00633
August 7, 2015	10.6	5.7	0.00044	0.000032	0.0107	0.0000646	0.410	0.0754	0.000613	0.00359	0.000747	0.00044	0.00057	0.01064
August 13, 2015	26.6	6.32	0.00043	0.0000391	0.0039	0.0001520	0.490	0.268	0.000396	0.01040	0.000941	0.00043	0.00055	0.00948
August 19, 2015	8.6	1.08	0.00045	0.0000124	0.0029	0.0000676	0.255	0.0650	0.000142	0.00204	0.000733	0.00045	0.00057	0.00548
August 25, 2015	8.1	1.08	0.00044	0.0000108	0.0026	0.000046	0.448	0.0340	0.000162	0.00183	0.000592	0.00044	0.00057	0.00800
August 31, 2015	38.5	15.04	0.00044	0.0000906	0.0032	0.000220	0.346	0.3485	0.001368	0.01586	0.001056	0.00044	0.00056	0.01730
September 6, 2015	13.9	1.66	0.00044	0.000035	0.0029	0.000088	0.315	0.084	0.00035	0.00393	0.00079	0.00044	0.00056	0.01412
September 12, 2015	15.2	2.4	0.00044	0.000027	0.0029	0.0000910	0.365	0.1122	0.000373	0.01739	0.000561	0.00044	0.00056	0.00723
September 18, 2015	38.3	0.83	0.00044	0.0000246	0.0048	0.0003224	0.392	0.409	0.000532	0.01133	0.001245	0.00044	0.00056	0.01133
September 24, 2015	11.2	1.00	0.00044	0.0000167	0.0035	0.0000702	0.733	0.0708	0.000266	0.00186	0.000476	0.00044	0.00056	0.01128
September 30, 2015	136.3	3.08	0.00044	0.0000631	0.0064	0.002088	0.694	2.3912	0.001199	0.05823	0.003293	0.00044	0.00177	0.01779

Geometric mean	21.8	3.19	N/R	0.000030	0.0054	0.00013	0.316	0.142	0.000405	0.00632	0.00089	N/R	N/R	0.0101
Arithmetic mean	29.5	4.60	N/R	0.000035	0.0061	0.00026	0.356	0.323	0.00050	0.0107	0.00101	N/R	N/R	0.0109
Max. concentration	136.3	15.0	N/R	0.00009	0.0107	0.00209	0.733	2.391	0.00137	0.05823	0.00329	N/R	N/R	0.01880
Min. concentration	8.1	0.83	N/R	0.000011	0.0026	0.000046	0.116	0.0287	0.000142	0.00183	0.00048	N/R	N/R	0.00548
90th percentile	42.1	10.3	N/R	0.00007	0.0098	0.00043	0.592	0.607	0.00097	0.0180	0.0014	N/R	N/R	0.018
95th percentile	68.4	13.4	N/R	0.00008	0.0100	0.00092	0.704	1.202	0.00124	0.0286	0.0020	N/R	N/R	0.018
CAAQS	N/A	28	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
No. > CAAQS value**	0	0	0	0	0	0	0	0	0	0	0	0	0	0
AAQC	120	30	0.3	0.025	0.5	0.1	50	4	0.5	0.4	0.2	10	2	120
No. > AAQC	1	0	0	0	0	0	0	0	0	0	0	0	0	0
No. of valid samples	16	16	16	16	16	16	16	16	16	16	16	16	16	16
No. samples < mdl	0	0	15	0	0	0	0	0	0	0	0	15	14	0
Detection limit (µg)	1	1	1.4	0.0090	1.4	0.0077	3.4	17	0.081	0.44	0.10	1.4	1.8	1.4
Half detection limit (µg)	0.5	0.5	0.7	0.0045	0.7	0.00385	1.7	8.5	0.0405	0.22	0.05	0.7	0.9	0.7
% < detection limit	0	0	94	0	0	0	0	0	0	0	0	94	88	0
% valid data	100	100	100	100	100	100	100	100	100	100	100	100	100	100

Notes:

N/R: Statisics not reported due to high % of values <detedciton limit

N/A: Not applicable

INV: Invalid Sample

*Arsenic, Selenium, and Vanadium concentrations were below detection limit and as such were reported at 1/2 the detection limit with the exception of the Vanadium concentrations on 1 August 2015 and 25 September 20

**Canadian Ambient Air Quality Standard, 24-hour standard

APPENDIX B-2

TOTAL DUSTFALL SAMPLING RESULTS

Tait Road Monitoring Results for Dustfall (Third Quarter 2015)
(results expresed in g/m^2/30days)

Month	No. Exposure Days	Dustfall (insoluble)	Dustfall (soluble)	Dustfall (total)
July	33	INV	INV	INV
August	28	2.3	2.6	4.86
September	35	2.5	0.87	3.39

Arithmetic mean	4.1
Max. concentration	4.9
Min. concentration	3.39
AAQC	7
No. > AAQC value**	0
No. of valid samples	2
% Valid data	100
No. samples < mdl	0
Detection limit	0.3
Half detection limit	0.15

Notes:
N/R: Statisics not reported due to high % of values <detedciton limit
N/A: Not applicable
INV: Invalid Sample; algae growth
**Ontario Ambient Air Quality Criteria, 30-day standard

Gallinger Road Monitoring Results for Dustfall (Third Quarter 2015)
(results expresed in g/m^2/30days)

Month	No. Exposure Days	Dustfall (insoluble)	Dustfall (soluble)	Dustfall (total)
July	33	INV	INV	INV
August	28	5.67	8.10	13.8
September	35	8.61	3.87	12.5

Arithmetic mean	13.1
Max. concentration	13.80
Min. concentration	12.5
AAQC	7
No. > AAQC value**	2
No. of valid samples	2
% Valid data	100
No. samples < mdl	0
Detection limit	0.3
Half detection limit	0.15

Notes:
N/R: Statisics not reported due to high % of values <detedciton limit
N/A: Not applicable
INV: Invalid Sample; algae growth
**Ontario Ambient Air Quality Criteria, 30-day standard

APPENDIX B-3

SO_2 AND NO_2 PASSIVE SAMPLING RESULTS

Monitoring Results for Passive SO_2 and NO_2 (Third Quarter 2015)

	Tait Road		Gallinger Road	
Month	**SO_2**	**NO_2**	**SO_2**	**NO_2**
July	<0.3 µg/m3 (<0.1 ppb)	0.8 µg/m3 (0.4 ppb)	<0.3 µg/m3 (<0.1 ppb)	0.8 µg/m3 (0.4 ppb)
August	<0.3 µg/m3 (<0.1 ppb)	0.4 µg/m3 (0.2 ppb)	0.3 µg/m3 (0.1 ppb)	<0.2 µg/m3 (<0.1 ppb)
September	<0.3 µg/m3 (<0.1 ppb)	0.8 µg/m3 (0.4 ppb)	<0.3 µg/m3 (<0.1 ppb)	0.4 µg/m3 (0.2 ppb)

Arithmetic mean	0.05	0.3	0.07	0.2
Max. concentration	0.05	0.4	0.1	0.4
Min. concentration	0.05	0.2	0.05	0.05
AAQC* 24-hr converted to 30-day	N/A	78 µg/m^3	N/A	78 µg/m^3
Alberta Ambient Air Quality Objectives 2013	30 µg/m^3	N/A	30 µg/m^3	N/A
No. of valid samples	3	3	3	3
No. samples < mdl	3	0	2	1
Detection limit	0.1	0.1	0.1	0.1
Half detection limit	0.05	0.05	0.05	0.05

Notes:

All statistics were calculated using 1/2DL for values reported as <DL

All results reported by the lab in parts per billion (ppb) and are converted to µg/m3 assuming 101.23kPA and 25C

N/R: Statisics not reported due to high % of values <detedciton limit

N/A: Not applicable

INV: Invalid Sample

*Ontario Ambient Air Quality Criteria

AIR QUALITY MONITORING PROGRAM
FOURTH QUARTER 2015 REPORT
RAINY RIVER PROJECT

Submitted to:

New Gold Inc.
1111 Victoria Avenue East
Thunder Bay, Ontario
P7C 1B7

Submitted by:

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

February 2016

Amec Foster Wheeler Project No.: TC111504.2015.6

February 17, 2015

Amec Foster Wheeler Project No.: TC111504.2015.6

New Gold Inc.
1111 Victoria Avenue East
Thunder Bay, Ontario
P7C 1B7

Attention: Kyle Stanfield
Director Environment & Sustainability

Dear Mr. Stanfield:

Re: Rainy River Project, Fourth Quarter 2015 Air Monitoring Report

Amec Foster Wheeler Environment & Infrastructure, a Division of Amec Foster Wheeler Americas Limited (Amec Foster Wheeler), is pleased to submit to New Gold Inc. (New Gold) a summary report for the data collected in the fourth quarter 2015 for the air quality monitoring program initiated in 2015 at the Rainy River Project. Two air quality sampling stations were established in May 2015: one to the south of the Site near the beginning of the Highway 600 reroute on Tait Road, and one to the east of the Site on Gallinger Road. The sampling stations were operated and maintained by New Gold staff.

Should you have any questions or wish to discuss the air monitoring program, please do not hesitate to contact the undersigned.

Sincerely,

Amec Foster Wheeler Environment & Infrastructure
a Division of Amec Foster Wheeler Americas Limited

<Original signed by>

Caleb Vandenberg, P.Eng.
Air Quality Engineer

<Original signed by>

Tony van der Vooren P.Eng, Ph.D, QEP
Senior Air Quality Consultant

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Revision	Date	Revised By	Description
0	3-February-2016	Caleb Vandenberg	Drafted Report
0.1	3-February-2016	Ryan Fletcher	Data formatting
0.2	17-February-2016	Tony van der Vooren	Text change

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Appendix B-3 SO_2 and NO_2 Passive Sampling Results

ACRONYMS AND ABBREVIATIONS

AAQC	Ambient Air Quality Criteria
ACFM	Cubic Feet Per Minute at Actual Conditions
ASTM	American Society for Testing and Materials
CAAQS	Canadian Ambient Air Quality Standards
Hi-Vol	High Volume Sampler
ICP/AES	Inductively Coupled Plasma Atomic Emission Spectroscopy
MOECC	Ministry of the Environment and Climate Change
NIST	National Institute of Standards and Technology
TSP	Total Suspended Particulate
USEPA	United States Environmental Protection Agency

1.0 INTRODUCTION

Amec Foster Wheeler Environment & Infrastructure, a Division of Amec Foster Wheeler Americas Limited (Amec Foster Wheeler), is pleased to provide a summary of the fourth quarter (Q4) 2015 results for the air quality monitoring program undertaken at the Rainy River Project located in northwestern Ontario. Two sampling stations were established in May 2015: one to the south of the Site near the beginning of the Highway 600 reroute on Tait Road, and one to the east of the Site on Gallinger Road. Their locations are shown in the satellite images in Appendix A (Figures 1, 2 and 3).

New Gold Inc. (New Gold) staff operate and maintain the sampling stations. Amec Foster Wheeler provided technical guidance to New Gold field staff, communicated with the laboratory staff as required and prepared the data summary report.

2.0 ANALYTICAL AND MONITORING METHODS

2.1 TSP and Metals

The total suspended particulate (TSP) concentrations were determined using the standard gravimetric method following the reference methods approved by the United States Environmental Protection Agency (USEPA) and the Ontario Ministry of the Environment and Climate Change (MOECC) as described in its Operations Manual (MOECC, 2008). Measurements of 24-hour average TSP and metal concentrations were undertaken as this is the averaging time upon which these parameters are set under Ontario Ambient Air Quality Criteria (AAQC 2012). Sampling was performed with hi-vol samplers (brush motor and mass flow controlled). The metals and metalloids analyzed included, but were not limited to, the following: arsenic (As), cadmium (Cd), chromium (Cr), cobalt (Co), copper (Cu), iron (Fe), lead (Pb), manganese (Mn), nickel (Ni), selenium (Se), vanadium (V) and zinc (Zn).

The lowest detectable limit is 0.1 milligrams (mg) of total particulate, resulting in a method detection limit of 0.06 micrograms per cubic metre (µg/m^3; based on a typical 24-hour sample volume of 1630 m^3).

The metal concentrations were determined with the standard ICP/AES method. The method detection limits are as shown in the data sheets in Appendix B-1.

2.2 $PM_{2.5}$

The $PM_{2.5}$ concentrations were determined using the standard gravimetric method following the reference methods approved by the USEPA and the MOECC as described in its Operations Manual (MOECC, 2008). Measurement of 24-hour average $PM_{2.5}$ was undertaken to match the averaging time for the Canadian Ambient Air Quality Standard (CAAQS). Sampling was performed with PQ200 samplers.

The lowest detectable limit is 1 µg of $PM_{2.5}$, resulting in a method detection limit of 0.04 µg/m^3 (based on a typical 24-hour sample volume of 24 m^3).

2.3 Total Dustfall

The water soluble and insoluble portions of dustfall were determined using ASTM method D-1739-98 and MOECC method DF-E3043A (September 8, 1995). Standard dustfall samplers were used to measure total dustfall deposition. The dustfall jars were lined with a 4 Mil plastic bag as required in the MOECC Operations Manual (MOECC, 2008). The method detection limit for total dustfall is 0.3 g/m^2/30 days.

2.4 Passive Sampling for SO_2 and NO_2

SO_2 and NO_2 concentrations were monitored with passive sampling devices. The exposed permeation filters were analyzed using the methodology employed by the Maxxam Analytics Inc. laboratory located in Edmonton, Alberta. The methodology was developed, approved and validated by Alberta Environment with the support of the Alberta Research Council, the Clean Air Strategic Alliance of Alberta, and the National Research Council of Canada.

Since the sample uptake is dependent on temperature, relative humidity and wind speed, the analytical results are adjusted for these meteorological parameters measured during the exposure period (monthly averages). The required meteorological data are taken from the Environment Canada Fort Frances meteorological station (Climate ID 6022474) by Maxxam Analytics to use with each sample submission. The method detection limit is in the order of 0.1 parts per billion (ppb) for both SO_2 and NO_2. Validation tests conducted in Alberta show that results from passive sampling are typically within 10% of those obtained from sampling with continuous analyzers for 30-day exposure periods.

Since there are no MOECC guidelines for monthly concentrations of SO_2 and NO_2 obtained from passive sampling, the data will only be used for screening purposes and potentially for comparison with dispersion modelling results. For NO_2, the monthly results were compared to the MOECC AAQC for 24-hour converted to a 30-day average (78 ug/m^3) using the methodology outlined in the *Procedure for Preparing an Emission Summary and Dispersion Modelling Report* (MOECC 2009). For SO_2, the results were compared against the 30-day Alberta Ambient Air Quality Objectives (2013) of 30 ug/m^3.

2.5 Field Operations

2.5.1 Hi-Vol Samplers

The two sites were visited once every six days to recover the exposed filter and install a pre-weighed filter for the subsequent sample in order to meet the requirements of the 1 in 6 day sampling schedule. Additional visits were made to resolve instrumentation issues and perform flow calibration checks and preventative maintenance.

Amec Foster Wheeler staff performed the original calibrations on the hi-vol samplers on 25 May 2015 using a BGI direct reading hi-vol electronic flow calibrator. The flows were set at 40 acfm for each station; the samplers are mass flow controlled. Two calibrations were performed that are relevant to this quarter's data.

On 2 October 2015, Amec Foster Wheeler staff recalibrated both hi-vol samplers with a BGI flow calibrator which was sent to the manufacturer most recently for re-certification to National Institute of Standards and Technology (NIST) traceability in June 2015. The overall uncertainty of the calibrator was determined to be 0.60% (ambient temperature, barometric pressure and flow), with an average error of 0.01% in the flow at standard conditions (Q_s) relative to the USEPA standard.

On 22 December 2015, Amec Foster Wheeler staff recalibrated both hi-vol samplers with a BGI flow calibrator which was sent to the manufacturer most recently for re-certification to National Institute of Standards and Technology (NIST) traceability in in October 2015. The overall uncertainty of the calibrator was determined to be 0.60% (ambient temperature, barometric pressure and flow), with an average error of -0.01% in the flow at standard conditions (Q_s) relative to the USEPA standard.

2.5.2 PQ200 Samplers

The stations were visited once every six days to recover the exposed filter and install a pre-weighed filter for the subsequent sample in order to meet the requirements of the 1 in 6 day sampling schedule. Additional visits were made to resolve instrumentation issues and perform flow calibration checks and preventative maintenance.

The PQ200 supplier performed the original calibrations on 20 May 2015 and the flow, temperature, and barometric pressure were checked using an electronic BGI flow calibrator by Amec Foster Wheeler staff on 26 May 2015 after the instruments had been installed. Two calibrations were performed that are relevant to this quarter's data.

On 2 October 2015, Amec Foster Wheeler staff recalibrated both PQ200 samplers with a BGI flow calibrator which was sent to the manufacturer most recently for re-certification to National Institute of Standards and Technology (NIST) traceability in June 2015. The overall uncertainty of the calibrator was determined to be 0.35% (ambient temperature, barometric pressure and flow), with an average error of 0.06% in the flow at standard conditions (Q_s) relative to the USEPA standard.

On 22 December 2015, Amec Foster Wheeler staff recalibrated both PQ200 samplers with a BGI flow calibrator which was sent to the manufacturer most recently for re-certification to National Institute of Standards and Technology (NIST) traceability in in June 2015. The overall uncertainty of the calibrator was determined to be 0.35% (ambient temperature, barometric pressure and flow), with an average error of 0.06% in the flow at standard conditions (Q_s) relative to the USEPA standard.

2.5.3 Dustfall Samplers

The dustfall samplers were changed every month, as required.

2.5.4 Passive Samplers

The permeation filters in the passive samplers were changed every month, as required.

3.0 RESULTS

The results for the Q4 2015 sampling program are presented in Appendix B-1 for the hi-vol data, Appendix B-2 for the dustfall data and Appendix B-3 for the passive SO_2 and NO_2 data. For the purpose of performing statistical analyses and in keeping was a commonly accepted practice, a value of half the detection limit was substituted for concentrations less than the detection limit.

For comparison purposes, the MOECC AAQC and CAAQS values are presented, where available.

A summary of the statistical analyses for Q4 for the TSP concentrations is presented in Table 1 below. During the quarter, the 1 in 6 day hi-vol sampling schedule comprised a possible total of 15 sampling days between 1 October and 31 December 2015.

A summary of the statistical analyses for Q4 2015 for the total dustfall data is presented below in Table 2. A summary of the statistical analysis for the fourth quarter of 2015 for the passive SO_2 and NO_2 results is presented in Table 3.

3.1 Total Suspended Particulates and Metals

At both the Tait Road and Gallinger Road stations, fifteen (15) valid samples were collected in Q4 2015, resulting in 100% valid data.

For the quarter, the arithmetic mean TSP concentrations were comparable, with the Tait Road station averaging 16.2 µg/m^3 and the Gallinger Road station averaging 12.3 µg/m^3. For values below the detection limit, by convention they are substituted with half of the detection limit. The maximum 24-hour concentration for TSP was 91.3 µg/m^3 at the Tait Road station (29 November 2015), and 43.9 µg/m^3 at the Gallinger Road station (18 October 2015); there were no exceedances of the TSP AAQC measured in the quarter.

In the quarter, the 24-hour metal concentrations were all well below the applicable O.Reg.419/05 Schedule 3 standards and AAQCs. For three metals (As, Se, and V), statistics were not reported as more than 50% of the results were below the method detection limit.

Table 1: Summary Statistics for Q4 2015 for TSP Data

Statistic	Q4	
	Tait Road (SW)	Gallinger Road (NE)
Geometric mean (µg/m^3)	10.0	8.8
Arithmetic mean (µg/m^3)	16.2	12.3
October Maximum (µg/m^3)	27.1	43.9
November Maximum (µg/m^3)	91.3	23.9
December Maximum (µg/m^3)	17.4	11.0
Maximum 24 hour (µg/m^3)	91.3 (29 Nov.)	43.9 (18 Oct.)
90th percentile	24.5	28.7
95th percentile	46.3	35.4
24-hour AAQC	120	120
No. of valid samples	15	15
% valid data	100	100
No. samples > AAQC (particulate)	0	0
No. samples > AAQC (metals)	0	0
No. samples > AAQC (elements)	0	0

3.2 $PM_{2.5}$

At the both the Tait Road and Gallinger Road stations, fifteen (15) valid samples were collected in Q4 2015, resulting in 100% valid data.

The arithmetic mean $PM_{2.5}$ concentrations for Q4 2015 were comparable with the Tait Road station averaging 2.62 µg/m^3 and the Gallinger Road station averaging 2.63 µg/m^3. For values below the detection limit, by convention they are substituted with a concentration representing half of the detection limit. The maximum 24-hour concentration for $PM_{2.5}$ was 5.28 µg/m^3 at the Tait Road station (23 December), and 5.03 µg/m^3 at the Gallinger Road station (23 December). Both values are lower than the $PM_{2.5}$ AAQC of 30 µg/m^3 and the CAAQS of 28 µg/m^3.

The Q4 $PM_{2.5}$ data is summarized in Table 2.

Table 2: Summary Statistics for Q4 2015 for $PM_{2.5}$ Data

Statistic	Q4	
	Tait Road (SW)	Gallinger Road (NE)
Geometric mean (µg/m^3)	2.00	2.12
Arithmetic mean (µg/m^3)	2.62	2.63
October Maximum (µg/m^3)	2.99	2.99
November Maximum (µg/m^3)	4.41	4.37
December Maximum (µg/m^3)	5.28	5.03
Maximum 24 hour (µg/m^3)	5.28 (23 Dec.)	5.03 (23 Dec.)
90th percentile	4.9	4.7
95th percentile	5.2	5.0
24-hour CAAQS	28	28
No. of valid samples	15	15
% valid data	100	100
No. samples > CAAQS	0	0

3.3 Total Dustfall

One valid sample was collected at each station each month for dustfall during Q4 2015; each dustfall jar was exposed for approximately 30-days to coincide with each calendar month in the quarter. There were no exceedances of the AAQC for dustfall. Decreased truck traffic related to the construction of the East Access Road in Q4 may have been influential in the decrease of dustfall concentrations between Q3 and Q4. A summary of the results is presented in Table 3.

The monthly results are shown in Appendix B-2.

Table 3: Summary Statistics for Q4 2015 Total Dustfall Data

Statistic	Tait Road (SW)	Gallinger Road (NE)
Arithmetic mean ($g/m^2/30d$)	1.7	1.3
Maximum ($g/m^2/30d$)	4.14	2.91
30-day AAQC	7	7
No. > AAQC	0	0
No. valid samples	3	3
% Valid data	100	100

N/A: No applicable criteria

3.4 Passive SO_2 and NO_2

In Q4 2015, three (3) valid samples were collected at each station for each of SO_2 and NO_2.

There are no MOECC standards, guidelines or AAQCs for SO_2 and NO_2 data obtained from passive samplers for the 30-day averaging period.

The 30-day average SO_2 and NO_2 concentrations measured allow for future analysis of trends in the ambient concentrations, to identify any notable increases, and for comparison with dispersion modelling results. For NO_2 the monthly results were compared to the MOECC AAQC for 24-hour converted to a 30-day average (78 µg/m^3), which is equal to the Ontario 24-hour average AAQC converted to a 30-day averaging period using the methodology outlined in the *Procedure for Preparing and Emission Summary and Dispersion Modelling Report* (MOECC 2009). For SO_2, the results were compared against the Alberta Ambient Air Quality Objectives (2013) of 30 µg/m^3.

Table 4: Summary Statistics for Q4 2015 for Passive SO_2 and NO_2 Data

	Tait Road (SW)		Gallinger Road (NE)	
Statistic	**SO_2**	**NO_2**	**SO_2**	**NO_2**
Mean	0.2 µg/m^3 (0.08 ppb)	2.4 µg/m^3 (1.3 ppb)	0.3 µg/m^3 (0.1 ppb)	1.5 µg/m^3 (0.8 ppb)
Maximum	0.3 µg/m^3 (0.1 ppb)	4.0 µg/m^3 (2.1 ppb)	0.8 µg/m^3 (0.3 ppb)	1.9 µg/m^3 (1.0 ppb)
AAQC 24-hr converted to 30-day	N/A	78 µg/m^3	N/A	78 µg/m^3
Alberta Ambient Air Quality Objectives 2013	30 µg/m^3	N/A	30 µg/m^3	N/A
No. valid samples	3	3	3	3
% Valid data	100	100	100	100

N/A: No applicable criteria

4.0 CONCLUSIONS

Two ambient air quality monitoring stations were installed and commissioned in May 2015 at the Rainy River Project.

The following samples were collected in Q4 2015:

- Fifteen (15) valid TSP samples were collected at each of the two monitoring stations (100% valid data), with metal analyses performed on each of the TSP filters;
- Sixteen (15) valid $PM_{2.5}$ samples were collected at each of the two monitoring stations (100% valid data);
- Three (3) valid dustfall samples were collected at each of the two stations; and
- Three (3) valid passive samples for each of SO_2 and NO_2 at each of the two stations.

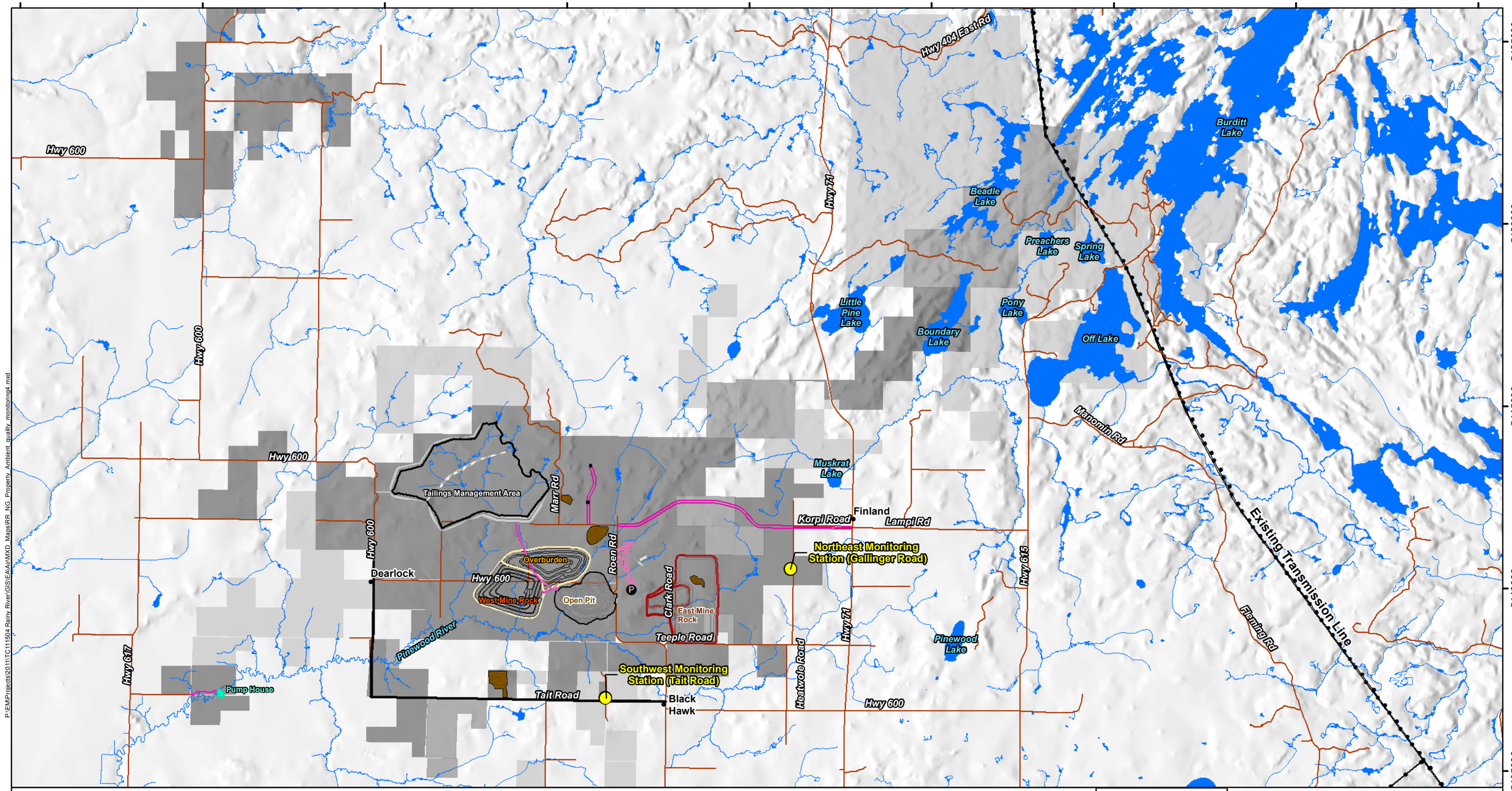
There were no measured exceedances of MOECC air quality standards, guidelines, or AAQCs, nor were there any exceedances of the Federal CAAQS for $PM_{2.5}$ or other established criteria.

5.0 REFERENCES

Ministry of the Environment. 2008. Operations Manual for Air Quality Monitoring in Ontario.

APPENDIX A

SATELLITE IMAGES OF THE AIR SAMPLING STATION LOCATIONS



LEGEND

- Ambient Air Quality Monitoring Stations
- New Gold - Rainy River Property Boundary
- New Gold Unpatented Claim (Applied to bring to lease) Acquisition in Progress
- New Gold Lands with No Current Access Control

Proposed Site Features

- Underground Portal
- Open Pit
- Plant Site / Ancillary Facilities
- Explosives Facilities
- Overburden / West Mine Rock Stockpile
- Ore / East Mine Rock Stockpile
- Proposed Pump House
- Tailings Management Area
- Aggregate Pit / Quarry
- Site Roads
- Roads
- Existing Transmission Line
- First Nation Land

0 2 4 8 12 16 20 Kilometres

NOTES:
- Road and Utility data and topographic data extracted from Land Information Ontario, Ontario Road Network, MNR Queen's Printer for Ontario, 2011-2012
- Land tenure information and parcels provided by NewGold, June 9, 2015

Datum: NAD83
Projection: UTM Zone 15N

newgold™ Rainy River Project

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RAINY RIVER PROJECT

Ambient Air Monitoring Stations

PROJECT N°: TC111504 | **FIGURE: 1**

SCALE: 1:100,000 | DATE: August 2015

425950
426000
426050
426100
426150
426200
5407000
5406950
5406900
69 m
TAIT ROAD
P:\EM\Projects\2011\TC111504 Rainy River\GIS\EA\Air\MXD_Maps\RR_NG_Ambient_quality_monitoring_stationTait.mxd

LEGEND

- Southwest Monitoring Station (Tait Road)
- Highway Re-alignment

0 10 20 40 60 80 100 Meters

Notes:
- Aerial imagery provided by RRR Plieades imagery (August 2014).

Datum & Projection:
NAD 1983 UTM Zone 15N

N
W E
S

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RAINY RIVER PROJECT

Ambient Air Monitoring
Southwest Monitoring Station

PROJECT N°: TC111504 | **FIGURE: 2**

SCALE: 1:700 | DATE: August 2015

P:\EM\Projects\2011\TC111504 Rainy River\GIS\EA\MXD_Maps\RR_NG_Ambient quality_monitoring_station_Gallinger.mxd

LEGEND

- Northeast Monitoring Station (Gallinger Road)
- Gallinger Road

0 10 20 40 60 80 100 Meters

Notes:
- Aerial imagery provided by RRR Plieades imagery (August 2014).

Datum & Projection: NAD 1983 UTM Zone 15N

N W E S

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RAINY RIVER PROJECT

Ambient Air Monitoring
Northeast Monitoring Station

PROJECT N°: TC111504	**FIGURE: 3**
SCALE: 1:700	DATE: August 2015

APPENDIX B

Appendix B-1: TSP Sampling Results

Appendix B-2: Total Dustfall Sampling Results

Appendix B-3: SO_2 AND NO_2 Passive Sampling Results

APPENDIX B-1

TSP SAMPLING RESULTS

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Southwest Tait Road Monitoring Results for TSP and Metals (Fourth Quarter 2015)
(results expressed in µg/m^3)

Date	TSP	PM2.5	As*	Cd	Cr	Co	Cu	Fe	Pb	Mn	Ni	Se*	V*	Zn
October 6, 2015	20.6	2.41	0.00042	0.0000256	0.0033	0.000229	0.0497	0.296	0.00039	0.01147	0.000772	0.00042	0.00054	0.00628
October 12, 2015	10.1	0.5	0.00041	0.000021	0.0067	0.0001131	0.047	0.125	0.000206	0.0050	0.000766	0.00041	0.00053	0.01154
October 18, 2015	27.1	2.99	0.00044	0.0000555	0.0063	0.000213	0.040	0.323	0.000887	0.01882	0.000963	0.00044	0.00057	0.00868
October 24, 2015	7.9	2.33	0.00043	0.0000435	0.0059	0.0001073	0.038	0.133	0.000310	0.00394	0.000670	0.00043	0.00056	0.00750
October 30, 2015	6.9	1.29	0.00043	0.0000465	0.005	0.000040	0.029	0.038	0.000292	0.00420	0.00055	0.00043	0.00056	0.01229
November 5, 2015	5.9	3.49	0.00043	0.0000530	0.0052	0.000041	0.0236	0.038	0.00013	0.00260	0.000506	0.00043	0.00055	0.00920
November 11, 2015	17.0	4.2	0.00043	0.000082	0.0061	0.0001103	0.049	0.166	0.000254	0.0109	0.000690	0.00043	0.00055	0.00826
November 17, 2015	3.0	0.91	0.00042	0.0001316	0.0050	0.000032	0.040	0.025	0.000097	0.00092	0.000489	0.00042	0.00054	0.00863
November 23, 2015	9.2	3.70	0.00044	0.0000756	0.0060	0.0002168	0.047	0.260	0.000208	0.00744	0.000794	0.00044	0.00057	0.00800
November 29, 2015	91.3	4.41	0.00043	0.0000808	0.008	0.001838	0.048	2.677	0.000283	0.08329	0.00297	0.00043	0.00376	0.01400
December 5, 2015	10.7	5.19	0.00044	0.0000772	0.0065	0.000194	0.0139	0.227	0.00042	0.00734	0.000791	0.00044	0.00056	0.00866
December 11, 2015	2.4	0.5	0.00042	0.000061	0.0031	0.0000877	0.018	0.105	0.000191	0.0029	0.000520	0.00042	0.00054	0.00520
December 17, 2015	17.4	0.91	0.00041	0.0005292	0.0035	0.000371	0.025	0.468	0.000474	0.01240	0.001181	0.00041	0.00053	0.01345
December 23, 2015	11.6	5.28	0.00040	0.0002707	0.0067	0.0001265	0.038	0.108	0.000767	0.00355	0.001391	0.00040	0.00052	0.01958
December 29, 2015	2.5	1.16	0.00041	0.0001051	0.003	0.000033	0.070	0.030	0.000282	0.00081	0.00040	0.00041	0.00053	0.00479

Geometric mean	10.0	2.00	N/R	0.000076	0.0051	0.00013	0.036	0.144	0.000293	0.00571	0.00078	N/R	N/R	0.0091
Arithmetic mean	16.2	2.62	N/R	0.000111	0.0053	0.00025	0.038	0.335	0.000346	0.0117	0.00090	N/R	N/R	0.0097
Max. concentration	91.3	5.3	N/R	0.00053	0.008	0.00184	0.070	2.677	0.00089	0.08329	0.0030	N/R	N/R	0.01958
Min. concentration	2.4	0.46	N/R	0.000021	0.0027	0.000032	0.014	0.025	0.000097	0.00081	0.00040	N/R	N/R	0.00479
90th percentile	24.5	4.9	N/R	0.00022	0.007	0.00031	0.050	0.410	0.00065	0.0162	0.0013	N/R	N/R	0.0138
95th percentile	46.3	5.2	N/R	0.00035	0.007	0.00081	0.056	1.131	0.00080	0.0382	0.0019	N/R	N/R	0.0157
CAAQS	N/A	28	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
No. > CAAQS value**	0	0	0	0	0	0	0	0	0	0	0	0	0	0
AAQC (24 h)	120	30	0.3	0.025	0.5	0.1	50	4	0.5	0.4	0.2	10	2	120
No. > AAQC (24 h)	0	0	0	0	0	0	0	0	0	0	0	0	0	0
No. of valid samples	15	15	15	15	15	15	15	15	15	15	15	15	15	15
No. samples < mdl	0	0	14	0	0	0	0	0	0	0	0	14	13	0
Detection limit (µg)	1	1	1.4	0.0090	1.4	0.0077	3.4	17	0.081	0.44	0.10	1.4	1.8	1.4
Half detection limit (µg)	0.5	0.5	0.7	0.0045	0.7	0.00385	1.7	8.5	0.0405	0.22	0.05	0.7	0.9	0.7
% < detection limit	0	0	93	0	0	0	0	0	0	0	0	93	87	0
% valid data	100	100	100	100	100	100	100	100	100	100	100	100	100	100

Notes:

N/R: Statistics not reported due to high % of values <detection limit

N/A: Not applicable

INV: Invalid Sample

*Arsenic, Selenium, and Vanadium concentrations were below detection limit and as such were reported at 1/2 the detection limit with the exception of the Vanadium concentrations on 29 November 2015

**Canadian Ambient Air Quality Standard, 24-hour standard

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Northeast Gallinger Road Monitoring Results for TSP and Metals (Fourth Quarter 2015)
(results expressed in µg/m^3)

Date	TSP	PM2.5	As*	Cd	Cr	Co	Cu	Fe	Pb	Mn	Ni	Se*	V*	Zn
October 6, 2015	31.8	2.91	0.00042	0.000061	0.0033	0.000276	0.302	0.326	0.00044	0.01129	0.00078	0.00042	0.00053	0.00659
October 12, 2015	9.9	1.2	0.00041	0.000039	0.0062	0.0000850	0.175	0.1069	0.000207	0.00391	0.000732	0.00041	0.00053	0.00620
October 18, 2015	43.9	2.99	0.00041	0.0000728	0.0073	0.0004344	0.239	0.681	0.001042	0.02391	0.001326	0.00041	0.00053	0.01012
October 24, 2015	7.8	2.49	0.00042	0.0000706	0.0060	0.0000483	0.237	0.0398	0.000337	0.00162	0.000579	0.00042	0.00054	0.00700
October 30, 2015	6.3	1.16	0.00042	0.0000288	0.0049	0.000039	0.134	0.0290	0.000082	0.00351	0.000779	0.00042	0.00054	0.00900
November 5, 2015	8.1	4.37	0.00043	0.000059	0.0051	0.000047	0.088	0.031	0.00012	0.00264	0.00057	0.00043	0.00055	0.00996
November 11, 2015	13.4	4.2	0.00044	0.000049	0.0045	0.0000586	0.212	0.0747	0.000190	0.00641	0.000454	0.00044	0.00056	0.00759
November 17, 2015	2.3	0.75	0.00043	0.0000462	0.0058	0.0000468	0.180	0.027	0.000124	0.00104	0.000608	0.00043	0.00055	0.00750
November 23, 2015	8.2	3.37	0.00044	0.0000748	0.0054	0.0000539	0.223	0.0692	0.000219	0.00295	0.000555	0.00044	0.00056	0.01795
November 29, 2015	23.9	3.16	0.00042	0.0000637	0.0057	0.000191	0.257	0.2602	0.000178	0.00934	0.000740	0.00042	0.00055	0.00758
December 5, 2015	6.0	4.99	0.00043	0.000046	0.0049	0.000037	0.055	0.036	0.00030	0.00137	0.00048	0.00043	0.00056	0.00713
December 11, 2015	4.0	0.6	0.00044	0.000041	0.0028	0.0000758	0.333	0.0690	0.000183	0.00153	0.000485	0.00044	0.00056	0.00360
December 17, 2015	11.0	0.91	0.00042	0.0000977	0.0030	0.0000656	0.064	0.065	0.000375	0.00183	0.000656	0.00042	0.00055	0.00728
December 23, 2015	4.2	5.03	0.00045	0.0001157	0.0030	0.0000739	0.116	0.0334	0.000714	0.00145	0.000649	0.00045	0.00058	0.00971
December 29, 2015	3.7	1.37	0.00047	0.0000414	0.0030	0.000144	0.528	0.0523	0.000186	0.00125	0.000456	0.00047	0.00060	0.00402

Geometric mean	8.8	2.12	N/R	0.000057	0.0045	0.00008	0.178	0.073	0.000247	0.00307	0.00063	N/R	N/R	0.0075
Arithmetic mean	12.3	2.63	N/R	0.000060	0.0047	0.00011	0.209	0.127	0.00031	0.0049	0.00066	N/R	N/R	0.0081
Max. concentration	43.9	5.0	N/R	0.00012	0.0073	0.00043	0.528	0.681	0.00104	0.02391	0.00133	N/R	N/R	0.01795
Min. concentration	2.3	0.58	N/R	0.000029	0.0028	0.000037	0.055	0.0270	0.000082	0.00104	0.00045	N/R	N/R	0.00360
90th percentile	28.7	4.7	N/R	0.00009	0.0061	0.00024	0.321	0.300	0.00060	0.0105	0.0008	N/R	N/R	0.010
95th percentile	35.4	5.0	N/R	0.00010	0.0065	0.00032	0.392	0.432	0.00081	0.0151	0.0009	N/R	N/R	0.012
CAAQS	N/A	28	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
No. > CAAQS value**	0	0	0	0	0	0	0	0	0	0	0	0	0	0
AAQC	120	30	0.3	0.025	0.5	0.1	50	4	0.5	0.4	0.2	10	2	120
No. > AAQC	0	0	0	0	0	0	0	0	0	0	0	0	0	0
No. of valid samples	15	15	15	15	15	15	15	15	15	15	15	15	15	15
No. samples < mdl	0	0	14	0	0	0	0	0	0	0	0	14	14	0
Detection limit (µg)	1	1	1.4	0.0090	1.4	0.0077	3.4	17	0.081	0.44	0.10	1.4	1.8	1.4
Half detection limit (µg)	0.5	0.5	0.7	0.0045	0.7	0.00385	1.7	8.5	0.0405	0.22	0.05	0.7	0.9	0.7
% < detection limit	0	0	93	0	0	0	0	0	0	0	0	93	93	0
% valid data	100	100	100	100	100	100	100	100	100	100	100	100	100	100

Notes:

N/R: Statistics not reported due to more than 50% of values being less than the detection limit

N/A: Not applicable

INV: Invalid Sample

*Arsenic, Selenium, and Vanadium concentrations were below detection limit and as such were reported at 1/2 the detection limit.

**Canadian Ambient Air Quality Standard, 24-hour standard

APPENDIX B-2

TOTAL DUSTFALL SAMPLING RESULTS

Tait Road Monitoring Results for Dustfall (Fourth Quarter 2015)
(results expresed in g/m^2/30days)

Month	No. Exposure Days	Dustfall (insoluble)	Dustfall (soluble)	Dustfall (total)
October	27	1.1	3.06	4.14
November	32	0.15	0.75	0.66
December	28	0.17	0.17	0.33

Arithmetic mean	1.7
Max. concentration	4.14
Min. concentration	0.33
AAQC	7
No. > AAQC value**	0
No. of valid samples	3
% Valid data	100
No. samples < mdl	0
Detection limit	0.3
Half detection limit	0.15

Gallinger Road Monitoring Results for Dustfall (Fourth Quarter 2015)
(results expresed in g/m^2/30days)

Month	No. Exposure Days	Dustfall (insoluble)	Dustfall (soluble)	Dustfall (total)
October	27	0.17	2.6	2.9
November	32	0.15	0.42	0.60
December	28	0.17	0.17	0.36

Arithmetic mean	1.3
Max. concentration	2.91
Min. concentration	0.36
AAQC	7
No. > AAQC value**	0
No. of valid samples	3
% Valid data	100
No. samples < mdl	0
Detection limit	0.3
Half detection limit	0.15

Notes:
N/R: Statisics not reported due to high % of values <detedciton limit
N/A: Not applicable
INV: Invalid Sample
**Ontario Ambient Air Quality Criteria, 30-day standard

APPENDIX B-3

SO_2 AND NO_2 PASSIVE SAMPLING RESULTS

Monitoring Results for Passive SO_2 and NO_2 (Fourth Quarter 2015)

	Tait Road		Gallinger Road	
Month	**SO_2**	**NO_2**	**SO_2**	**NO_2**
October	<0.3 µg/m3 (<0.1 ppb)	0.9 µg/m3 (0.5 ppb)	<0.3 µg/m3 (<0.1 ppb)	1.3 µg/m3 (0.7 ppb)
November	0.3 µg/m3 (0.1 ppb)	4.0 µg/m3 (2.1 ppb)	<0.3 µg/m3 (<0.1 ppb)	1 µg/m3 (0.7 ppb)
December	0.3 µg/m3 (0.1 ppb)	2.6 µg/m3 (1.4 ppb)	0.8 µg/m3 (0.3 ppb)	1.9 µg/m3 (1.0 ppb)

Arithmetic mean	0.08	1.3	0.13	0.8
Max. concentration	0.10	2.1	0.3	1.0
Min. concentration	0.05	0.5	0.05	0.70
AAQC* 24-hr converted to 30-day	N/A	78 µg/m^3	N/A	78 µg/m^3
Alberta Ambient Air Quality Objectives 2013	30 µg/m^3	N/A	30 µg/m^3	N/A
No. of valid samples	3	3	3	3
No. samples < mdl	1	0	2	0
Detection limit	0.1	0.1	0.1	0.1
Half detection limit	0.05	0.05	0.05	0.05

Notes:

All statistics were calculated using 1/2DL for values reported as <DL

All results reported by the lab in parts per billion (ppb) and are converted to µg/m3 assuming 101.23kPA and 25C

N/R: Statisics not reported due to high % of values <detedciton limit

N/A: Not applicable

INV: Invalid Sample

*Ontario Ambient Air Quality Criteria

RAINY RIVER PROJECT

2015 ANNUAL GROUNDWATER MONITORING REPORT

PER ENVIRONMENTAL COMPLIANCE APPROVAL

#5781-9VJQ2J Condition 13(6)c

and

PER PERMITS TO TAKE WATER

#0040-9VUL6B Condition 4.2.3
#1386-9VTP2H Condition 4.2.3
#2133-9VUPVZ Condition 4.2.3
#7631-9VULMS Condition 4.2.4
#8776-9W2QN3 Condition 4.2.5

March 2016
TC111504

newgold™ Rainy River Project

Principal Contact: Darrell Martindale Environmental Manager
Rainy River Project
5967 Highway 11/71
P.O. Box 5
Emo, Ontario, Canada P0W IE0
Telephone: (807) 707-3497
E-mail: Darrell.Martindale@newgold.com

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C Borehole Logs
D Historical Groundwater Chemistry and Water Level Data
E Historical Groundwater Chemistry and Level Trends

1.0 PROJECT BACKGROUND

New Gold Inc. (New Gold) is currently constructing, and plans to operate and eventually reclaim a new open pit and underground gold mine, the Rainy River Project (RRP). An Environmental Compliance Approval (ECA) Industrial Sewage Works #5781-9VJQ2J was issued by the Ontario Ministry of the Environment and Climate Change (MOECC) on May 8, 2015 related to the Tait Quarry and Construction Phase industrial sewage works. Condition 13(6)c of this approval requires that:

> *The Owner shall prepare and submit the following reports to the District Manager on an annual basis by March 31 of every year, with the first report(s) due March 31, 2016. The Owner shall ensure that all reports submitted in accordance with this Approval are accompanied by a signed and dated certification statement from the Mine Manager, or a person designated by the Mine Manager, on behalf of the Owner, in the following form: "I certify that the information in this document and all attachments are correct, accurate and complete to the best of my knowledge".*
>
> *,…(c) Groundwater Monitoring Report*

The required certification is provided in Appendix A.

Table 1 provides a summary of the Annual Groundwater Monitoring Report content requirements for each these approvals for reader reference. A similar approval condition was included in each of the following Permits to Take Water (PTTWs):

- Condition 4.2.3 of PTTW #0040-9VUL6B issued by the MOECC on May 8, 2015 related to water takings from:

  1) Water Management Pond Dam
  2) Loslo Creek (Tailings Management Area Construction Diversion Dam)
  3) Tailings Management Area West Dam
  4) Loslo Creek (Tailings Management Area South Dam)
  5) Tailings Management Area North Dam
  6) Water Management Pond Control Outlet
  7) Water Management Pond Emergency Spillway
  8) Tailings Management Area Emergency Spillway
  9) Borrow Area A
  10) Borrow Area B

- Condition 4.2.3 of PTTW #1386-9VTP2H issued by the MOECC on May 8, 2015 related to water takings from:

1) Outcrop 3 Quarry
2) Outcrop 4 Quarry
3) Roen Road Pit

- Condition 4.2.3 of PTTW #2133-9VUPVZ as amended issued by the MOECC on May 21, 2015 related to minor construction water takings from 25 sources.

- Condition 4.2.4 of PTTW #7631-9VULMS issued by the MOECC on August 31, 2015 related to water takings from:

  1) Rainy River Project Mine Workings
  2) Well 1
  3) Well 2A
  4) Well B
  5) Well C

- Condition 4.2.5 of PTTW # 8776-9W2QN3 issued by the MOECC on August 31, 2015 related to water takings from the Pinewood River.

Sections are provided in this report describing each of the requirements as required by these approvals. Please note that installation of groundwater monitoring wells was not completed until early 2016. As such, no groundwater quality samples were obtained, nor were any groundwater level measurements obtained.

2.0 SITE PLAN

The site plan (Figure 1) shows the location of the entire site illustrating significant site features and sampling locations during 2015.

3.0 MAP OF POTENTIALLY SENSITIVE RECEPTORS

Figure 1 illustrates the entire site relative to nearby potentially sensitive groundwater / surface water features and includes the groundwater monitoring well network (from Table 1 of the PTTWs referenced in this annual report) that was established as of December 2015.

4.0 WATER CONTOUR MAP

Figure 2 provides a water table contour map (Figure 3-3 taken from the Federal Environmental Assessment Report, issued December 2013).

5.0 STRATIGRAPHIC CROSS SECTIONS

Appendix B provides stratigraphic cross sections which illustrate subsurface distribution of geological materials.

6.0 BOREHOLE LOGS

Appendix C provides copies of borehole logs for all existing monitoring wells. Borehole logs for new monitoring wells (those constructed as part of the monitoring plan as listed in Table 11a of ECA #5781-9VJQ2J) will be provided with the next annual monitoring report, or upon request.

7.0 HISTORICAL GROUNDWATER CHEMISTRY AND LEVEL DATA

Appendix D provides water level data and tables summarizing historical (prior to 2015) groundwater chemistry.

8.0 HISTORICAL GROUNDWATER CHEMISTRY AND LEVEL TRENDS

Appendix E provides graphs demonstrating the baseline (pre-development) condition. Subsequent annual reports will provide information regarding groundwater quality trends for key parameters in a graphical format as applicable.

9.0 ASSESSMENT OF IMPACT ON SURFACE WATER AND OFFSITE GROUNDWATER

The data presented in Appendices D and E represent the baseline condition. Data presented in Appendix F represents monitoring data collected from wells that were existing in 2015. As the site was not operating in 2015, no impacts to surface water, receiving water and offsite groundwater are anticipated. Subsequent annual reports will evaluate the monitoring data with respect to potential impacts to receiving surface waterbodies and offsite groundwater.

10.0 ASSESSMENT OF CONTINGENCY PLAN TRIGGERS

As the monitoring well network was not completed until early 2016, no water quality samples or water levels were obtained. No contingency measures (as triggered by certain criteria such as water quality) were required to be implemented.

11.0 ASSESSMENT OF GROUNDWATER LEVEL DATA TO PREDICTIONS

As the monitoring well network was not completed until early 2016, no water levels were obtained. Subsequent annual reports will summarize the monitoring data in the format requested.

12.0 SUMMARY OF ANNUAL MONITORING PROGRAM

Groundwater monitoring was not completed during 2015, due to delay in monitoring well installation.

Subsequent annual reports will summarize the monitoring data in the format requested.

13.0 HYDROGEOLOGICAL MODEL UPDATE

Updates to the hydrogeological model are to occur once every three years, with the first update to be provided in the March 2018 report. The 2018 annual report will provide the information requested.

14.0 RECOMMENDATIONS FOR MONITORING OR REMEDIAL ACTIONS

Groundwater monitoring was not completed during 2015, due to a delay in monitoring well installation. No recommendations / remedial actions are proposed at this time.

15.0 FIELD SAMPLING PROTOCOLS AND QA/QC MEASURES

Groundwater monitoring was not completed during 2015, due to a delay in monitoring well installation. Subsequent annual reports will summarize the field sampling protocols and QA/QC measures utilized.

16.0 CLOSING

This environmental compliance report was prepared by Amec Foster Wheeler Environment & Infrastructure on behalf of New Gold Inc. with information provided by New Gold. The quality of information and conclusions are based on: i) information available at the time of preparation, and ii) the assumptions, conditions and qualifications set forth in this document. This report has been prepared in accordance with generally accepted industry-standard. No other warranty, expressed or implied, is made. If you require further, please contact Sheila Daniel, Principal, Mining Environmental at (905) 568-2929.

<Original signed by>

<Original signed by>

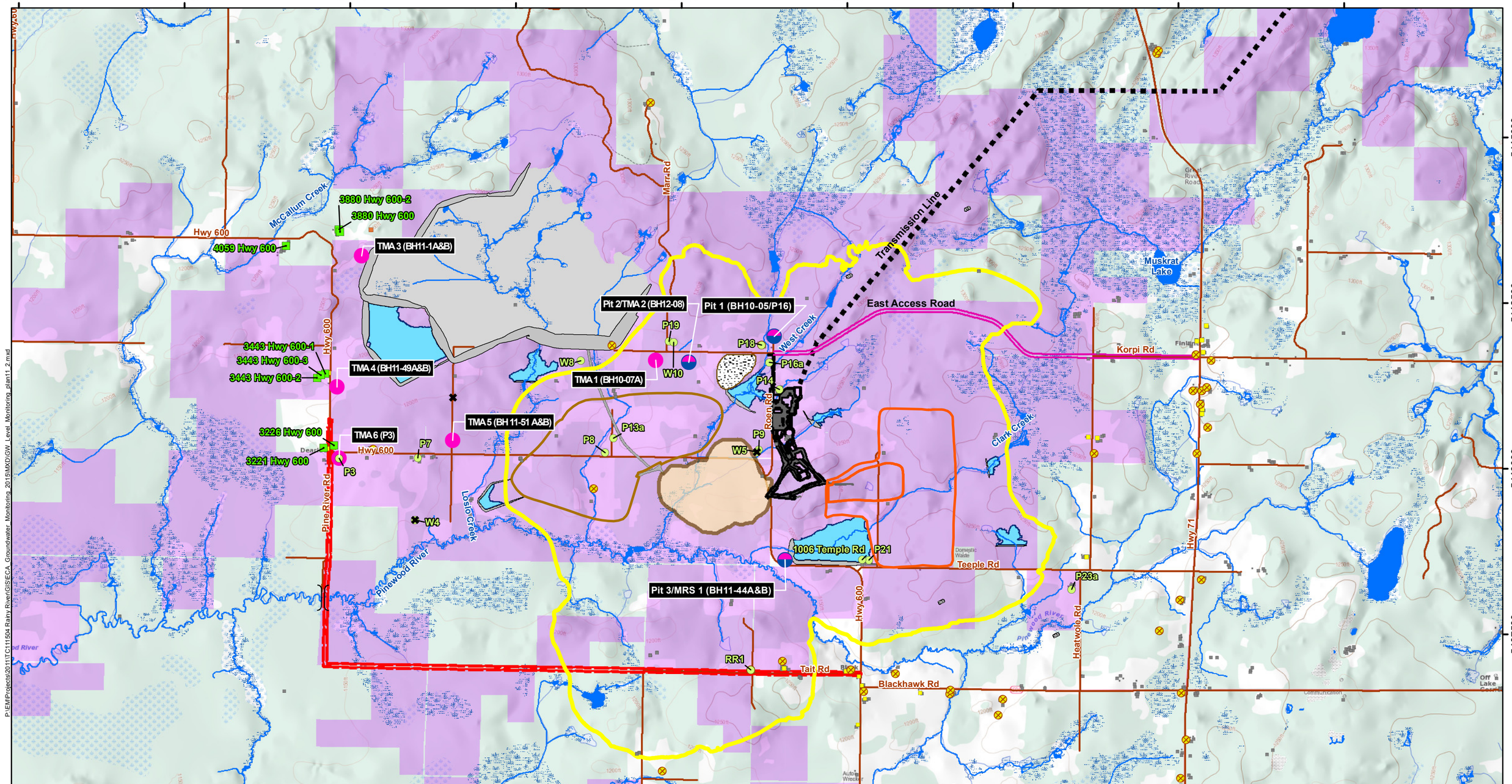
Lesley Lorrimer, B.Sc.
Environmental Scientist

Sheila Daniel, M.Sc., P. Geo.
Principal, Mining Environmental

cc. MOECC, Kenora Office

Table 1: Summary of Groundwater Report Content by Approval

Groundwater Report Content Requirements (or very similar)	ECA #5781-9VJQ2J Condition 13(6)c	PTTW #0040-9VUL6B Condition 4.2.3	PTTW #1386-9VTP2H Condition 4.2.3	PTTW #2133-9VUPVZ Condition 4.2.3	PTTW #7631-9VULMS Condition 4.2.4	PTTW #8776-9W2QN3 Condition 4.2.5
A scale site plan or plans of the entire site illustrating significant site features such as mine facilities, rivers, seeps, ponds, ditches, collection and treatment facilities, and Roadways, as well as all of the monitoring locations.	I	a	a	a	a	a
A scale location map illustrating the site relative to nearby potentially sensitive groundwater/surface water features (lakes, streams, wells, etc.).	ii	b	b	b	b	b
Water table contour maps [including current and baseline contour maps for comparison purposes]. Where multiple groundwater flow regimes exist, a contour map for each groundwater flow regime shall be included.	iii	c	c	c	c	c
Stratigraphic cross-sections which clearly illustrate the subsurface distribution of geological materials.	iv	d	d	d	d	d
Borehole logs for all monitoring wells.	v					
Tables illustrating historical water chemistry and water level data.	vi					
Tables illustrating historical water level data.		e	e	e	e	e
Graphs illustrating historical water quality trends with time for the key analytical parameters.	vii					
Graphs illustrating historical water level trends with time for the key monitoring locations.		f	f	f	f	f
An assessment of monitoring data to evaluate the impact on receiving bodies and offsite groundwater.	viii					
An assessment of monitoring data to evaluate the impact on surface water features and offsite groundwater supply wells.		g	g	g	g	g
Assessment of the monitoring criteria with respect to the trigger mechanisms identified in the Contingency Plan, and discussion related to requirements for contingency measures to be implemented.	ix					
An assessment of the groundwater level monitoring results as related to the anticipated groundwater levels as predicted by the current hydrogeological model.		h	h	h	h	h
A summary of the annual monitoring program in the format of Tables 11a and 11b [ECA] / Table 1 [PTTW] (or similar).	x	i	i	i	i	i
Results and discussion of hydrogeological model update once every 3 years, with the first update to be included in the report due march 31, 2018.	xi					
Recommendations for future monitoring and/or remedial actions.	xii	j	j	j	j	j
A section detailing the field sampling protocols and QA/QC measures.	xiii					



P:\EM\Projects\2011\TC111504 Rainy River\GIS\ECA_Groundwater_Monitoring\Groundwater_Monitoring_2015\MXD\GW_Level_Monitoring_plan11_2.mxd

LEGEND

- Residence-House
- Lodging Cabin-Occasional Use
- Building - Unknown Use
- Roads
- Contours, 10 m interval
- Watercourses
- Low-lying Area
- RRR Active Dispositions/Unpatented Claims

Proposed Site Features

- Plant Site / Ancillary Facilities
- Open Pit
- Highway Re-alignment
- East Access Road
- Site Roads
- Transmission Line
- Pond
- Aggregate Pit
- Dams
- Tailings Management Area
- Overburden / West Mine Rock Stockpile
- Ore / East Mine Rock Stockpile

Proposed Monitoring Wells (labelled on map)

- Groundwater quality monitoring location
- Groundwater level and quality monitoring location
- 1 m Drawdown Envelope of all Sensitivity Runs Extended Model
- Destroyed or Decommissioned Wells

- Private Water Wells (2013 Survey)
- Private Water Wells (2012 Survey)
- Private Water Wells (MOE Records)

Source / Notes:
- Background topographic and elevation data extracted from MNR Land Information Ontario
- Only major facilities are shown. Connecting infrastructure and supporting facilities are generally not shown.
- RRP lands current as of Dec. 2015

Datum: NAD83
Projection: UTM Zone 15N

0 1 2 4 6 8 10 Kilometres

newgold™ Rainy River Project

amec foster wheeler

RAINY RIVER PROJECT

Groundwater Quality and Level Monitoring Well Network as of December 31, 2015

PROJECT Nº: TC111504	**FIGURE: 1**
SCALE: 1:55,000	Date: March 2016

417500 420000 422500 425000 427500 430000 432500

5415000 5412500 5410000 5407500

P:\EM\Projects\2011\TC111504 Rainy River\GIS\HydroGeology\Report_1\MXD_Mars\GroundwaterLevel_Contours_5.mxd

McCallum Creek
Hwy 600
Pine River Rd
Marr Rd
Marr Creek
Loslo Creek
Hwy 600
Pinewood River
Clark Rd
Teeple Rd
Tait Rd
Blackhawk Rd
Heatwole Rd
Hwy 71

B (see figure 3-5)
A (see figure 3-4)
A'
B'

LEGEND

- General Project Area
- Approximate Open Pit Outline
- Cross Section
- Roads
- Watercourses
- Borehole Used in Groundwater Contour Interpolation labelled with Groundwater level (masl)
- 360 Groundwater Level Contours

Quaternary Geology

O	Organic: peat and organic clay; includes bogs, fens, marsh, ponds and standing water along poorly defined creeks.	GL	Glaciolacustrine: clay, silt, and minor sand; glacial lake bottom
A	Alluvium: fine sand, silt, and clay; deposits of Pinewood River and tributaries	GLc	Glaciolacustrine Coarse Grained: sand and gravel; beach, bar and, near-shore deposits
		GF	Glaciofluvial: sand, gravel, and boulders, minor till; deposited from glacial meltwater in ice-contact environment.
B	Bedrock: exposures or with very thin cover	M	Moraine: glacial till with some interbedded glaciolacustrine clay and silt; inferred to mostly Whitemouth Lake Till, clay rich with carbonate rocks and matrix.

NOTES:
- Road data extracted from Land Information Ontario, Ontario Road Network, MNR
- Township and watercourse data extracted from Land Information Ontario, MNR
- Surficial geology based on air photo analysis and review of published geology maps. Surficial materials may vary from those indicated

Datum: NAD83
Projection: UTM Zone 15N

0 1 2 4 6 8 10 Kilometres

RAINYRIVER amec

RAINY RIVER GOLD PROJECT

Groundwater Level Contour Map for June 2012 for Whiteshell Till and Shallow Bedrock

PROJECT N°: TC111504 | FIGURE: 2

SCALE: 1:46,000 | DATE: March 2013

APPENDIX A

CERTIFICATION OF DOCUMENT BY OWNER

newgold™ Rainy River Project

March 28, 2016

Director Manager
Ministry of the Environment and Climate Change
Thunder Bay District Office
331-435 James St S
Thunder Bay ON P7E 6S7

Re: Certification regarding Rainy River Project, 2015 Annual Groundwater Monitoring Report Per ECA #5781-9VJQ2J, Condition 13(6)c

With regards to the Rainy River Project located in Unsurveyed Territory (Kenora Area Office), District of Rainy River, Ontario:

I certify that the information in this document and all attachments are correct, accurate and complete to the best of my knowledge.

Should you have any questions or require additional information for any part of this submission, please contact the undersigned or Cailey Anderson at 807-707-3058.

Sincerely,
<Original signed by>

Darrell Martindale
Environmental Manager

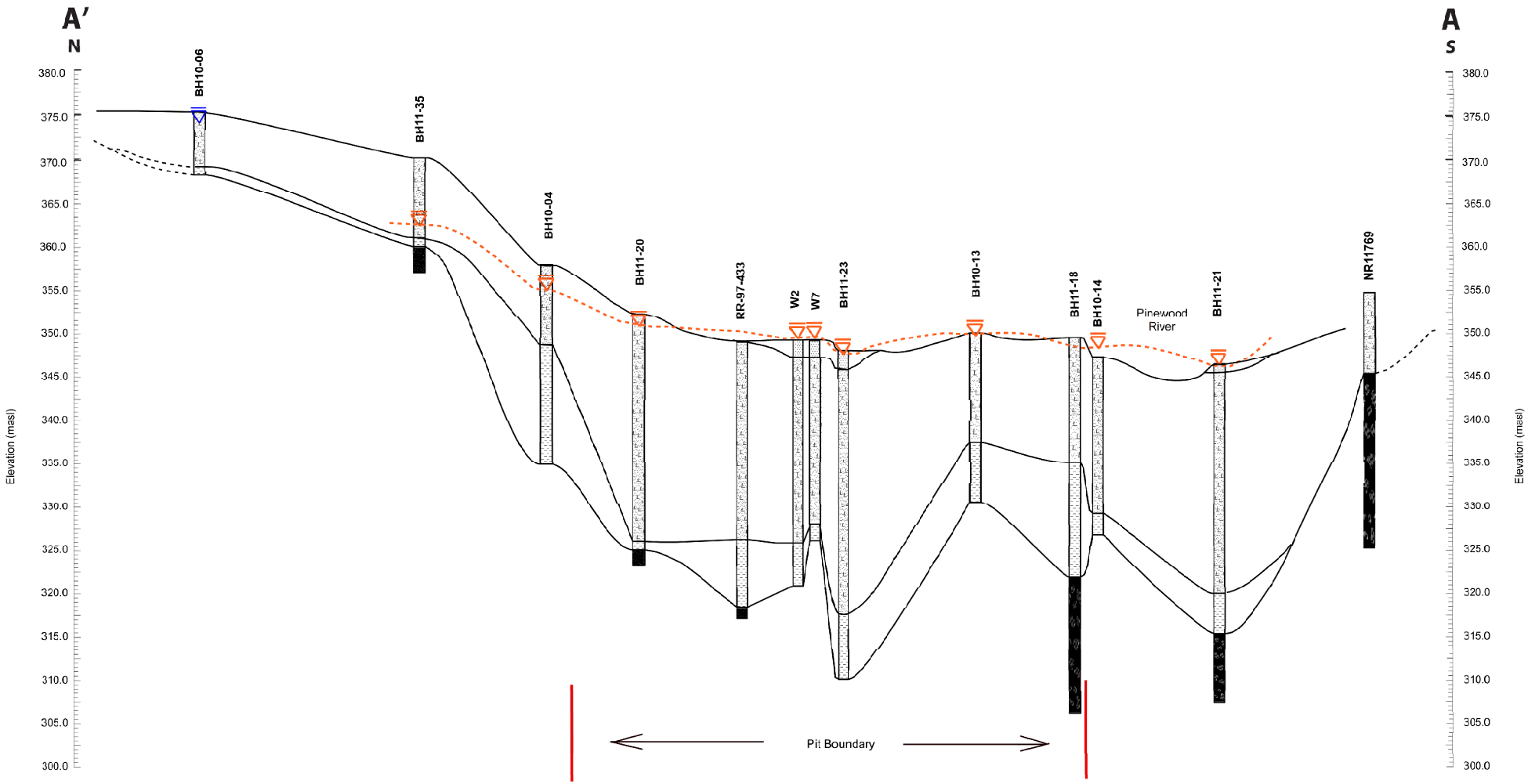
cc. MOECC Northern Region, Kenora Area Office

New Gold Inc., Rainy River Project
5967 Highway 11/71, P.O. Box 5
Emo, Ontario, Canada P0W IE0
www.newgold.com

T 807-707-3497

APPENDIX B

STRATIGRAPHIC CROSS SECTIONS



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LEGEND

- Top soil/shallow sediments
- Predominantly Whitemouth Lake Till, (Pleistocene Aquitard)
- Predominantly Whiteshell Till, (Pleistocene Lower Granular Deposits)
- Bedrock
- Groundwater level (within Whitemouth Lake Till)
- Groundwater level (within Whiteshell Till and bedrock)
- Interpreted contact
- Interpreted groundwater level (within Whitesehll Till and shallow bedrock)

NOTES:
- RR-97 Data sourced from Nuinsco (1997)

RAINY RIVER

amec

RAINY RIVER GOLD PROJECT

Cross Section of Overburden and Shallow Bedrock (North-South)

Datum: NAD83
Projection: UTM Zone 15N

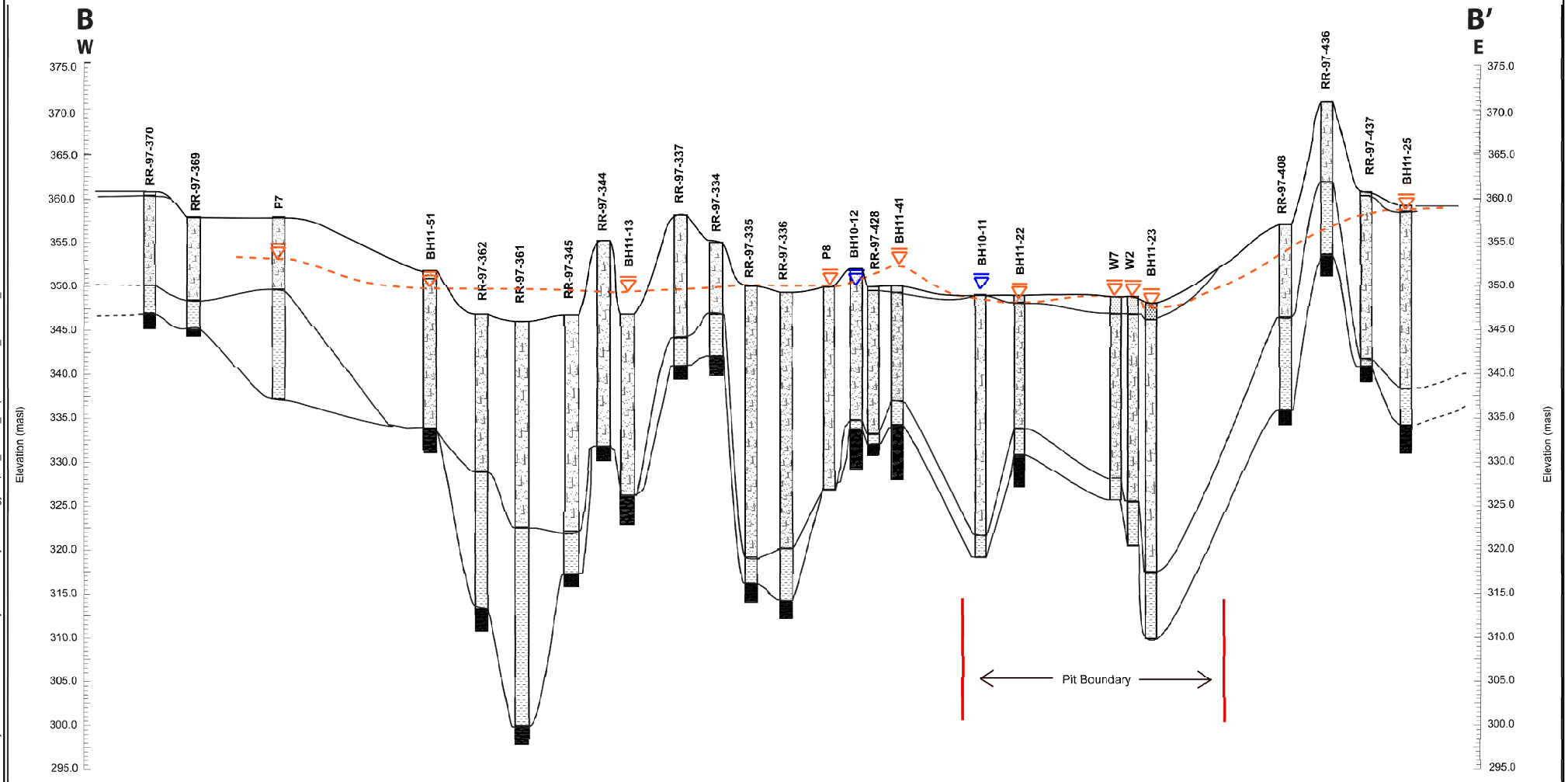
N S

PROJECT N°: TC111504

FIGURE: 3-4

SCALE: As Shown

DATE: March 2013



P:\EM\Projects\2011\TC111504 Rainy River\GIS\HydroGeology\Report_1\MXD_Maps\EastWest_XSection_2.mxd

LEGEND

- Top soil/shallow sediments
- Predominantly Whitemouth Lake Till, (Pleistocene Aquitard)
- Predominantly Whiteshell Till, (Pleistocene Lower Granular Deposits)
- Bedrock
- Groundwater level (within Whitemouth Lake Till)
- Groundwater level (within Whiteshell Till and bedrock)
- Interpreted contact
- Interpreted groundwater level (within Whitesehll Till and shallow bedrock)

NOTES:
- RR-97 Data sourced from Nuinsco (1997)

RAINY RIVER

amec

RAINY RIVER GOLD PROJECT

Cross Section of Overburden and Shallow Bedrock (West-East)

Datum: NAD83
Projection: UTM Zone 15N

W E

PROJECT N°: TC111504

FIGURE: 3-5

SCALE: As Shown

DATE: March 2013

APPENDIX C

BOREHOLE LOGS

TEST HOLE LOG

STARTED: 11/17/2009 **FINISHED:** 11/17/2009
DRILL METHOD: Reverse Circulation
GROUND ELEV. (m): 350.00
COORDINATES (m): N 5409786 E 425850

DEPTH (m)	SPT BLOWS PER 0.15m	SAMPLE TYPE	SAMPLE No.	SYMBOL	DESCRIPTION OF MATERIALS	INSTRUMENT	DETAILS
0					Peat.		
3.00							
347.00					KEEWATIN TILL (CH) High plasticity clay with trace sand (fine to medium grain), grey, soft-firm		

Su - kPa
20 60 100 140 180
VANE PEAK ◆ FIELD ■ LAB
REMOLD ◇ □
▲ UC/2
△ P.PEN/2
★ % FINES ● SPT N
W_P% W% W_L%
× – – – – o – – – – ×
20 40 60 80

Continued Next Page

Klohn Crippen Berger

PROJECT NO.: M09559A04
PROJECT: Rainy River Baseline Studies
LOCATION: Richardson Township, Ontario
LOGGED BY: TJ **CHECKED BY:**
SHEET 1 **OF** 3 **HOLE NO.:** RR09-213A

KOBL_TEST_HOLE-SI KOBWELLS.GPJ KC_DATA.GDT 11/16/10

TEST HOLE LOG

STARTED: 11/17/2009 **FINISHED:** 11/17/2009
DRILL METHOD: Reverse Circulation
GROUND ELEV. (m): 350.00
COORDINATES (m): N 5409786 E 425850

DEPTH (m)	SPT BLOWS PER 0.15m	SAMPLE TYPE	SAMPLE No.	SYMBOL	DESCRIPTION OF MATERIALS	INSTRUMENT	DETAILS
24					24.00 326.00 As above, but 30% of regular recovery.		
25					25.50 324.50 As above		

Su - kPa: 20 60 100 140 180
VANE PEAK ◆ FIELD ■ LAB ▲ UC/2
REMOLD ◇ □ △ P.PEN/2
★ % FINES ● SPT N
W_P% W% W_L%
20 40 60 80

Continued Next Page

Klohn Crippen Berger

PROJECT NO.: M09559A04
PROJECT: Rainy River Baseline Studies
LOCATION: Richardson Township, Ontario
LOGGED BY: TJ **CHECKED BY:**
SHEET 2 **OF** 3 **HOLE NO.:** RR09-213A

KCBL_TEST_HOLE-SI KCBWELLS.GPJ KC_DATA.GDT 11/16/10

TEST HOLE LOG

STARTED: 11/17/2009 **FINISHED:** 11/17/2009
DRILL METHOD: Reverse Circulation
GROUND ELEV. (m): 350.00
COORDINATES (m): N 5409786 E 425850

DEPTH (m)	SPT BLOWS PER 0.15m	SAMPLE TYPE	SAMPLE No.	SYMBOL	DESCRIPTION OF MATERIALS	INSTRUMENT DETAILS
					41.50 308.50 LABRADOREAN/boulder (no sample)	
					308.20 DACITE	
					46.50 303.50 End of Hole at 46.50 m	

Su - kPa
20 60 100 140 180
VANE PEAK ◆ ■ ▲UC/2
REMOLD ◇ □ △P.PEN/2
★ % FINES ● SPT N
W_P% W% W_L%
× – – – o – – – ×
20 40 60 80

Klohn Crippen Berger

PROJECT NO.: M09559A04
PROJECT: Rainy River Baseline Studies
LOCATION: Richardson Township, Ontario
LOGGED BY: TJ **CHECKED BY:**
SHEET 3 **OF** 3 **HOLE NO.:** RR09-213A

KCBL_TEST_HOLE-SI KCBWELLS.GPJ KC_DATA.GDT 11/16/10

TEST HOLE LOG

STARTED: 11/18/2009 **FINISHED:** 11/18/2009
DRILL METHOD: Reverse Circulation
GROUND ELEV. (m): 350.00
COORDINATES (m): N 5409790 E 425850

DEPTH (m)	SPT BLOWS PER 0.15m	SAMPLE TYPE	SAMPLE No.	SYMBOL	DESCRIPTION OF MATERIALS	INSTRUMENT DETAILS
0					Peat.	
3.00						
347.00					KEEWATIN TILL (CH) High plasticity clay with trace sand (fine to medium grain), grey, soft-firm	
16.90						
333.10					End of Hole at 16.90 m	

Su - kPa
20 60 100 140 180
VANE PEAK ◆ FIELD ■ LAB
REMOLD ◇ □
▲ UC/2
△ P.PEN/2
★ % FINES ● SPT N
W_P% W% W_L%
× – – – – o – – – – ×
20 40 60 80

PROJECT NO.: M09559A04
PROJECT: Rainy River Baseline Studies
LOCATION: Richardson Township, Ontario
LOGGED BY: TJ **CHECKED BY:**
SHEET 1 **OF** 1 **HOLE NO.:** RR09-213B

Klohn Crippen Berger

KCBL_TEST_HOLE-SI KCBWELLS.GPJ KC_DATA.GDT 11/16/10

TEST HOLE LOG

STARTED: 11/20/2009 **FINISHED:** 11/21/2009
DRILL METHOD: Reverse Circulation
GROUND ELEV. (m): 348.00
COORDINATES (m): N 5409856 E 425286

DEPTH (m)	SPT BLOWS PER 0.15m	SAMPLE TYPE	SAMPLE No.	SYMBOL	DESCRIPTION OF MATERIALS
					Peat (no recovery)
					1.00
					347.00 Clay and Silt (CH), beige/brown, heavily oxidized
					2.00
					346.00 Clay (CH) Sandy to some fine to coarse sand (likely interbedded fine sand/silt), grey, soft to firm, possibly stiff if undisturbed
					18.00
					330.00 As above with little to no recovery.
					19.50
					328.50 As above.

INSTRUMENT | DETAILS

Su - kPa
20 60 100 140 180
VANE PEAK ◆ FIELD ■ LAB
REMOLD ◇ □
▲ UC/2 △ P.PEN/2
★ % FINES ● SPT N
W_P% W% W_L%
× – – – o – – – ×
20 40 60 80

Continued Next Page

Klohn Crippen Berger

PROJECT NO.: M09559A04
PROJECT: Rainy River Baseline Studies
LOCATION: Richardson Township, Ontario
LOGGED BY: TJ **CHECKED BY:**
SHEET 1 **OF** 3 **HOLE NO.:** RR09-214A

KCBL_TEST_HOLE-SI KCBWELLS.GPJ KC_DATA.GDT 11/16/10

TEST HOLE LOG

STARTED: 11/20/2009 **FINISHED:** 11/21/2009
DRILL METHOD: Reverse Circulation
GROUND ELEV. (m): 348.00
COORDINATES (m): N 5409856 E 425286

DEPTH (m)	SPT BLOWS PER 0.15m	SAMPLE TYPE	SAMPLE No.	SYMBOL	DESCRIPTION OF MATERIALS	INSTRUMENT DETAILS
21						
22						
23					23.00 325.00 As above increasing coarse sand content. 324.90	
24						
25						
26						
27						
28						
29					As above decreasing sand content to trace or none.	
30					30.20 317.80 Sand, gravel and cobbles. Trace to some silt.	
31						
32						
33						
34						
35						
36						
37						
38						
39					39.50	
40					308.50 BEDROCK	

Continued Next Page

Su - kPa
20 60 100 140 180
VANE PEAK ◆ FIELD ■ LAB
REMOLD ◇ □
▲ UC/2
△ P.PEN/2
★ % FINES ● SPT N
W_P% W% W_L%
× – – – – o – – – – ×
20 40 60 80

Klohn Crippen Berger

PROJECT NO.: M09559A04
PROJECT: Rainy River Baseline Studies
LOCATION: Richardson Township, Ontario
LOGGED BY: TJ **CHECKED BY:**
SHEET 2 **OF** 3 **HOLE NO.:** RR09-214A

KCBL_TEST_HOLE-SI KCBWELLS.GPJ KC_DATA.GDT 11/16/10

TEST HOLE LOG

STARTED: 11/20/2009 **FINISHED:** 11/21/2009
DRILL METHOD: Reverse Circulation
GROUND ELEV. (m): 348.00
COORDINATES (m): N 5409856 E 425286

DEPTH (m)	SPT BLOWS PER 0.15m	SAMPLE TYPE	SAMPLE No.	SYMBOL	DESCRIPTION OF MATERIALS	INSTRUMENT DETAILS
40.50 / 307.50					End of Hole at 40.50 m	

Su - kPa
20 60 100 140 180
VANE PEAK ◆ ■ ▲UC/2
REMOLD ◇ □ △P.PEN/2
★ % FINES ● SPT N
W_P% W% W_L%
× – – – – o – – – – ×
20 40 60 80

41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60

Klohn Crippen Berger

PROJECT NO.: M09559A04
PROJECT: Rainy River Baseline Studies
LOCATION: Richardson Township, Ontario
LOGGED BY: TJ **CHECKED BY:**
SHEET 3 **OF** 3 **HOLE NO.:** RR09-214A

KCBL_TEST_HOLE-SI KCBWELLS.GPJ KC_DATA.GDT 11/16/10

TEST HOLE LOG

STARTED: 11/22/2009 **FINISHED:** 11/22/2009

DRILL METHOD: Reverse Circulation

GROUND ELEV. (m): 348.00

COORDINATES (m): N 5409860 E 425286

DEPTH (m)	SPT BLOWS PER 0.15m	SAMPLE TYPE	SAMPLE No.	SYMBOL	DESCRIPTION OF MATERIALS	INSTRUMENT DETAILS
					Peat (no recovery)	
					1.00	
1					347.00 Clay and Silt (CH), beige/brown, heavily oxidized	
					2.00	
2					346.00 Clay (CH)	
3					Sandy to some fine to coarse sand (likely interbedded fine sand/silt), grey, soft to firm, possibly stiff if undisturbed	
4						
5						
6						
7						
8						
9						
10						
11						
12						
13					13.50	
					334.50 End of Hole at 13.50 m	
14						
15						
16						
17						
18						
19						
20						

Su - kPa

20 60 100 140 180

VANE PEAK ◆ FIELD ■ LAB
REMOLD ◇ □
▲ UC/2
△ P.PEN/2
★ % FINES ● SPT N

W_P% W% W_L%

× – – – – o – – – – ×

20 40 60 80

Klohn Crippen Berger

PROJECT NO.: M09559A04

PROJECT: Rainy River Baseline Studies

LOCATION: Richardson Township, Ontario

LOGGED BY: TJ **CHECKED BY:**

SHEET 1 **OF** 1 **HOLE NO.:** RR09-214B

KCBL_TEST_HOLE-SI KCBWELLS.GPJ KC_DATA.GDT 11/16/10

TEST HOLE LOG

STARTED: May 31, 2010 **FINISHED:** May 31, 2010
DRILL METHOD: Air Rotary
GROUND ELEV. (m): 349.00
COORDINATES (m): N 5409720 E 425718

DEPTH (m)	SPT BLOWS PER 0.15m	SAMPLE TYPE	SAMPLE No.	SYMBOL	DESCRIPTION OF MATERIALS	INSTRUMENT DETAILS
0					PEAT (PT), "black muskeg", logs, wet	
1.83 / 347.17					CLAY (CL), silty, sandy, brown, wet	
3.05 / 345.95					CLAY (CH), trace of organics, blue-grey, wet	
6.10 / 342.90					CLAY (CH), trace of sands and gravels, blue-grey, wet	
22.86 / 326.14					GRAVEL (GM), and sand, silty, some cobbles, wet, producing water	
25.91 / 323.09						
28.04 / 320.96					GRANITE, cuttings, blue-green, producing little water End of Hole at 28.00 m	

5" 14-slot stainless steel screen installed with K-packer

Su - kPa
20 60 100 140 180
VANE PEAK ◆ ■ ▲UC/2
REMOLD ◇ □ △P.PEN/2
★ % FINES ● SPT N
W_P% W% W_L%
× – – – o – – – ×
20 40 60 80

Klohn Crippen Berger

PROJECT NO.: M09559A04
PROJECT: Rainy River Baseline Studies
LOCATION: Richardson Township, Ontario
LOGGED BY: KP **CHECKED BY:**
SHEET 1 **OF** 1 **HOLE NO.:** TW10-01

KCBL_TEST_HOLE-SI KCBWELLS.GPJ KC_DATA.GDT 11/15/10

TEST HOLE LOG

STARTED: Jun 1, 2010 **FINISHED:** Jun 1, 2010
DRILL METHOD: Air Rotary
GROUND ELEV. (m): 349.00
COORDINATES (m): N 5409718 E 425672

DEPTH (m)	SPT BLOWS PER 0.15m	SAMPLE TYPE	SAMPLE No.	SYMBOL	DESCRIPTION OF MATERIALS	INSTRUMENT DETAILS
0					PEAT (PT), "black muskeg", logs, wet	
1.83					347.17	
2					CLAY (CL), silty, sandy, brown, wet	
3.05					345.95	
3					CLAY (CH), blue-grey, wet, soft	
21.34					327.66	
21					GRAVEL (GM), and sand, silty, some cobbles, wet, producing water	
23.06					325.94	
23					End of Hole at 23.10 m	
					No screen installed. Bottom of casing left open.	

Su - kPa: 20 60 100 140 180

VANE PEAK ◆ FIELD ■ LAB
REMOLD ◇ □
▲ UC/2 △ P.PEN/2

★ % FINES ● SPT N

W_P% W% W_L%
× – – – – o – – – – ×
20 40 60 80

Klohn Crippen Berger

PROJECT NO.: M09559A04
PROJECT: Rainy River Baseline Studies
LOCATION: Richardson Township, Ontario
LOGGED BY: KP **CHECKED BY:**
SHEET 1 **OF** 1 **HOLE NO.:** TW10-02

KCBL_TEST_HOLE-SI KCBWELLS.GPJ KC_DATA.GDT 11/15/10

TEST HOLE LOG

STARTED: Jun 2, 2010 **FINISHED:** Jun 2, 2010
DRILL METHOD: Air Rotary
GROUND ELEV. (m): 348.00
COORDINATES (m): N 5409707 E 424744

DEPTH (m)	SPT BLOWS PER 0.15m	SAMPLE TYPE	SAMPLE No.	SYMBOL	DESCRIPTION OF MATERIALS	INSTRUMENT DETAILS
					CLAY (CL), silty, sandy, some organics, brown, wet	
					2.74 / 345.26 CLAY (CH), blue-grey, wet, soft	
					6.10 / 341.90 CLAY (CH), blue-grey, wet, soft	
					25.60 / 322.40 GRAVEL (GM), and sand, silty, some cobbles, wet, producing water	
					28.65 / 319.35 GRANITE, broken, blue-green	
					29.26 / 318.74 End of Hole at 29.30 m	
					5" 14-slot stainless steel screen installed with K-packer	

Su - kPa
20 60 100 140 180
VANE PEAK ◆ FIELD ■ LAB
REMOLD ◇ □
▲ UC/2 △ P.PEN/2
★ % FINES ● SPT N
W_P% W% W_L%
× – – – – o – – – – ×
20 40 60 80

Klohn Crippen Berger

PROJECT NO.: M09559A04
PROJECT: Rainy River Baseline Studies
LOCATION: Richardson Township, Ontario
LOGGED BY: KP **CHECKED BY:**
SHEET 1 **OF** 1 **HOLE NO.:** TW10-03

KCBL_TEST_HOLE-SI KCBWELLS.GPJ KC_DATA.GDT 11/15/10

TEST HOLE LOG

STARTED: Jun 3, 2010 **FINISHED:** Jun 3, 2010
DRILL METHOD: Air Rotary
GROUND ELEV. (m): 348.00
COORDINATES (m): N 5409651 E 424745

Su - kPa: 20 60 100 140 180
VANE PEAK ◆ ■ ▲UC/2
REMOLD ◇ □ △P.PEN/2
★ % FINES ● SPT N
W_P% W% W_L%
× – – – – o – – – – ×
20 40 60 80

DEPTH (m)	SPT BLOWS PER 0.15m	SAMPLE TYPE	SAMPLE No.	SYMBOL	DESCRIPTION OF MATERIALS	INSTRUMENT DETAILS
0					PEAT (PT), "black muskeg", logs, wet	
1.22					346.78 CLAY (CL), silty, sandy, brown, wet	
3.66					344.34 CLAY (CH), blue-grey, wet, soft	
28.96					319.04 GRAVEL (GM), and sand, silty, some cobbles, grey silt, wet, producing water	
31.09					316.91 GRAVEL (GM), coarse, and sand, silty, some cobbles, wet, compact, producing water	
32.31					315.69 GRANITE, broken, blue-green	
					End of Hole at 32.30 m	

No screen installed. Bottom of casing left open.

Klohn Crippen Berger

PROJECT NO.: M09559A04
PROJECT: Rainy River Baseline Studies
LOCATION: Richardson Township, Ontario
LOGGED BY: KP **CHECKED BY:**
SHEET 1 **OF** 1 **HOLE NO.:** TW10-04

KCBL_TEST_HOLE-SI KCBWELLS.GPJ KC_DATA.GDT 11/15/10

TEST HOLE LOG

STARTED: May 11, 2010 **FINISHED:** May 12, 2010
DRILL METHOD: Washbore
GROUND ELEV. (m): 358.00
COORDINATES (m): N 5410646 E 425815

DEPTH (m)	SPT BLOWS PER 0.15m	SAMPLE TYPE	SAMPLE No.	SYMBOL	DESCRIPTION OF MATERIALS
0					**SILTY CLAY (CH)** high plasticity, some grey mottling, moist, brown
1		D	1		
2					
3		D	2		with some medium gravels, well rounded, black red
4					
5		D	3		
6					
7		U	1		becoming grey
8		D	4		
8.80					
9					349.20 **SAND (SW)** well graded, fine to medium sand, wet, grey and black
		D	5		
10					10.00

Continued Next Page

INSTRUMENT | DETAILS

Su - kPa
20 60 100 140 180
VANE PEAK ◆ ■ ▲UC/2
REMOLD ◇ □ △P.PEN/2
★ % FINES ● SPT N
W_P% W% W_L%
× – – – – o – – – – ×
20 40 60 80

Klohn Crippen Berger

PROJECT NO.: M09559A06
PROJECT: Rainy River Mine Waste and Geotech.
LOCATION: Richardson Township, Ontario
LOGGED BY: ARD **CHECKED BY:**
SHEET 1 **OF** 3 **HOLE NO.:** BH10-04

KCBL_TEST_HOLE-SI M09559A06 DRILLHOLE LOGS.GPJ KC_DATA.GDT 19/10/10

TEST HOLE LOG

STARTED: May 11, 2010 **FINISHED:** May 12, 2010
DRILL METHOD: Washbore
GROUND ELEV. (m): 358.00
COORDINATES (m): N 5410646 E 425815

Su - kPa: 20 60 100 140 180
VANE PEAK ◆ FIELD ■ LAB
REMOLD ◇ □
▲UC/2 △P.PEN/2
★ % FINES ● SPT N
W_P% W% W_L%
20 40 60 80

DEPTH (m)	SPT BLOWS PER 0.15m	SAMPLE TYPE	SAMPLE No.	SYMBOL	DESCRIPTION OF MATERIALS	INSTRUMENT DETAILS
					348.00 Alternating layers of **SAND (SW) and SILTY CLAY (CH)** Sand is well graded, fine to medium, wet, grey and black, 10 cm thick. Clay is high plasticity, grey, moist, 10 cm thick.	
11	3,1,8,8	D	6			
12		D	7			
13						
14		U	2		cobble	
15	7,6,8	D	8		with some fine to medium gravels, sub-rounded, white, grey	
16						
17		D	9			
18		D	10			
19						
20					20.00	

Continued Next Page

Klohn Crippen Berger

PROJECT NO.: M09559A06
PROJECT: Rainy River Mine Waste and Geotech.
LOCATION: Richardson Township, Ontario
LOGGED BY: ARD **CHECKED BY:**
SHEET 2 **OF** 3 **HOLE NO.:** BH10-04

KCBL_TEST_HOLE-SI M09559A06 DRILLHOLE LOGS.GPJ KC_DATA.GDT 19/10/10

TEST HOLE LOG

STARTED: May 11, 2010 **FINISHED:** May 12, 2010

DRILL METHOD: Washbore

GROUND ELEV. (m): 358.00

COORDINATES (m): N 5410646 E 425815

DEPTH (m)	SPT BLOWS PER 0.15m	SAMPLE TYPE	SAMPLE No.	SYMBOL	DESCRIPTION OF MATERIALS
		D	11		338.00 Alternating layers of **SAND (SW) and SILTY CLAY (CH)** Sand is well graded, fine to medium, wet, grey and black, 10 cm thick. Clay is high plasticity, grey, moist, 10 cm thick. Some fine to medium gravels, sub-rounded, white, grey.
21					21.50 336.50 **GRAVEL (GP)** poorly sorted, angular, wet, maximum particle 3 cm
22	24,30,31	D	12		22.00 336.00 **SAND (SP)** poorly sorted, rounded, wet
					22.50 335.50 **SILTY CLAY (CH)** high plasticity, grey
23	16,17,29,50	D	13		23.00 335.00 **SILT (ML)** low plasticity, grey
					23.25 334.75
24					End of Hole at 23.26 m
					Refusal on cobbles
25					
26					
27					
28					
29					
30					

INSTRUMENT DETAILS

Su - kPa

20 60 100 140 180

VANE FIELD LAB
PEAK ◆ ■ ▲UC/2
REMOLD ◇ □ △P.PEN/2

★ % FINES ● SPT N

W_P% W% W_L%

20 40 60 80

PROJECT NO.: M09559A06

PROJECT: Rainy River Mine Waste and Geotech.

LOCATION: Richardson Township, Ontario

LOGGED BY: ARD **CHECKED BY:**

SHEET 3 **OF** 3 **HOLE NO.:** BH10-04

Klohn Crippen Berger

KCBL_TEST_HOLE-SI M09559A06 DRILLHOLE LOGS.GPJ KC_DATA.GDT 19/10/10

TEST HOLE LOG

STARTED: May 12, 2010 **FINISHED:** May 13, 2010

DRILL METHOD: Washbore

GROUND ELEV. (m): 373.00

COORDINATES (m): N 5411993 E 426400

DEPTH (m)	SPT BLOWS PER 0.15m	SAMPLE TYPE	SAMPLE No.	SYMBOL	DESCRIPTION OF MATERIALS	INSTRUMENT DETAILS
0					**SILTY CLAY (CH)** high plasticity, moist, brown, some fine to coarse sand, sub-rounded, white and black, moist	
1		D	1			
2						
3		D	2			
4					becoming grey	
5		D	3			
6		U	4			
7		D	5			
8						
9		D	6			
10					10.00	

Continued Next Page

Su - kPa

20 60 100 140 180

VANE PEAK ◆ FIELD ■ LAB ▲UC/2

REMOLD ◇ □ ▲P.PEN/2

★ % FINES ● SPT N

W_P% W% W_L%

20 40 60 80

PROJECT NO.: M09559A06

PROJECT: Rainy River Mine Waste and Geotech.

LOCATION: Richardson Township, Ontario

LOGGED BY: ARD **CHECKED BY:**

SHEET 1 **OF** 2 **HOLE NO.:** BH10-05

Klohn Crippen Berger

KCBL_TEST_HOLE-SI M09559A06 DRILLHOLE LOGS.GPJ KC_DATA.GDT 19/10/10

TEST HOLE LOG

STARTED: May 12, 2010 **FINISHED:** May 13, 2010

DRILL METHOD: Washbore

GROUND ELEV. (m): 373.00

COORDINATES (m): N 5411993 E 426400

DEPTH (m)	SPT BLOWS PER 0.15m	SAMPLE TYPE	SAMPLE No.	SYMBOL	DESCRIPTION OF MATERIALS	INSTRUMENT DETAILS
					363.00 **SILTY CLAY (CH)** high plasticity, moist, grey, some fine to coarse sand, sub-rounded, white and black, moist	
					10.50	
11		D	7		362.50 **SILTY SAND (SM)** fine sand, wet, grey, fine to coarse silt, non plastic	
					11.27	
					361.73	
12					End of Hole at 11.27 m	
					Refusal on probable bedrock	
13						
14						
15						
16						
17						
18						
19						
20						

Su - kPa

20 60 100 140 180

VANE PEAK ◆ FIELD ■ LAB ▲UC/2

REMOLD ◇ □ △P.PEN/2

★ % FINES ● SPT N

W_P% W% W_L%

× – – – – o – – – – ×

20 40 60 80

◇ ◆

Klohn Crippen Berger

PROJECT NO.: M09559A06

PROJECT: Rainy River Mine Waste and Geotech.

LOCATION: Richardson Township, Ontario

LOGGED BY: ARD **CHECKED BY:**

SHEET 2 **OF** 2 **HOLE NO.:** BH10-05

KCBL_TEST_HOLE-SI M09559A06 DRILLHOLE LOGS.GPJ KC_DATA.GDT 19/10/10

TEST HOLE LOG

STARTED: May 14, 2010 **FINISHED:** May 14, 2010

DRILL METHOD: Washbore

GROUND ELEV. (m): 375.50

COORDINATES (m): N 5411494 E 426904

DEPTH (m)	SPT BLOWS PER 0.15m	SAMPLE TYPE	SAMPLE No.	SYMBOL	DESCRIPTION OF MATERIALS	INSTRUMENT DETAILS
0					**SILTY CLAY (CH)** high plasticity, brown, moist, some fine to coarse sand, sub-rounded, some fine gravel, sub-rounded	
1		D	1			
2					becoming grey	
3		D	2			
4						
5		D	3			
6		D	4			
6.70 / 368.80					**SANDY GRAVEL** maximum particle size 3 cm, fine to medium gravel, fine to medium sand	
7.16 / 368.34					End of Hole at 7.16 m Refusal on probable bedrock	
7						
8						
9						
10						

Su - kPa

20 60 100 140 180

VANE PEAK ◆ FIELD ■ LAB ▲ UC/2

REMOLD ◇ □ △ P.PEN/2

★ % FINES ● SPT N

W_P% W% W_L%

× – – – – o – – – – ×

20 40 60 80

Klohn Crippen Berger

PROJECT NO.: M09559A06

PROJECT: Rainy River Mine Waste and Geotech.

LOCATION: Richardson Township, Ontario

LOGGED BY: ARD **CHECKED BY:**

SHEET 1 **OF** 1 **HOLE NO.:** BH10-06

KCBL_TEST_HOLE-SI M09559A06 DRILLHOLE LOGS.GPJ KC_DATA.GDT 19/10/10

TEST HOLE LOG

STARTED: May 15, 2010 **FINISHED:** May 16, 2010

DRILL METHOD: Washbore

GROUND ELEV. (m): 350.50

COORDINATES (m): N 5411633 E 424605

DEPTH (m)	SPT BLOWS PER 0.15m	SAMPLE TYPE	SAMPLE No.	SYMBOL	DESCRIPTION OF MATERIALS	INSTRUMENT DETAILS
0					**SILTY CLAY (CH)** high plasticity, moist, grey, some fine to coarse sand, sub-rounded	
3		D	2		some gravel layers, fine to medium at 30 cm intervals, maximum particle size 3 cm, sub-rounded	
7		U	1			
10					10.00	

Su - kPa: 20 60 100 140 180

VANE PEAK ◆ FIELD ◆ LAB ■ ▲UC/2

REMOLD ◇ FIELD ◇ LAB □ △P.PEN/2

★ % FINES ● SPT N

W_P% W% W_L%

× – – – – o – – – – ×

20 40 60 80

Continued Next Page

Klohn Crippen Berger

PROJECT NO.: M09559A06

PROJECT: Rainy River Mine Waste and Geotech.

LOCATION: Richardson Township, Ontario

LOGGED BY: ARD **CHECKED BY:**

 HOLE NO.: BH10-07

KCBL_TEST_HOLE-SI M09559A06 DRILLHOLE LOGS.GPJ KC_DATA.GDT 19/10/10

TEST HOLE LOG

STARTED: May 15, 2010 **FINISHED:** May 16, 2010

DRILL METHOD: Washbore

GROUND ELEV. (m): 350.50

COORDINATES (m): N 5411633 E 424605

DEPTH (m)	SPT BLOWS PER 0.15m	SAMPLE TYPE	SAMPLE No.	SYMBOL	DESCRIPTION OF MATERIALS	INSTRUMENT DETAILS
340.50					**SILTY CLAY (CH)** high plasticity, moist, grey, some fine to coarse sand, sub-rounded. Some gravel layers, fine to medium at 30 cm intervals, maximum particle size 3 cm, sub-rounded	
11						
12		D	7			
13						
14		D	8			
15						
16						
17		D	9			
18	2,3,2,4	D	10			
19						
20		U	1		20.00	

Su - kPa: 20 60 100 140 180

VANE PEAK ◆ FIELD ■ LAB
REMOLD ◇ □
▲UC/2 ▲P.PEN/2

★ % FINES ● SPT N

W_P% W% W_L%

20 40 60 80

Continued Next Page

Klohn Crippen Berger

PROJECT NO.: M09559A06

PROJECT: Rainy River Mine Waste and Geotech.

LOCATION: Richardson Township, Ontario

LOGGED BY: ARD **CHECKED BY:**

SHEET 2 **OF** 3 **HOLE NO.:** BH10-07

KCBL_TEST_HOLE-SI M09559A06 DRILLHOLE LOGS.GPJ KC_DATA.GDT 19/10/10

TEST HOLE LOG

STARTED: May 15, 2010 **FINISHED:** May 16, 2010

DRILL METHOD: Washbore

GROUND ELEV. (m): 350.50

COORDINATES (m): N 5411633 E 424605

DEPTH (m)	SPT BLOWS PER 0.15m	SAMPLE TYPE	SAMPLE No.	SYMBOL	DESCRIPTION OF MATERIALS	INSTRUMENT DETAILS
					330.50 **SILTY CLAY (CH)** high plasticity, moist, grey, some fine to coarse sand, sub-rounded. Some gravel layers, fine to medium at 30 cm intervals, maximum particle size 3 cm, sub-rounded	
21		D	11			
22		D	12			
23		D	13			
24						
25	12,15,19,24	D	14		25.50 325.00 **SANDY SILT (ML)** low plasticity, fine to coarse silt, fine sand, wet, grey	
					25.80 324.70 **SILTY CLAY (CL)** varves at 3 cm intervals, clay varves are 5 mm, low plasticity, dark grey	
26						
27					End of Hole at 26.60 m	
28						
29						
30						

Su - kPa

20 60 100 140 180

VANE PEAK ◆ FIELD ■ LAB ▲UC/2

REMOLD ◇ □ △P.PEN/2

★ % FINES ● SPT N

W_P% W% W_L%

× – – – – o – – – – ×

20 40 60 80

PROJECT NO.: M09559A06

PROJECT: Rainy River Mine Waste and Geotech.

LOCATION: Richardson Township, Ontario

LOGGED BY: ARD **CHECKED BY:**

SHEET 3 **OF** 3 **HOLE NO.:** BH10-07

Klohn Crippen Berger

KCBL_TEST_HOLE-SI M09559A06 DRILLHOLE LOGS.GPJ KC_DATA.GDT 19/10/10

TEST HOLE LOG

STARTED: May 27, 2010 **FINISHED:** May 28, 2010

DRILL METHOD: Washbore

GROUND ELEV. (m): 357.50

COORDINATES (m): N 5411756 E 423975

DEPTH (m)	SPT BLOWS PER 0.15m	SAMPLE TYPE	SAMPLE No.	SYMBOL	DESCRIPTION OF MATERIALS	INSTRUMENT DETAILS
0					**SILTY CLAY (CH)** high plasticity, brown, moist with grey mottling, some fine to coarse sand	
1		D	1			
2					becoming grey	
3		D	2			
4						
5		D	3			
6		D	4			
7						
8		U	1			
9		D	5			
10						

Su - kPa: 20 60 100 140 180

VANE PEAK ◆ FIELD ■ LAB ▲UC/2
REMOLD ◇ □ ▲P.PEN/2

★ % FINES ● SPT N

W_P% W% W_L%

× – – – – o – – – – ×

20 40 60 80

Continued Next Page

Klohn Crippen Berger

PROJECT NO.: M09559A06

PROJECT: Rainy River Mine Waste and Geotech.

LOCATION: Richardson Township, Ontario

LOGGED BY: ARD **CHECKED BY:**

 HOLE NO.: BH10-08

KCBL_TEST_HOLE-SI M09559A06 DRILLHOLE LOGS.GPJ KC_DATA.GDT 19/10/10

TEST HOLE LOG

STARTED: May 27, 2010 **FINISHED:** May 28, 2010

DRILL METHOD: Washbore

GROUND ELEV. (m): 357.50

COORDINATES (m): N 5411756 E 423975

DEPTH (m)	SPT BLOWS PER 0.15m	SAMPLE TYPE	SAMPLE No.	SYMBOL	DESCRIPTION OF MATERIALS	INSTRUMENT DETAILS
11		D	6		**SILTY CLAY (CH)** high plasticity, grey, moist, some fine to coarse sand	
12		D	7			
13						
					13.60	
14		U	2		343.90 **VARVED CLAY** Clay (CH) is high plasticity, dark grey, 5 mm layers. Silt (ML) is low plasticity, grey, 10 mm layers.	
15		D	9		15.00 342.50 **SAND (SP)** fine sand, grey, wet, well rounded	
16					16.50	
17	12,17,50	D	10		341.00 16.80 340.70 **SANDY GRAVEL (GW)** fine to coarse, sub-angular, wet, grey, sand is fine to coarse, sub-angular, wet, grey	
18					End of Hole at 16.80 m	
19					Refusal on cobbles	
20						

Su - kPa: 20 60 100 140 180

VANE PEAK ◆ FIELD ■ LAB ▲UC/2
REMOLD ◇ □ △P.PEN/2

★ % FINES ● SPT N

W_P% W% W_L%

20 40 60 80

Klohn Crippen Berger

PROJECT NO.: M09559A06	
PROJECT: Rainy River Mine Waste and Geotech.	
LOCATION: Richardson Township, Ontario	
LOGGED BY: ARD	**CHECKED BY:**
SHEET 2 **OF** 2	**HOLE NO.:** BH10-08

KCBL_TEST_HOLE-SI M09559A06 DRILLHOLE LOGS.GPJ KC_DATA.GDT 19/10/10

TEST HOLE LOG

STARTED: May 29, 2010 **FINISHED:** May 29, 2010
DRILL METHOD: Washbore
GROUND ELEV. (m): 367.50
COORDINATES (m): N 5412736 E 423950

DEPTH (m)	SPT BLOWS PER 0.15m	SAMPLE TYPE	SAMPLE No.	SYMBOL	DESCRIPTION OF MATERIALS	INSTRUMENT DETAILS
					SILTY CLAY (CH) high plasticity, brown, wet	
0.50 / 367.00					**SANDY GRAVEL (GW)** well graded, fine to coarse, angular, black, sand is fine to coarse sub-angular	
1						
2	12,22,23,28	D	1			
2.20 / 365.30					**BEDROCK**	
					End of Hole at 2.20 m	
3.72 / 363.78						
3						
4						
5						
6						
7						
8						
9						
10						

Su - kPa
20 60 100 140 180
VANE PEAK ◆ FIELD ■ LAB ▲UC/2
REMOLD ◇ □ ▲P.PEN/2
★ % FINES ● SPT N
W_P% W% W_L%
× – – – – o – – – – ×
20 40 60 80

Klohn Crippen Berger

PROJECT NO.: M09559A06
PROJECT: Rainy River Mine Waste and Geotech.
LOCATION: Richardson Township, Ontario
LOGGED BY: ARD **CHECKED BY:**
SHEET 1 **OF** 1 **HOLE NO.:** BH10-09

KCBL_TEST_HOLE-SI M09559A06 DRILLHOLE LOGS.GPJ KC_DATA.GDT 19/10/10

TEST HOLE LOG

STARTED: May 29, 2010 **FINISHED:** May, 30, 2010

DRILL METHOD: Washbore

GROUND ELEV. (m): 350.50

COORDINATES (m): N 5410003 E 425995

DEPTH (m)	SPT BLOWS PER 0.15m	SAMPLE TYPE	SAMPLE No.	SYMBOL	DESCRIPTION OF MATERIALS	INSTRUMENT	DETAILS
0					**SILTY CLAY (CH)** high plasticity, some fine sand, brown		
1		D	1				
2							
3		D	2				
4					becoming grey		
5		D	3				
6							
7							
8		U	1				
9							
10		D	5				

Continued Next Page

Su - kPa

20 60 100 140 180

VANE PEAK ◆ FIELD ■ LAB ▲UC/2

REMOLD ◇ □ △P.PEN/2

★ % FINES ● SPT N

W_P% W% W_L%

× – – – – o – – – – ×

20 40 60 80

Klohn Crippen Berger

PROJECT NO.: M09559A06

PROJECT: Rainy River Mine Waste and Geotech.

LOCATION: Richardson Township, Ontario

LOGGED BY: ARD **CHECKED BY:**

SHEET 1 **OF** 4 **HOLE NO.:** BH10-10

KCBL_TEST_HOLE-SI M09559A06 DRILLHOLE LOGS.GPJ KC_DATA.GDT 19/10/10

TEST HOLE LOG

STARTED: May 29, 2010 **FINISHED:** May, 30, 2010

DRILL METHOD: Washbore

GROUND ELEV. (m): 350.50

COORDINATES (m): N 5410003 E 425995

DEPTH (m)	SPT BLOWS PER 0.15m	SAMPLE TYPE	SAMPLE No.	SYMBOL	DESCRIPTION OF MATERIALS	INSTRUMENT DETAILS
					10.20 **SILTY CLAY (CH)** high plasticity, some fine sand, grey	
					340.30 **SILTY SAND (SM)** fine, moist, grey, silt is low plasticity, with some gravels, sub-angular, maximum particle size 1 cm	
11		D	6			
12	8,9,10	D	7			
13					13.50	
	5,4,6,8	D	8		337.00 **SILTY CLAY (CH)** high plasticity, grey moist, some fine to coarse sand and gravel, sub-angular	
14						
15					with some silt	
16						
		D	10		attempted undisturbed sample - no return	
17						
18		U	2			
19						
		D	11			
20						

Continued Next Page

Su - kPa

20 60 100 140 180

VANE PEAK ◆ FIELD ■ LAB ▲UC/2

REMOLD ◇ □ ▲P.PEN/2

★ % FINES ● SPT N

W_P% W% W_L%

× – – – – o – – – – ×

20 40 60 80

Klohn Crippen Berger

PROJECT NO.: M09559A06

PROJECT: Rainy River Mine Waste and Geotech.

LOCATION: Richardson Township, Ontario

LOGGED BY: ARD **CHECKED BY:**

SHEET 2 **OF** 4 **HOLE NO.:** BH10-10

KCBL_TEST_HOLE-SI M09559A06 DRILLHOLE LOGS.GPJ KC_DATA.GDT 19/10/10

TEST HOLE LOG

STARTED: May 29, 2010 **FINISHED:** May, 30, 2010
DRILL METHOD: Washbore
GROUND ELEV. (m): 350.50
COORDINATES (m): N 5410003 E 425995

DEPTH (m)	SPT BLOWS PER 0.15m	SAMPLE TYPE	SAMPLE No.	DESCRIPTION OF MATERIALS
21		D	12	**SILTY CLAY (CH)** high plasticity, grey moist, some fine to coarse sand and gravel, sub-angular
22				
23				
24		D	13	
25				
				25.30 / 325.20 **SILTY SAND (SM)** fine, grey, moist
26	8,14,23	D	14	
27	8,7,8,9	D	15	with some high plasticity clay and some gravels, sub-angular
28				
				28.30 / 322.20 **SILTY CLAY(CH)** high plasticity, grey, moist, with some fine to coarse sand and fine gravel
29	5,7,7,9	D	16	
30				

INSTRUMENT DETAILS

Su - kPa
20 60 100 140 180
VANE PEAK ◆ FIELD ■ LAB ▲UC/2
REMOLD ◇ □ △P.PEN/2
★ % FINES ● SPT N
W_P% W% W_L%
× – – – – o – – – – ×
20 40 60 80

Continued Next Page

Klohn Crippen Berger

PROJECT NO.: M09559A06
PROJECT: Rainy River Mine Waste and Geotech.
LOCATION: Richardson Township, Ontario
LOGGED BY: ARD **CHECKED BY:**
SHEET 3 **OF** 4 **HOLE NO.:** BH10-10

KCBL_TEST_HOLE-SI M09559A06 DRILLHOLE LOGS.GPJ KC_DATA.GDT 19/10/10

TEST HOLE LOG

STARTED: May 29, 2010 **FINISHED:** May, 30, 2010

DRILL METHOD: Washbore

GROUND ELEV. (m): 350.50

COORDINATES (m): N 5410003 E 425995

DEPTH (m)	SPT BLOWS PER 0.15m	SAMPLE TYPE	SAMPLE No.	SYMBOL	DESCRIPTION OF MATERIALS	INSTRUMENT DETAILS
	18,22,31	D	17		**SILTY CLAY(CH)** high plasticity, grey, moist, with some fine to coarse sand and fine gravel. Driller reported increased resistance	
31		D	18			
32					32.60 / 317.90 **GRAVELLY SILT (ML)** low plasticity, grey,, gravel is angular, maximum particle size 2.5 cm with some fine sand	
33		D	19			
34					34.10 / 316.40 End of Hole at 34.10 m. Refusal on bedrock or boulders	
35						
36						
37						
38						
39						
40						

Su - kPa: 20 60 100 140 180

VANE FIELD LAB
PEAK ◆ ■ ▲UC/2
REMOLD ◇ □ △P.PEN/2

★ % FINES ● SPT N

W_P% W% W_L%

× – – – – o – – – – ×

20 40 60 80

Klohn Crippen Berger

PROJECT NO.: M09559A06

PROJECT: Rainy River Mine Waste and Geotech.

LOCATION: Richardson Township, Ontario

LOGGED BY: ARD **CHECKED BY:**

SHEET 4 **OF** 4 **HOLE NO.:** BH10-10

KCBL_TEST_HOLE-SI M09559A06 DRILLHOLE LOGS.GPJ KC_DATA.GDT 19/10/10

TEST HOLE LOG

STARTED: June 1, 2010 **FINISHED:** June 2, 2010

DRILL METHOD: Washbore

GROUND ELEV. (m): 349.00

COORDINATES (m): N 5409864 E 424735

DEPTH (m)	SPT BLOWS PER 0.15m	SAMPLE TYPE	SAMPLE No.	SYMBOL	DESCRIPTION OF MATERIALS	INSTRUMENT DETAILS
0					**SILTY CLAY (CH)** high plastcity, moist, brown sand fine to course sand, sub-angular, some fine gravel, sub-angular	
1		D	1			
2						
3		D	2		becoming grey	
4					4.20	
					344.80 **SILTY CLAY (CH)** high plasticity, grey, moist, some fine sand	
		D	3			
5						
6		D	4			
7						
		D	5			
8						
9		U	1			
10					Continued Next Page	

Su - kPa

20 60 100 140 180

VANE FIELD LAB

PEAK ◆ ■ ▲UC/2

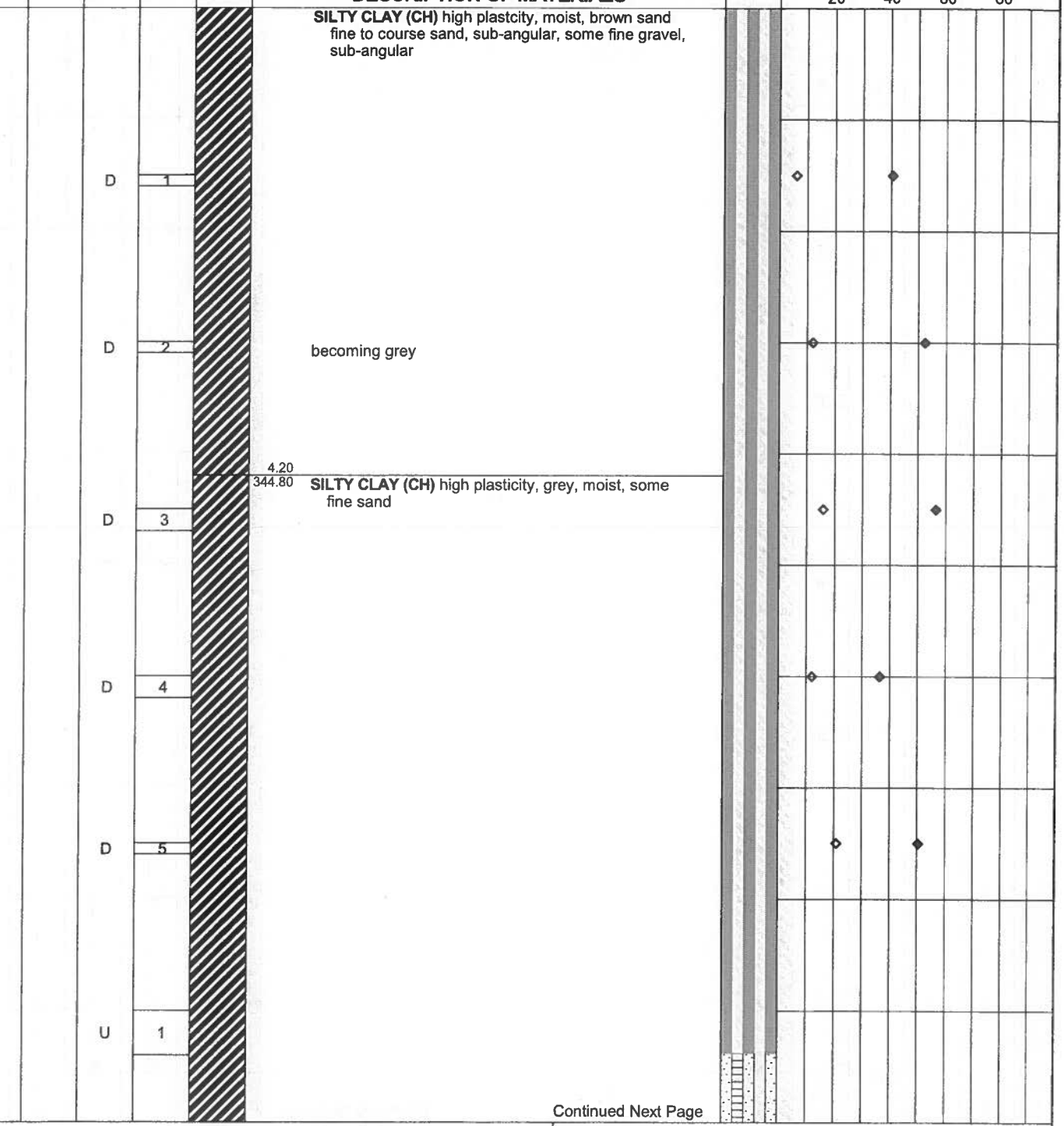
REMOLD ◇ □ △P.PEN/2

★ % FINES ● SPT N

W_P% W% W_L%

× – – – – o – – – – ×

20 40 60 80



Klohn Crippen Berger

PROJECT NO.: M09559A06

PROJECT: Rainy River Mine Waste and Geotech.

LOCATION: Richardson Township, Ontario

LOGGED BY: ARD **CHECKED BY:**

SHEET 1 **OF** 4 **HOLE NO.:** BH10-11

KCBL_TEST_HOLE-SI M09559A06 DRILLHOLE LOGS.GPJ KC_DATA.GDT 19/10/10

TEST HOLE LOG

STARTED: June 1, 2010 **FINISHED:** June 2, 2010

DRILL METHOD: Washbore

GROUND ELEV. (m): 349.00

COORDINATES (m): N 5409864 E 424735

DEPTH (m)	SPT BLOWS PER 0.15m	SAMPLE TYPE	SAMPLE No.	SYMBOL	DESCRIPTION OF MATERIALS
					SILTY CLAY (CH) high plasticity, grey, moist, some fine sand
11		D	6		
12		D	7		
13		D	8		
14					
15		D	9		
16		D	10		
17					
18					
19		D	11		
20					

INSTRUMENT DETAILS

Su - kPa

20 60 100 140 180

VANE PEAK ◆ ■ ▲UC/2

FIELD LAB

REMOLD ◇ □ ▲P.PEN/2

★ % FINES ● SPT N

W_P% W% W_L%

× – – – – o – – – – ×

20 40 60 80

Continued Next Page

Klohn Crippen Berger

PROJECT NO.: M09559A06

PROJECT: Rainy River Mine Waste and Geotech.

LOCATION: Richardson Township, Ontario

LOGGED BY: ARD **CHECKED BY:**

KCBL_TEST_HOLE-SI M09559A06 DRILLHOLE LOGS.GPJ KC_DATA.GDT 19/10/10

TEST HOLE LOG

STARTED: June 1, 2010 **FINISHED:** June 2, 2010

DRILL METHOD: Washbore

GROUND ELEV. (m): 349.00

COORDINATES (m): N 5409864 E 424735

DEPTH (m)	SPT BLOWS PER 0.15m	SAMPLE TYPE	SAMPLE No.	SYMBOL	DESCRIPTION OF MATERIALS	INSTRUMENT DETAILS
21		U	2		**SILTY CLAY (CH)** high plasticity, grey, moist, some fine sand	
22		D	12			
23						
24		D	13			
25						
26		D	14		26.70	
27		D	15		322.30 **SILTY SAND (SM)** fine, grey, wet, silt is non plastic, grey, wet	
28					28.10	
29		D	16		320.90 **SAND AND GRAVEL (SW/GW)** sand is fine to coarse, subangular, gravel is fine, angular, some non plastic silt	
30						

Continued Next Page

Su - kPa

20 60 100 140 180

VANE PEAK ◆ FIELD ■ LAB ▲UC/2

REMOLD ◇ □ ▲P.PEN/2

★ % FINES ● SPT N

W_P% W% W_L%

× – – – – o – – – – ×

20 40 60 80

Klohn Crippen Berger

PROJECT NO.: M09559A06

PROJECT: Rainy River Mine Waste and Geotech.

LOCATION: Richardson Township, Ontario

LOGGED BY: ARD **CHECKED BY:**

KCBL_TEST_HOLE-SI M09559A06 DRILLHOLE LOGS.GPJ KC_DATA.GDT 19/10/10

TEST HOLE LOG

STARTED: June 1, 2010 **FINISHED:** June 2, 2010

DRILL METHOD: Washbore

GROUND ELEV. (m): 349.00

COORDINATES (m): N 5409864 E 424735

DEPTH (m)	SPT BLOWS PER 0.15m	SAMPLE TYPE	SAMPLE No.	SYMBOL	DESCRIPTION OF MATERIALS	INSTRUMENT DETAILS
					30.17 (318.83) **SAND AND GRAVEL (SW/GW)** sand is fine to coarse, subangular, gravel is fine, angular, some non plastic silt	
					End of Hole at 30.17 m	
					Refusal on boulder or bedrock	

Su - kPa: 20 60 100 140 180

VANE PEAK ◆ FIELD ■ LAB ▲UC/2

REMOLD ◇ □ △P.PEN/2

★ % FINES ● SPT N

W_P% W% W_L%

× – – – – o – – – – × 20 40 60 80

31 32 33 34 35 36 37 38 39 40

PROJECT NO.: M09559A06

PROJECT: Rainy River Mine Waste and Geotech.

LOCATION: Richardson Township, Ontario

LOGGED BY: ARD **CHECKED BY:**

SHEET 4 **OF** 4 **HOLE NO.:** BH10-11

Klohn Crippen Berger

KCBL_TEST_HOLE-SI M09559A06 DRILLHOLE LOGS.GPJ KC_DATA.GDT 19/10/10

TEST HOLE LOG

STARTED: June 2, 2010 **FINISHED:** June 3, 2010

DRILL METHOD: Washbore

GROUND ELEV. (m): 351.50

COORDINATES (m): N 5410568 E 424015

DEPTH (m)	SPT BLOWS PER 0.15m	SAMPLE TYPE	SAMPLE No.	SYMBOL	DESCRIPTION OF MATERIALS	INSTRUMENT DETAILS
1		D	1		**SILTY CLAY (CH)** brown, high plasticity, some gravel, maximum particle size 1 cm, sub-angular	
2						
3		D	2			
4					becoming grey	
5		D	3			
6		D	4			
7						
8		D	5			
9						
10		D	6			

Su - kPa: 20 60 100 140 180

VANE PEAK ◆ FIELD ■ LAB ▲UC/2
REMOLD ◇ □ △P.PEN/2

★ % FINES ● SPT N

W_P% W% W_L%

20 40 60 80

Continued Next Page

Klohn Crippen Berger

PROJECT NO.: M09559A06

PROJECT: Rainy River Mine Waste and Geotech.

LOCATION: Richardson Township, Ontario

LOGGED BY: ARD **CHECKED BY:**

 HOLE NO.: BH10-12

KCBL_TEST_HOLE-SI M09559A06 DRILLHOLE LOGS.GPJ KC_DATA.GDT 19/10/10

TEST HOLE LOG

STARTED: June 2, 2010 **FINISHED:** June 3, 2010

DRILL METHOD: Washbore

GROUND ELEV. (m): 351.50

COORDINATES (m): N 5410568 E 424015

DEPTH (m)	SPT BLOWS PER 0.15m	SAMPLE TYPE	SAMPLE No.	SYMBOL	DESCRIPTION OF MATERIALS	INSTRUMENT DETAILS
11		D	7		**SILTY CLAY (CH)** grey, high plasticity, some gravel, maximum particle size 1 cm, sub-angular	
12		D	8			
13						
14		D	9			
15		D	10			
16						
16.60		D	11			
334.90					**SILTY SAND (SM)** fine, grey, wet, silt is non plastic	
17						
18.00						
333.50					**BEDROCK**	
19						
20						

Continued Next Page

Su - kPa: 20 60 100 140 180

VANE PEAK ◆ FIELD ■ LAB ▲UC/2

REMOLD ◇ □ △P.PEN/2

★ % FINES ● SPT N

W_P% W% W_L%

× – – – – o – – – – × 20 40 60 80

Klohn Crippen Berger

PROJECT NO.: M09559A06

PROJECT: Rainy River Mine Waste and Geotech.

LOCATION: Richardson Township, Ontario

LOGGED BY: ARD **CHECKED BY:**

SHEET 2 **OF** 3 **HOLE NO.:** BH10-12

TEST HOLE LOG

STARTED: June 2, 2010 **FINISHED:** June 3, 2010

DRILL METHOD: Washbore

GROUND ELEV. (m): 351.50

COORDINATES (m): N 5410568 E 424015

DEPTH (m)	SPT BLOWS PER 0.15m	SAMPLE TYPE	SAMPLE No.	SYMBOL	DESCRIPTION OF MATERIALS	INSTRUMENT DETAILS
21					**BEDROCK**	
22						
22.70 / 328.80						
23					End of Hole at 22.70 m Bedrock at 18.5 m 1 inch PVC at 19.5 m	
24						
25						
26						
27						
28						
29						
30						

Su - kPa: 20 60 100 140 180

VANE PEAK ◆ FIELD ■ LAB ▲UC/2
REMOLD ◇ FIELD □ LAB △P.PEN/2

★ % FINES ● SPT N

W_P% W% W_L%

× – – – – o – – – – ×

20 40 60 80

PROJECT NO.: M09559A06

PROJECT: Rainy River Mine Waste and Geotech.

LOCATION: Richardson Township, Ontario

LOGGED BY: ARD **CHECKED BY:**

SHEET 3 **OF** 3 **HOLE NO.:** BH10-12

Klohn Crippen Berger

KCBL_TEST_HOLE-SI M09559A06 DRILLHOLE LOGS.GPJ KC_DATA.GDT 19/10/10

TEST HOLE LOG

STARTED: June 3, 2010 **FINISHED:** June 4, 2010
DRILL METHOD: Washbore
GROUND ELEV. (m): 349.50
COORDINATES (m): N 5409311 E 425433

DEPTH (m)	SPT BLOWS PER 0.15m	SAMPLE TYPE	SAMPLE No.	SYMBOL	DESCRIPTION OF MATERIALS	INSTRUMENT DETAILS
0					**SILTY CLAY (CH)** high plasticity, brown, some fine sand, moist	
1		D	1			
2						
3		D	2		becoming grey	
4						
5		D	3			
6		D	4		artesian conditions encountered	
7						
8		D	5			
9						
10		D	6			

Su - kPa
20 60 100 140 180
VANE PEAK ◆ FIELD ■ LAB ▲UC/2
REMOLD ◇ □ ▲P.PEN/2
★ % FINES ● SPT N
W_P% W% W_L%
× – – – – o – – – – ×
20 40 60 80

Continued Next Page

Klohn Crippen Berger

PROJECT NO.: M09559A06
PROJECT: Rainy River Mine Waste and Geotech.
LOCATION: Richardson Township, Ontario
LOGGED BY: ARD **CHECKED BY:**
SHEET 1 **OF** 2 **HOLE NO.:** BH10-13

KCBL_TEST_HOLE-SI M09559A06 DRILLHOLE LOGS.GPJ KC_DATA.GDT 19/10/10

TEST HOLE LOG

STARTED: June 3, 2010 **FINISHED:** June 4, 2010
DRILL METHOD: Washbore
GROUND ELEV. (m): 349.50
COORDINATES (m): N 5409311 E 425433

DEPTH (m)	SPT BLOWS PER 0.15m	SAMPLE TYPE	SAMPLE No.	SYMBOL	DESCRIPTION OF MATERIALS
					SILTY CLAY (CH) high plasticity, grey, some fine sand, moist
		D	7		increasing fine sand, some gravels, sub-angular
12	6,6,5,7	D	8		
13					13.00 / 336.50 **SILTY SAND (SM)** fine, grey, wet
		D	9		13.60 / 335.90 **SANDY GRAVEL (GP)** poorly graded, fine, sand is fine to coarse, with some silt
15	8,8,9,11	D	10		increasing silt content
16					
	7,7,9,7	D	11		16.80 / 332.70 **SILTY CLAY (CH)** high plasticity, grey, moist
17					17.80 / 331.70 **SAND (SW)** fine to coarse, moist, sub-angular, some gravel, angular, maximum aprticle size 2 cm, some silt, low plasticity, grey
18	13,17,14,18	D	12		Clay lens at 18.3 - 18.35 m, high plasticity, grey
19					19.50 / 330.00
20					End of Hole at 19.50 m

INSTRUMENT DETAILS

Su - kPa
20 60 100 140 180
VANE PEAK ◆ ■ ▲UC/2
FIELD REMOLD ◇ □ ▲P.PEN/2
★ % FINES ● SPT N
W_P% W% W_L%
× – – – o – – – ×
20 40 60 80

PROJECT NO.: M09559A06
PROJECT: Rainy River Mine Waste and Geotech.
LOCATION: Richardson Township, Ontario
LOGGED BY: ARD **CHECKED BY:**
SHEET 2 **OF** 2 **HOLE NO.:** BH10-13

Klohn Crippen Berger

KCBL_TEST_HOLE-SI M09559A06 DRILLHOLE LOGS.GPJ KC_DATA.GDT 19/10/10

TEST HOLE LOG

STARTED: June 5, 2010 **FINISHED:** June 5, 2010

DRILL METHOD: Washbore

GROUND ELEV. (m): 347.00

COORDINATES (m): N 5408924 E 425168

DEPTH (m)	SPT BLOWS PER 0.15m	SAMPLE TYPE	SAMPLE No.	SYMBOL	DESCRIPTION OF MATERIALS	INSTRUMENT DETAILS
1		D	1		**SILTY CLAY (CH)** high plasticity, moist, brown, sand is fine to coarse, angular, brown, some non plastic silt, brown	
2						
3		D	2		becoming grey with some coarse gravel, subangular	
4						
5		D	3		decreasing sand and gravel content	
6						
7		D	4			
8		U	1			
9		D	5			
10						

Su - kPa: 20 60 100 140 180

VANE PEAK ◆ FIELD ■ LAB ▲UC/2

REMOLD ◇ □ △P.PEN/2

★ % FINES ● SPT N

W_P% W% W_L%

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20 40 60 80

Continued Next Page

Klohn Crippen Berger

PROJECT NO.: M09559A06

PROJECT: Rainy River Mine Waste and Geotech.

LOCATION: Richardson Township, Ontario

LOGGED BY: ARD **CHECKED BY:**

SHEET 1 **OF** 3 **HOLE NO.:** BH10-14

KCBL_TEST_HOLE-SI M09559A06 DRILLHOLE LOGS.GPJ KC_DATA.GDT 19/10/10

TEST HOLE LOG

STARTED: June 5, 2010 **FINISHED:** June 5, 2010

DRILL METHOD: Washbore

GROUND ELEV. (m): 347.00

COORDINATES (m): N 5408924 E 425168

DEPTH (m)	SPT BLOWS PER 0.15m	SAMPLE TYPE	SAMPLE No.	SYMBOL	DESCRIPTION OF MATERIALS	INSTRUMENT DETAILS
11		D	6		**SILTY CLAY (CH)** high plasticity, moist, brown, sand is fine to coarse, angular, brown, some non plastic silt, brown	
12		D	7			
13						
14		D	8			
15						
16		D	9			
17		D	10			
18	9,5,17,16	D	11		17.80 329.20 **SANDY GRAVEL (GW)** fine to coarse gravel, sub-angular, maximum particle size 3 cm, sand is fine to coarse, sub-angular	
19						
20	10,15,18,22	D	12			

Continued Next Page

Su - kPa

20 60 100 140 180

VANE PEAK ◆ ■ ▲UC/2
FIELD
LAB
REMOLD ◇ □ △P.PEN/2

★ % FINES ● SPT N

W_P% W% W_L%

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20 40 60 80

PROJECT NO.: M09559A06

PROJECT: Rainy River Mine Waste and Geotech.

LOCATION: Richardson Township, Ontario

LOGGED BY: ARD **CHECKED BY:**

Klohn Crippen Berger

KCBL_TEST_HOLE-SI M09559A06 DRILLHOLE LOGS.GPJ KC_DATA.GDT 19/10/10

TEST HOLE LOG

STARTED: June 5, 2010 **FINISHED:** June 5, 2010

DRILL METHOD: Washbore

GROUND ELEV. (m): 347.00

COORDINATES (m): N 5408924 E 425168

DEPTH (m)	SPT BLOWS PER 0.15m	SAMPLE TYPE	SAMPLE No.	SYMBOL	DESCRIPTION OF MATERIALS	INSTRUMENT DETAILS
					SANDY GRAVEL (GW) fine to coarse gravel, sub-angular, maximum particle size 3 cm, sand is fine to coarse, sub-angular	
20.40 / 326.60					End of Hole at 20.40 m Refusal on bedrock or boulders	

Su - kPa: 20 60 100 140 180

VANE PEAK ◆ FIELD ■ LAB ▲UC/2
REMOLD ◇ □ ▲P.PEN/2

★ % FINES ● SPT N

W_P% W% W_L%

20 40 60 80

21 22 23 24 25 26 27 28 29 30

PROJECT NO.: M09559A06

PROJECT: Rainy River Mine Waste and Geotech.

LOCATION: Richardson Township, Ontario

LOGGED BY: ARD **CHECKED BY:**

SHEET 3 **OF** 3 **HOLE NO.:** BH10-14

Klohn Crippen Berger

KCBL_TEST_HOLE-SI M09559A06 DRILLHOLE LOGS.GPJ KC_DATA.GDT 19/10/10

TEST HOLE LOG

STARTED: June 6, 2010 **FINISHED:** June 7, 2010
DRILL METHOD: Washbore
GROUND ELEV. (m): 349.50
COORDINATES (m): N 5409401 E 425244

DEPTH (m)	SPT BLOWS PER 0.15m	SAMPLE TYPE	SAMPLE No.	SYMBOL	DESCRIPTION OF MATERIALS	INSTRUMENT DETAILS
0					**SILTY CLAY (CH)** high plasticity, brown, some fine sand	
1						
2		D	1			
3					becoming grey	
4		D	2			
5						
6		D	3			
7						
8		D	4			
9	4,4,3,1	D	5		sand in return water	
10		D	6			

Continued Next Page

Su - kPa
20 60 100 140 180
VANE PEAK ◆ FIELD ■ LAB ▲UC/2
REMOLD ◇ □ ▲P.PEN/2
★ % FINES ● SPT N
W_P% W% W_L%
× – – – – o – – – – ×
20 40 60 80

Klohn Crippen Berger

PROJECT NO.: M09559A06
PROJECT: Rainy River Mine Waste and Geotech.
LOCATION: Richardson Township, Ontario
LOGGED BY: ARD **CHECKED BY:**
SHEET 1 **OF** 2 **HOLE NO.:** BH10-15

KCBL_TEST_HOLE-SI M09559A06 DRILLHOLE LOGS.GPJ KC_DATA.GDT 19/10/10

TEST HOLE LOG

STARTED: June 6, 2010 **FINISHED:** June 7, 2010
DRILL METHOD: Washbore
GROUND ELEV. (m): 349.50
COORDINATES (m): N 5409401 E 425244

DEPTH (m)	SPT BLOWS PER 0.15m	SAMPLE TYPE	SAMPLE No.	DESCRIPTION OF MATERIALS
		D	7	**SILTY CLAY (CH)** high plasticity, brown, some fine sand
10.80				
338.70				**SAND** fine to coarse, some silt, wet
11.30				
338.20				**SILTY CLAY (CH)** high plasticity, grey, some fine sand
12	6,5,6,6	D	8	
13		D	9	
14				
15		D	10	
16				
		D	11	
17				
17.90				
331.60				**SANDY SILT (ML)** low plasticity, grey, sand is fine to coarse, well graded
18		D	12	
19	34,29	D	13	
19.20				
330.30				End of Hole at 19.20 m
20				Refusal on bedrock or boulders

INSTRUMENT DETAILS

Su - kPa
20 60 100 140 180
VANE FIELD LAB
PEAK ◆ ■ ▲UC/2
REMOLD ◇ □ ▲P.PEN/2
★ % FINES ● SPT N
W_P% W% W_L%
× – – – o – – – ×
20 40 60 80

PROJECT NO.: M09559A06
PROJECT: Rainy River Mine Waste and Geotech.
LOCATION: Richardson Township, Ontario
LOGGED BY: ARD **CHECKED BY:**
SHEET 2 **OF** 2 **HOLE NO.:** BH10-15

Klohn Crippen Berger

KCBL_TEST_HOLE-SI M09559A06 DRILLHOLE LOGS.GPJ KC_DATA.GDT 19/10/10

RECORD OF BOREHOLE No. BBAF-BH-2004

PROJECT	Rainy River - Geotechnical Investigation 2011/2012			ENGINEER	MS
PROJECT NO.	TC113921	DRILLER	Marathon Drilling	BORING METHOD	200 mm HSA, NQ Coring	LOGGED BY	PDR
CLIENT	Rainy River Resources.	LOCATION	Plant Site			COMPILED BY	SM
ELEVATION	368.882 m	COORD.	N 5,410,565 E 426,971	BORING DATE	Start: Apr 17, 12 End: Apr 18, 12	CHECKED BY	DGR

SAMPLE TYPES
AU Auger; BU Bulk; DC Dynamic Cone; RC Rock Core; SS Split Spoon; TW Thin Walled Open (Shelby); WS Wash Sample

ABBREVIATIONS
P.P. Pocket Penetrometer; U.W. Wet Unit Weight; PT Standard Proctor Test; P.L. Point Load Strength Index (I_{50}); RQD Rock Quality Designation; SCR Solid Core Recovery; k Permeability; C Consolidation; DS Direct Shear; GS Grain Size Analysis

ELEV / DEPTH (m)	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	RECOVERY (%)	SPT "N" VALUES or RQD	WELL / PIEZOMETER INSTALLATION	DEPTH (m)	ELEVATION (m)	DYNAMIC CONE PENETRATION RESISTANCE PLOT / MTO VANE / NILCON VANE / UNDRAINED SHEAR STRENGTH (kPa)	PLASTIC LIMIT / NATURAL MOISTURE CONTENT / LIQUID LIMIT / WATER CONTENT (%)	PERMEABILITY (cm/s)	REMARKS
368.9	Ground surface												
368.8 / 0.1	**TOPSOIL**		1	SS		6					23		
	Silty CLAY Light brown silty clay, trace sand, firm to stiff, low plasticity, moist, trace rootlets [Upper Glaciolacustrine]		2	SS	71	10		1	368		26		
	...at 1.5m clayey silt, some sand, trace oxidation, no to low plasticity		3	SS	79	14	▽	2	367		20		
	...at 2.6m occasional grey silty sand layers, trace clay, trace fine gravel, stiff to very stiff, moist to wet		4	SS	75	19		3	366		22		
			5	SS	79	14					21		
364.3			6	SS	88	8		4	365		21		
4.6	**SILTY CLAY** Grey silty clay, trace fine gravel, trace silt lenses, firm to stiff, medium plasticity, moist [WML Till]		8	SS	92	8		5	364	23 47			
			9	SS	92	9		6	363		22		
			12	TW				7	362				
			13	SS	100	8		8	361	66 69	137 142		
			16	SS	100	13		9	360		35		
356.1								10	359				
12.8	**End of Borehole** at 12.8m Standpipe installed with flush mounted steel casing. Water Level at 1.8m on April18/2012							11	358		42		
								12	357	59 51 85	135		

RECORD OF BOREHOLE No. BBAF-BH-2009

PROJECT Rainy River - Geotechnical Investigation 2011/2012 ENGINEER MS

PROJECT NO. TC113921 DRILLER Marathon Drilling BORING METHOD 200 mm HSA, NQ Coring LOGGED BY PDR

CLIENT Rainy River Resources. LOCATION Plant Site COMPILED BY SM

ELEVATION 378.292 m COORD. N 5,410,976 E 427,029 BORING DATE Start: Apr 15, 12 End: Apr 17, 12 CHECKED BY DGR

SAMPLE TYPES
AU Auger
BU Bulk
DC Dynamic Cone
RC Rock Core
SS Split Spoon
TW Thin Walled Open (Shelby)
WS Wash Sample

ABBREVIATIONS
P.P. Pocket Penetrometer
U.W. Wet Unit Weight
PT Standard Proctor Test
P.L. Point Load Strength Index (I_{50})
RQD Rock Quality Designation
SCR Solid Core Recovery
k Permeability
C Consolidation
DS Direct Shear
GS Grain Size Analysis

ELEV / DEPTH (m)	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	RECOVERY (%)	SPT "N" VALUES or RQD	WELL / PIEZOMETER INSTALLATION	DEPTH (m)	ELEVATION (m)	DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100) / MTO VANE: INTACT, REMOULDED / NILCON VANE: INTACT, REMOULDED / UNDRAINED SHEAR STRENGTH (kPa) 20 40 60 80 100	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L / WATER CONTENT (%) 20 40 60	PERMEABILITY (cm/s)	REMARKS
378.3	Ground surface												
378.2 / 378.0 / 377.9 / 377.8 / 377.7 / 377.6 / 377.5 / 377.4 / 377.3 / 377.2 / 377.1 / 377.0 / 376.9 / 376.8 / 376.7 / 376.6 / 376.5	**TOPSOIL**		1	SS	50	5		1	378				
0.4	**Silty CLAY** Brown silty clay, trace to some sand, firm to stiff, medium plasticity, moist, trace rootlets, trace oxidised pockets [Upper Glaciolacustrine]		2	SS	79	11		1	377				
376.5			3A&B	SS	83	17	▽	2	376				
1.8	**SILTY CLAY** Dark brown silty clay, trace fine gravel, trace silty pockets, very stiff, medium plasticity, moist [WML Till]		4	SS	87	17		3	375				
375.1													
3.2	**SILTY CLAY** Brown silty clay, some sand and gravel, sand lensing, hard, low plasticity, moist		5	SS	92	44		4	374				
373.7													
4.6	**Sandy TILL** Inferred sandy Till [WS TILL] ...from 5.2m to 6.7m - boulders		6	SS	0	39		5	373				
			7	RC				6	372				
371.6													
6.7	**BEDROCK** Bluish grey rock, fractured		8	RC	100	27		7	371				
			9	RC	100			8	370				
	...at 9.8m slightly fractured							9	369				
			10	RC	100	92		10	368				
367.0								11					
11.3	**End of Borehole** at 11.3m Stand pipe installed with 1.0m stick up Water Level (b.g.s): at 1.8m on April17/12												

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RECORD OF BOREHOLE No. BBAF-BH-2010

PROJECT Rainy River - Geotechnical Investigation 2011/2012 | ENGINEER MS

PROJECT NO. TC113921 | DRILLER Marathon Drilling | BORING METHOD 200 mm HSA, NQ Coring | LOGGED BY PDR

CLIENT Rainy River Resources. | LOCATION Plant Site | COMPILED BY SM

ELEVATION 377.417 m | COORD. N 5,411,078 E 426,970 | BORING DATE Start: Apr 14, 12 End: Apr 14, 12 | CHECKED BY DGR

SAMPLE TYPES
AU Auger; BU Bulk; DC Dynamic Cone; RC Rock Core; SS Split Spoon; TW Thin Walled Open (Shelby); WS Wash Sample

ABBREVIATIONS
P.P. Pocket Penetrometer; U.W. Wet Unit Weight; PT Standard Proctor Test; P.L. Point Load Strength Index (I_{50}); RQD Rock Quality Designation; SCR Solid Core Recovery; k Permeability; C Consolidation; DS Direct Shear; GS Grain Size Analysis

ELEV / DEPTH (m)	DESCRIPTION	NUMBER	TYPE	RECOVERY (%)	SPT "N" VALUES or RQD	REMARKS
377.4	Ground surface					
377.3 / 0.1	**TOPSOIL** Dark brown topsoil	1	SS	63	5	
	Silty CLAY Brown silty clay, trace gravel, some oxidation, firm to stiff, low to medium plasticity, moist, trace rootlets [Upper Glaciolacustrine]	2	SS	79	16	
375.9 / 1.5	**SAND AND GRAVEL** Grey sand and gravel, very dense, well graded, damp [WS Till]	3	SS	52	101	
375.3 / 2.1	**Bedrock**	4	RC	97	48	
		5	RC	90	63	
		6	RC	100	52	
370.2		7	RC	100	0	
7.2	**End of Borehole** at 7.18m Standpipe installed with 0.5m stick-up Water level (b.g.s): at 1.25m on April 14/12					

DEPTH (m): 1 2 3 4 5 6 7

ELEVATION (m): 377 376 375 374 373 372 371

DYNAMIC CONE PENETRATION RESISTANCE PLOT 20 40 60 80 100

MTO VANE: □ INTACT ■ REMOULDED
NILCON VANE: △ INTACT ▲ REMOULDED
UNDRAINED SHEAR STRENGTH (kPa) 20 40 60 80 100

PLASTIC LIMIT w_P | NATURAL MOISTURE CONTENT w | LIQUID LIMIT w_L
WATER CONTENT (%) 20 40 60

PERMEABILITY (cm/s)

RECORD OF BOREHOLE No. BBAF-BH-2012

PROJECT	Rainy River - Geotechnical Investigation 2011/2012					ENGINEER	MS
PROJECT NO.	TC113921	DRILLER	Marathon Drilling	BORING METHOD	200 mm HSA, NQ Coring	LOGGED BY	PDR
CLIENT	Rainy River Resources.	LOCATION	Plant Site			COMPILED BY	SM
ELEVATION	376.154 m	COORD.	N 5,411,172 E 426,823	BORING DATE	Start: Apr 13, 12 End: Apr 14, 12	CHECKED BY	DGR

SAMPLE TYPES
AU Auger; BU Bulk; DC Dynamic Cone; RC Rock Core; SS Split Spoon; TW Thin Walled Open (Shelby); WS Wash Sample

ABBREVIATIONS
P.P. Pocket Penetrometer; U.W. Wet Unit Weight; PT Standard Proctor Test; P.L. Point Load Strength Index (I_{50}); RQD Rock Quality Designation; SCR Solid Core Recovery; k Permeability; C Consolidation; DS Direct Shear; GS Grain Size Analysis

ELEV / DEPTH (m)	DESCRIPTION	NUMBER	TYPE	RECOVERY (%)	SPT "N" VALUES or RQD	DEPTH (m)	ELEVATION (m)	REMARKS
376.2	Ground surface							
376.0 / 0.1	**TOPSOIL**	1	SS	67	7		376	
375.6 / 0.6	**Silty CLAY** Brown silty clay, trace sand, firm, medium plasticity, moist, trace rootlets [Upper Glaciolacustrine]	2	SS	67	13	1	375	
	Silty CLAY Dark grey silty clay, sand pockets, trace fine gravel, very stiff, medium plasticity, moist [WML Till]	3	SS	79	18	2	374	
		4	SS	88	17	3	373	
		5	SS	96	15	4	372	
371.4								
4.8 / 371.0	**SAND** Brownish grey sand, some silt, trace clay, trace gravel, very dense, wet.	6	SS	63	114	5	371	
5.2	**Bedrock**	7	RC					
		8	RC	100	73	6	370	
		9	RC	100	43	7	369	
		10	RC	100	92	8	368	
366.1						9	367	
10.1	**End of Borehole** at 10.1m Stand pipe installed with 1.3m stick up Water level (b.g.s): at 4.92m on April 21/12					10		

RECORD OF BOREHOLE No. BH11-01

PROJECT	Rainy River - Geotechnical Investigation 2011/2012			ENGINEER	MS
PROJECT NO.	TC113921	DRILLER	Marathon Drilling	BORING METHOD	200 mm HSA, NQ Coring	LOGGED BY	PDR
CLIENT	Rainy River Resources.	LOCATION	Tailings Management Area			COMPILED BY	SM
ELEVATION	362.945 m	COORD.	N 5,413,209 E 420,171	BORING DATE	Start: Apr 12, 12 End: Apr 13, 12	CHECKED BY	DGR

SAMPLE TYPES
AU Auger; BU Bulk; DC Dynamic Cone; RC Rock Core; SS Split Spoon; TW Thin Walled Open (Shelby); WS Wash Sample

ABBREVIATIONS
P.P. Pocket Penetrometer; U.W. Wet Unit Weight; PT Standard Proctor Test; P.L. Point Load Strength Index (I_{50}); RQD Rock Quality Designation; SCR Solid Core Recovery; k Permeability; C Consolidation; DS Direct Shear; GS Grain Size Analysis

ELEV / DEPTH (m)	DESCRIPTION	NUMBER	TYPE	RECOVERY (%)	SPT "N" VALUES or RQD	REMARKS
362.9	Ground surface					
0.0	**Silty CLAY** Light Brown silty clay, trace to some sand, trace gravel, low to medium plasticity, stiff, moist [Upper Glaciolacustrine]	2	SS	67	9	
		3	SS		12	
		4	SS	100	12	
359.9						
3.0	**Silty CLAY** Dark brown silty clay, trace gravel, medium plasticity, stiff, moist [WML Till]	5	SS	100	11	
		8	SS	100	11	
		11	SS	100	10	
	...becoming firm at 7.6m	14	SS	100	8	
		17	SS	100	8	
		18	SS	100	7	
		21	SS	100	6	
348.9		24	SS	100	8	
14.0 348.6	**SILTY CLAY** Dark grey silty clay, varved, low plastic, firm, moist [Lower Glaciolacustrine]	25	RC	95	63	
14.3						

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RECORD OF BOREHOLE No. BH11-01

PROJECT	Rainy River - Geotechnical Investigation 2011/2012			ENGINEER	MS
PROJECT NO.	TC113921	DRILLER	Marathon Drilling	BORING METHOD	200 mm HSA, NQ Coring	LOGGED BY	PDR
CLIENT	Rainy River Resources.	LOCATION	Tailings Management Area			COMPILED BY	SM
ELEVATION	362.945 m	COORD.	N 5,413,209 E 420,171	BORING DATE	Start: Apr 12, 12 End: Apr 13, 12	CHECKED BY	DGR

SAMPLE TYPES
AU Auger; BU Bulk; DC Dynamic Cone; RC Rock Core; SS Split Spoon; TW Thin Walled Open (Shelby); WS Wash Sample

ABBREVIATIONS
P.P. Pocket Penetrometer; U.W. Wet Unit Weight; PT Standard Proctor Test; P.L. Point Load Strength Index (I_{50}); RQD Rock Quality Designation; SCR Solid Core Recovery; k Permeability; C Consolidation; DS Direct Shear; GS Grain Size Analysis

ELEV / DEPTH (m)	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	RECOVERY (%)	SPT "N" VALUES or RQD	WELL / PIEZOMETER INSTALLATION	DEPTH (m)	ELEVATION (m)	DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100) / MTO VANE (□ INTACT ■ REMOULDED) / NILCON VANE (△ INTACT ▲ REMOULDED) / UNDRAINED SHEAR STRENGTH (kPa) 20 40 60 80 100	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L / WATER CONTENT (%) 20 40 60	PERMEABILITY (cm/s)	REMARKS
	BEDROCK							16	347				
			26	RC	100	88		17	346				
344.7			27	RC	100	80		18	345				
18.2	**End of Borehole** at 18.2m Standpipes installed with flush mounted steel casing Water level (b.g.s): For Piezometer A (bottom sensing zone) at 0.3m on April 13/12 For Piezometer B (top sensing zone) at surface on April 13/12												

RECORD OF BOREHOLE No. BH11-04

PROJECT	Rainy River - Geotechnical Investigation 2011/2012			ENGINEER	MS
PROJECT NO.	TC113921	DRILLER	Marathon Drilling	BORING METHOD	200 mm HSA, NQ Coring	LOGGED BY	SM
CLIENT	Rainy River Resources.	LOCATION	Tailings Management Area			COMPILED BY	SM
ELEVATION	365.477 m	COORD.	N 5,411,832 E 421,970	BORING DATE	Start: Mar 20, 12 End: Mar 20, 12	CHECKED BY	DGR

SAMPLE TYPES
AU Auger; BU Bulk; DC Dynamic Cone; RC Rock Core; SS Split Spoon; TW Thin Walled Open (Shelby); WS Wash Sample

ABBREVIATIONS
P.P. Pocket Penetrometer; U.W. Wet Unit Weight; PT Standard Proctor Test; P.L. Point Load Strength Index (I_{50}); RQD Rock Quality Designation; SCR Solid Core Recovery; k Permeability; C Consolidation; DS Direct Shear; GS Grain Size Analysis

ELEV / DEPTH (m)	DESCRIPTION	NUMBER	TYPE	RECOVERY (%)	SPT "N" VALUES or RQD	DEPTH (m)	ELEVATION (m)	REMARKS
365.5	Ground surface							
365.3 / 0.2	**TOPSOIL** Dark brown organics, fibrous, rootlets	1	SS	63	4			
	CLAYEY SILT Light Brown to brown clayey silt, some sand and gravel, varved, low to medium plasticity, stiff, damp to moist [Upper Glaciolacustrine]	2	SS	63	10	1	365	
	...at 0.76 m becoming sandy , grey clay lenses	3	SS	100	10	2	364	
	...at 2.3m , trace mottled brown lenses	4	SS	100	10	3	363	
		5	SS	100	11	4	362	
360.9 / 4.6	**Silty CLAY** Dark grey silty clay, trace sand, high plasticity, firm, moist [WML Till]	6	SS	100	8	5	361	
		8	SS	92	8	6	360	
357.9 / 7.6	**SILTY CLAY** Greenish grey silty clay , varved [Lower Glaciolacustrine]	11	TW	91		7	359	
		13	SS	63	39	8	358	...at 6.4m PP=49-61 kPa TV=20 KPa
356.3 / 9.1	**SAND & GRAVEL** Greenish grey sand and gravel, silty, angular to subangular (black, grey and brown, granite pebbles), dense, wet	14	SS	0	67	9	357	
		15	SS	54	15	10	356	...at 9.1 m switched to washboring
	...below 12.2m greenish silt, trace gravel, no plasticity, firm, moist	16	SS	58	50/0.15	11	355	
352.1 / 13.4	**BEDROCK** Greenish grey , highly fractured and weathered	17	RC	35	44	12	354	
						13	353	
						14	352	...at 13.7 m switched to NQ coring
						15	351	

DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100)
MTO VANE: □ INTACT ■ REMOULDED
NILCON VANE: △ INTACT ▲ REMOULDED
UNDRAINED SHEAR STRENGTH (kPa) 20 40 60 80 100

PLASTIC LIMIT w_P | NATURAL MOISTURE CONTENT w | LIQUID LIMIT w_L
WATER CONTENT (%) 20 40 60

PERMEABILITY (cm/s)

Continued on Next Page

RECORD OF BOREHOLE No. BH11-04

PROJECT	Rainy River - Geotechnical Investigation 2011/2012			ENGINEER	MS
PROJECT NO.	TC113921	DRILLER	Marathon Drilling	BORING METHOD	200 mm HSA, NQ Coring	LOGGED BY	SM
CLIENT	Rainy River Resources.	LOCATION	Tailings Management Area			COMPILED BY	SM
ELEVATION	365.477 m	COORD.	N 5,411,832 E 421,970	BORING DATE	Start: Mar 20, 12 End: Mar 20, 12	CHECKED BY	DGR

SAMPLE TYPES
AU Auger; BU Bulk; DC Dynamic Cone; RC Rock Core; SS Split Spoon; TW Thin Walled Open (Shelby); WS Wash Sample

ABBREVIATIONS
P.P. Pocket Penetrometer; U.W. Wet Unit Weight; PT Standard Proctor Test; P.L. Point Load Strength Index (I_{50}); RQD Rock Quality Designation; SCR Solid Core Recovery; k Permeability; C Consolidation; DS Direct Shear; GS Grain Size Analysis

ELEV / DEPTH (m)	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	RECOVERY (%)	SPT "N" VALUES or RQD	WELL / PIEZOMETER INSTALLATION	DEPTH (m)	ELEVATION (m)	DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100) / MTO VANE □ INTACT ■ REMOULDED / NILCON VANE △ INTACT ▲ REMOULDED / UNDRAINED SHEAR STRENGTH (kPa) (20 40 60 80 100)	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L / WATER CONTENT (%) (20 40 60)	PERMEABILITY (cm/s)	REMARKS
	... very mushy bellow 14.7 m, possible infill		18	RC	60	0		16	350				
349.2													
16.2	**End of Borehole** at 16.2 m Standpipe installed with flush mounted steel casing Water level (b.g.s): at 0.48 m on Mar 20/12												

RECORD OF BOREHOLE No. BH11-08

PROJECT	Rainy River - Geotechnical Investigation 2011/2012			ENGINEER	MS
PROJECT NO.	TC113921	DRILLER	Marathon Drilling	BORING METHOD	200 mm HSA, NQ Coring	LOGGED BY	PDR
CLIENT	Rainy River Resources.	LOCATION	Flotation Tailings			COMPILED BY	SM
ELEVATION	356.564 m	COORD.	N 5,411,863 E 423,205	BORING DATE	Start: Dec 13, 11 End: Dec 16, 11	CHECKED BY	DGR

SAMPLE TYPES
AU Auger; BU Bulk; DC Dynamic Cone; RC Rock Core; SS Split Spoon; TW Thin Walled Open (Shelby); WS Wash Sample

ABBREVIATIONS
P.P. Pocket Penetrometer; U.W. Wet Unit Weight; PT Standard Proctor Test; P.L. Point Load Strength Index (I_{50}); RQD Rock Quality Designation; SCR Solid Core Recovery; k Permeability; C Consolidation; DS Direct Shear; GS Grain Size Analysis

ELEV / DEPTH (m)	DESCRIPTION	NUMBER	TYPE	RECOVERY (%)	SPT "N" VALUES or RQD	DEPTH (m)	ELEVATION (m)	PLASTIC LIMIT / NATURAL MOISTURE CONTENT / LIQUID LIMIT (w_P, w, w_L)	PERMEABILITY (cm/s)	REMARKS
356.6	Ground Surface									
356.4 / 0.0	**TOPSOIL**									
0.2 / 356.0	**SILTY CLAY** Light Brown silty clay, trace sand, low plastic, rootlets [Upper Glaciolacustrine]	1	SS	75	7			16		...frozen to 0.6m
0.6	**SILTY CLAY** Light brown silty clay, trace to some silt, trace sand, trace gravel, firm to stiff, medium to low plastic, moist [WML Till]	2	SS	67	9	1	356	17		
	...at 2.3m becoming dark brown	3	SS	100	8	2	355	19		
		4	SS	71	11	3	354	32		
		5	SS	75	9	4	353	35		
	...below 4.57m dark grey	6	SS	100	7	5	352	32		
		7	TW	92		6	351			...at 6.4m PP=73 kPa TV=49 KPa
		8	SS	100	7	7	350	40		...at 7.63m , switched to wash boring
		9	SS	100	8	8	349	36		
		10	SS	100	8	9	348	39		
		11	SS	100	9	10	347	37		
		12	SS	100	7	11	346	38		
						12	345			
						13	344			
						14	343			
						15	342			

DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100)
MTO VANE: □ INTACT ■ REMOULDED
NILCON VANE: △ INTACT ▲ REMOULDED
UNDRAINED SHEAR STRENGTH (kPa) 20 40 60 80 100
WATER CONTENT (%) 20 40 60

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RECORD OF BOREHOLE No. BH11-08

PROJECT	Rainy River - Geotechnical Investigation 2011/2012			ENGINEER	MS
PROJECT NO.	TC113921	DRILLER	Marathon Drilling	BORING METHOD	200 mm HSA, NQ Coring	LOGGED BY	PDR
CLIENT	Rainy River Resources.	LOCATION	Flotation Tailings			COMPILED BY	SM
ELEVATION	356.564 m	COORD.	N 5,411,863 E 423,205	BORING DATE	Start: Dec 13, 11 End: Dec 16, 11	CHECKED BY	DGR

SAMPLE TYPES
AU Auger; BU Bulk; DC Dynamic Cone; RC Rock Core; SS Split Spoon; TW Thin Walled Open (Shelby); WS Wash Sample

ABBREVIATIONS
P.P. Pocket Penetrometer; U.W. Wet Unit Weight; PT Standard Proctor Test; P.L. Point Load Strength Index (I_{50}); RQD Rock Quality Designation; SCR Solid Core Recovery; k Permeability; C Consolidation; DS Direct Shear; GS Grain Size Analysis

ELEV / DEPTH (m)	DESCRIPTION	NUMBER	TYPE	RECOVERY (%)	SPT "N" VALUES or RQD	DEPTH (m)	ELEVATION (m)	REMARKS
		13	TW	100		16	341	...at 15.25m TV=78 kPa PP=98 kPa
	...At 16.77m , sandy lenses/laminate	14	SS	100	9	17	340	
338.3						18	339	
18.3	**Varved SILTY CLAY** Grey silty clay , moist to wet, varved, medium plastic, very stiff [Lower Glaciolacustrine]	15	SS	100	15	19	338	GS on SS15
337.4								
19.2	**Gravelly SAND** Sand boulders, some cobbles in silty sand, very wet [WS Till, inferred]	16	RC	67		20	337	...switched to NQ coring at 19.2m
		17	RC	67			336	
334.6		18	RC	47	88	21	335	
22.0	**BEDROCK**					22	334	
		19	RC	100	97	23	333	
		20	RC	97	95	24	332	
331.1						25		
25.5	**End of Borehole** at 25.5m Standpipes installed with flush mounted steel casing Water level (b.g.s): For Piezometer A (bottom sensing zone) at surface on Dec 16/11 For Piezometer B (middle sensing zone) Artesian condition on Dec 16/11 For Piezometer C (top sensing zone) 3.05 m on Dec 16/11							

DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100)
MTO VANE: □ INTACT ■ REMOULDED; NILCON VANE: △ INTACT ▲ REMOULDED
UNDRAINED SHEAR STRENGTH (kPa) 20 40 60 80 100

PLASTIC LIMIT w_P — NATURAL MOISTURE CONTENT w — LIQUID LIMIT w_L
WATER CONTENT (%) 20 40 60
28
37

PERMEABILITY (cm/s)

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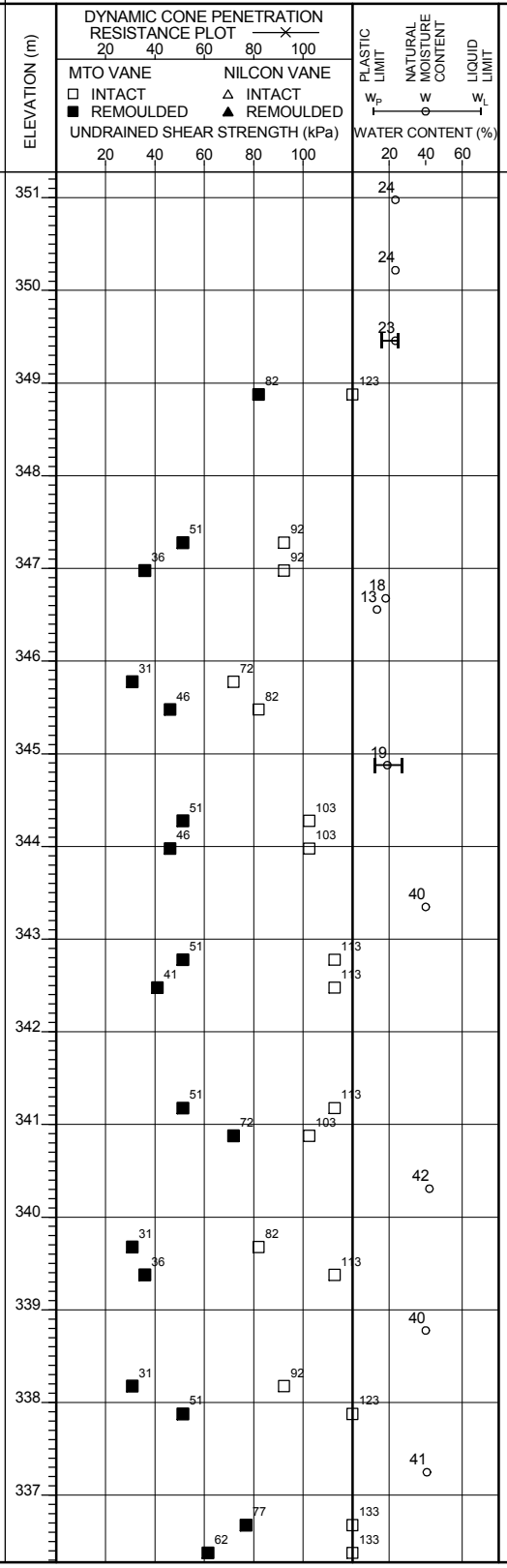
RECORD OF BOREHOLE No. BH11-09

PROJECT	Rainy River - Geotechnical Investigation 2011/2012			ENGINEER	MS
PROJECT NO.	TC113921	DRILLER	Marathon Drilling	BORING METHOD	200 mm HSA, NQ Coring	LOGGED BY	SM
CLIENT	Rainy River Resources.	LOCATION	Flotation Tailings			COMPILED BY	SM
ELEVATION	351.277 m	COORD.	N 5,411,182 E 424,201	BORING DATE	Start: Dec 10, 11 End: Dec 11, 11	CHECKED BY	DGR

SAMPLE TYPES
AU Auger; BU Bulk; DC Dynamic Cone; RC Rock Core; SS Split Spoon; TW Thin Walled Open (Shelby); WS Wash Sample

ABBREVIATIONS
P.P. Pocket Penetrometer; U.W. Wet Unit Weight; PT Standard Proctor Test; P.L. Point Load Strength Index (I_{50}); RQD Rock Quality Designation; SCR Solid Core Recovery; k Permeability; C Consolidation; DS Direct Shear; GS Grain Size Analysis

ELEV / DEPTH (m)	DESCRIPTION	NUMBER	TYPE	RECOVERY (%)	SPT "N" VALUES or RQD
351.3	Ground Surface				
0.0 / 350.5	**TOP SOIL** Dark brown silty clay, trace muskeg, rootlets, plastic, firm	1	AU		
0.8 / 348.2	**SILTY CLAY** Light brown silty clay (grey clay in lenses), low to medium plasticity, firm to stiff, moist [Upper Glaciolacustrine] ...at 1.52m becoming firm, trace clay	2	SS	79	10
		3	SS	100	6
3.0	**SILTY CLAY** Dark grey silty clay, trace sand and gravel, firm to stiff, medium to high plasticity, moist [WML Till] ...Sand and Gravel layer between 4.64m to 4.8m	6	TW	63	
		8 (A&B)	SS	100	5
		9	SS	100	5
		12	SS	100	5
		15	TW	88	
		18	SS	100	6
		20	SS	100	6
		23	SS	100	5



REMARKS
...frozen to 1.4m
...at 3.35m PP=61 KPa TV=49 KPa
...at 9.45m PP=61 KPa TV=69 KPa

Continued on Next Page

RECORD OF BOREHOLE No. BH11-09

PROJECT: Rainy River - Geotechnical Investigation 2011/2012 | ENGINEER: MS

PROJECT NO.: TC113921 | DRILLER: Marathon Drilling | BORING METHOD: 200 mm HSA, NQ Coring | LOGGED BY: SM

CLIENT: Rainy River Resources. | LOCATION: Flotation Tailings | COMPILED BY: SM

ELEVATION: 351.277 m | COORD.: N 5,411,182 E 424,201 | BORING DATE: Start: Dec 10, 11 End: Dec 11, 11 | CHECKED BY: DGR

SAMPLE TYPES
AU Auger; BU Bulk; DC Dynamic Cone; RC Rock Core; SS Split Spoon; TW Thin Walled Open (Shelby); WS Wash Sample

ABBREVIATIONS
P.P. Pocket Penetrometer; U.W. Wet Unit Weight; PT Standard Proctor Test; P.L. Point Load Strength Index (I_{50}); RQD Rock Quality Designation; SCR Solid Core Recovery; k Permeability; C Consolidation; DS Direct Shear; GS Grain Size Analysis

ELEV / DEPTH (m)	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	RECOVERY (%)	SPT "N" VALUES or RQD	WELL / PIEZOMETER INSTALLATION	DEPTH (m)	ELEVATION (m)	REMARKS
			26	SS	100			16	336	
									335	
			27	SS	100	6		17	334	
								18	333	
	...at 18.3m small brown sandy pockets		28	SS	100	8		19	332	
	...at 19.8m small silty pockets		30	SS	100	9		20	331	
								21	330	
			31	SS	100	11		22	329	
			34	SS	100	12		23	328	
								24	327	
	..at 24.4m trace to some gravel, angular to subangular		35	SS	100	12		25	326	
			36	SS	100	15		26	325	
								27	324	
			37	SS	100	15		28	323	
322.2 / 29.1	... at 29m becoming firm, low to medium plastic, some gravel **GRAVELLY SAND** Greyish blue boulders and gravel,		38 (A&B)	RC	67			29	322	...at 29m, switched to NQ coring.
								30		

DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100)

MTO VANE: □ INTACT ■ REMOULDED; NILCON VANE: △ INTACT ▲ REMOULDED

UNDRAINED SHEAR STRENGTH (kPa) 20 40 60 80 100

Plotted values: 92, 102, 133, 164

PLASTIC LIMIT w_P | NATURAL MOISTURE CONTENT w | LIQUID LIMIT w_L

WATER CONTENT (%) 20 40 60

Plotted values: 42, 42, 42, 43, 42, 43, 42, 42, 40

PERMEABILITY (cm/s)

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RECORD OF BOREHOLE No. BH11-09

PROJECT Rainy River - Geotechnical Investigation 2011/2012 ENGINEER MS

PROJECT NO. TC113921 DRILLER Marathon Drilling BORING METHOD 200 mm HSA, NQ Coring LOGGED BY SM

CLIENT Rainy River Resources. LOCATION Flotation Tailings COMPILED BY SM

ELEVATION 351.277 m COORD. N 5,411,182 E 424,201 BORING DATE Start: Dec 10, 11 End: Dec 11, 11 CHECKED BY DGR

SAMPLE TYPES
AU Auger
BU Bulk
DC Dynamic Cone
RC Rock Core
SS Split Spoon
TW Thin Walled Open (Shelby)
WS Wash Sample

ABBREVIATIONS
P.P. Pocket Penetrometer
U.W. Wet Unit Weight
PT Standard Proctor Test
P.L. Point Load Strength Index (I_{50})
RQD Rock Quality Designation
SCR Solid Core Recovery
k Permeability
C Consolidation
DS Direct Shear
GS Grain Size Analysis

ELEV / DEPTH (m)	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	RECOVERY (%)	SPT "N" VALUES or RQD	WELL / PIEZOMETER INSTALLATION	DEPTH (m)	ELEVATION (m)	DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100) / MTO VANE □ INTACT ■ REMOULDED / NILCON VANE △ INTACT ▲ REMOULDED / UNDRAINED SHEAR STRENGTH (kPa) (20 40 60 80 100)	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L / WATER CONTENT (%) (20 40 60)	PERMEABILITY (cm/s)	REMARKS
	trace clay and sand, angular to subangular [WS Till, inferred]		39	RC	92				321				...at 30.17m, encountered artesian pressure up to 2.85m above ground level
			40	RC				31	320				
319.6													
31.7	**End of Borehole** at 31.7m Standpipe installed with 0.9m stick up Water Level (bgs): at 2.23m on Dec 13/12 at 1.36m on Dec 18/12												

RECORD OF BOREHOLE No. BH11-11 A&B

PROJECT Rainy River - Geotechnical Investigation 2011/2012 | ENGINEER MS

PROJECT NO. TC113921 | DRILLER Marathon Drilling | BORING METHOD 200 mm HSA, NQ Coring | LOGGED BY MM

CLIENT Rainy River Resources. | LOCATION Flotation Tailings | COMPILED BY NH

ELEVATION 359.84 m | COORD. N 5,410,763 E 425,205 | BORING DATE Start: Jan 30, 12 End: Feb 2, 12 | CHECKED BY DGR

SAMPLE TYPES
AU Auger; BU Bulk; DC Dynamic Cone; RC Rock Core; SS Split Spoon; TW Thin Walled Open (Shelby); WS Wash Sample

ABBREVIATIONS
P.P. Pocket Penetrometer; TV Torvane; PT Standard Proctor Test; P.L. Point Load Strength Index (I_{50}); RQD Rock Quality Designation; SCR Solid Core Recovery; k Permeability; C Consolidation; DS Direct Shear; GS Grain Size Analysis

ELEV / DEPTH (m)	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	RECOVERY (%)	SPT "N" VALUES or RQD	WELL / PIEZOMETER INSTALLATION	DEPTH (m)	ELEVATION (m)	DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100) / MTO VANE (□ INTACT ■ REMOULDED) / NILCON VANE (△ INTACT ▲ REMOULDED) / UNDRAINED SHEAR STRENGTH (kPa) 20 40 60 80 100	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L — WATER CONTENT (%) 20 40 60	PERMEABILITY (cm/s)	REMARKS
359.8	Ground surface												
359.6 / 0.2	**TOP SOIL** Dark brown organics, silty, fibrous, rootlets		1	SS	54	10		0	359		24		
	Silty CLAY Light brown silty clay, trace sand, trace gravel, varved, moist, low to medium plasticity, stiff [Upper Glaciolacustrine]		2	SS	67	11		1			14		
	...at 1.52m, occasional sand lenses		3	SS	100	10		2	358		22		
357.6 / 2.3	**Silty SAND** Light brown silty sand, trace clay, well graded, loose to compact, occasional silt lenses, moist [Glacial sand]		4	SS	100	11		3	357		17		
			5	SS	100	8		4	356		21		
	...below 4.57m, very loose to loose, wet		6	SS	83	6		5	355		20		
			7	SS	100	7		6	354		22		
			8	SS	83	2		7	353		23		
			9	SS	83	3		8	352		19		
			10	SS	75			9	351		21		...at 10.8m SPT sampler sank under its own weight
			11	SS	92	4		10	350		21		
346.1 / 13.7			12	SS	96	5		11	349		21		
								12	348				
								13	347				
								14	346				
								15	345				

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RECORD OF BOREHOLE No. BH11-11 A&B

PROJECT Rainy River - Geotechnical Investigation 2011/2012 | ENGINEER MS

PROJECT NO. TC113921 | DRILLER Marathon Drilling | BORING METHOD 200 mm HSA, NQ Coring | LOGGED BY MM

CLIENT Rainy River Resources. | LOCATION Flotation Tailings | COMPILED BY NH

ELEVATION 359.84 m | COORD. N 5,410,763 E 425,205 | BORING DATE Start: Jan 30, 12 End: Feb 2, 12 | CHECKED BY DGR

SAMPLE TYPES
AU Auger; BU Bulk; DC Dynamic Cone; RC Rock Core; SS Split Spoon; TW Thin Walled Open (Shelby); WS Wash Sample

ABBREVIATIONS
P.P. Pocket Penetrometer; TV Torvane; PT Standard Proctor Test; P.L. Point Load Strength Index (I_{50}); RQD Rock Quality Designation; SCR Solid Core Recovery; k Permeability; C Consolidation; DS Direct Shear; GS Grain Size Analysis

ELEV / DEPTH (m)	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	RECOVERY (%)	SPT "N" VALUES or RQD	WELL / PIEZOMETER INSTALLATION	DEPTH (m)	ELEVATION (m)	DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100) / MTO VANE (□ INTACT ■ REMOULDED) / NILCON VANE (△ INTACT ▲ REMOULDED) / UNDRAINED SHEAR STRENGTH (kPa) (20 40 60 80 100)	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L / WATER CONTENT (%) (20 40 60)	PERMEABILITY (cm/s)	REMARKS
			15	SS	100	6		16	344		22		
	Silty CLAY Grey silty clay, trace gravel, trace sand, high plasticity, stiff, moist [WML Till] ...at 17m, sand pocket/layer.		18	SS	100	11		17	343		29		
								18	342				
			19	SS	100	11		19	341		35		...at 18.3m, 75 mm of heaving sand.
			20	SS	100	10		20	340		38		
								21	339				
337.0			21	SS	100	6		22	338		23		
22.9	**Silty SAND** Dark grey silty sand, trace clay, gravel, compact to dense, saturated [WS Till] ...below 23.5m, frequent cobles and boulders		24	SS	46	24		23	337		21		
								24	336				
			25	SS	25	24		25	335		8		
								26	334		9		...at 25.9m- SPT refusal on possible cobbles and boulders; switched to coring.
			26	SS	0.04	50/0.1		27	333				
								28	332				
								29	331				
								30	330				

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RECORD OF BOREHOLE No. BH11-11 A&B

PROJECT	Rainy River - Geotechnical Investigation 2011/2012					ENGINEER	MS
PROJECT NO.	TC113921	DRILLER	Marathon Drilling	BORING METHOD	200 mm HSA, NQ Coring	LOGGED BY	MM
CLIENT	Rainy River Resources.	LOCATION	Flotation Tailings			COMPILED BY	NH
ELEVATION	359.84 m	COORD.	N 5,410,763 E 425,205	BORING DATE	Start: Jan 30, 12 End: Feb 2, 12	CHECKED BY	DGR

SAMPLE TYPES
AU Auger
BU Bulk
DC Dynamic Cone
RC Rock Core
SS Split Spoon
TW Thin Walled Open (Shelby)
WS Wash Sample

ABBREVIATIONS
P.P. Pocket Penetrometer
TV Torvane
PT Standard Proctor Test
P.L. Point Load Strength Index (I_{50})
RQD Rock Quality Designation
SCR Solid Core Recovery
k Permeability
C Consolidation
DS Direct Shear
GS Grain Size Analysis

ELEV / DEPTH (m)	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	RECOVERY (%)	SPT "N" VALUES or RQD	WELL / PIEZOMETER INSTALLATION	DEPTH (m)	ELEVATION (m)	DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100); MTO VANE: □ INTACT ■ REMOULDED; NILCON VANE: △ INTACT ▲ REMOULDED; UNDRAINED SHEAR STRENGTH (kPa) (20 40 60 80 100)	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L; WATER CONTENT (%) (20 40 60)	PERMEABILITY (cm/s)	REMARKS
325.2								31	329				
								32	328				
								33	327				
								34	326				
34.6	**BEDROCK**		27	RC	83	67		35	325				
			28	RC	98	70		36	324				
322.1			29	RC	100	93		37	323				
37.8	**End of Borehole** at 37.8m. Standpipe A and B installed with flush mounted casing Water Level (bgs): For Piezometer A (bottom sensing zone) at 4.7m on Feb 02/12 For Piezometer B (middle sensing zone) at 5.6 m on Feb 02/12												

RECORD OF BOREHOLE No. BH11-11C

PROJECT	Rainy River - Geotechnical Investigation 2011/2012			ENGINEER	MS
PROJECT NO.	TC113921	DRILLER	Marathon Drilling	BORING METHOD		LOGGED BY	MM
CLIENT	Rainy River Resources.	LOCATION	Flotation Tailings			COMPILED BY	SM
ELEVATION	359.84 m	COORD.	N 5,410,763 E 425,205	BORING DATE	Start: Feb 2, 12 End: Feb 2, 12	CHECKED BY	DGR

SAMPLE TYPES
AU Auger; BU Bulk; DC Dynamic Cone; RC Rock Core; SS Split Spoon; TW Thin Walled Open (Shelby); WS Wash Sample

ABBREVIATIONS
P.P. Pocket Penetrometer; TV Torvane; PT Standard Proctor Test; P.L. Point Load Strength Index (I_{50}); RQD Rock Quality Designation; SCR Solid Core Recovery; k Permeability; C Consolidation; DS Direct Shear; GS Grain Size Analysis

ELEV / DEPTH (m)	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	RECOVERY (%)	SPT "N" VALUES or RQD	WELL / PIEZOMETER INSTALLATION	DEPTH (m)	ELEVATION (m)	DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100); MTO VANE □ INTACT ■ REMOULDED; NILCON VANE △ INTACT ▲ REMOULDED; UNDRAINED SHEAR STRENGTH (kPa) 20 40 60 80 100	PLASTIC LIMIT w_P	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w_L; WATER CONTENT (%) 20 40 60	PERMEABILITY (cm/s)	REMARKS
359.8	Ground surface														
0.0	BH11-11C shows installation details of shallow standpipe piezometer BH11-11C Refer to BH11-11 for stratigraphic Information							1 2 3 4 5 6 7	359 358 357 356 355 354 353 352						
351.9															
7.9	**End of Borehole** Standpipes installed with flush mounted steel casing Water Level (b.g.s): At 5.25m on Feb 02/12														

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RECORD OF BOREHOLE No. BH11-12

PROJECT Rainy River - Geotechnical Investigation 2011/2012 | ENGINEER MS

PROJECT NO. TC113921 | DRILLER Marathon Drilling | BORING METHOD 200 mm HSA, NQ Coring | LOGGED BY PDR

CLIENT Rainy River Resources. | LOCATION Flotation Tailings | COMPILED BY SM

ELEVATION 355.723 m | COORD. N 5,411,178 E 425,311 | BORING DATE Start: Mar 17, 12 End: Mar 17, 12 | CHECKED BY DGR

SAMPLE TYPES
AU Auger; BU Bulk; DC Dynamic Cone; RC Rock Core; SS Split Spoon; TW Thin Walled Open (Shelby); WS Wash Sample

ABBREVIATIONS
P.P. Pocket Penetrometer; U.W. Wet Unit Weight; PT Standard Proctor Test; P.L. Point Load Strength Index (I_{50}); RQD Rock Quality Designation; SCR Solid Core Recovery; k Permeability; C Consolidation; DS Direct Shear; GS Grain Size Analysis

ELEV / DEPTH (m)	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	RECOVERY (%)	SPT "N" VALUES or RQD	WELL / PIEZOMETER INSTALLATION	DEPTH (m)	ELEVATION (m)	DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100) / MTO VANE (□ INTACT ■ REMOULDED) / NILCON VANE (△ INTACT ▲ REMOULDED) / UNDRAINED SHEAR STRENGTH (kPa) 20 40 60 80 100	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L — WATER CONTENT (%) 20 40 60	PERMEABILITY (cm/s)	REMARKS
355.7	Ground surface												
0.0	**TOPSOIL** Dark brown peat and clay, some rootlets		1	AS							42		...frozen to 0.8m
355.0									355				
0.8	**SILTY CLAY** Greyish brown silty clay, trace to some sand, some lensing and oxidation, varved, firm to stiff, low to medium plasticity, moist [Upper Glaciolacustrine] ...at 1.5 m trace gravel ...at 2.3 m trace rootlets		2	SS	67	8		1			39		
			3	SS	92	14		2	354		19		
			4	SS	100	8		3	353		35		...at 3.04m TV=64 KPa
			5	TW	100								
351.2								4	352				
4.6	**Silty CLAY** Dark brown to grey silty clay, trace sand, trace gravel, occasional silt pockets, medium plasticity, stiff, moist [WML Till]		6	SS	87	10		5	351		19		
			7	SS	100	10		6	350		35		
			8	SS	100	9		7	349				
			9	SS	100	14		8	348		36		
			10	SS	100	14		9	347		36		
			11	SS	100	13		10	346				
			12	SS	100	7		11	345		35		
								12	344				
								13	343		36		
								14	342				
								15	341		36		

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RECORD OF BOREHOLE No. BH11-12

PROJECT Rainy River - Geotechnical Investigation 2011/2012 | ENGINEER MS

PROJECT NO. TC113921 | DRILLER Marathon Drilling | BORING METHOD 200 mm HSA, NQ Coring | LOGGED BY PDR

CLIENT Rainy River Resources. | LOCATION Flotation Tailings | COMPILED BY SM

ELEVATION 355.723 m | COORD. N 5,411,178 E 425,311 | BORING DATE Start: Mar 17, 12 End: Mar 17, 12 | CHECKED BY DGR

SAMPLE TYPES
AU Auger; BU Bulk; DC Dynamic Cone; RC Rock Core; SS Split Spoon; TW Thin Walled Open (Shelby); WS Wash Sample

ABBREVIATIONS
P.P. Pocket Penetrometer; U.W. Wet Unit Weight; PT Standard Proctor Test; P.L. Point Load Strength Index (I_{50}); RQD Rock Quality Designation; SCR Solid Core Recovery; k Permeability; C Consolidation; DS Direct Shear; GS Grain Size Analysis

ELEV / DEPTH (m)	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	RECOVERY (%)	SPT "N" VALUES or RQD	WELL / PIEZOMETER INSTALLATION	DEPTH (m)	ELEVATION (m)	DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100) / MTO VANE (□ INTACT ■ REMOULDED) / NILCON VANE (△ INTACT ▲ REMOULDED) / UNDRAINED SHEAR STRENGTH (kPa) 20 40 60 80 100	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L — WATER CONTENT (%) 20 40 60	PERMEABILITY (cm/s)	REMARKS
	... at 16.8 m sand lenses/laminae, firm		13	SS	100	10		16	340		38		
			14	SS	100	8		17	339		20		
337.4								18	338				
18.3	**SILTY CLAY** Dark grey silty clay and gravel, varved, low plasticity, stiff, moist [Lower Glaciolacustrine]		15	SS	100	10		19	337		34		
335.9									336		19		
19.8	**Gravelly SAND** Grey sand, some silt and gravel, well graded, boulders, compact, wet [inferred WS Till]		17	SS	25	11		20	335				
			18	RC				21	334				
333.3								22					
22.4	**BEDROCK** highly fractured and weathered, bluish green		19	RC	63	0		23	333				...at 22.4 m switched to NQ
			20	RC	92	0		24	332				
			21	RC	82	0		25	331				
328.8								26	330				
27.0	**End of Borehole** at 27m Standpipes installed with flush mounted steel casing Water level (b.g.s): For Piezometer A (bottom sensing zone) at 1.1 m on Mar 18/12 For Piezometer B (top sensing zone) 0.65 m on Mar 18/12								329				

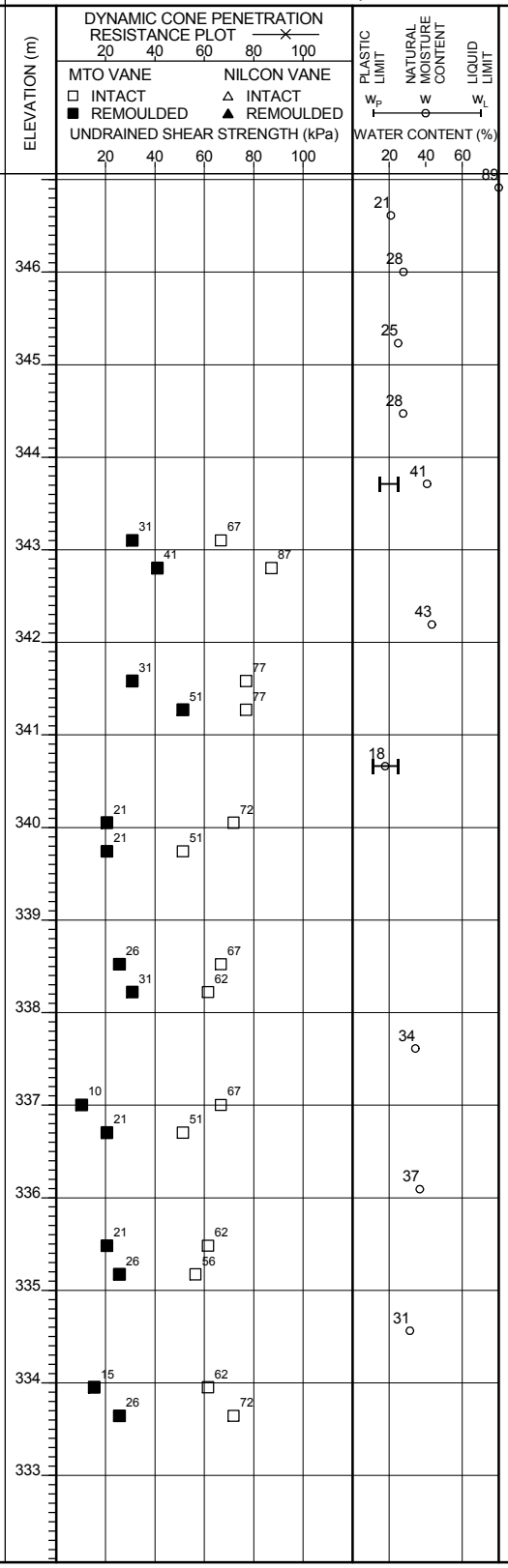
RECORD OF BOREHOLE No. BH11-13

PROJECT	Rainy River - Geotechnical Investigation 2011/2012			ENGINEER	MS
PROJECT NO.	TC113921	DRILLER	Marathon Drilling	BORING METHOD	200 mm HSA, NQ Coring	LOGGED BY	SM
CLIENT	Rainy River Resources.	LOCATION	Overburden stockpile			COMPILED BY	NH
ELEVATION	347.063 m	COORD.	N 5,410,290 E 422,597	BORING DATE	Start: Mar 3, 12 End: Mar 5, 12	CHECKED BY	DGR

SAMPLE TYPES
AU Auger; BU Bulk; DC Dynamic Cone; RC Rock Core; SS Split Spoon; TW Thin Walled Open (Shelby); WS Wash Sample

ABBREVIATIONS
P.P. Pocket Penetrometer; U.W. Wet Unit Weight; PT Standard Proctor Test; P.L. Point Load Strength Index (I_{50}); RQD Rock Quality Designation; SCR Solid Core Recovery; k Permeability; C Consolidation; DS Direct Shear; GS Grain Size Analysis

ELEV / DEPTH (m)	DESCRIPTION	NUMBER	TYPE	RECOVERY (%)	SPT "N" VALUES or RQD	REMARKS
347.1	Ground surface					
0.0 / 346.8	**TOPSOIL** Woody, fibrous organics	1	SS	87.5	4	
0.3	**Sandy SILT** Dark brown to light brown sandy silt, trace clay, rootlets, trace organics, soft, low plasticity, damp [Upper Glaciolacustrine]	2	SS	29.2	7	
		3	SS	92	4	
344.8						
2.3	**Clayey SILT** Grey clayey silt, trace sand, no to low plasticity, moist, soft ...30cm thick silty clay at the top	4	SS	83	7	
		5	SS	92	3	
342.5						
4.6	...at 4.49m, brown oxidised pockets **Silty CLAY** Dark grey silty clay, trace sand, trace subangular gravel, limestone, high plasticity, moist, firm [WMLTill]	8	SS	100	7	
	...from 6.25m to 9.14m, medium plasticity	11	SS	92	5	
		14	TW	100		...at 7.9m PP=37 KPa Torvane=49 KPa
		17	SS	92	5	
		20	SS	88	6	
		23	SS	96	5	
		26	TW	100		...at 14m PP=61-85 KPa Torvane=44 KPa



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RECORD OF BOREHOLE No. BH11-13

PROJECT	Rainy River - Geotechnical Investigation 2011/2012			ENGINEER	MS
PROJECT NO.	TC113921	DRILLER	Marathon Drilling	BORING METHOD	200 mm HSA, NQ Coring	LOGGED BY	SM
CLIENT	Rainy River Resources.	LOCATION	Overburden stockpile			COMPILED BY	NH
ELEVATION	347.063 m	COORD.	N 5,410,290 E 422,597	BORING DATE	Start: Mar 3, 12 End: Mar 5, 12	CHECKED BY	DGR

SAMPLE TYPES
AU Auger; BU Bulk; DC Dynamic Cone; RC Rock Core; SS Split Spoon; TW Thin Walled Open (Shelby); WS Wash Sample

ABBREVIATIONS
P.P. Pocket Penetrometer; U.W. Wet Unit Weight; PT Standard Proctor Test; P.L. Point Load Strength Index (I_{50}); RQD Rock Quality Designation; SCR Solid Core Recovery; k Permeability; C Consolidation; DS Direct Shear; GS Grain Size Analysis

ELEV / DEPTH (m)	DESCRIPTION	NUMBER	TYPE	RECOVERY (%)	SPT "N" VALUES or RQD	DEPTH (m)	ELEVATION (m)	REMARKS
		27	SS	100	5	16	331	Artesian pressure up to 1.06m encountered after installing the second standpipe.
		30	SS	100	6	17	330	
		33	SS	100	4	18	329	
327.3						19	328	
19.8	**Sandy SILT** Greyish green sandy silt, trace clay, grey clay lamination, no plasticity, wet, soft to firm [Lower Glaciolacustrine]	36	SS		7	20	327	
325.7						21	326	
21.3	**BEDROCK**	37	RC	98	70	22	325	
		38	RC	100	100	23	324	
322.6						24	323	
24.4	**End of Borehole** at 24.4m Two standpipes, BH11-13A and BH11-13B (orange spray) installed with flush mounted steel casing Water level (b.g.s): For Piezometer A (bottom sensing zone) at surface on Mar 5/12 For Piezometer B (top sensing zone) surface on Mar 5/12							

DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100)
MTO VANE: □ INTACT ■ REMOULDED; NILCON VANE: △ INTACT ▲ REMOULDED
UNDRAINED SHEAR STRENGTH (kPa) (20 40 60 80 100)

PLASTIC LIMIT w_P | NATURAL MOISTURE CONTENT w | LIQUID LIMIT w_L
WATER CONTENT (%) (20 40 60)

PERMEABILITY (cm/s)

RECORD OF BOREHOLE No. BH11-16 A&B

PROJECT	Rainy River - Geotechnical Investigation 2011/2012			ENGINEER	MS
PROJECT NO.	TC113921	DRILLER	Marathon Drilling	BORING METHOD	200 mm HSA, NQ Coring	LOGGED BY	SM
CLIENT	Rainy River Resources.	LOCATION	Overburden stockpile			COMPILED BY	NH
ELEVATION	348.843 m	COORD.	N 5,409,752 E 423,785	BORING DATE	Start: Feb 29, 12 End: Mar 2, 12	CHECKED BY	DGR

SAMPLE TYPES
AU Auger; BU Bulk; DC Dynamic Cone; RC Rock Core; SS Split Spoon; TW Thin Walled Open (Shelby); WS Wash Sample

ABBREVIATIONS
P.P. Pocket Penetrometer; U.W. Wet Unit Weight; PT Standard Proctor Test; P.L. Point Load Strength Index (I_{50}); RQD Rock Quality Designation; SCR Solid Core Recovery; k Permeability; C Consolidation; DS Direct Shear; GS Grain Size Analysis

ELEV / DEPTH (m)	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	RECOVERY (%)	SPT "N" VALUES or RQD	WELL / PIEZOMETER INSTALLATION	DEPTH (m)	ELEVATION (m)	DYNAMIC CONE PENETRATION RESISTANCE PLOT; MTO VANE (INTACT / REMOULDED); NILCON VANE (INTACT / REMOULDED); UNDRAINED SHEAR STRENGTH (kPa)	PLASTIC LIMIT w_P; NATURAL MOISTURE CONTENT w; LIQUID LIMIT w_L; WATER CONTENT (%)	PERMEABILITY (cm/s)	REMARKS
348.8	Ground surface												
348.8 / 0.0	**TOPSOIL**												
348.7 / 0.1	Dark brown organics, fibrous rootlets		1	SS	100	15					27		...frozen to 0.8m
	Clayey SILT Brown clayey silt, trace sand, grey clay laminations, varved, low plasticity, damp, organics [Upper Glaciolacustrine]		2	SS	100	6		1	348		21		
	...below 1.5m mottled brown lenses, no to low plasticity, firm, damp		3	SS	100	6		2	347		25		
345.8								3	346				
3.0	**Silty CLAY** Dark grey silty clay, medium to high plasticity, soft to firm, damp to moist [WML Till]		6	SS	100	6					46		
	...at 4.57m, some sand, subangular to subrounded gravel, damp to moist, soft to firm, sand lenses		9	SS	100	3		4 5	345 344		25		
	...sandy lense between 6.3 and 6.35m		12	SS	100	4		6 7	343 342		19		
	...between 7.6m to 9.5m - clayey silt, soft, no to low plasticity, wet		15	SS	71			8	341		24		...at 7.6m SPT sampler sank under its own weight
			18	SS	100	4		9 10	340 339		39		
			21	SS	100	5		11	338		36		
			24	SS	100	5		12 13	337 336		34		
			27	SS	100	6		14	335		35		
								15	334				

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RECORD OF BOREHOLE No. BH11-16 A&B

PROJECT	Rainy River - Geotechnical Investigation 2011/2012			ENGINEER	MS
PROJECT NO.	TC113921	DRILLER	Marathon Drilling	BORING METHOD	200 mm HSA, NQ Coring	LOGGED BY	SM
CLIENT	Rainy River Resources.	LOCATION	Overburden stockpile			COMPILED BY	NH
ELEVATION	348.843 m	COORD.	N 5,409,752 E 423,785	BORING DATE	Start: Feb 29, 12 End: Mar 2, 12	CHECKED BY	DGR

SAMPLE TYPES
AU Auger; BU Bulk; DC Dynamic Cone; RC Rock Core; SS Split Spoon; TW Thin Walled Open (Shelby); WS Wash Sample

ABBREVIATIONS
P.P. Pocket Penetrometer; U.W. Wet Unit Weight; PT Standard Proctor Test; P.L. Point Load Strength Index (I_{50}); RQD Rock Quality Designation; SCR Solid Core Recovery; k Permeability; C Consolidation; DS Direct Shear; GS Grain Size Analysis

ELEV / DEPTH (m)	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	RECOVERY (%)	SPT "N" VALUES or RQD	WELL / PIEZOMETER INSTALLATION	DEPTH (m)	ELEVATION (m)	DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100) / MTO VANE (□ INTACT ■ REMOULDED) / NILCON VANE (△ INTACT ▲ REMOULDED) / UNDRAINED SHEAR STRENGTH (kPa)	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L / WATER CONTENT (%) (20 40 60)	PERMEABILITY (cm/s)	REMARKS
	...sand and gravel lense between 15.75 m and 15.85m		30	SS	79	11		16	333		26		
			31	SS	79	8		17	332		45		
	...sand and gravel lense between 17.3 m and 17.4m		32	SS	100	6		18	331		41		
			35	SS	100	6		19	330	10, 26, 56, 67			
			38	SS	100	6		20	329		44		
326.0								21	328	15, 21, 56, 53			
22.9	**Silty CLAY** Silty clay, medium plasticity, varved, firm, moist to wet [Lower Glaciolacustrine]		41	SS	100	6		22	327		43		
324.5								23	326	15, 26, 62, 56			
24.4	**Silty SAND and GRAVEL** Silty sand and white brown angular to subangular gravel, trace clay, compact, moist to wet [WS Till]		43	SS	38	25		24	325		58		
			44	SS	29	25		25	324		28		
321.4								26	323		10		
27.4	**BEDROCK** Fractured at the top		45	SS	25	27		27	322				
			46	RC	100	30		28	321		5		
			47	RC	100	63		29	320				
								30	319				

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RECORD OF BOREHOLE No. BH11-16 A&B

PROJECT Rainy River - Geotechnical Investigation 2011/2012 ENGINEER MS

PROJECT NO. TC113921 DRILLER Marathon Drilling BORING METHOD 200 mm HSA, NQ Coring LOGGED BY SM

CLIENT Rainy River Resources. LOCATION Overburden stockpile COMPILED BY NH

ELEVATION 348.843 m COORD. N 5,409,752 E 423,785 BORING DATE Start: Feb 29, 12 End: Mar 2, 12 CHECKED BY DGR

SAMPLE TYPES
AU Auger
BU Bulk
DC Dynamic Cone
RC Rock Core
SS Split Spoon
TW Thin Walled Open (Shelby)
WS Wash Sample

ABBREVIATIONS
P.P. Pocket Penetrometer
U.W. Wet Unit Weight
PT Standard Proctor Test
P.L. Point Load Strength Index (I_{50})
RQD Rock Quality Designation
SCR Solid Core Recovery
k Permeability
C Consolidation
DS Direct Shear
GS Grain Size Analysis

ELEV / DEPTH (m)	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	RECOVERY (%)	SPT "N" VALUES or RQD	WELL / PIEZOMETER INSTALLATION	DEPTH (m)	ELEVATION (m)	DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100); MTO VANE □ INTACT ■ REMOULDED; NILCON VANE △ INTACT ▲ REMOULDED; UNDRAINED SHEAR STRENGTH (kPa) 20 40 60 80 100	PLASTIC LIMIT w_P	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w_L; WATER CONTENT (%) 20 40 60	PERMEABILITY (cm/s)	REMARKS
			48	RC	100	83		31	318					
317.2														
31.6	**End of Borehole** at 31.65m Two standpipes, BH11-16A and BH11-16B (orange spray) installed with flush mounted steel casing Water level (b.g.s): For Piezometer A (bottom sensing zone) at surface on Mar 3/12 For Piezometer B (middle sensing zone) surface on Mar 3/12													

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RECORD OF BOREHOLE No. BH11-16C

PROJECT	Rainy River - Geotechnical Investigation 2011/2012			ENGINEER	MS
PROJECT NO.	TC113921	DRILLER	Marathon Drilling	BORING METHOD		LOGGED BY	SM
CLIENT	Rainy River Resources.	LOCATION	Overburden stockpile			COMPILED BY	SM
ELEVATION	348.431 m	COORD.	N 5,409,753 E 423,785	BORING DATE	Start: Mar 3, 12 End: Mar 3, 12	CHECKED BY	DGR

SAMPLE TYPES
AU Auger
BU Bulk
DC Dynamic Cone
RC Rock Core
SS Split Spoon
TW Thin Walled Open (Shelby)
WS Wash Sample

ABBREVIATIONS
P.P. Pocket Penetrometer
U.W. Wet Unit Weight
PT Standard Proctor Test
P.L. Point Load Strength Index (I_{50})
RQD Rock Quality Designation
SCR Solid Core Recovery
k Permeability
C Consolidation
DS Direct Shear
GS Grain Size Analysis

ELEV / DEPTH (m)	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	RECOVERY (%)	SPT "N" VALUES or RQD	WELL / PIEZOMETER INSTALLATION	DEPTH (m)	ELEVATION (m)	DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100) / MTO VANE ☐ INTACT ■ REMOULDED / NILCON VANE △ INTACT ▲ REMOULDED / UNDRAINED SHEAR STRENGTH (kPa) 20 40 60 80 100	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L / WATER CONTENT (%) 20 40 60	PERMEABILITY (cm/s)	REMARKS
348.4	Ground surface												
0.0	BH11-16C shows installation details of shallow standpipe piezometer BH11-16C Refer to BH11-16 for stratigraphic Information							0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15	348 347 346 345 344 343 342 341 340 339 338 337 336 335 334				

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RECORD OF BOREHOLE No. BH11-16C

PROJECT	Rainy River - Geotechnical Investigation 2011/2012			ENGINEER	MS
PROJECT NO.	TC113921	DRILLER	Marathon Drilling	BORING METHOD		LOGGED BY	SM
CLIENT	Rainy River Resources.	LOCATION	Overburden stockpile			COMPILED BY	SM
ELEVATION	348.431 m	COORD.	N 5,409,753 E 423,785	BORING DATE	Start: Mar 3, 12 End: Mar 3, 12	CHECKED BY	DGR

SAMPLE TYPES
AU Auger
BU Bulk
DC Dynamic Cone
RC Rock Core
SS Split Spoon
TW Thin Walled Open (Shelby)
WS Wash Sample

ABBREVIATIONS
P.P. Pocket Penetrometer
U.W. Wet Unit Weight
PT Standard Proctor Test
P.L. Point Load Strength Index (I_{50})
RQD Rock Quality Designation
SCR Solid Core Recovery
k Permeability
C Consolidation
DS Direct Shear
GS Grain Size Analysis

ELEV / DEPTH (m)	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	RECOVERY (%)	SPT "N" VALUES or RQD	WELL / PIEZOMETER INSTALLATION	DEPTH (m)	ELEVATION (m)	DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100); MTO VANE □ INTACT ■ REMOULDED; NILCON VANE △ INTACT ▲ REMOULDED; UNDRAINED SHEAR STRENGTH (kPa) 20 40 60 80 100	PLASTIC LIMIT w_P	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w_L; WATER CONTENT (%) 20 40 60	PERMEABILITY (cm/s)	REMARKS
								16	333						
								17	332						
330.1								18	331						
18.3	**End of Borehole** at 16.3m Standpipes installed with flush mounted steel casing Water Level (b.g.s): At surface on March 03/12														

RECORD OF BOREHOLE No. BH11-17

PROJECT	Rainy River - Geotechnical Investigation 2011/2012			ENGINEER	MS
PROJECT NO.	TC113921	DRILLER	Marathon Drilling	BORING METHOD	200 mm HSA, NQ Coring	LOGGED BY	SM
CLIENT	Rainy River Resources.	LOCATION	Pit diversion			COMPILED BY	NH
ELEVATION	349.346 m	COORD.	N 5,410,114 E 424,758	BORING DATE	Start: Feb 27, 12 End: Feb 28, 12	CHECKED BY	DGR

SAMPLE TYPES
AU Auger; BU Bulk; DC Dynamic Cone; RC Rock Core; SS Split Spoon; TW Thin Walled Open (Shelby); WS Wash Sample

ABBREVIATIONS
P.P. Pocket Penetrometer; U.W. Wet Unit Weight; PT Standard Proctor Test; P.L. Point Load Strength Index (I_{50}); RQD Rock Quality Designation; SCR Solid Core Recovery; k Permeability; C Consolidation; DS Direct Shear; GS Grain Size Analysis

ELEV / DEPTH (m)	DESCRIPTION	NUMBER	TYPE	RECOVERY (%)	SPT "N" VALUES or RQD	REMARKS
349.3	Ground surface					
0.0 / 349.0	**TOPSOIL** Dark brown, fibrous, rootlets	1	SS	100	29	...frozen to 0.8m
0.3 / 348.6	**SILT** Light brown silt, trace clay, some sand, trace organics	2	SS	96	8	
0.8	**Clayey SILT to Silty CLAY** Light brown clayey silt, trace gravel, trace sand, rootlets, mottled brown lenses, low to medium plasticity, firm, damp [Upper Glaciolacustrine]	3	SS	88	4	
	..at 1.7m brown silty clay, medium to high plasticity, firm to stiff, damp					
346.3 / 3.0	**Silty CLAY** Brown silty clay, trace sand and gravel, medium to high plasticity, soft to firm, damp to moist [WML Till]	6	SS	100	4	
		9	SS	100	3	
	...at 6.1m grey silty, low plasticity	12	SS	100	3	
	... below 7.6m becoming dark grey	15	SS	100	6	
		18	SS	100	5	
		20A&B	SS		3	
	...from 10.7m to 14.3m occasional dark grey silty sand and gravel lamination	23	SS		5	...at 11.89m, heaving sands; switched to wash boring.
		26	SS	100	5	

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RECORD OF BOREHOLE No. BH11-17

PROJECT: Rainy River - Geotechnical Investigation 2011/2012 | ENGINEER: MS

PROJECT NO.: TC113921 | DRILLER: Marathon Drilling | BORING METHOD: 200 mm HSA, NQ Coring | LOGGED BY: SM

CLIENT: Rainy River Resources. | LOCATION: Pit diversion | COMPILED BY: NH

ELEVATION: 349.346 m | COORD.: N 5,410,114 E 424,758 | BORING DATE: Start: Feb 27, 12 End: Feb 28, 12 | CHECKED BY: DGR

SAMPLE TYPES
AU Auger; BU Bulk; DC Dynamic Cone; RC Rock Core; SS Split Spoon; TW Thin Walled Open (Shelby); WS Wash Sample

ABBREVIATIONS
P.P. Pocket Penetrometer; U.W. Wet Unit Weight; PT Standard Proctor Test; P.L. Point Load Strength Index (I_{50}); RQD Rock Quality Designation; SCR Solid Core Recovery; k Permeability; C Consolidation; DS Direct Shear; GS Grain Size Analysis

ELEV / DEPTH (m)	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	RECOVERY (%)	SPT "N" VALUES or RQD	WELL / PIEZOMETER INSTALLATION	DEPTH (m)	ELEVATION (m)	DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100) / MTO VANE (□ INTACT ■ REMOULDED) / NILCON VANE (△ INTACT ▲ REMOULDED) / UNDRAINED SHEAR STRENGTH (kPa) 20 40 60 80 100	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L — WATER CONTENT (%) 20 40 60	PERMEABILITY (cm/s)	REMARKS
			27	SS	92	5		16	334		38		
			28	SS	100	6		17	333		37		
	...at 18.29m, silty pockets.		29	SS	100	6		18	332				
329.4								19	331		31		
20.0	**Silty CLAY** Greyish green silty clay(silt as 3-4mm lamintions) medium plasticity, varved, firm, moist [Lower Glaciolacustrine]		30	SS	100	8		20	330				
328.0								21	329				
21.3	**Clayey SAND and GRAVEL** Dark grey clayey sand and gravel, subrounded to angular [WS Till]							22	328				
	...below 22.6m, boulders							23	327				
325.0			34	RC	37	0		24	326				
24.4	**BEDROCK** Highly fractured bedrock		35	RC	100	0		25	325				
			36	RC	78	9		26	324				Artesian pressure up to 0.7m encountered pulling rods out
322.2			37	RC	100	100		27	323				
27.2	**End of Borehole** at 27.1m Standpipe installed with flush mounted steel casing Water level (b.g.s): at 0.15m on Feb 29/12												

RECORD OF BOREHOLE No. BH11-18

PROJECT Rainy River - Geotechnical Investigation 2011/2012 | ENGINEER MS

PROJECT NO. TC113921 | DRILLER Marathon Drilling | BORING METHOD 200 mm HSA, NQ Coring | LOGGED BY PDR/SM

CLIENT Rainy River Resources. | LOCATION Open Pit | COMPILED BY NH

ELEVATION 348.507 m | COORD. N 5,408,990 E 425,202 | BORING DATE Start: Jan 15, 12 | CHECKED BY DGR

SAMPLE TYPES
AU Auger; BU Bulk; DC Dynamic Cone; RC Rock Core; SS Split Spoon; TW Thin Walled Open (Shelby); WS Wash Sample

ABBREVIATIONS
P.P. Pocket Penetrometer; U.W. Wet Unit Weight; PT Standard Proctor Test; P.L. Point Load Strength Index (I_{50}); RQD Rock Quality Designation; SCR Solid Core Recovery; k Permeability; C Consolidation; DS Direct Shear; GS Grain Size Analysis

ELEV / DEPTH (m)	DESCRIPTION	NUMBER	TYPE	RECOVERY (%)	SPT "N" VALUES or RQD	REMARKS
348.5	Ground surface					
0.0 / 347.7	**TOPSOIL** Silt and peat, dark brown, fibrous					
0.8 / 343.9	**Silty CLAY** Brown silty clay, trace to some sand, trace gravel, varved, low to medium plasticity, stiff, moist, occasional sand laminations [Upper Glaciolacustrine]	2	SS	88	10	...frozen to 1.5m
		3	SS	83	11	
		4	SS	96	10	
		5	SS	96	10	
4.6 / 336.3	**silty CLAY** Dark brown silty clay, trace sand, trace gravel, stiff, medium plasticity, moist [WML Till].	6	SS	100	11	
		7	SS	100	10	
		8	SS	100	9	
	From 9.45m to 9.78m, silty sand, trace clay, compact, wet.	9	SS	100	14	
		10	SS	92	9	
12.2 / 334.8	**silty CLAY** Dark grey silty clay, varved (greenish grey silty layers 2-3mm), soft, medium to high plasticity, moist, varved [Glaciolacustrine].	11	SS	100	4	
13.7	**SAND AND GRAVEL** Greenish brown sand and gravel, trace silt, well graded, very dense, angular to subangular, wet [WS Till].	12	SS		69	...at 13.72m, heaving sand; switched to wash boring.

DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100)
MTO VANE: □ INTACT ■ REMOULDED
NILCON VANE: △ INTACT ▲ REMOULDED
UNDRAINED SHEAR STRENGTH (kPa) (20 40 60 80 100)

PLASTIC LIMIT w_P | NATURAL MOISTURE CONTENT w | LIQUID LIMIT w_L
WATER CONTENT (%) (20 40 60)

Plotted values: 34; 22; 22; 25; 36; 35; 35; 33; 32; 43; 11

PERMEABILITY (cm/s)

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RECORD OF BOREHOLE No. BH11-18

PROJECT	Rainy River - Geotechnical Investigation 2011/2012			ENGINEER	MS
PROJECT NO.	TC113921	DRILLER	Marathon Drilling	BORING METHOD	200 mm HSA, NQ Coring	LOGGED BY	PDR/SM
CLIENT	Rainy River Resources.	LOCATION	Open Pit			COMPILED BY	NH
ELEVATION	348.507 m	COORD.	N 5,408,990 E 425,202	BORING DATE	Start: Jan 15, 12	CHECKED BY	DGR

SAMPLE TYPES
AU Auger; BU Bulk; DC Dynamic Cone; RC Rock Core; SS Split Spoon; TW Thin Walled Open (Shelby); WS Wash Sample

ABBREVIATIONS
P.P. Pocket Penetrometer; U.W. Wet Unit Weight; PT Standard Proctor Test; P.L. Point Load Strength Index (I_{50}); RQD Rock Quality Designation; SCR Solid Core Recovery; k Permeability; C Consolidation; DS Direct Shear; GS Grain Size Analysis

ELEV / DEPTH (m)	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	RECOVERY (%)	SPT "N" VALUES or RQD	WELL / PIEZOMETER INSTALLATION	DEPTH (m)	ELEVATION (m)	DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100) / MTO VANE (□ INTACT ■ REMOULDED) / NILCON VANE (△ INTACT ▲ REMOULDED) / UNDRAINED SHEAR STRENGTH (kPa) 20 40 60 80 100	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L — WATER CONTENT (%) 20 40 60	PERMEABILITY (cm/s)	REMARKS
333.3													
15.3	**BOULDERS AND COBBLES** Boulders and cobbles, some coarse sand [Inferred WS Till].							16	333				...at 15.7m, switched to NQ coring
			13	WS				17	332				
								18	331				
								19	330				
								20	329				
								21	328				
			14	WS				22	327				
								23	326				
								24	325				
								25	324				
								26	323				
321.6									322				
26.9	**BEDROCK**		16	RC	100	55		27	321				
								28	320				
			16	RC	100	93		29	319				...at 28.9m to 43.4m, Constant head Packer test carried out; no change in flow noted.
								30					

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RECORD OF BOREHOLE No. BH11-18

PROJECT Rainy River - Geotechnical Investigation 2011/2012 | ENGINEER MS

PROJECT NO. TC113921 | DRILLER Marathon Drilling | BORING METHOD 200 mm HSA, NQ Coring | LOGGED BY PDR/SM

CLIENT Rainy River Resources. | LOCATION Open Pit | COMPILED BY NH

ELEVATION 348.507 m | COORD. N 5,408,990 E 425,202 | BORING DATE Start: Jan 15, 12 | CHECKED BY DGR

SAMPLE TYPES
AU Auger; BU Bulk; DC Dynamic Cone; RC Rock Core; SS Split Spoon; TW Thin Walled Open (Shelby); WS Wash Sample

ABBREVIATIONS
P.P. Pocket Penetrometer; U.W. Wet Unit Weight; PT Standard Proctor Test; P.L. Point Load Strength Index (I_{50}); RQD Rock Quality Designation; SCR Solid Core Recovery; k Permeability; C Consolidation; DS Direct Shear; GS Grain Size Analysis

ELEV / DEPTH (m)	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	RECOVERY (%)	SPT "N" VALUES or RQD	WELL / PIEZOMETER INSTALLATION	DEPTH (m)	ELEVATION (m)	DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100); MTO VANE □ INTACT ■ REMOULDED; NILCON VANE △ INTACT ▲ REMOULDED; UNDRAINED SHEAR STRENGTH (kPa)	PLASTIC LIMIT w_P	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w_L; WATER CONTENT (%) (20 40 60)	PERMEABILITY (cm/s)	REMARKS
			17	RC	100	75		31	318						
			18	RC	100	83		32	317						
			19	RC	100	100		33	316						
			20	RC	100	93		34	315						
			21	RC	100	70		35	314						
			22	RC	100	90		36	313						
			23	RC	100	75		37	312						
			24	RC	100	73		38	311						
			25	RC	98	98		39	310						
305.2								40	309						
43.4	**End of Borehole** at 43.35m Standpipe installed with flushmounted steel casing Water Level (bgs): For Piezometer A (bottom sensing							41	308						
								42	307						
								43	306						

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RECORD OF BOREHOLE No. BH11-18

PROJECT Rainy River - Geotechnical Investigation 2011/2012 | ENGINEER MS

PROJECT NO. TC113921 | DRILLER Marathon Drilling | BORING METHOD 200 mm HSA, NQ Coring | LOGGED BY PDR/SM

CLIENT Rainy River Resources. | LOCATION Open Pit | COMPILED BY NH

ELEVATION 348.507 m | COORD. N 5,408,990 E 425,202 | BORING DATE Start: Jan 15, 12 | CHECKED BY DGR

SAMPLE TYPES
AU Auger
BU Bulk
DC Dynamic Cone
RC Rock Core
SS Split Spoon
TW Thin Walled Open (Shelby)
WS Wash Sample

ABBREVIATIONS
P.P. Pocket Penetrometer
U.W. Wet Unit Weight
PT Standard Proctor Test
P.L. Point Load Strength Index (I_{50})
RQD Rock Quality Designation
SCR Solid Core Recovery
k Permeability
C Consolidation
DS Direct Shear
GS Grain Size Analysis

ELEV / DEPTH (m)	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	RECOVERY (%)	SPT "N" VALUES or RQD	WELL / PIEZOMETER INSTALLATION	DEPTH (m)	ELEVATION (m)	DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100); MTO VANE □ INTACT ■ REMOULDED; NILCON VANE △ INTACT ▲ REMOULDED; UNDRAINED SHEAR STRENGTH (kPa) 20 40 60 80 100	PLASTIC LIMIT w_P	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w_L; WATER CONTENT (%) 20 40 60	PERMEABILITY (cm/s)	REMARKS
	zone) at 0.76m on Feb 02/12 For Piezometer B (middle sensing zone) at 0.76m on Feb 02/12													

RECORD OF BOREHOLE No. BH11-19 A&B

PROJECT: Rainy River - Geotechnical Investigation 2011/2012 | ENGINEER: MS

PROJECT NO.: TC113921 | DRILLER: Marathon Drilling | BORING METHOD: 200 mm HSA, NQ Coring | LOGGED BY: PDR

CLIENT: Rainy River Resources. | LOCATION: Open Pit | COMPILED BY: NH

ELEVATION: 350.323 m | COORD.: N 5,409,287 E 426,009 | BORING DATE: Start: Jan 3, 12 End: Jan 5, 12 | CHECKED BY: DGR

SAMPLE TYPES
AU Auger; BU Bulk; DC Dynamic Cone; RC Rock Core; SS Split Spoon; TW Thin Walled Open (Shelby); WS Wash Sample

ABBREVIATIONS
P.P. Pocket Penetrometer; U.W. Wet Unit Weight; PT Standard Proctor Test; P.L. Point Load Strength Index (I_{50}); RQD Rock Quality Designation; SCR Solid Core Recovery; k Permeability; C Consolidation; DS Direct Shear; GS Grain Size Analysis

ELEV / DEPTH (m)	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	RECOVERY (%)	SPT "N" VALUES or RQD	WELL / PIEZOMETER INSTALLATION	DEPTH (m)	ELEVATION (m)	DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100) / MTO VANE (□ INTACT ■ REMOULDED) / NILCON VANE (△ INTACT ▲ REMOULDED) / UNDRAINED SHEAR STRENGTH (kPa) (20 40 60 80 100)	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L / WATER CONTENT (%) (20 40 60)	PERMEABILITY (cm/s)	REMARKS
350.3	Ground Surface												
350.1 / 0.3	**TOPSOIL** dark brown, peat		1	SS	83	15							
	SILTY CLAY Light brown silty clay, some sand, varved, soft to firm, low plastic, moist to wet [Upper Glaciolacustrine]		2	SS	46	5		1	349		18		..frozen to 1.4m
	...at 0.8m becoming sandy		3	SS	100	8		2	348		26		
	...becoming dark brown below 2.2m		4	SS	100	3		3	347		29		
			5	SS	100	7		4	346		26		
345.5			6	SS	100	11		5	345		24 43		
4.9	**SILTY CLAY** Drak grey silty (to trace silt) clay, trace sand, trace gravel, firm to stiff, medium to high plasticity, moist [WML Till]		7	TW	100			6	344				...at 6.4m PP=122-134 KPa
			8	SS	92	8		7	343		27		
			9	SS	100	5		8	342				
			10	SS	100	13		9	341		49 92		
			11	SS	100	9		10	340				
			12	SS	100	11		11	339				
								12	338		21		
								13	337				
								14	336				
								15					

Continued on Next Page

RECORD OF BOREHOLE No. BH11-19 A&B

PROJECT	Rainy River - Geotechnical Investigation 2011/2012			ENGINEER	MS
PROJECT NO.	TC113921	DRILLER	Marathon Drilling	BORING METHOD	200 mm HSA, NQ Coring	LOGGED BY	PDR
CLIENT	Rainy River Resources.	LOCATION	Open Pit			COMPILED BY	NH
ELEVATION	350.323 m	COORD.	N 5,409,287 E 426,009	BORING DATE	Start: Jan 3, 12 End: Jan 5, 12	CHECKED BY	DGR

SAMPLE TYPES
AU Auger; BU Bulk; DC Dynamic Cone; RC Rock Core; SS Split Spoon; TW Thin Walled Open (Shelby); WS Wash Sample

ABBREVIATIONS
P.P. Pocket Penetrometer; U.W. Wet Unit Weight; PT Standard Proctor Test; P.L. Point Load Strength Index (I_{50}); RQD Rock Quality Designation; SCR Solid Core Recovery; k Permeability; C Consolidation; DS Direct Shear; GS Grain Size Analysis

ELEV / DEPTH (m)	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	RECOVERY (%)	SPT "N" VALUES or RQD	WELL / PIEZOMETER INSTALLATION	DEPTH (m)	ELEVATION (m)	DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100) / MTO VANE (□ INTACT ■ REMOULDED) / NILCON VANE (△ INTACT ▲ REMOULDED) / UNDRAINED SHEAR STRENGTH (kPa) 20 40 60 80 100	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L — WATER CONTENT (%) 20 40 60	PERMEABILITY (cm/s)	REMARKS
	...below 16.8m very stiff		13	SS	100	14		16	335				...at 15.25 switch to washboring
			14	SS	100	17		17	334				
			15	SS	100	22		18	333				
			16	SS	100	16		19	332				
			17	SS	100	19		20	331				
	...possibly varved below 22.9m		18	SS	100	22		22	330		24		
326.2								23	329				
24.1	**Sandy GRAVEL** Sandy gravel and boulders, wet [inferred WS Till]		19	RC				24	328		21		...at 24m switched to NQ coring
			20	RC				25	327				
323.0								26	326				
27.3	**Bedrock**		21	RC	100	79		27	325				
			22	RC	100	92		28	324				
320.3								29	323				
								30	322				
									321				

Continued on Next Page

RECORD OF BOREHOLE No. BH11-19 A&B

PROJECT Rainy River - Geotechnical Investigation 2011/2012 ENGINEER MS

PROJECT NO. TC113921 DRILLER Marathon Drilling BORING METHOD 200 mm HSA, NQ Coring LOGGED BY PDR

CLIENT Rainy River Resources. LOCATION Open Pit COMPILED BY NH

ELEVATION 350.323 m COORD. N 5,409,287 E 426,009 BORING DATE Start: Jan 3, 12 End: Jan 5, 12 CHECKED BY DGR

SAMPLE TYPES
AU Auger
BU Bulk
DC Dynamic Cone
RC Rock Core
SS Split Spoon
TW Thin Walled Open (Shelby)
WS Wash Sample

ABBREVIATIONS
P.P. Pocket Penetrometer
U.W. Wet Unit Weight
PT Standard Proctor Test
P.L. Point Load Strength Index (I_{50})
RQD Rock Quality Designation
SCR Solid Core Recovery
k Permeability
C Consolidation
DS Direct Shear
GS Grain Size Analysis

ELEV / DEPTH (m)	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	RECOVERY (%)	SPT "N" VALUES or RQD	WELL / PIEZOMETER INSTALLATION	DEPTH (m)	ELEVATION (m)	DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100) / MTO VANE □ INTACT ■ REMOULDED / NILCON VANE △ INTACT ▲ REMOULDED / UNDRAINED SHEAR STRENGTH (kPa) 20 40 60 80 100	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L / WATER CONTENT (%) 20 40 60	PERMEABILITY (cm/s)	REMARKS
30.0	**End of Borehole** at 30.02m Standpipes installed with A 0.86m, B 0.91m stick up Water Level (b.g.s): For Piezometer A (bottom sensing zone) at 1.83 m on Jan 07/12 at 1.86 m on Jan 14/12 For Piezometer B (middle sensing zone) at 1.83 m on Jan 07/12 at 1.86 m on Jan 14/12								320				

RECORD OF BOREHOLE No. BH11-19C

PROJECT	Rainy River - Geotechnical Investigation 2011/2012			ENGINEER	MS
PROJECT NO.	TC113921	DRILLER	Marathon Drilling	BORING METHOD		LOGGED BY	PDR
CLIENT	Rainy River Resources.	LOCATION	Open Pit			COMPILED BY	NH
ELEVATION	350.453 m	COORD.	N 5,409,285 E 426,011	BORING DATE	Start: Jan 7, 12 End: Jan 7, 12	CHECKED BY	DGR

SAMPLE TYPES
AU Auger
BU Bulk
DC Dynamic Cone
RC Rock Core
SS Split Spoon
TW Thin Walled Open (Shelby)
WS Wash Sample

ABBREVIATIONS
P.P. Pocket Penetrometer
U.W. Wet Unit Weight
PT Standard Proctor Test
P.L. Point Load Strength Index (I_{50})
RQD Rock Quality Designation
SCR Solid Core Recovery
k Permeability
C Consolidation
DS Direct Shear
GS Grain Size Analysis

ELEV / DEPTH (m)	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	RECOVERY (%)	SPT "N" VALUES or RQD	WELL / PIEZOMETER INSTALLATION	DEPTH (m)	ELEVATION (m)	DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100) / MTO VANE (□ INTACT ■ REMOULDED) / NILCON VANE (△ INTACT ▲ REMOULDED) / UNDRAINED SHEAR STRENGTH (kPa) 20 40 60 80 100	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L / WATER CONTENT (%) 20 40 60	PERMEABILITY (cm/s)	REMARKS
350.5	Ground Surface												
0.0	BH11-19C shows installation details of shallow standpipe piezometer BH11-19C Refer to BH11-19 for stratigraphic Information							1 2 3 4 5 6	350 349 348 347 346 345				
344.1													
6.4	**End of Borehole** at 6.4m Standpipe installed with 0.91m stick up Water level (b.g.s): ...at 4.57 m on Jan 07/12 at 1.24 m on Jan 14/12.												

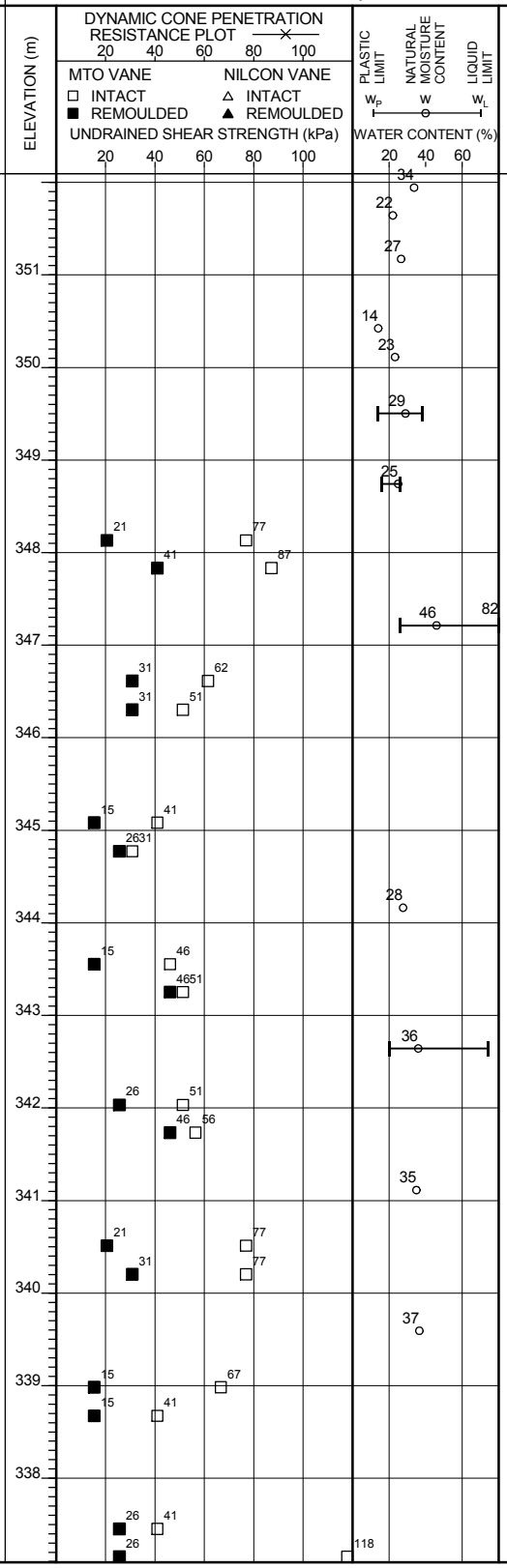
RECORD OF BOREHOLE No. BH11-20 A&B

PROJECT	Rainy River - Geotechnical Investigation 2011/2012			ENGINEER	MS
PROJECT NO.	TC113921	DRILLER	Marathon Drilling	BORING METHOD	200 mm HSA, NQ Coring	LOGGED BY	SM
CLIENT	Rainy River Resources.	LOCATION	Open pit			COMPILED BY	NH
ELEVATION	352.093 m	COORD.	N 5,410,232 E 425,891	BORING DATE	Start: Jan 6, 12 End: Jan 9, 12	CHECKED BY	DGR

SAMPLE TYPES
AU Auger; BU Bulk; DC Dynamic Cone; RC Rock Core; SS Split Spoon; TW Thin Walled Open (Shelby); WS Wash Sample

ABBREVIATIONS
P.P. Pocket Penetrometer; U.W. Wet Unit Weight; PT Standard Proctor Test; P.L. Point Load Strength Index (I_{50}); RQD Rock Quality Designation; SCR Solid Core Recovery; k Permeability; C Consolidation; DS Direct Shear; GS Grain Size Analysis

ELEV / DEPTH (m)	DESCRIPTION	NUMBER	TYPE	RECOVERY (%)	SPT "N" VALUES or RQD	REMARKS
352.1	Ground surface					
351.9 / 0.0	**TOPSOIL**	1	SS	63	10	
0.2	Dark brown organics, fibrous, rootlets					
	SANDY SILT Brown sandy silt to silty sand, trace clay, trace brown lenses , organics, low to medium plasticity, soft to firm, damp to moist [Glacial Sand??]	2	SS	50	3	
		3	SS	54	5	
349.8						
2.3	...below 2.3m - Greyish blue silty clay, trace sand, low to medium plasticity, soft, moist	4	SS	83	4	
	... becoming brown, sandy, low plasticity	5	SS	92	3	
347.5						
4.6	**CLAY** Dark grey clay, trace silt, trace sand, trace gravel, firm to stiff, medium to high plasticity, moist [WML Till]	8	SS	100	5	
	...becoming soft	11	TW	100		...at 6.4m PP = 36 KPa TV=44 KPa
	...at 7.62 becoming silty	14	SS	96	5	
	..becoming firm, moist to wet	17	SS	100	5	
		20	SS	100	7	
		23	SS	100	5	
		26	TW	95		...at 14m PP = 49 KPa TV=59 KPa



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RECORD OF BOREHOLE No. BH11-20 A&B

PROJECT	Rainy River - Geotechnical Investigation 2011/2012			ENGINEER	MS
PROJECT NO.	TC113921	DRILLER	Marathon Drilling	BORING METHOD	200 mm HSA, NQ Coring	LOGGED BY	SM
CLIENT	Rainy River Resources.	LOCATION	Open pit			COMPILED BY	NH
ELEVATION	352.093 m	COORD.	N 5,410,232 E 425,891	BORING DATE	Start: Jan 6, 12 End: Jan 9, 12	CHECKED BY	DGR

SAMPLE TYPES
AU Auger; BU Bulk; DC Dynamic Cone; RC Rock Core; SS Split Spoon; TW Thin Walled Open (Shelby); WS Wash Sample

ABBREVIATIONS
P.P. Pocket Penetrometer; U.W. Wet Unit Weight; PT Standard Proctor Test; P.L. Point Load Strength Index (I_{50}); RQD Rock Quality Designation; SCR Solid Core Recovery; k Permeability; C Consolidation; DS Direct Shear; GS Grain Size Analysis

ELEV / DEPTH (m)	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	RECOVERY (%)	SPT "N" VALUES or RQD	WELL / PIEZOMETER INSTALLATION	DEPTH (m)	ELEVATION (m)	DYNAMIC CONE PENETRATION RESISTANCE PLOT; MTO VANE; NILCON VANE; UNDRAINED SHEAR STRENGTH (kPa)	PLASTIC LIMIT; NATURAL MOISTURE CONTENT; LIQUID LIMIT; WATER CONTENT (%)	PERMEABILITY (cm/s)	REMARKS
			29	SS	100	5		16	336				
			32	SS	100	6		17	335				...at 16.76m switched to washboring
			35	SS	100	7		18	334				
			38	SS	100	6		19	333				
			40	SS	100	7		20	332				
	...At 22.86m occasional sandy pockets, stiff		41	SS	100	9		21	331				
327.6								22	330				
24.5	**SILTY CLAY** Greenish grey silty clay, varved (2-3 mm) dark grey clay , firm, medium plasticity, moist [Lower Glaciolacustrine]		42	SS	100	16		23	329				
326.2								24	328				
25.9	**BOULDERS AND GRAVEL** Dark grey boulders in sand and clay, angular, cm scale [WS Till]		43	SS		/0.08		25	327				
325.5			44	RC	67			26	326				...at 26m spoon refused switched to NQ coring
26.6	**BEDROCK** Highly fractured		45	RC	87	23		27	325				
			46	RC	100	22							
			47	RC	100	0		28	324				
323.1			48	RC	0								
29.0	**End of Borehole** at 29m due to fractured rock cavin Standpipes installed with flush mounted steel casing Water Level (b.g.s):												

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RECORD OF BOREHOLE No. BH11-20 A&B

PROJECT Rainy River - Geotechnical Investigation 2011/2012 ENGINEER MS

PROJECT NO. TC113921 DRILLER Marathon Drilling BORING METHOD 200 mm HSA, NQ Coring LOGGED BY SM

CLIENT Rainy River Resources. LOCATION Open pit COMPILED BY NH

ELEVATION 352.093 m COORD. N 5,410,232 E 425,891 BORING DATE Start: Jan 6, 12 End: Jan 9, 12 CHECKED BY DGR

SAMPLE TYPES
AU Auger
BU Bulk
DC Dynamic Cone
RC Rock Core
SS Split Spoon
TW Thin Walled Open (Shelby)
WS Wash Sample

ABBREVIATIONS
P.P. Pocket Penetrometer
U.W. Wet Unit Weight
PT Standard Proctor Test
P.L. Point Load Strength Index (I_{50})
RQD Rock Quality Designation
SCR Solid Core Recovery
k Permeability
C Consolidation
DS Direct Shear
GS Grain Size Analysis

ELEV / DEPTH (m)	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	RECOVERY (%)	SPT "N" VALUES or RQD	WELL / PIEZOMETER INSTALLATION	DEPTH (m)	ELEVATION (m)	DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100); MTO VANE □ INTACT ■ REMOULDED; NILCON VANE △ INTACT ▲ REMOULDED; UNDRAINED SHEAR STRENGTH (kPa) 20 40 60 80 100	PLASTIC LIMIT w_P	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w_L; WATER CONTENT (%) 20 40 60	PERMEABILITY (cm/s)	REMARKS
	For Piezometer A (bottom sensing zone) at surface on Jan 09/12 Frozen on Jan 14/12													

RECORD OF BOREHOLE No. BH11-20C

PROJECT Rainy River - Geotechnical Investigation 2011/2012 | ENGINEER MS

PROJECT NO. TC113921 | DRILLER Marathon Drilling | BORING METHOD | LOGGED BY SM

CLIENT Rainy River Resources. | LOCATION Open pit | COMPILED BY SM

ELEVATION 352.093 m | COORD. N 5,410,232 E 425,891 | BORING DATE Start: Jan 9, 12 End: Jan 9, 12 | CHECKED BY DGR

SAMPLE TYPES
AU Auger
BU Bulk
DC Dynamic Cone
RC Rock Core
SS Split Spoon
TW Thin Walled Open (Shelby)
WS Wash Sample

ABBREVIATIONS
P.P. Pocket Penetrometer
U.W. Wet Unit Weight
PT Standard Proctor Test
P.L. Point Load Strength Index (I_{50})
RQD Rock Quality Designation
SCR Solid Core Recovery
k Permeability
C Consolidation
DS Direct Shear
GS Grain Size Analysis

ELEV / DEPTH (m)	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	RECOVERY (%)	SPT "N" VALUES or RQD	WELL / PIEZOMETER INSTALLATION	DEPTH (m)	ELEVATION (m)	DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100) / MTO VANE □ INTACT ■ REMOULDED / NILCON VANE △ INTACT ▲ REMOULDED / UNDRAINED SHEAR STRENGTH (kPa) 20 40 60 80 100	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L / WATER CONTENT (%) 20 40 60	PERMEABILITY (cm/s)	REMARKS
352.1	Ground surface												
0.0	BH11-20C shows installation details of shallow standpipe piezometer BH11-20C Refer to BH11-20 for stratigraphic Information							1 2 3	351 350				
349.1													
3.0	**End of Borehole** at 3.0m Standpipe installed with flushmounted steel casing Water Level (b.g.s): At 0.15m on 09-Jan-12												

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RECORD OF BOREHOLE No. BH11-21

PROJECT: Rainy River - Geotechnical Investigation 2011/2012 | ENGINEER: MS

PROJECT NO.: TC113921 | DRILLER: Marathon Drilling | BORING METHOD: 200 mm HSA, NQ Coring | LOGGED BY: PDR

CLIENT: Rainy River Resources. | LOCATION: South of river | COMPILED BY: NH

ELEVATION: 346.495 m | COORD.: N 5,408,466 E 425,055 | BORING DATE: Start: Feb 25, 12 End: Mar 2, 12 | CHECKED BY: DGR

SAMPLE TYPES
AU Auger; BU Bulk; DC Dynamic Cone; RC Rock Core; SS Split Spoon; TW Thin Walled Open (Shelby); WS Wash Sample

ABBREVIATIONS
P.P. Pocket Penetrometer; U.W. Wet Unit Weight; PT Standard Proctor Test; P.L. Point Load Strength Index (I_{50}); RQD Rock Quality Designation; SCR Solid Core Recovery; k Permeability; C Consolidation; DS Direct Shear; GS Grain Size Analysis

ELEV / DEPTH (m)	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	RECOVERY (%)	SPT "N" VALUES or RQD	DEPTH (m)	ELEVATION (m)	DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100) / MTO VANE (□ INTACT ■ REMOULDED) / NILCON VANE (△ INTACT ▲ REMOULDED) / UNDRAINED SHEAR STRENGTH (kPa) 20 40 60 80 100	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L — WATER CONTENT (%) 20 40 60	PERMEABILITY (cm/s)	REMARKS
346.5	Ground surface											
0.0 / 345.7	**TOPSOIL** dark brown peat, trace clay.							346		299		...frozen to 0.8m
0.8 / 345.0	**Silty SAND** Brownish grey silty sand, trace fine gravel, well graded, loose, wet.		2	SS	29	6	1			17		
1.5	**Silty CLAY** Light brown silty clay, trace sand, dark brown lenses, low to medium plasticity, firm, varved, moist [Upper Glaciolacustrine]		3	SS	92	5	2	345		26		
			4	SS	100	5		344		25		
			5	SS	100	6	3			42		
								343		45		
			6	SS	100	5	4	342				
							5			21		
			7	TW	67		6	341				...at 6.1m PP = 73 KPa TV=74 KPa
338.9							7	340				
7.6	**Silty CLAY** Dark grey silty clay, trace fine gravel, occasional silt pockets, firm, moist [WML Till]		8	SS	100	7	8	339				
	...below 9.2m, becoming stiff.							338		36		
			9	SS	100	9	9	337		35		
							10	336				
			10	SS	100	10	11	335		36		
							12					
			11	SS		11		334		35		
							13	333				
			12	SS	100	10	14			37		
								332				
							15					

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RECORD OF BOREHOLE No. BH11-21

PROJECT	Rainy River - Geotechnical Investigation 2011/2012			ENGINEER	MS
PROJECT NO.	TC113921	DRILLER	Marathon Drilling	BORING METHOD	200 mm HSA, NQ Coring	LOGGED BY	PDR
CLIENT	Rainy River Resources.	LOCATION	South of river			COMPILED BY	NH
ELEVATION	346.495 m	COORD.	N 5,408,466 E 425,055	BORING DATE	Start: Feb 25, 12 End: Mar 2, 12	CHECKED BY	DGR

SAMPLE TYPES
AU Auger; BU Bulk; DC Dynamic Cone; RC Rock Core; SS Split Spoon; TW Thin Walled Open (Shelby); WS Wash Sample

ABBREVIATIONS
P.P. Pocket Penetrometer; U.W. Wet Unit Weight; PT Standard Proctor Test; P.L. Point Load Strength Index (I_{50}); RQD Rock Quality Designation; SCR Solid Core Recovery; k Permeability; C Consolidation; DS Direct Shear; GS Grain Size Analysis

ELEV / DEPTH (m)	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	RECOVERY (%)	SPT "N" VALUES or RQD	WELL / PIEZOMETER INSTALLATION	DEPTH (m)	ELEVATION (m)	DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100) / MTO VANE (□ INTACT ■ REMOULDED) / NILCON VANE (△ INTACT ▲ REMOULDED) / UNDRAINED SHEAR STRENGTH (kPa) (20 40 60 80 100)	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L — WATER CONTENT (%) (20 40 60)	PERMEABILITY (cm/s)	REMARKS
	...at 17.2m - 2cm thick light brown sandy layer/lense		13	SS	100	11		16	331		38		...switch to NW wash boring.
			14	SS	100	15		17	330				
			15	SS	100	11		18	329				
			16	SS	100	10		19	328				
			17	SS	100	12		20	327		38		
			18	SS	100	13		22	326				
			19	SS	100	13		23	325		38		
320.6								24	324				
25.9	**Silty CLAY** Dark grey silty clay, varved, stiff, low to medium plasticity, moist [Lower Glaciolacustrine]		20	SS	100	14		25	323		43		
319.4								26	322				
27.1	**SAND AND GRAVEL** Sand and gravel. [Inferred WS Till]		21	RC	45			27	321				...at 27.1m, 1.2m of artesian pressure encountered
			22	RC	67			28	320				
								29	319				
								30	318				
									317				

Continued on Next Page

RECORD OF BOREHOLE No. BH11-21

PROJECT Rainy River - Geotechnical Investigation 2011/2012 ENGINEER MS

PROJECT NO. TC113921 DRILLER Marathon Drilling BORING METHOD 200 mm HSA, NQ Coring LOGGED BY PDR

CLIENT Rainy River Resources. LOCATION South of river COMPILED BY NH

ELEVATION 346.495 m COORD. N 5,408,466 E 425,055 BORING DATE Start: Feb 25, 12 End: Mar 2, 12 CHECKED BY DGR

SAMPLE TYPES
AU Auger
BU Bulk
DC Dynamic Cone
RC Rock Core
SS Split Spoon
TW Thin Walled Open (Shelby)
WS Wash Sample

ABBREVIATIONS
P.P. Pocket Penetrometer
U.W. Wet Unit Weight
PT Standard Proctor Test
P.L. Point Load Strength Index (I_{50})
RQD Rock Quality Designation
SCR Solid Core Recovery
k Permeability
C Consolidation
DS Direct Shear
GS Grain Size Analysis

ELEV / DEPTH (m)	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	RECOVERY (%)	SPT "N" VALUES or RQD	WELL / PIEZOMETER INSTALLATION	DEPTH (m)	ELEVATION (m)	DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100) / MTO VANE (□ INTACT ■ REMOULDED) / NILCON VANE (△ INTACT ▲ REMOULDED) / UNDRAINED SHEAR STRENGTH (kPa) (20 40 60 80 100)	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L / WATER CONTENT (%) (20 40 60)	PERMEABILITY (cm/s)	REMARKS
			23	RC	45			31	316				
314.8									315				
31.7	**BEDROCK** Highly weathered/fractured		24	RC		0		32	314				
			25	RC		0		33	313				
			26	RC	77	0		34	312				
			27	RC	37	0		35	311				
			28	RC	60	0		36	310				
307.2								37	309				
39.3	**End of Borehole** at 39.3m Standpipes installed with flushmounted steel casing Water Level (b.g.s): For Piezometer A (bottom sensing zone) at surface on March 02/12 For Piezometer B (middle sensing zone) at surface on March 02/12							38 39	308				...borehole terminated due to dificult drilling condition

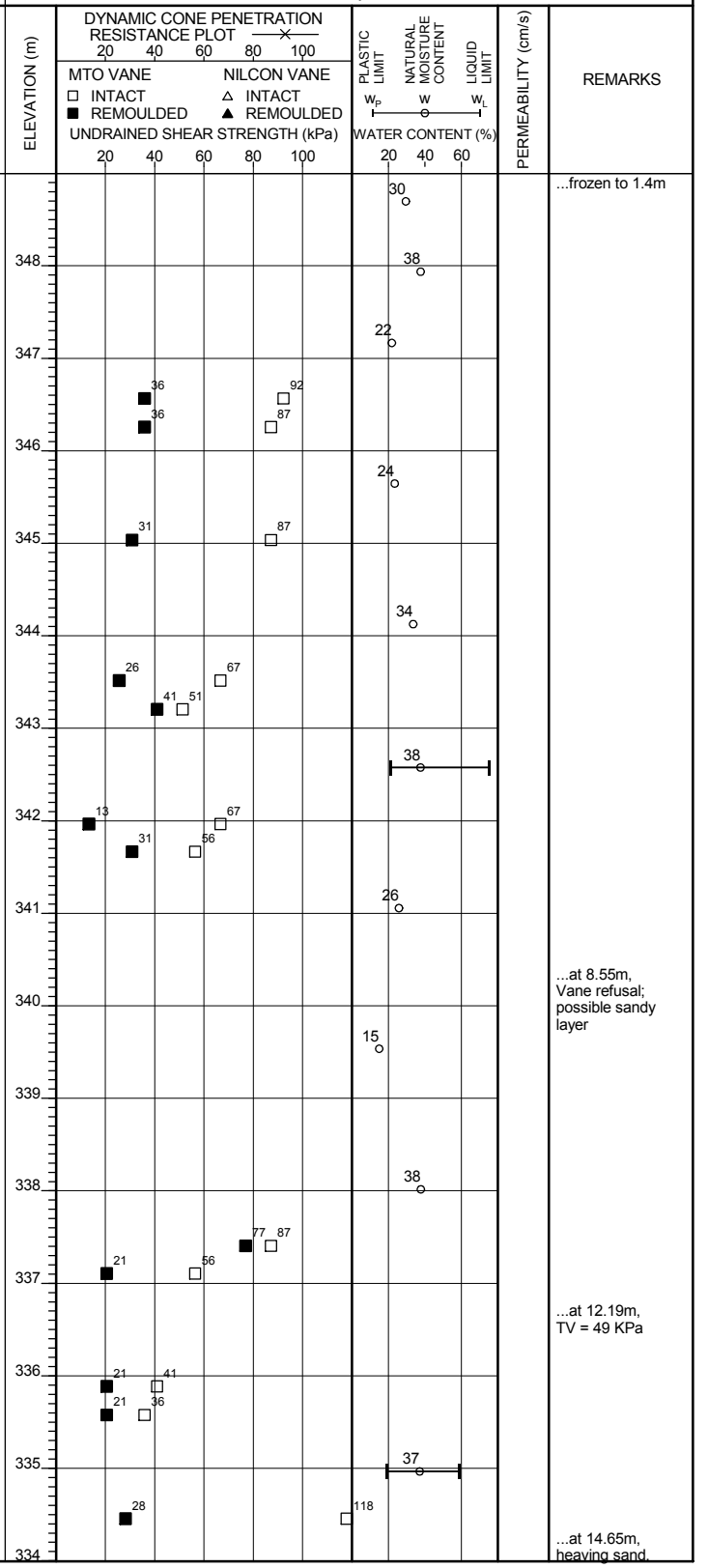
RECORD OF BOREHOLE No. BH11-22

PROJECT	Rainy River - Geotechnical Investigation 2011/2012			ENGINEER	MS
PROJECT NO.	TC113921	DRILLER	Marathon Drilling	BORING METHOD	200 mm HSA, NQ Coring	LOGGED BY	MM
CLIENT	Rainy River Resources.	LOCATION	Open Pit			COMPILED BY	NH
ELEVATION	348.996 m	COORD.	N 5,409,908 E 424,953	BORING DATE	Start: Feb 2, 12 End: Feb 3, 12	CHECKED BY	DGR

SAMPLE TYPES
AU Auger; BU Bulk; DC Dynamic Cone; RC Rock Core; SS Split Spoon; TW Thin Walled Open (Shelby); WS Wash Sample

ABBREVIATIONS
P.P. Pocket Penetrometer; U.W. Wet Unit Weight; PT Standard Proctor Test; P.L. Point Load Strength Index (I_{50}); RQD Rock Quality Designation; SCR Solid Core Recovery; k Permeability; C Consolidation; DS Direct Shear; GS Grain Size Analysis

ELEV / DEPTH (m)	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	RECOVERY (%)	SPT "N" VALUES or RQD	REMARKS
349.0	Ground surface						
0.0 / 348.2	**TOPSOIL** Light brown silty sand, moist, loose, trace organics.		1	SS	96	18	...frozen to 1.4m
0.8 / 344.4	**Silty CLAY** Light brown silty clay, trace sand, varved [Upper Glaciolacustrine]		2	SS	83	7	
			3	SS	100	6	
			6	SS	100	5	
4.6 / 335.3	**Silty CLAY** Grey silty clay, trace sand, moist, medium to high plasticity, soft [WML Till]		9	SS	100	5	
			12	SS	100	4	
	...at 9.15m, 15cm thick grey silty sand layer, trace gravel, compact, wet		15	SS	100	6	
			16	SS	50	15	...at 8.55m, Vane refusal; possible sandy layer
			17	SS	100	6	
			20	TW	95		...at 12.19m, TV = 49 KPa
13.7 / 334.3	**CLAY** Grey clay, trace gravel, trace silt, varved, moist, medium to high plasticity, firm [Lower Glaciolacustrine]		23	SS	100	6	
14.7							...at 14.65m, heaving sand.



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RECORD OF BOREHOLE No. BH11-22

PROJECT	Rainy River - Geotechnical Investigation 2011/2012			ENGINEER	MS
PROJECT NO.	TC113921	DRILLER	Marathon Drilling	BORING METHOD	200 mm HSA, NQ Coring	LOGGED BY	MM
CLIENT	Rainy River Resources.	LOCATION	Open Pit			COMPILED BY	NH
ELEVATION	348.996 m	COORD.	N 5,409,908 E 424,953	BORING DATE	Start: Feb 2, 12 End: Feb 3, 12	CHECKED BY	DGR

SAMPLE TYPES
AU Auger; BU Bulk; DC Dynamic Cone; RC Rock Core; SS Split Spoon; TW Thin Walled Open (Shelby); WS Wash Sample

ABBREVIATIONS
P.P. Pocket Penetrometer; U.W. Wet Unit Weight; PT Standard Proctor Test; P.L. Point Load Strength Index (I_{50}); RQD Rock Quality Designation; SCR Solid Core Recovery; k Permeability; C Consolidation; DS Direct Shear; GS Grain Size Analysis

ELEV / DEPTH (m)	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	RECOVERY (%)	SPT "N" VALUES or RQD	WELL / PIEZOMETER INSTALLATION	DEPTH (m)	ELEVATION (m)	DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100) / MTO VANE (□ INTACT ■ REMOULDED) / NILCON VANE (△ INTACT ▲ REMOULDED) / UNDRAINED SHEAR STRENGTH (kPa) 20 40 60 80 100	PLASTIC LIMIT / NATURAL MOISTURE CONTENT / LIQUID LIMIT (w_P w w_L) / WATER CONTENT (%) 20 40 60	PERMEABILITY (cm/s)	REMARKS
	Silty SAND Grey silty sand, trace gravels, wet, loose [inferred WS Till]							16	333		20		
	...boulders below 16.8m		27	RC				17	332				...at 16.38m; switched to NQ coring.
330.6			28	RC				18	331				
18.4	**BEDROCK**		29	RC	100	22		19	330				
								20	329				
327.5			20	RC	100	97		21	328				
21.5	**End of Borehole** at 21.5m Standpipe installed with flush mounted steel casing. Water Level (bgs): at 0.9 m on Feb04/12												

RECORD OF BOREHOLE No. BH11-23

PROJECT Rainy River - Geotechnical Investigation 2011/2012 | ENGINEER MS

PROJECT NO. TC113921 | DRILLER Marathon Drilling | BORING METHOD 200 mm HSA, NQ Coring | LOGGED BY PDR

CLIENT Rainy River Resources. | LOCATION Open Pit | COMPILED BY NH

ELEVATION 348.143 m | COORD. N 5,409,645 E 425,704 | BORING DATE Start: Jan 7, 12 End: Jan 9, 12 | CHECKED BY DGR

SAMPLE TYPES
AU Auger; BU Bulk; DC Dynamic Cone; RC Rock Core; SS Split Spoon; TW Thin Walled Open (Shelby); WS Wash Sample

ABBREVIATIONS
P.P. Pocket Penetrometer; U.W. Wet Unit Weight; PT Standard Proctor Test; P.L. Point Load Strength Index (I_{50}); RQD Rock Quality Designation; SCR Solid Core Recovery; k Permeability; C Consolidation; DS Direct Shear; GS Grain Size Analysis

ELEV / DEPTH (m)	DESCRIPTION	NUMBER	TYPE	RECOVERY (%)	SPT "N" VALUES or RQD	REMARKS
348.1	Ground Surface					
0.0	**SILTY SAND** Brown silty sand, fine grained, some clay and gravel, some wood, peat.	1	AS			
		2	SS	42		...frozen to 1.3m
346.6						
1.5	**SILT** Light brown silt some clay, varved, firm, low plastic, wet [Upper Glaciolacustrine]	3	SS	50	7	...at 1.5m - SPT sample on possible slough
		4	SS	100	6	
		5	SS	83	10	
343.6						
4.6	**SILTY CLAY** Dark grey clay, some silt and sand, varved, occasional silt lamination, firm, medium plasticity, moist [WML Till]	6	SS	96	6	
		7	TW	67		...at 6.4m PP=49 KPa TV=49 KPa
	...At 7.6m , occasional sand laminations, very soft	8	SS	100		...at 7.6m , SPT spoon sank on its own weight
	...at 9.2m becoming stiff	9	SS	100	9	
		10	SS	100	9	
		11	SS	100	9	...at 12.9m , switched to wash boring
	...soft clay layer between 13.9m and 14.2m	12	SS	100	8	

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RECORD OF BOREHOLE No. BH11-23

PROJECT Rainy River - Geotechnical Investigation 2011/2012 | ENGINEER MS

PROJECT NO. TC113921 | DRILLER Marathon Drilling | BORING METHOD 200 mm HSA, NQ Coring | LOGGED BY PDR

CLIENT Rainy River Resources. | LOCATION Open Pit | COMPILED BY NH

ELEVATION 348.143 m | COORD. N 5,409,645 E 425,704 | BORING DATE Start: Jan 7, 12 End: Jan 9, 12 | CHECKED BY DGR

SAMPLE TYPES
AU Auger; BU Bulk; DC Dynamic Cone; RC Rock Core; SS Split Spoon; TW Thin Walled Open (Shelby); WS Wash Sample

ABBREVIATIONS
P.P. Pocket Penetrometer; U.W. Wet Unit Weight; PT Standard Proctor Test; P.L. Point Load Strength Index (I_{50}); RQD Rock Quality Designation; SCR Solid Core Recovery; k Permeability; C Consolidation; DS Direct Shear; GS Grain Size Analysis

ELEV / DEPTH (m)	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	RECOVERY (%)	SPT "N" VALUES or RQD	WELL / PIEZOMETER INSTALLATION	DEPTH (m)	ELEVATION (m)	REMARKS
	...at 15.25m occasional pockets of sandy silt		13	SS	100	11		16	332	
			14	TW	100			17	331	...at 17.1m PP=73 KPa TV=83 KPa
			15	SS	100	11		18	330	
			16	SS	100	11		19	329	
			17	SS	100	13		20	328	
			18	SS	100	12		22	327	
			19	SS	100	13		23	326	
			20	SS	100	13		24	325	
			21	SS	100	14		25	324	
			22	SS	100	15		26	323	
								27	322	
								28	321	
								29	320	
								30	319	

DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100)
MTO VANE: □ INTACT ■ REMOULDED
NILCON VANE: △ INTACT ▲ REMOULDED
UNDRAINED SHEAR STRENGTH (kPa) 20 40 60 80 100

PLASTIC LIMIT w_P | NATURAL MOISTURE CONTENT w | LIQUID LIMIT w_L
WATER CONTENT (%) 20 40 60

Plotted values: 34; 31; 29; 28; 33; 40; 43; 42; 51; 89

PERMEABILITY (cm/s)

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RECORD OF BOREHOLE No. BH11-23

PROJECT	Rainy River - Geotechnical Investigation 2011/2012			ENGINEER	MS
PROJECT NO.	TC113921	DRILLER	Marathon Drilling	BORING METHOD	200 mm HSA, NQ Coring	LOGGED BY	PDR
CLIENT	Rainy River Resources.	LOCATION	Open Pit			COMPILED BY	NH
ELEVATION	348.143 m	COORD.	N 5,409,645 E 425,704	BORING DATE	Start: Jan 7, 12 End: Jan 9, 12	CHECKED BY	DGR

SAMPLE TYPES
AU Auger
BU Bulk
DC Dynamic Cone
RC Rock Core
SS Split Spoon
TW Thin Walled Open (Shelby)
WS Wash Sample

ABBREVIATIONS
P.P. Pocket Penetrometer
U.W. Wet Unit Weight
PT Standard Proctor Test
P.L. Point Load Strength Index (I_{50})
RQD Rock Quality Designation
SCR Solid Core Recovery
k Permeability
C Consolidation
DS Direct Shear
GS Grain Size Analysis

ELEV / DEPTH (m)	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	RECOVERY (%)	SPT "N" VALUES or RQD	WELL / PIEZOMETER INSTALLATION	DEPTH (m)	ELEVATION (m)	DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100) / MTO VANE □ INTACT ■ REMOULDED / NILCON VANE △ INTACT ▲ REMOULDED / UNDRAINED SHEAR STRENGTH (kPa) (20 40 60 80 100)	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L / WATER CONTENT (%) (20 40 60)	PERMEABILITY (cm/s)	REMARKS
317.7								31	318				
30.5	**SANDY GRAVEL Silty** Grey sandy gravel, trace clay, dense to very dense [WS Till]		23	SS		51/0.15		32	317		16		...at 30.6m ,SPT sampler bouncing on possible boulder; switched to NQ coring
	Heaving sands from 34.4m to 35.05m							33	316				
								34	315				
								35	314				
								36	313				
310.0								37	312				
38.1	**End of Borehole** at 38.1m Standpipes installed with flush mounted steel casing. Water Level (bgs): For piezometer A (bottom sensing zone) at 0.27m on Jan10/12 frozen on Jan14/12 For piezometer B (top sensing zone) at 0.82m on Jan10/12 frozen on Jan14/12							38	311				

RECORD OF BOREHOLE No. BH11-24

PROJECT Rainy River - Geotechnical Investigation 2011/2012 | ENGINEER MS

PROJECT NO. TC113921 | DRILLER Marathon Drilling | BORING METHOD 200 mm HSA, NQ Coring | LOGGED BY PDR

CLIENT Rainy River Resources. | LOCATION Mine Rock Stockpile | COMPILED BY SM

ELEVATION 354 m | COORD. N 5,408,843 E 426,940 | BORING DATE Start: Mar 13, 12 End: Mar 14, 12 | CHECKED BY DGR

SAMPLE TYPES
AU Auger; BU Bulk; DC Dynamic Cone; RC Rock Core; SS Split Spoon; TW Thin Walled Open (Shelby); WS Wash Sample

ABBREVIATIONS
P.P. Pocket Penetrometer; U.W. Wet Unit Weight; PT Standard Proctor Test; P.L. Point Load Strength Index (I_{50}); RQD Rock Quality Designation; SCR Solid Core Recovery; k Permeability; C Consolidation; DS Direct Shear; GS Grain Size Analysis

ELEV / DEPTH (m)	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	RECOVERY (%)	SPT "N" VALUES or RQD	DEPTH (m)	ELEVATION (m)	REMARKS
354.0	Ground Surface								
0.0 / 353.2	**TOPSOIL** Dark brown sandy silt muskeg, occasional rootlets		1	AS					...frozen to 0.6m
0.8 / 349.4	**Silty CLAY** Light brown silty clay, trace sand lensing, varved, firm, medium plasticity, moist [Glaciolacustrine] ...at 1.52m trace fine gravel, stiff		2	SS	75	7	1	353	
			3	SS	88	10	2	352	
			4	SS	100	13	3	351	
			5	SS	100	11	4	350	
4.6	**Silty CLAY** Dark greyish brown silty clay, trace to some fine gravel, occasional silt pockets, stiff, medium plasticity, moist [WML Till]		8	SS	100	10	5	349	
			11	SS	100	10	6	348	
			14	SS	100	9	7	347	
			17	SS	100	7	8	346	
			20	SS	100	11	9	345	
			23	SS	92	12	10	344	
			24	SS	100	10	11	343	
							12	342	
							13	341	
							14	340	
							15	339	

WELL / PIEZOMETER INSTALLATION

DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100)

MTO VANE: □ INTACT ■ REMOULDED
NILCON VANE: △ INTACT ▲ REMOULDED
UNDRAINED SHEAR STRENGTH (kPa) (20 40 60 80 100)

PLASTIC LIMIT w_P | NATURAL MOISTURE CONTENT w | LIQUID LIMIT w_L
WATER CONTENT (%) (20 40 60)

PERMEABILITY (cm/s)

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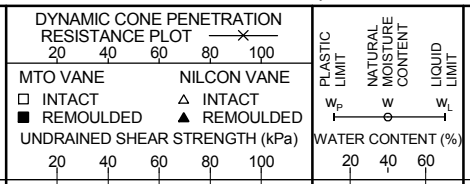
RECORD OF BOREHOLE No. BH11-24

PROJECT	Rainy River - Geotechnical Investigation 2011/2012			ENGINEER	MS
PROJECT NO.	TC113921	DRILLER	Marathon Drilling	BORING METHOD	200 mm HSA, NQ Coring	LOGGED BY	PDR
CLIENT	Rainy River Resources.	LOCATION	Mine Rock Stockpile			COMPILED BY	SM
ELEVATION	354 m	COORD.	N 5,408,843 E 426,940	BORING DATE	Start: Mar 13, 12 End: Mar 14, 12	CHECKED BY	DGR

SAMPLE TYPES
AU Auger; BU Bulk; DC Dynamic Cone; RC Rock Core; SS Split Spoon; TW Thin Walled Open (Shelby); WS Wash Sample

ABBREVIATIONS
P.P. Pocket Penetrometer; U.W. Wet Unit Weight; PT Standard Proctor Test; P.L. Point Load Strength Index (I_{50}); RQD Rock Quality Designation; SCR Solid Core Recovery; k Permeability; C Consolidation; DS Direct Shear; GS Grain Size Analysis

ELEV / DEPTH (m)	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	RECOVERY (%)	SPT "N" VALUES or RQD	WELL / PIEZOMETER INSTALLATION	DEPTH (m)	ELEVATION (m)	REMARKS
	...at 15.25m firm		25	SS	100	5		16	338	...at 15.9m switched to washboring
			28	SS	100	10		17	337	
335.7								18	336	
18.3	**Silty CLAY**		31	SS	100	8		19	335	
335.1	Dark grey clay some light grey silt, varved, firm, low plasticity, moist									
18.9	[Lower Glaciolacustrine]		32	BS						
334.8										
19.2	**BOULDERS** [inferred WS Till]		33	RC	97	58		20	334	...at 19.2m switched to NQ coring
	BEDROCK		34	RC	98	38		22	332	
			35	RC	95	75		23	331	
			36	RC	100	67		24	330	
			37	RC	97	40		26	328	
			38	RC	100	50		27	327	
			39	RC	100	100		29	325	
								30	324	



PERMEABILITY (cm/s)

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RECORD OF BOREHOLE No. BH11-24

PROJECT	Rainy River - Geotechnical Investigation 2011/2012			ENGINEER	MS
PROJECT NO.	TC113921	DRILLER	Marathon Drilling	BORING METHOD	200 mm HSA, NQ Coring	LOGGED BY	PDR
CLIENT	Rainy River Resources.	LOCATION	Mine Rock Stockpile			COMPILED BY	SM
ELEVATION	354 m	COORD.	N 5,408,843 E 426,940	BORING DATE	Start: Mar 13, 12 End: Mar 14, 12	CHECKED BY	DGR

SAMPLE TYPES
AU Auger
BU Bulk
DC Dynamic Cone
RC Rock Core
SS Split Spoon
TW Thin Walled Open (Shelby)
WS Wash Sample

ABBREVIATIONS
P.P. Pocket Penetrometer
U.W. Wet Unit Weight
PT Standard Proctor Test
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RQD Rock Quality Designation
SCR Solid Core Recovery
k Permeability
C Consolidation
DS Direct Shear
GS Grain Size Analysis

ELEV / DEPTH (m)	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	RECOVERY (%)	SPT "N" VALUES or RQD	WELL / PIEZOMETER INSTALLATION	DEPTH (m)	ELEVATION (m)	DYNAMIC CONE PENETRATION RESISTANCE PLOT 20 40 60 80 100 / MTO VANE □ INTACT ■ REMOULDED / NILCON VANE △ INTACT ▲ REMOULDED / UNDRAINED SHEAR STRENGTH (kPa) 20 40 60 80 100	PLASTIC LIMIT w_P	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w_L / WATER CONTENT (%) 20 40 60	PERMEABILITY (cm/s)	REMARKS
			40	RC	100	87		31	323						
			41	RC	100	52		32	322						
			42	RC	100	80		33	321						
319.6								34	320						
34.4	**End of Borehole** at 34.44m Standpipes installed with flush mounted steel casing Water level (b.g.s): For Piezometer A (bottom sensing zone) 1.67m on March 14/12 For Piezometer B (top sensing zone) 0.35 on April 22/12														

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RECORD OF BOREHOLE No. BH11-25

PROJECT	Rainy River - Geotechnical Investigation 2011/2012			ENGINEER	MS
PROJECT NO.	TC113921	DRILLER	Marathon Drilling	BORING METHOD	200 mm HSA, NQ Coring	LOGGED BY	PDR
CLIENT	Rainy River Resources.	LOCATION	Mine Rock Stockpile			COMPILED BY	SM
ELEVATION	358.780 m	COORD.	N 5,409,122 E 427,302	BORING DATE	Start: Mar 15, 12 End: Mar 16, 12	CHECKED BY	DGR

SAMPLE TYPES
AU Auger; BU Bulk; DC Dynamic Cone; RC Rock Core; SS Split Spoon; TW Thin Walled Open (Shelby); WS Wash Sample

ABBREVIATIONS
P.P. Pocket Penetrometer; U.W. Wet Unit Weight; PT Standard Proctor Test; P.L. Point Load Strength Index (I_{50}); RQD Rock Quality Designation; SCR Solid Core Recovery; k Permeability; C Consolidation; DS Direct Shear; GS Grain Size Analysis

ELEV / DEPTH (m)	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	RECOVERY (%)	SPT "N" VALUES or RQD	WELL / PIEZOMETER INSTALLATION	DEPTH (m)	ELEVATION (m)	DYNAMIC CONE PENETRATION RESISTANCE PLOT / MTO VANE / NILCON VANE / UNDRAINED SHEAR STRENGTH (kPa)	PLASTIC LIMIT / NATURAL MOISTURE CONTENT / LIQUID LIMIT / WATER CONTENT (%)	PERMEABILITY (cm/s)	REMARKS
358.8	Ground Surface												
0.0	**Silty CLAY** Brown silty clay, some sand, trace fine gravel, low plasticity, occasional rootlets		1	AS							30		...frozen to 0.8m
358.0													
0.8	**Silty CLAY** Light brown silty clay, some sand, trace gravel, varved, very stiff, low plasticity, moist, trace oxidation [Upper Glaciolacustrine]		2	SS	75	18		1	358		18		
			3	SS	96	17		2	357		14		
	...at 2.3m becoming stiff		4	SS	92	14		3	356		17		
			5	SS	96	13	▽	4	355		17		
354.2													
4.6	**Silty CLAY** Dark grey silty clay, trace to some sand, trace gravel, occasional silt lenses, stiff, medium plasticity, moist [WML Till]		6	SS	100	12		5	354		18		
	...at 6.1m becoming firm, no gravel		7	SS	100	6		6	353		27		
			10	SS	100	8		7	352	50, 72, 98, 128	24		
	...at 9.15m trace gravel		13	SS	100	4		8	351	37, 42, 81, 78			
			16	SS	100	4		9	350		41		
	...at 12.2m stiff		19	SS	100	10		10	349	40, 37, 91, 85			
								11	348		42		
	...at 13.7m very stiff		22	SS	100	20		12	347	37, 44, 80, 83			
								13	346		18		
								14	345		19		
								15	344				

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RECORD OF BOREHOLE No. BH11-25

PROJECT	Rainy River - Geotechnical Investigation 2011/2012			ENGINEER	MS
PROJECT NO.	TC113921	DRILLER	Marathon Drilling	BORING METHOD	200 mm HSA, NQ Coring	LOGGED BY	PDR
CLIENT	Rainy River Resources.	LOCATION	Mine Rock Stockpile			COMPILED BY	SM
ELEVATION	358.780 m	COORD.	N 5,409,122 E 427,302	BORING DATE	Start: Mar 15, 12 End: Mar 16, 12	CHECKED BY	DGR

SAMPLE TYPES
AU Auger; BU Bulk; DC Dynamic Cone; RC Rock Core; SS Split Spoon; TW Thin Walled Open (Shelby); WS Wash Sample

ABBREVIATIONS
P.P. Pocket Penetrometer; U.W. Wet Unit Weight; PT Standard Proctor Test; P.L. Point Load Strength Index (I_{50}); RQD Rock Quality Designation; SCR Solid Core Recovery; k Permeability; C Consolidation; DS Direct Shear; GS Grain Size Analysis

ELEV / DEPTH (m)	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	RECOVERY (%)	SPT "N" VALUES or RQD	WELL / PIEZOMETER INSTALLATION	DEPTH (m)	ELEVATION (m)	DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100) / MTO VANE (□ INTACT ■ REMOULDED) / NILCON VANE (△ INTACT ▲ REMOULDED) / UNDRAINED SHEAR STRENGTH (kPa)	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L / WATER CONTENT (%) (20 40 60)	PERMEABILITY (cm/s)	REMARKS
	...at 15.25m some gravel		23	SS	58	17		16	343		22		...at 15.3m switched to washboring
			24	TW				17	342				
								18	341				...at 17.5m PP = 73 KPa Torvane = 25 KPa
			25	TW				19	340				...at 18.6m PP = 73 KPa Torvane = 25 KPa
338.4	... at 19.8m gravel, trace sand, hard, low plasticity, moist		26	SS	17	46		20	339		10		
20.4	**BOULDERS** [Inferred WS Till]		27	RC				21	338				...at 20.4m switched to NQ coring
333.6								22	337				
25.2	**BEDROCK**		28	RC	95	85		23	336				
330.6			29	RC	97	85		24	335				
28.2	**End of Borehole** at 28.19m Standpipes installed with flush mounted steel casing Water level (b.g.s): For Piezometer A at 3.35m on Mar 16/12							25	334				
								26	333				
								27	332				
								28	331				

RECORD OF BOREHOLE No. BH11-27

PROJECT: Rainy River - Geotechnical Investigation 2011/2012 | ENGINEER: MS

PROJECT NO.: TC113921 | DRILLER: Marathon Drilling | BORING METHOD: 200 mm HSA, NQ Coring | LOGGED BY: SM

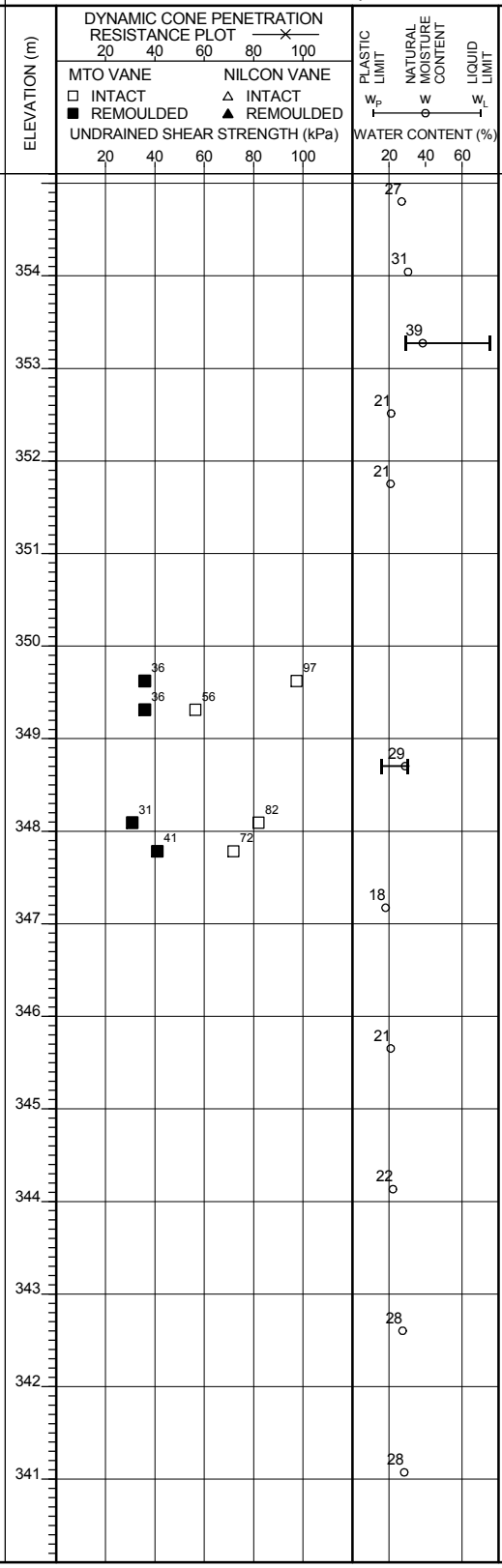
CLIENT: Rainy River Resources. | LOCATION: Mine Rock Stockpile | COMPILED BY: SM

ELEVATION: 355.103 m | COORD.: N 5,408,603 E 427,269 | BORING DATE: Start: Mar 14, 12 End: Mar 17, 12 | CHECKED BY: DGR

SAMPLE TYPES
AU Auger; BU Bulk; DC Dynamic Cone; RC Rock Core; SS Split Spoon; TW Thin Walled Open (Shelby); WS Wash Sample

ABBREVIATIONS
P.P. Pocket Penetrometer; U.W. Wet Unit Weight; PT Standard Proctor Test; P.L. Point Load Strength Index (I_{50}); RQD Rock Quality Designation; SCR Solid Core Recovery; k Permeability; C Consolidation; DS Direct Shear; GS Grain Size Analysis

ELEV / DEPTH (m)	DESCRIPTION	NUMBER	TYPE	RECOVERY (%)	SPT "N" VALUES or RQD	REMARKS
355.1	Ground Surface					
0.0	**TOPSOIL** Brown silty clay, trace to some sand, stiff, rootlets and organics	1	SS	100	21	...frozen to 1.2m
353.9		2	SS	83	16	
1.2	**SILTY CLAY** Greyish brown silty clay, trace sand and gravel, stiff, medium plasticity, damp to moist. [Upper Glaciolacustrine]	3	SS	88	9	
	...at 1.5m varved, medium to high plasticity, trace mottled brown lenses	4	SS	100	9	
	...at 3.0 m trace to some sand and gravel, rounded to subangular	5	SS	100	9	
350.5						
4.6	**SILTY CLAY** Greyish brown silty clay, firm to stiff, medium to high plasticity, moist. [WML Till]	6	SS	100	5	
		9	SS	100	6	
		12	SS	100	9	
	...at 9.1m becoming dark grey, trace to some sand and gravel (subangular)	14	SS	71	9	
		15	SS	100	12	
	...at 12.6m , 5cm thick sand lense	16	SS	100	9	...at 12.2 switched to washboring
	...at 13.7m occasional silty pockets	18	SS	100	9	



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RECORD OF BOREHOLE No. BH11-27

PROJECT Rainy River - Geotechnical Investigation 2011/2012 | ENGINEER MS

PROJECT NO. TC113921 | DRILLER Marathon Drilling | BORING METHOD 200 mm HSA, NQ Coring | LOGGED BY SM

CLIENT Rainy River Resources. | LOCATION Mine Rock Stockpile | COMPILED BY SM

ELEVATION 355.103 m | COORD. N 5,408,603 E 427,269 | BORING DATE Start: Mar 14, 12 End: Mar 17, 12 | CHECKED BY DGR

SAMPLE TYPES
AU Auger; BU Bulk; DC Dynamic Cone; RC Rock Core; SS Split Spoon; TW Thin Walled Open (Shelby); WS Wash Sample

ABBREVIATIONS
P.P. Pocket Penetrometer; U.W. Wet Unit Weight; PT Standard Proctor Test; P.L. Point Load Strength Index (I_{50}); RQD Rock Quality Designation; SCR Solid Core Recovery; k Permeability; C Consolidation; DS Direct Shear; GS Grain Size Analysis

ELEV / DEPTH (m)	DESCRIPTION	NUMBER	TYPE	RECOVERY (%)	SPT "N" VALUES or RQD	REMARKS
	...at 16.8m becoming firm	19	SS	100	8	
		21	SS	100	5	
336.4		24	SS	100	8	
18.7	**Silty CLAY** Greyish green silty clay, varved, firm, medium plasticity, moist. [Lower Glaciolacustrine]					
335.3						
19.8	**Sandy GRAVEL AND SILT** Grey sandy gravel, trace clay, angular, dense, wet [inferred WS Till]	26	SS	13	36	
		27	SS	25	49	
	...below 22.3m occasional boulders					
327.2						
27.9	**BEDROCK** Grey fractured	28	RC	84	67	...switched to NQ coring at 27.9 m

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RECORD OF BOREHOLE No. BH11-27

PROJECT Rainy River - Geotechnical Investigation 2011/2012 ENGINEER MS

PROJECT NO. TC113921 DRILLER Marathon Drilling BORING METHOD 200 mm HSA, NQ Coring LOGGED BY SM

CLIENT Rainy River Resources. LOCATION Mine Rock Stockpile COMPILED BY SM

ELEVATION 355.103 m COORD. N 5,408,603 E 427,269 BORING DATE Start: Mar 14, 12 End: Mar 17, 12 CHECKED BY DGR

SAMPLE TYPES
AU Auger
BU Bulk
DC Dynamic Cone
RC Rock Core
SS Split Spoon
TW Thin Walled Open (Shelby)
WS Wash Sample

ABBREVIATIONS
P.P. Pocket Penetrometer
U.W. Wet Unit Weight
PT Standard Proctor Test
P.L. Point Load Strength Index (I_{50})
RQD Rock Quality Designation
SCR Solid Core Recovery
k Permeability
C Consolidation
DS Direct Shear
GS Grain Size Analysis

ELEV / DEPTH (m)	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	RECOVERY (%)	SPT "N" VALUES or RQD	WELL / PIEZOMETER INSTALLATION	DEPTH (m)	ELEVATION (m)	DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100) / MTO VANE □ INTACT ■ REMOULDED / NILCON VANE △ INTACT ▲ REMOULDED / UNDRAINED SHEAR STRENGTH (kPa) (20 40 60 80 100)	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L / WATER CONTENT (%) (20 40 60)	PERMEABILITY (cm/s)	REMARKS
	...bedrock highly fractured between 29.8m and 31.1m		29	RC	100	50		31	324				
			30	RC	100	68		32	323				
	...slightly fractured below 32.7m		31	RC	100	92		33	322				
319.4			32	RC	100	93		34	321				
35.7	**End of Borehole** at 35.7m Standpipe installed with flush mounted steel casing. Water level(b.g.s): at 0.87m on March 17/2012							35	320				

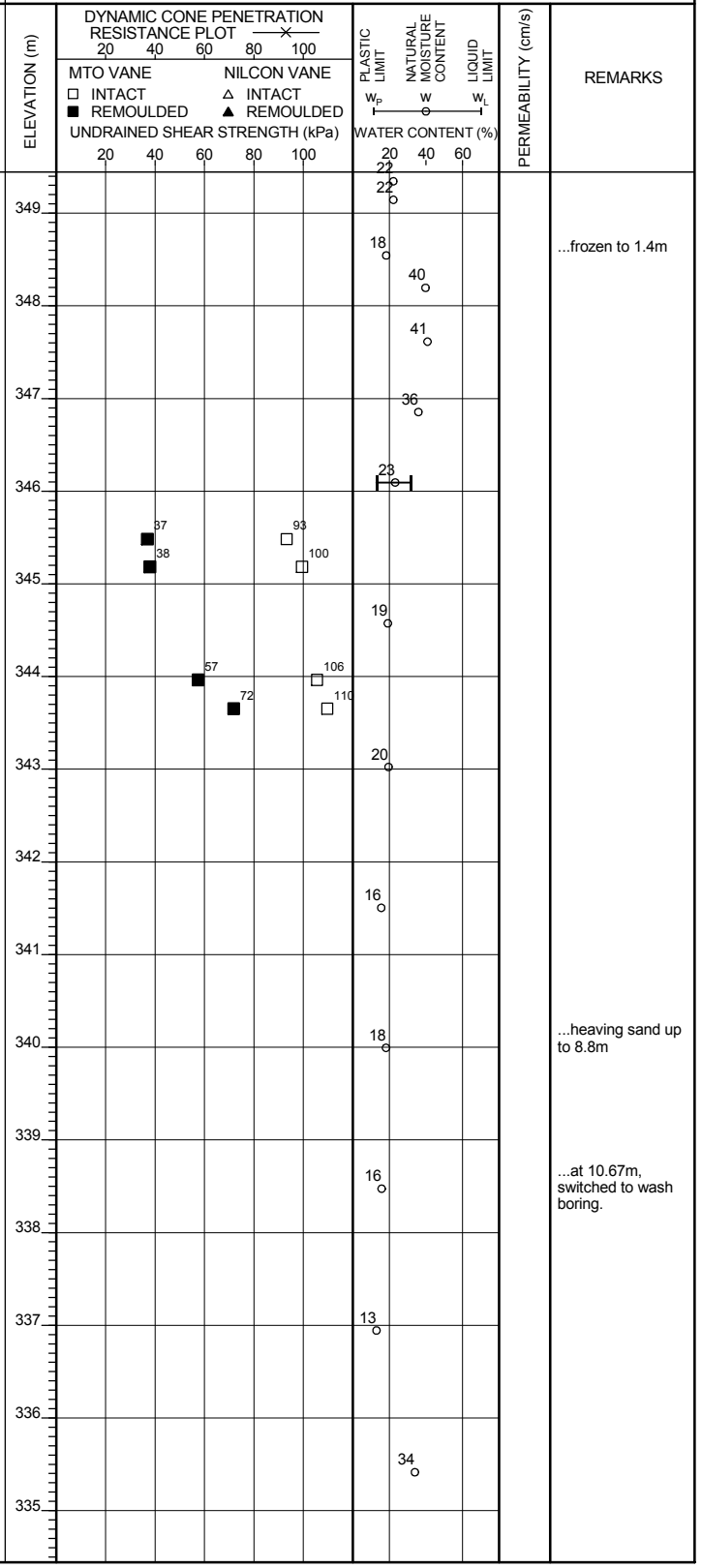
RECORD OF BOREHOLE No. BH11-28

PROJECT	Rainy River - Geotechnical Investigation 2011/2012			ENGINEER	MS
PROJECT NO.	TC113921	DRILLER	Marathon Drilling	BORING METHOD	200 mm HSA, NQ Coring	LOGGED BY	PDR
CLIENT	Rainy River Resources.	LOCATION	South of Open Pit			COMPILED BY	NH
ELEVATION	349.444 m	COORD.	N 5,408,218 E 426,325	BORING DATE	Start: Feb 12, 12 End: Feb 23, 12	CHECKED BY	DGR

SAMPLE TYPES
AU Auger; BU Bulk; DC Dynamic Cone; RC Rock Core; SS Split Spoon; TW Thin Walled Open (Shelby); WS Wash Sample

ABBREVIATIONS
P.P. Pocket Penetrometer; U.W. Wet Unit Weight; PT Standard Proctor Test; P.L. Point Load Strength Index (I_{50}); RQD Rock Quality Designation; SCR Solid Core Recovery; k Permeability; C Consolidation; DS Direct Shear; GS Grain Size Analysis

ELEV / DEPTH (m)	DESCRIPTION	NUMBER	TYPE	RECOVERY (%)	SPT "N" VALUES or RQD	REMARKS
349.4	Ground surface					
0.0	**Silty SAND** Light brown silty sand, fine, trace clay, oxidised, woods.	1	AS			
348.6	...organics at top.					...frozen to 1.4m
0.9	**Silty CLAY** Dark brown silty clay, light brown lenses, medium plasticity, stiff, moist [Upper Glaciolacustrine]	2	SS	83	16	
		3	SS	88	9	
		4	SS	96	9	
		5	SS	96	7	
344.9						
4.6	**Silty CLAY** Grey silty clay, trace gravel, trace sand, light grey lenses, medium plasticity, firm, moist [WML Till]	8	SS	100	7	
		11	SS	67	10	
	...below 7.63m, wet, hard	12	SS	21	27	
341.2						
8.2	**GRAVELLY SAND** Grey sand and gravel, trace clay, some silt, poorly graded, compact, wet [Glaciofluvial]	13	AS			
		14	SS	50	20	...heaving sand up to 8.8m
		15	SS	33	34	...at 10.67m, switched to wash boring.
		16	SS	54	42	
335.7						
13.7	**Silty CLAY** Dark grey silty clay, trace light brown lenses, occasional silt pockets, very stiff, medium plasticity [WML Till]	17	SS	100	16	



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RECORD OF BOREHOLE No. BH11-28

PROJECT Rainy River - Geotechnical Investigation 2011/2012 | ENGINEER MS

PROJECT NO. TC113921 | DRILLER Marathon Drilling | BORING METHOD 200 mm HSA, NQ Coring | LOGGED BY PDR

CLIENT Rainy River Resources. | LOCATION South of Open Pit | COMPILED BY NH

ELEVATION 349.444 m | COORD. N 5,408,218 E 426,325 | BORING DATE Start: Feb 12, 12 End: Feb 23, 12 | CHECKED BY DGR

SAMPLE TYPES
AU Auger; BU Bulk; DC Dynamic Cone; RC Rock Core; SS Split Spoon; TW Thin Walled Open (Shelby); WS Wash Sample

ABBREVIATIONS
P.P. Pocket Penetrometer; U.W. Wet Unit Weight; PT Standard Proctor Test; P.L. Point Load Strength Index (I_{50}); RQD Rock Quality Designation; SCR Solid Core Recovery; k Permeability; C Consolidation; DS Direct Shear; GS Grain Size Analysis

ELEV / DEPTH (m)	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	RECOVERY (%)	SPT "N" VALUES or RQD	WELL / PIEZOMETER INSTALLATION	DEPTH (m)	ELEVATION (m)	DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100) / MTO VANE: INTACT, REMOULDED / NILCON VANE: INTACT, REMOULDED / UNDRAINED SHEAR STRENGTH (kPa) 20 40 60 80 100	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L / WATER CONTENT (%) 20 40 60	PERMEABILITY (cm/s)	REMARKS
			20	TW	100			16	334				...at 16m PP=49 KPa TV=49 KPa
332.7													
16.8	**Silty CLAY** Dark grey silty clay, trace gravel, varved, low plasticity, wet [Lower Glaciolacustrine]		23 A&B	SS		25		17	333		30 14		
332.1									332				
17.4	**BOULDERS** [inferred WS Till]		24	RC				18	331				...at 17.4m, 1m of artesian pressure encountered
329.0								19	330				
20.4	**BEDROCK**		26	RC	97	28		20	329				
								21	328				
			27	RC	98	97		22	327				
325.7								23	326				
23.8	**End of Borehole** Standpipe installed with flush mounted steel casing. Water level(b.g.s): at 3.05m on February 23/2012		25	RC									

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RECORD OF BOREHOLE No. BH11-28

PROJECT	Rainy River - Geotechnical Investigation 2011/2012			ENGINEER	MS
PROJECT NO.	TC113921	DRILLER	Marathon Drilling	BORING METHOD	200 mm HSA, NQ Coring	LOGGED BY	PDR
CLIENT	Rainy River Resources.	LOCATION	South of Open Pit			COMPILED BY	NH
ELEVATION	349.444 m	COORD.	N 5,408,218 E 426,325	BORING DATE	Start: Feb 12, 12 End: Feb 23, 12	CHECKED BY	DGR

SAMPLE TYPES
AU Auger
BU Bulk
DC Dynamic Cone
RC Rock Core
SS Split Spoon
TW Thin Walled Open (Shelby)
WS Wash Sample

ABBREVIATIONS
P.P. Pocket Penetrometer
U.W. Wet Unit Weight
PT Standard Proctor Test
P.L. Point Load Strength Index (I_{50})
RQD Rock Quality Designation
SCR Solid Core Recovery
k Permeability
C Consolidation
DS Direct Shear
GS Grain Size Analysis

ELEV / DEPTH (m)	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	RECOVERY (%)	SPT "N" VALUES or RQD	WELL / PIEZOMETER INSTALLATION	DEPTH (m)	ELEVATION (m)	DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100); MTO VANE: INTACT / REMOULDED; NILCON VANE: INTACT / REMOULDED; UNDRAINED SHEAR STRENGTH (kPa) (20 40 60 80 100)	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L; WATER CONTENT (%) (20 40 60)	PERMEABILITY (cm/s)	REMARKS
	SOIL PROFILE	SAMPLES											

RECORD OF BOREHOLE No. BH11-29

PROJECT Rainy River - Geotechnical Investigation 2011/2012 | ENGINEER MS

PROJECT NO. TC113921 | DRILLER Marathon Drilling | BORING METHOD 200 mm HSA, NQ Coring | LOGGED BY PDR

CLIENT Rainy River Resources. | LOCATION South of Pinewood River | COMPILED BY NH

ELEVATION 345.784 m | COORD. N 5,408,528 E 424,526 | BORING DATE Start: Mar 2, 12 End: Mar 5, 12 | CHECKED BY DGR

SAMPLE TYPES
AU Auger; BU Bulk; DC Dynamic Cone; RC Rock Core; SS Split Spoon; TW Thin Walled Open (Shelby); WS Wash Sample

ABBREVIATIONS
P.P. Pocket Penetrometer; U.W. Wet Unit Weight; PT Standard Proctor Test; P.L. Point Load Strength Index (I_{50}); RQD Rock Quality Designation; SCR Solid Core Recovery; k Permeability; C Consolidation; DS Direct Shear; GS Grain Size Analysis

ELEV / DEPTH (m)	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	RECOVERY (%)	SPT "N" VALUES or RQD	DEPTH (m)	ELEVATION (m)	REMARKS
345.8	Ground surface								
0.0 / 345.0	**TOPSOIL** Dark brown fibrous peat.		1	AS					...frozen to 0.6m
0.8 / 344.3	**Silty CLAY** Light brown silty clay, soft. ...at 0.79m, grey sandy clay, low plasticity, soft.		2	SS	17	3	1	345	
1.5	**Silty CLAY** Grey silty clay, some sand, low plasticity, varved, moist, firm, trace oxidised pockets [Upper Glaciolacustrine]		3	SS	63	4	2	344	
			4	AS	100		3	343	
			5	TW	100		4	342	...at 3.35m, TV=25 KPa
341.2									
4.6	**Silty CLAY** Dark grey silty clay, trace sand, medium to high plasticity, stiff, moist. [WML Till]		6	SS	96	6	5	341	
			7	SS	100	5	6	340	
	...below 7.63m, trace fine gravel.		8	SS	75	5	7	339	
			9	SS	100	11	8	338	
			10	SS	100	7	9	337	
			11	SS	100	7	10	336	
			12	SS	100	12	11	335	...at 10.7m, switched to wash boring.
							12	334	
							13	333	
							14	332	
							15	331	

WELL / PIEZOMETER INSTALLATION

DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100)

MTO VANE: □ INTACT ■ REMOULDED
NILCON VANE: △ INTACT ▲ REMOULDED
UNDRAINED SHEAR STRENGTH (kPa) 20 40 60 80 100

PLASTIC LIMIT w_P | NATURAL MOISTURE CONTENT w | LIQUID LIMIT w_L
WATER CONTENT (%) 20 40 60

ELEVATION (m)	PLASTIC LIMIT	NATURAL MOISTURE CONTENT	LIQUID LIMIT
345		27	
344		26	
343		35	
341		23	
340			53
338		20	
336		33	
335		38	
333		38	
332		33	

PERMEABILITY (cm/s)

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RECORD OF BOREHOLE No. BH11-29

PROJECT Rainy River - Geotechnical Investigation 2011/2012 | ENGINEER MS

PROJECT NO. TC113921 | DRILLER Marathon Drilling | BORING METHOD 200 mm HSA, NQ Coring | LOGGED BY PDR

CLIENT Rainy River Resources. | LOCATION South of Pinewood River | COMPILED BY NH

ELEVATION 345.784 m | COORD. N 5,408,528 E 424,526 | BORING DATE Start: Mar 2, 12 End: Mar 5, 12 | CHECKED BY DGR

SAMPLE TYPES
AU Auger
BU Bulk
DC Dynamic Cone
RC Rock Core
SS Split Spoon
TW Thin Walled Open (Shelby)
WS Wash Sample

ABBREVIATIONS
P.P. Pocket Penetrometer
U.W. Wet Unit Weight
PT Standard Proctor Test
P.L. Point Load Strength Index (I_{50})
RQD Rock Quality Designation
SCR Solid Core Recovery
k Permeability
C Consolidation
DS Direct Shear
GS Grain Size Analysis

ELEV / DEPTH (m)	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	RECOVERY (%)	SPT "N" VALUES or RQD	WELL / PIEZOMETER INSTALLATION	DEPTH (m)	ELEVATION (m)	DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100) / MTO VANE (□ INTACT ■ REMOULDED) / NILCON VANE (△ INTACT ▲ REMOULDED) / UNDRAINED SHEAR STRENGTH (kPa) 20 40 60 80 100	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L — WATER CONTENT (%) 20 40 60	PERMEABILITY (cm/s)	REMARKS
			13	SS	100	10		16	330		35		
			14	SS	100	12		17	329		35		
			15	SS	100	9		18	328		36		
			16	SS	100	9		19	327		35		
			17	SS	100	10		20	326		35		
			18	SS	100	11		21	325		16		
			19	SS	100	13		22	324		25		
	...below 25.9m, stiff to very stiff.		20	SS	100	19		23	323		26		
			21	SS	100	23		24	322		24		
			22	SS	100	14		25	321		37		
								26	320				
								27	319				
								28	318				
								29	317				
								30	316				

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RECORD OF BOREHOLE No. BH11-29

PROJECT Rainy River - Geotechnical Investigation 2011/2012 | ENGINEER MS

PROJECT NO. TC113921 | DRILLER Marathon Drilling | BORING METHOD 200 mm HSA, NQ Coring | LOGGED BY PDR

CLIENT Rainy River Resources. | LOCATION South of Pinewood River | COMPILED BY NH

ELEVATION 345.784 m | COORD. N 5,408,528 E 424,526 | BORING DATE Start: Mar 2, 12 End: Mar 5, 12 | CHECKED BY DGR

SAMPLE TYPES
AU Auger; BU Bulk; DC Dynamic Cone; RC Rock Core; SS Split Spoon; TW Thin Walled Open (Shelby); WS Wash Sample

ABBREVIATIONS
P.P. Pocket Penetrometer; U.W. Wet Unit Weight; PT Standard Proctor Test; P.L. Point Load Strength Index (I_{50}); RQD Rock Quality Designation; SCR Solid Core Recovery; k Permeability; C Consolidation; DS Direct Shear; GS Grain Size Analysis

ELEV / DEPTH (m)	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	RECOVERY (%)	SPT "N" VALUES or RQD	WELL / PIEZOMETER INSTALLATION	DEPTH (m)	ELEVATION (m)	REMARKS
	...from 30.6m to 30.8m, grey silty sand layer.		23	SS	100	9		31	315	
			24	SS	100	11		32	314	
			25	SS	100	11		33	313	
310.7								34	312	
35.1	**Silty CLAY** Dark grey silty clay, trace sand, trace silt, varved, low to medium plasticity, very stiff [Lower Glaciolacustrine]		26	SS	100	24		35	311	
309.8								36	310	
36.0	**Sandy GRAVEL and BOULDERS** Sandy gravel, silty [inferred WS Till]		27	SS	54	45		37	309	...at 36.6m, artesian pressure encountered up to 2.1m
306.5								38	308	
39.3	**BEDROCK**		28	RC	100	20		39	307	
			29	RC	100	58		40	306	
			30	RC	100	57		41	305	
			31	RC	100	77		42	304	
								43	303	
								44	302	
								45	301	

DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100)
MTO VANE: □ INTACT ■ REMOULDED; NILCON VANE: △ INTACT ▲ REMOULDED
UNDRAINED SHEAR STRENGTH (kPa) 20 40 60 80 100

PLASTIC LIMIT w_P | NATURAL MOISTURE CONTENT w | LIQUID LIMIT w_L
WATER CONTENT (%) 20 40 60

PERMEABILITY (cm/s)

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RECORD OF BOREHOLE No. BH11-29

PROJECT	Rainy River - Geotechnical Investigation 2011/2012					ENGINEER	MS
PROJECT NO.	TC113921	DRILLER	Marathon Drilling	BORING METHOD	200 mm HSA, NQ Coring	LOGGED BY	PDR
CLIENT	Rainy River Resources.	LOCATION	South of Pinewood River			COMPILED BY	NH
ELEVATION	345.784 m	COORD.	N 5,408,528 E 424,526	BORING DATE	Start: Mar 2, 12 End: Mar 5, 12	CHECKED BY	DGR

SAMPLE TYPES
AU Auger; BU Bulk; DC Dynamic Cone; RC Rock Core; SS Split Spoon; TW Thin Walled Open (Shelby); WS Wash Sample

ABBREVIATIONS
P.P. Pocket Penetrometer; U.W. Wet Unit Weight; PT Standard Proctor Test; P.L. Point Load Strength Index (I_{50}); RQD Rock Quality Designation; SCR Solid Core Recovery; k Permeability; C Consolidation; DS Direct Shear; GS Grain Size Analysis

ELEV / DEPTH (m)	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	RECOVERY (%)	SPT "N" VALUES or RQD	WELL / PIEZOMETER INSTALLATION	DEPTH (m)	ELEVATION (m)	REMARKS
			32	RC	100	72		46	300	
			33	RC	100	50		47	299	
			34	RC	100	57		48	298	
			35	RC	100	88		49	297	
			36	RC	100	10		50	296	
			37	RC	100	77		51	295	
291.3								52	294	
54.5	**End of Borehole** at 54.35 Standpipe installed with flush mounted steel casing. Water level (b.g.s): at surface on March 05/12							53	293	
								54	292	

DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100)
MTO VANE: □ INTACT ■ REMOULDED
NILCON VANE: △ INTACT ▲ REMOULDED
UNDRAINED SHEAR STRENGTH (kPa) 20 40 60 80 100

PLASTIC LIMIT w_P — NATURAL MOISTURE CONTENT w — LIQUID LIMIT w_L
WATER CONTENT (%) 20 40 60

PERMEABILITY (cm/s)

RECORD OF BOREHOLE No. BH11-33

PROJECT	Rainy River - Geotechnical Investigation 2011/2012			ENGINEER	MS
PROJECT NO.	TC113921	DRILLER	Marathon Drilling	BORING METHOD	200 mm HSA, NQ Coring	LOGGED BY	PDR
CLIENT	Rainy River Resources.	LOCATION	South of River			COMPILED BY	NH
ELEVATION	346.707 m	COORD.	N 5,408,476 E 425,586	BORING DATE	Start: Feb 23, 12 End: Feb 24, 12	CHECKED BY	DGR

SAMPLE TYPES
AU Auger; BU Bulk; DC Dynamic Cone; RC Rock Core; SS Split Spoon; TW Thin Walled Open (Shelby); WS Wash Sample

ABBREVIATIONS
P.P. Pocket Penetrometer; U.W. Wet Unit Weight; PT Standard Proctor Test; P.L. Point Load Strength Index (I_{50}); RQD Rock Quality Designation; SCR Solid Core Recovery; k Permeability; C Consolidation; DS Direct Shear; GS Grain Size Analysis

ELEV / DEPTH (m)	DESCRIPTION	NUMBER	TYPE	RECOVERY (%)	SPT "N" VALUES or RQD	DEPTH (m)	ELEVATION (m)	REMARKS
346.7	Ground surface							
346.6 / 0.1	**TOPSOIL**							
	Silty CLAY Brown silty clay, some sand, slightly oxidised, low plasticity, soft, moist to wet at tip	2	SS	54	4	1	346	
		3	SS	79	11	2	345	
344.4 / 2.3	...at 1.8m grey silty sand, poorly graded, compact, wet							
	Silty CLAY Dark brown silty clay, some sand, trace gravel, occasional sand laminations, low plasticity, firm, moist [Upper Glaciolacustrine]	4	SS	88	6	3	344	
		5	SS	71	4	4	343	
341.8 / 4.9	**Silty CLAY** Dark grey silty clay, some sand, firm, medium plasticity, moist	6 A&B	SS	83	3	5	342	
	...below 6.1m, sand and gravel laminations	7	SS	100	7	6	341	
		8	SS	100	10	7	340	
		9	SS	100		8	339	
		10	SS	100	10	9	338	
		11	SS		9	10	337	
	...from 12.5 to 13.7m, boulders	12	RC	19		11	336	
		13	RC	7		12	335	...at 12.5m, SPT refusal
						13	334	
						14	333	
						15	332	

DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100)
MTO VANE: □ INTACT ■ REMOULDED
NILCON VANE: △ INTACT ▲ REMOULDED
UNDRAINED SHEAR STRENGTH (kPa) (20 40 60 80 100)

PLASTIC LIMIT w_P | NATURAL MOISTURE CONTENT w | LIQUID LIMIT w_L
WATER CONTENT (%) (20 40 60)

ELEVATION (m)	PLASTIC LIMIT	NATURAL MOISTURE CONTENT	LIQUID LIMIT
346		49	
345		26	
		28	
		23	
344		31	
343		27	
342		30	
		47	83
341			
340		36	
339		23	
338			
337		40	
336		37	
335			
334		34	
333			
332		46	

PERMEABILITY (cm/s)

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RECORD OF BOREHOLE No. BH11-33

PROJECT Rainy River - Geotechnical Investigation 2011/2012 | ENGINEER MS

PROJECT NO. TC113921 | DRILLER Marathon Drilling | BORING METHOD 200 mm HSA, NQ Coring | LOGGED BY PDR

CLIENT Rainy River Resources. | LOCATION South of River | COMPILED BY NH

ELEVATION 346.707 m | COORD. N 5,408,476 E 425,586 | BORING DATE Start: Feb 23, 12 End: Feb 24, 12 | CHECKED BY DGR

SAMPLE TYPES
AU Auger; BU Bulk; DC Dynamic Cone; RC Rock Core; SS Split Spoon; TW Thin Walled Open (Shelby); WS Wash Sample

ABBREVIATIONS
P.P. Pocket Penetrometer; U.W. Wet Unit Weight; PT Standard Proctor Test; P.L. Point Load Strength Index (I_{50}); RQD Rock Quality Designation; SCR Solid Core Recovery; k Permeability; C Consolidation; DS Direct Shear; GS Grain Size Analysis

ELEV / DEPTH (m)	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	RECOVERY (%)	SPT "N" VALUES or RQD	WELL / PIEZOMETER INSTALLATION	DEPTH (m)	ELEVATION (m)	DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100) / MTO VANE (□ INTACT ■ REMOULDED) / NILCON VANE (△ INTACT ▲ REMOULDED) / UNDRAINED SHEAR STRENGTH (kPa) 20 40 60 80 100	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L — WATER CONTENT (%) 20 40 60	PERMEABILITY (cm/s)	REMARKS
	...below 15.25m very stiff		14	SS	4	36		16	331		37		
			15	SS	100	18		17	330		31		
			16	SS	100	18		18	329		24		
			17	SS	100	13		19	328				
	...below 21.34m, occasional silt pockets		18	SS	100	14		20	327		22		
			19	SS	100	15		21	326				
			20	SS	100	14		22	325		35		
			21	SS	100	15		23	324		37		
319.3								24	323				
27.4	**Silty CLAY** Grey silty clay, varved, low plasticity, very stiff, moist [Lower Glaciolacustrine]		22	SS	100	17		25	322		35		
317.7								26	321				
29.0	**SAND and GRAVEL** Grey sand and gravel, trace silt, well graded, dense, wet [WS till]		23	SS	100	54		27	320		25		
								28	319		35		
								29	318				
								30	317				

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RECORD OF BOREHOLE No. BH11-33

PROJECT	Rainy River - Geotechnical Investigation 2011/2012			ENGINEER	MS
PROJECT NO.	TC113921	DRILLER	Marathon Drilling	BORING METHOD	200 mm HSA, NQ Coring	LOGGED BY	PDR
CLIENT	Rainy River Resources.	LOCATION	South of River			COMPILED BY	NH
ELEVATION	346.707 m	COORD.	N 5,408,476 E 425,586	BORING DATE	Start: Feb 23, 12 End: Feb 24, 12	CHECKED BY	DGR

SAMPLE TYPES
AU Auger; BU Bulk; DC Dynamic Cone; RC Rock Core; SS Split Spoon; TW Thin Walled Open (Shelby); WS Wash Sample

ABBREVIATIONS
P.P. Pocket Penetrometer; U.W. Wet Unit Weight; PT Standard Proctor Test; P.L. Point Load Strength Index (I_{50}); RQD Rock Quality Designation; SCR Solid Core Recovery; k Permeability; C Consolidation; DS Direct Shear; GS Grain Size Analysis

ELEV / DEPTH (m)	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	RECOVERY (%)	SPT "N" VALUES or RQD	WELL / PIEZOMETER INSTALLATION	DEPTH (m)	ELEVATION (m)	REMARKS
			24	SS	0	76		31	316	
			25	SS	38	41		32	315	
			26	SS	42	19		33	314	
			27	SS	83	38		34	313	
								35	312	
	...below 36.6m, boulders							36	311	
308.9								37	310	
37.8	**BEDROCK** Highly weathered		28	RC	77	0		38	309	
			29	RC	83	0		39	308	
			30	RC	58	0		40	307	
			31	RC	47	0		41	306	
302.8								42	305	
43.9	**End of Borehole** Standpipe installed with flush mounted steel casing Water level at ground surface upon installation							43	304 303	

DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100)
MTO VANE: □ INTACT ■ REMOULDED
NILCON VANE: △ INTACT ▲ REMOULDED
UNDRAINED SHEAR STRENGTH (kPa) 20 40 60 80 100

PLASTIC LIMIT w_P — NATURAL MOISTURE CONTENT w — LIQUID LIMIT w_L
WATER CONTENT (%) 20 40 60

PERMEABILITY (cm/s)

RECORD OF BOREHOLE No. BH11-34

PROJECT	Rainy River - Geotechnical Investigation 2011/2012			ENGINEER	MS
PROJECT NO.	TC113921	DRILLER	Marathon Drilling	BORING METHOD	200 mm HSA, NQ Coring	LOGGED BY	PDR
CLIENT	Rainy River Resources.	LOCATION	South of Open Pit			COMPILED BY	NH
ELEVATION	347.648 m	COORD.	N 5,408,419 E 426,102	BORING DATE	Start: Feb 9, 12 End: Feb 11, 12	CHECKED BY	DGR

SAMPLE TYPES
AU Auger; BU Bulk; DC Dynamic Cone; RC Rock Core; SS Split Spoon; TW Thin Walled Open (Shelby); WS Wash Sample

ABBREVIATIONS
P.P. Pocket Penetrometer; U.W. Wet Unit Weight; PT Standard Proctor Test; P.L. Point Load Strength Index (I_{50}); RQD Rock Quality Designation; SCR Solid Core Recovery; k Permeability; C Consolidation; DS Direct Shear; GS Grain Size Analysis

ELEV / DEPTH (m)	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	RECOVERY (%)	SPT "N" VALUES or RQD	WELL / PIEZOMETER INSTALLATION	DEPTH (m)	ELEVATION (m)	DYNAMIC CONE PENETRATION RESISTANCE PLOT; MTO VANE (INTACT / REMOULDED); NILCON VANE (INTACT / REMOULDED); UNDRAINED SHEAR STRENGTH (kPa)	PLASTIC LIMIT w_P; NATURAL MOISTURE CONTENT w; LIQUID LIMIT w_L; WATER CONTENT (%)	PERMEABILITY (cm/s)	REMARKS
347.6	Ground surface												
0.0 / 347.3	**TOPSOIL** Dark brown peat		1	AS									...frozen to 0.6m
0.3	**Silty CLAY** Greyish brown silty clay, trace gravel, grey lenses, trace oxidised pockets, medium plasticity, moist [Upper Glaciolacustrine] ...at 1.26m, sand laminations		2A B&C	SS	83	7		1	347				
			3	SS	79	6		2	346				
			4A B C	SS	75	5		3	345				
			5	TW	100			4	344				
343.1													
4.6	**Silty CLAY** Dark grey silty clay, trace sand, medium plasticity, firm to stiff, moist, light grey silt pockets [WML Till]		8	SS	83	7		5	343				
			10	SS	100	6		6	342				
			13	SS	92	6		7	341				
			14	SS	100	10		8	340				
			15	SS	100	11		9	339				
	...at sandy layer between 12.65 and 12.8m		6A&B	SS	100	17		10	338				...at 9.15m, switched to wash boring.
			17	SS	100	9		11	337				
								12	336				
								13	335				
								14	334				
								15	333				

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RECORD OF BOREHOLE No. BH11-34

PROJECT Rainy River - Geotechnical Investigation 2011/2012 | ENGINEER MS

PROJECT NO. TC113921 | DRILLER Marathon Drilling | BORING METHOD 200 mm HSA, NQ Coring | LOGGED BY PDR

CLIENT Rainy River Resources. | LOCATION South of Open Pit | COMPILED BY NH

ELEVATION 347.648 m | COORD. N 5,408,419 E 426,102 | BORING DATE Start: Feb 9, 12 End: Feb 11, 12 | CHECKED BY DGR

SAMPLE TYPES
AU Auger; BU Bulk; DC Dynamic Cone; RC Rock Core; SS Split Spoon; TW Thin Walled Open (Shelby); WS Wash Sample

ABBREVIATIONS
P.P. Pocket Penetrometer; U.W. Wet Unit Weight; PT Standard Proctor Test; P.L. Point Load Strength Index (I_{50}); RQD Rock Quality Designation; SCR Solid Core Recovery; k Permeability; C Consolidation; DS Direct Shear; GS Grain Size Analysis

ELEV / DEPTH (m)	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	RECOVERY (%)	SPT "N" VALUES or RQD	WELL / PIEZOMETER INSTALLATION	DEPTH (m)	ELEVATION (m)	DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100) / MTO VANE (□ INTACT ■ REMOULDED) / NILCON VANE (△ INTACT ▲ REMOULDED) / UNDRAINED SHEAR STRENGTH (kPa) 20 40 60 80 100	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L — WATER CONTENT (%) 20 40 60	PERMEABILITY (cm/s)	REMARKS
			18	SS	100	16		16	332		38		
			19	SS	100	12		17	331		37		
			20	SS	100	8		18	330				
328.4								19	329		26		
19.2	**Sandy GRAVEL** Boulders [inferred WS Till]							20	328				
326.9									327				
20.7	**BEDROCK**		22	RC	98	83		21	326				
			23	RC	97	55		22	325				
	...highly fractured		24	RC	95	7		23	324				
			25	RC	98	62		24	323				
			27	RC	95	68		25	322				
			28	RC	98	87		26	321				
								27	320				
								28	319				
								29	318				
								30					

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RECORD OF BOREHOLE No. BH11-34

PROJECT	Rainy River - Geotechnical Investigation 2011/2012			ENGINEER	MS
PROJECT NO.	TC113921	DRILLER	Marathon Drilling	BORING METHOD	200 mm HSA, NQ Coring	LOGGED BY	PDR
CLIENT	Rainy River Resources.	LOCATION	South of Open Pit			COMPILED BY	NH
ELEVATION	347.648 m	COORD.	N 5,408,419 E 426,102	BORING DATE	Start: Feb 9, 12 End: Feb 11, 12	CHECKED BY	DGR

SAMPLE TYPES
AU Auger; BU Bulk; DC Dynamic Cone; RC Rock Core; SS Split Spoon; TW Thin Walled Open (Shelby); WS Wash Sample

ABBREVIATIONS
P.P. Pocket Penetrometer; U.W. Wet Unit Weight; PT Standard Proctor Test; P.L. Point Load Strength Index (I_{50}); RQD Rock Quality Designation; SCR Solid Core Recovery; k Permeability; C Consolidation; DS Direct Shear; GS Grain Size Analysis

ELEV / DEPTH (m)	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	RECOVERY (%)	SPT "N" VALUES or RQD	WELL / PIEZOMETER INSTALLATION	DEPTH (m)	ELEVATION (m)	DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100) / MTO VANE (□ INTACT ■ REMOULDED) / NILCON VANE (△ INTACT ▲ REMOULDED) / UNDRAINED SHEAR STRENGTH (kPa) (20 40 60 80 100)	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L / WATER CONTENT (%) (20 40 60)	PERMEABILITY (cm/s)	REMARKS
			29	RC	97	80		31	317				
			30	RC	97	87		32	316				
			31	RC	95	55		33	315				
			32	RC	95	80		34	314				
			33	RC	100	62		35	313				
310.6								36	312				
37.0	**End of Borehole** at 37.0m Standpipe installed with flush mounted steel casing. Vibrating wire piezometer [sensor I.D: VW 20396] installed at 19.8 m.							37	311				

RECORD OF BOREHOLE No. BH11-35

PROJECT	Rainy River - Geotechnical Investigation 2011/2012			ENGINEER	MS
PROJECT NO.	TC113921	DRILLER	Marathon Drilling	BORING METHOD	200 mm HSA, NQ Coring	LOGGED BY	PDR
CLIENT	Rainy River Resources.	LOCATION	Ore Stockpile			COMPILED BY	NH
ELEVATION	368.08 m	COORD.	N 5,410,896 E 426,306	BORING DATE	Start: Jan 10, 12 End: Jan 12, 12	CHECKED BY	DGR

SAMPLE TYPES
AU Auger; BU Bulk; DC Dynamic Cone; RC Rock Core; SS Split Spoon; TW Thin Walled Open (Shelby); WS Wash Sample

ABBREVIATIONS
P.P. Pocket Penetrometer; TV Torvane; PT Standard Proctor Test; P.L. Point Load Strength Index (I_{50}); RQD Rock Quality Designation; SCR Solid Core Recovery; k Permeability; C Consolidation; DS Direct Shear; GS Grain Size Analysis

ELEV / DEPTH (m)	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	RECOVERY (%)	SPT "N" VALUES or RQD	WELL / PIEZOMETER INSTALLATION	DEPTH (m)	ELEVATION (m)	DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100) / MTO VANE (□ INTACT ■ REMOULDED) / NILCON VANE (△ INTACT ▲ REMOULDED) / UNDRAINED SHEAR STRENGTH (kPa) (20 40 60 80 100)	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L / WATER CONTENT (%) (20 40 60)	PERMEABILITY (cm/s)	REMARKS
368.1	Ground surface												
368.0 / 0.0	**TOPSOIL**												
0.2 / 367.5	**SANDY SILT** Light brown sandy silt, some clay, some roots, frozen.		1	SS	79	8							
0.6	**SANDY SILT** Light brown sandy silt, some clay, trace gravel, some silt laminations, varved, stiff, low to medium plasticity, moist [Upper Glaciolacustrine]		2	SS	75	12		1	367		18		...frozen to 1.4 m
			3	SS	96	13		2	366		22		
	...at 2.3m, some to trace clay, very stiff.		4	SS	100	19		3	365		24		
	...at 3.04m, becoming stiff, occasional sand laminations.		5	SS	100	11		4	364		24		
363.5 / 4.6	**SILTY SAND** Light brown silty sand, some clay, trace gravel, loose, wet [Glacial Sand]		6	SS	100	6	▽	5	363		26		
361.7 / 6.4	**CLAY** Dark grey some clay trace to some silt, trace gravel, stiff, medium plasticity, moist, light brown lenses [WML Till]		7	SS	75	6		6	362				
	...occasional 3mm sand laminations noted below 7.6m.		8	SS	100	8		7	361		18		
358.9 / 9.1	**SAND AND GRAVEL** Grey sand and gravel, boulders, trace silt, wet [WS Till]		10	RC	95	48		8	360				
358.3 / 9.8	**BEDROCK**		11	RC	88	67		9	359		19		
			12	RC	100	75		10	358				
354.8 / 13.3	**End of Borehole** at 13.3m Standpipe installed with flush mounted steel casing Water level (b.g.s): at 4.24 m on Jan12/12. at 5.70 m on Jan15/12.							11	357				
								12	356				
								13	355				

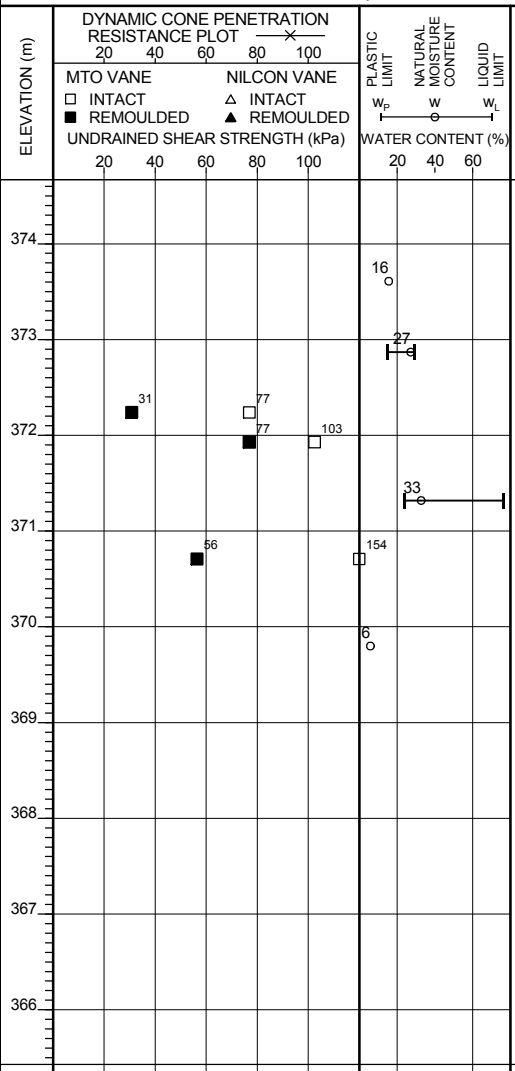
RECORD OF BOREHOLE No. BH11-36

PROJECT	Rainy River - Geotechnical Investigation 2011/2012					ENGINEER	MS
PROJECT NO.	TC113921	DRILLER	Marathon Drilling	BORING METHOD	200 mm HSA, NQ Coring	LOGGED BY	SM
CLIENT	Rainy River Resources.	LOCATION	Plant Site			COMPILED BY	SM
ELEVATION	374.669 m	COORD.	N 5,410,792 E 426,936	BORING DATE	Start: Dec 7, 11 End: Dec 9, 11	CHECKED BY	DGR

SAMPLE TYPES
AU Auger; BU Bulk; DC Dynamic Cone; RC Rock Core; SS Split Spoon; TW Thin Walled Open (Shelby); WS Wash Sample

ABBREVIATIONS
P.P. Pocket Penetrometer; U.W. Wet Unit Weight; PT Standard Proctor Test; P.L. Point Load Strength Index (I_{50}); RQD Rock Quality Designation; SCR Solid Core Recovery; k Permeability; C Consolidation; DS Direct Shear; GS Grain Size Analysis

ELEV / DEPTH (m)	DESCRIPTION	NUMBER	TYPE	RECOVERY (%)	SPT "N" VALUES or RQD	REMARKS
374.7	Ground Surface					
0.0 / 374.4	**TOPSOIL** Dark grey silty clay, trace sand, medium plastic, moist, rootlets					
0.3	**SILTY CLAY** Light brown silt, varved (grey clay in laminations), firm, low to medium plasticity, damp to moist [Upper Glaciolacustrine] ...at 0.3m, non-plastic ...at 1.52m, trace mottled brown lenses	1	SS	79	8	
		2	SS	100	13	
371.6						
3.1	**SILTY CLAY** Drak grey clay, some silt to silty, trace gravel , stiff to very stiff, medium to high plasticity, occasional sand pockets, moist [WML Till]	3	SS	100	12	
369.8	...below 4.6m, becoming silty and gravelly (subrounded)	4	SS	75	21	
4.8	**SAND** Dark grey sand, trace silt and gravel (subrounded), fine to medium, poorly graded, compact to dense, damp to moist					
368.4		5	SS	67	8/0.07	
6.2	...at 6.1 some fine gravel **BEDROCK** Metamorphic, highly fractured	6	RC	97	19	
365.4						
9.2	**End of Borehole** at 9.2m Stand pipe installed with 0.76m stick up and protected with steel casing; stand pipe pulled up by 0.45m while retrieving auger Water level (bgs): at 5.58m on Dec09/12 No water on De18/12					



PERMEABILITY (cm/s)

WELL / PIEZOMETER INSTALLATION

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RECORD OF BOREHOLE No. BH11-37

PROJECT: Rainy River - Geotechnical Investigation 2011/2012 | ENGINEER: MS

PROJECT NO.: TC113921 | DRILLER: Marathon Drilling | BORING METHOD: 200 mm HSA, NQ Coring | LOGGED BY: SM

CLIENT: Rainy River Resources. | LOCATION: Plant Site | COMPILED BY: SM

ELEVATION: 369.991 m | COORD.: N 5,410,528 E 426,658 | BORING DATE: Start: Dec 9, 11 End: Dec 13, 11 | CHECKED BY: DGR

SAMPLE TYPES
AU Auger; BU Bulk; DC Dynamic Cone; RC Rock Core; SS Split Spoon; TW Thin Walled Open (Shelby); WS Wash Sample

ABBREVIATIONS
P.P. Pocket Penetrometer; U.W. Wet Unit Weight; PT Standard Proctor Test; P.L. Point Load Strength Index (I_{50}); RQD Rock Quality Designation; SCR Solid Core Recovery; k Permeability; C Consolidation; DS Direct Shear; GS Grain Size Analysis

ELEV / DEPTH (m)	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	RECOVERY (%)	SPT "N" VALUES or RQD	WELL / PIEZOMETER INSTALLATION	DEPTH (m)	ELEVATION (m)	DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100) / MTO VANE (□ INTACT ■ REMOULDED) / NILCON VANE (△ INTACT ▲ REMOULDED) / UNDRAINED SHEAR STRENGTH (kPa) 20 40 60 80 100	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L / WATER CONTENT (%) 20 40 60	PERMEABILITY (cm/s)	REMARKS
370.0	Ground Surface												
0.0	**TOP SOIL** Light brown silt, trace gravel and cobbles (angular), mottled brown lenses, firm, no plasticity, dry to moist, rootlets at top		1	SS	83	22		1	369		7		
368.5													
1.5	**BEDROCK** Bluish grey, metamorphic, weathered ...fractured at the top		2	RC	100	65		2	368				
			3	RC	100	56		3	367				
			4	RC	100	96		4	366				...UCS strength = 133.9 MPa.
365.2													
4.8	**End of Borehole** at 4.8m Stand pipe installed with 0.91m stick up, protected with steel casing. Water level (bgs): at 1.88m on Dec 14/12 at 1.90m on Dec 18/12												

RECORD OF BOREHOLE No. BH11-38

PROJECT	Rainy River - Geotechnical Investigation 2011/2012			ENGINEER	MS
PROJECT NO.	TC113921	DRILLER	Marathon Drilling	BORING METHOD	200 mm HSA, NQ Coring	LOGGED BY	SM
CLIENT	Rainy River Resources.	LOCATION	Plant Site			COMPILED BY	NH
ELEVATION	371.593 m	COORD.	N 5,410,377 E 426,928	BORING DATE	Start: Jan 16, 12	CHECKED BY	DGR

SAMPLE TYPES
AU Auger; BU Bulk; DC Dynamic Cone; RC Rock Core; SS Split Spoon; TW Thin Walled Open (Shelby); WS Wash Sample

ABBREVIATIONS
P.P. Pocket Penetrometer; U.W. Wet Unit Weight; PT Standard Proctor Test; P.L. Point Load Strength Index (I_{50}); RQD Rock Quality Designation; SCR Solid Core Recovery; k Permeability; C Consolidation; DS Direct Shear; GS Grain Size Analysis

ELEV / DEPTH (m)	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	RECOVERY (%)	SPT "N" VALUES or RQD	WELL / PIEZOMETER INSTALLATION	DEPTH (m)	ELEVATION (m)	DYNAMIC CONE PENETRATION RESISTANCE PLOT; MTO VANE (INTACT / REMOULDED); NILCON VANE (INTACT / REMOULDED); UNDRAINED SHEAR STRENGTH (kPa); PLASTIC LIMIT; NATURAL MOISTURE CONTENT; LIQUID LIMIT; WATER CONTENT (%)	PERMEABILITY (cm/s)	REMARKS
371.6	Ground surface											
0.0	**TOP SOIL** brown silty clay , organics, rootlets, trace sand, firm, low plasticity, damp to moist											
370.8												
0.8	**SILTY CLAY** Light brown silt, trace sand and gravel, grey clay lenses, low to medium plasticity, stiff, moist, rootlets [Upper Glaciolacustrine] ...at 1.5m, becoming clayey, moist to wet, no rootlets		1	SS	92	13		1	371			
			2	SS	100	9		2	370			
			5	SS	100	8		3	369			
								4	368			
367.0												
4.6	**SILTY CLAY** Grey clay, silty, trace sand, trace gravel, occasional silt pocket, stiff , medium to high plasticity, moist [WML Till] ... becoming silty, firm, low to medium plastic, wet from 6.1m to 9.14m		6	SS	100	7		5	367			
			7	SS	100	6		6	366			
			12	SS	96	6		7	365			
			15	SS	100	10		8	364			
			18	SS		8		9	363			
			20	SS	100	6		10	362			
			23	SS	100	8		11	361			
								12	360			
								13	359			
								14	358			
								15	357			

...at 13.72m, occasional silt pockets, cm scale.

Continued on Next Page

RECORD OF BOREHOLE No. BH11-38

PROJECT	Rainy River - Geotechnical Investigation 2011/2012					ENGINEER	MS
PROJECT NO.	TC113921	DRILLER	Marathon Drilling	BORING METHOD	200 mm HSA, NQ Coring	LOGGED BY	SM
CLIENT	Rainy River Resources.	LOCATION	Plant Site			COMPILED BY	NH
ELEVATION	371.593 m	COORD.	N 5,410,377 E 426,928	BORING DATE	Start: Jan 16, 12	CHECKED BY	DGR

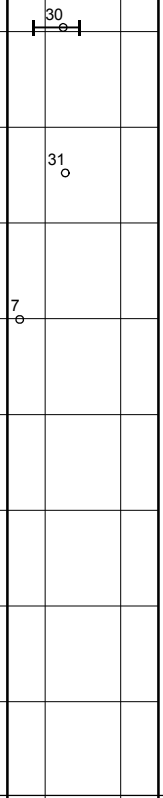
SAMPLE TYPES
AU Auger; BU Bulk; DC Dynamic Cone; RC Rock Core; SS Split Spoon; TW Thin Walled Open (Shelby); WS Wash Sample

ABBREVIATIONS
P.P. Pocket Penetrometer; U.W. Wet Unit Weight; PT Standard Proctor Test; P.L. Point Load Strength Index (I_{50}); RQD Rock Quality Designation; SCR Solid Core Recovery; k Permeability; C Consolidation; DS Direct Shear; GS Grain Size Analysis

ELEV / DEPTH (m)	DESCRIPTION	NUMBER	TYPE	RECOVERY (%)	SPT "N" VALUES or RQD	DEPTH (m)	ELEVATION (m)	REMARKS
	...at 16.8m trace sand and gravel angular to subangular, firm.	24	SS	100	4	16	356	
		25	SS	54	12	17	355	
353.3						18	354	
18.3	**SANDY GRAVEL** Greenish grey fine gravel, some sand, boulders, well graded ,angular to subangular [WS Till] ...at 18.9m, black greenish grey to light grey boulders, some cobbles, angular to sub angular	26	SS	17	15	19	353	
		27	RC	33		20	352	
350.7		28	RC	100			351	
20.9	**BEDROCK** Grey, metamorphic, fractured	29	RC	100	65	21		
		30	RC	98	80	22	350	
348.0		31	RC	100	100	23	349	
23.6	**End of borehole** at 23.6m Standpipe installed with 0.79m stick up and steel casing Water level (b.g.s): at 3.8m on Dec 19/12 at 3.9m on Jan14/12							

DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100)
MTO VANE: □ INTACT ■ REMOULDED; NILCON VANE: △ INTACT ▲ REMOULDED
UNDRAINED SHEAR STRENGTH (kPa) (20 40 60 80 100)

PLASTIC LIMIT (w_P) | NATURAL MOISTURE CONTENT (w) | LIQUID LIMIT (w_L)
WATER CONTENT (%) (20 40 60)



PERMEABILITY (cm/s)

RECORD OF BOREHOLE No. BH11-39

PROJECT	Rainy River - Geotechnical Investigation 2011/2012					ENGINEER	MS
PROJECT NO.	TC113921	DRILLER	Marathon Drilling	BORING METHOD	200 mm HSA, NQ Coring	LOGGED BY	SM
CLIENT	Rainy River Resources.	LOCATION	Plant Site			COMPILED BY	NH
ELEVATION	373.723 m	COORD.	N 5,409,832 E 426,819	BORING DATE	Start: Jan 5, 12 End: Jan 6, 12	CHECKED BY	DGR

SAMPLE TYPES
AU Auger; BU Bulk; DC Dynamic Cone; RC Rock Core; SS Split Spoon; TW Thin Walled Open (Shelby); WS Wash Sample

ABBREVIATIONS
P.P. Pocket Penetrometer; U.W. Wet Unit Weight; PT Standard Proctor Test; P.L. Point Load Strength Index (I_{50}); RQD Rock Quality Designation; SCR Solid Core Recovery; k Permeability; C Consolidation; DS Direct Shear; GS Grain Size Analysis

ELEV / DEPTH (m)	DESCRIPTION	NUMBER	TYPE	RECOVERY (%)	SPT "N" VALUES or RQD	DEPTH (m)	ELEVATION (m)	PLASTIC LIMIT / NATURAL MOISTURE CONTENT / LIQUID LIMIT (w_P, w, w_L)	PERMEABILITY (cm/s)	REMARKS
373.7	Ground Surface									
373.5 / 0.2	**TOPSOIL** Dark brown organics, fibrous, rootlets	1	SS	71	7					...frozen to 0.2m
373.0 / 0.8	**SILT AND SAND** Light brown silt and sand, trace gravel, dark brown pockets of organics, damp, rootlets	2	SS	75	10	1	373	16		
	SILTY CLAY Light brown to grey silt, trace sand and gravel, varved (grey clay lamination), firm to stiff, low to medium plasticity, damp to moist, occasional mottled brown lenses [Upper Glaciolacustrine]	3	SS	100	10	2	372	17		
		4	SS	100	10					
370.9 / 2.8	**BEDROCK** Fractured, greyish blue	5	RC	100	74	3	371	25		
		6	RC	86	0	4	370			
		7	RC	100	93					...UCS strength = 140.4 MPa.
		8	RC	87	50	5	369			
367.8		9	RC	100	75		368			
5.9	**End of Borehole** at 5.9m Stand pipe installed with 0.81m stick up and protected with steel casing Water level (b.g.s): at 0.2m on Jan 06/12 at 1.8m on Jan 14/12									

DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100)
MTO VANE: □ INTACT ■ REMOULDED
NILCON VANE: △ INTACT ▲ REMOULDED
UNDRAINED SHEAR STRENGTH (kPa) 20 40 60 80 100
WATER CONTENT (%) 20 40 60

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RECORD OF BOREHOLE No. BH11-40

PROJECT	Rainy River - Geotechnical Investigation 2011/2012			ENGINEER	MS
PROJECT NO.	TC113921	DRILLER	Marathon Drilling	BORING METHOD	200 mm HSA, NQ Coring	LOGGED BY	PDR
CLIENT	Rainy River Resources.	LOCATION	Flotation Tailings			COMPILED BY	NH
ELEVATION	370.100 m	COORD.	N 5,411,994 E 425,356	BORING DATE	Start: Feb 2, 12 End: Feb 3, 12	CHECKED BY	DGR

SAMPLE TYPES
AU Auger; BU Bulk; DC Dynamic Cone; RC Rock Core; SS Split Spoon; TW Thin Walled Open (Shelby); WS Wash Sample

ABBREVIATIONS
P.P. Pocket Penetrometer; U.W. Wet Unit Weight; PT Standard Proctor Test; P.L. Point Load Strength Index (I_{50}); RQD Rock Quality Designation; SCR Solid Core Recovery; k Permeability; C Consolidation; DS Direct Shear; GS Grain Size Analysis

ELEV / DEPTH (m)	DESCRIPTION	NUMBER	TYPE	RECOVERY (%)	SPT "N" VALUES or RQD	REMARKS
370.1	Ground surface					
370.0	**TOPSOIL**					
0.2	**SILT** Brown silt, some clay, trace to some sand, trace gravel, moist, stiff	1	SS	67	9	... frozen to 0.6m
	...at 0.76m, becoming light brown, clayey,	2	SS	75	10	
368.6						
1.5	**SILTY CLAY** Light brown clay, some silt, trace fine gravel, varved, tiny pockets of silt, low plastic, stiff, moist [Upper Glaciolacustrine]	3	SS	83	12	
367.8						
2.3	**SILTY CLAY** Dark brown clay, silty, trace gravel, lensed, tiny pockets of silt, medium to high plasticity, stiff [WML Till]	4	SS	88	14	
		5	SS	100	11	
		6	SS	100	8	
		7	SS	100	10	
		8	TW	75		...at 7.6m PP = 158 KPa TV (standard) = 49KPa
360.9						
9.2	**SILTY CLAY** Silty clay, trace sand, medium to high plastic, stiff [Lower Glaciolacustrine]	9	SS	14	11	
360.4						
9.7	**BOULDERS**	10	RC			...at 9.7m SPT spoon bouncing on possible boulders; switched to NQ coring
		11	RC			
	between 11.7m and 13.26m, silty sand, some gravel, wet	12	RC			
356.5						
13.6	**BEDROCK**	13	RC	75	58	

DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100)
MTO VANE: □ INTACT ■ REMOULDED
NILCON VANE: △ INTACT ▲ REMOULDED
UNDRAINED SHEAR STRENGTH (kPa) (20 40 60 80 100)

PLASTIC LIMIT w_P | NATURAL MOISTURE CONTENT w | LIQUID LIMIT w_L
WATER CONTENT (%) (20 40 60)

Plotted values: 30, 18, 26, 29, 32, 34, 37, 20

PERMEABILITY (cm/s)

WELL / PIEZOMETER INSTALLATION

DEPTH (m): 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15

ELEVATION (m): 370 369 368 367 366 365 364 363 362 361 360 359 358 357 356

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RECORD OF BOREHOLE No. BH11-40

PROJECT Rainy River - Geotechnical Investigation 2011/2012 ENGINEER MS

PROJECT NO. TC113921 DRILLER Marathon Drilling BORING METHOD 200 mm HSA, NQ Coring LOGGED BY PDR

CLIENT Rainy River Resources. LOCATION Flotation Tailings COMPILED BY NH

ELEVATION 370.100 m COORD. N 5,411,994 E 425,356 BORING DATE Start: Feb 2, 12 End: Feb 3, 12 CHECKED BY DGR

SAMPLE TYPES
AU Auger
BU Bulk
DC Dynamic Cone
RC Rock Core
SS Split Spoon
TW Thin Walled Open (Shelby)
WS Wash Sample

ABBREVIATIONS
P.P. Pocket Penetrometer
U.W. Wet Unit Weight
PT Standard Proctor Test
P.L. Point Load Strength Index (I_{50})
RQD Rock Quality Designation
SCR Solid Core Recovery
k Permeability
C Consolidation
DS Direct Shear
GS Grain Size Analysis

ELEV / DEPTH (m)	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	RECOVERY (%)	SPT "N" VALUES or RQD	WELL / PIEZOMETER INSTALLATION	DEPTH (m)	ELEVATION (m)	DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100) / MTO VANE (□ INTACT ■ REMOULDED) / NILCON VANE (△ INTACT ▲ REMOULDED) / UNDRAINED SHEAR STRENGTH (kPa) (20 40 60 80 100)	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L / WATER CONTENT (%) (20 40 60)	PERMEABILITY (cm/s)	REMARKS
			14	RC	95	93		16	354				
			15	RC	93	57		17	353				
352.7													
17.4	End of Borehole at 17.4m. Standpipe installed with 0.15m stick up and protected with steel casing. Water level(bgs): at 5.7m on Dec17/12												

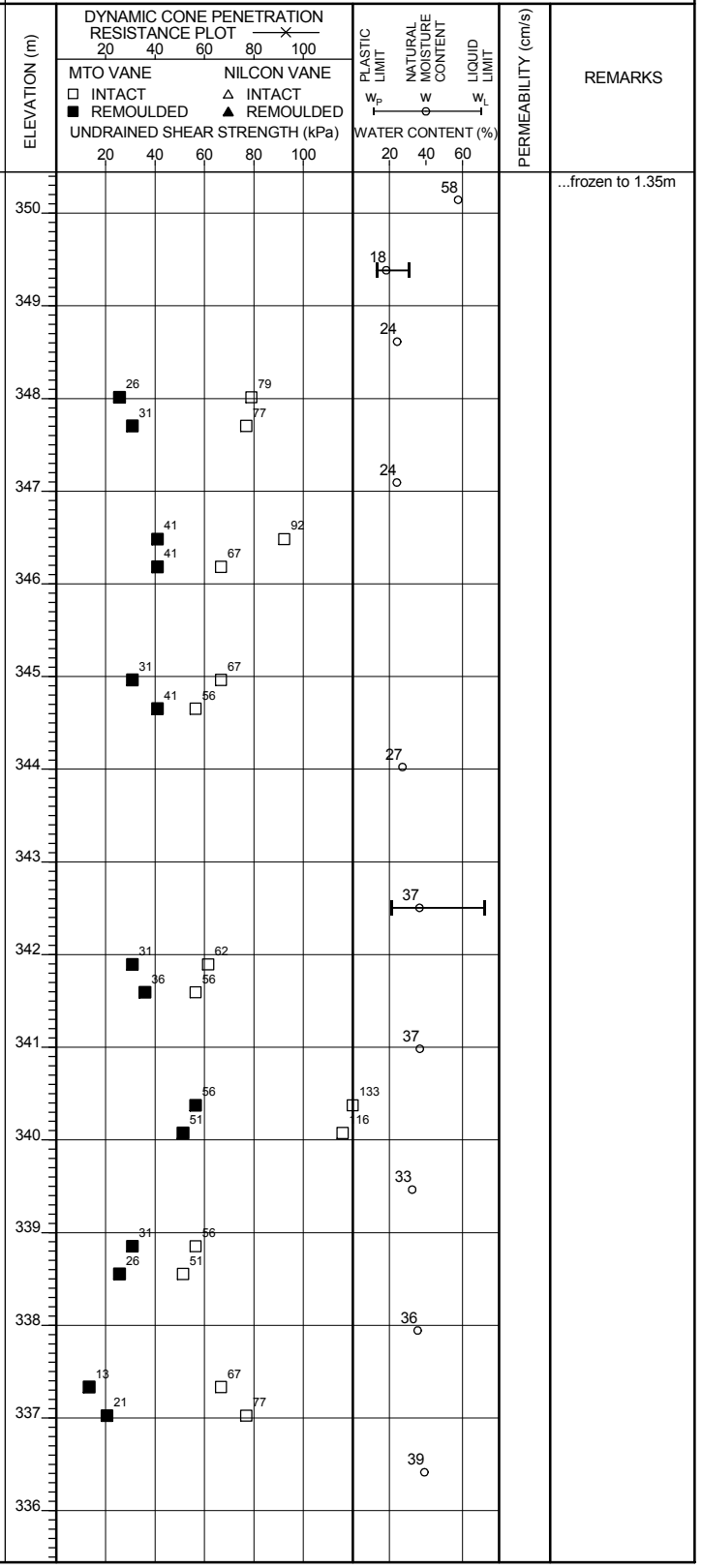
RECORD OF BOREHOLE No. BH11-41

PROJECT	Rainy River - Geotechnical Investigation 2011/2012			ENGINEER	MS
PROJECT NO.	TC113921	DRILLER	Marathon Drilling	BORING METHOD	200 mm HSA, NQ Coring	LOGGED BY	MM
CLIENT	Rainy River Resources.	LOCATION	Satelite Pit			COMPILED BY	NH
ELEVATION	350.444 m	COORD.	N 5,410,296 E 424,215	BORING DATE	Start: Feb 4, 12 End: Feb 5, 12	CHECKED BY	DGR

SAMPLE TYPES
AU Auger; BU Bulk; DC Dynamic Cone; RC Rock Core; SS Split Spoon; TW Thin Walled Open (Shelby); WS Wash Sample

ABBREVIATIONS
P.P. Pocket Penetrometer; U.W. Wet Unit Weight; PT Standard Proctor Test; P.L. Point Load Strength Index (I_{50}); RQD Rock Quality Designation; SCR Solid Core Recovery; k Permeability; C Consolidation; DS Direct Shear; GS Grain Size Analysis

ELEV / DEPTH (m)	DESCRIPTION	NUMBER	TYPE	RECOVERY (%)	SPT "N" VALUES or RQD	REMARKS
350.4	Ground surface					
0.0	**Silty SAND** Dark brown silty sand, trace gravel, organics, compact	1	SS	88	13	...frozen to 1.35m
349.7						
0.8	**Silty CLAY** Light brown silty clay, trace gravel, trace organics, medium plasticity, varved [Upper Glaciolacustrine]	2	SS	92	10	
		3	SS	96	7	
		6	SS		4	
		9	TW	83		
344.3						
6.1	**Silty CLAY** Dark grey silty clay, trace gravel, trace silt, moist, medium to high plasticity, firm [WML Till]	12	SS	100	7	
		13	SS	100	6	
		16	SS	100	9	
		19	SS	100	8	
		22	SS		2	
336.7						
13.7	**Sandy Till** [Inferred WS Till]	25	SS	0.04	13	



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RECORD OF BOREHOLE No. BH11-41

PROJECT	Rainy River - Geotechnical Investigation 2011/2012					ENGINEER	MS
PROJECT NO.	TC113921	DRILLER	Marathon Drilling	BORING METHOD	200 mm HSA, NQ Coring	LOGGED BY	MM
CLIENT	Rainy River Resources.	LOCATION	Satelite Pit			COMPILED BY	NH
ELEVATION	350.444 m	COORD.	N 5,410,296 E 424,215	BORING DATE	Start: Feb 4, 12 End: Feb 5, 12	CHECKED BY	DGR

SAMPLE TYPES
AU Auger; BU Bulk; DC Dynamic Cone; RC Rock Core; SS Split Spoon; TW Thin Walled Open (Shelby); WS Wash Sample

ABBREVIATIONS
P.P. Pocket Penetrometer; U.W. Wet Unit Weight; PT Standard Proctor Test; P.L. Point Load Strength Index (I_{50}); RQD Rock Quality Designation; SCR Solid Core Recovery; k Permeability; C Consolidation; DS Direct Shear; GS Grain Size Analysis

ELEV / DEPTH (m)	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	RECOVERY (%)	SPT "N" VALUES or RQD	WELL / PIEZOMETER INSTALLATION	DEPTH (m)	ELEVATION (m)	REMARKS
334.1			26	RC	58			16	335	
16.3	**BEDROCK** Highly fractured		27	RC	28	0		17	334	
			28	RC	50	12		18	333	
			29	RC	80	0		19	332	
			30	RC	100	68		20	331	
328.0								21	330	
22.4	**End of Borehole** at 22.41m. Standpipe installed with flush mounted casing Water Level (b.g.s): at surface upon completion							22	329	

DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100)
MTO VANE: □ INTACT ■ REMOULDED
NILCON VANE: △ INTACT ▲ REMOULDED
UNDRAINED SHEAR STRENGTH (kPa) 20 40 60 80 100

PLASTIC LIMIT (w_P) — NATURAL MOISTURE CONTENT (w) — LIQUID LIMIT (w_L)
WATER CONTENT (%) 20 40 60

PERMEABILITY (cm/s)

RECORD OF BOREHOLE No. BH11-44

PROJECT	Rainy River - Geotechnical Investigation 2011/2012			ENGINEER	MS
PROJECT NO.	TC113921	DRILLER	Marathon Drilling	BORING METHOD	200 mm HSA, NQ Coring	LOGGED BY	SM
CLIENT	Rainy River Resources.	LOCATION	Pinewood River hydro			COMPILED BY	SM
ELEVATION	351.43 m	COORD.	N 5,408,622 E 426,560	BORING DATE	Start: Mar 13, 12 End: Mar 14, 12	CHECKED BY	DGR

SAMPLE TYPES
AU Auger; BU Bulk; DC Dynamic Cone; RC Rock Core; SS Split Spoon; TW Thin Walled Open (Shelby); WS Wash Sample

ABBREVIATIONS
P.P. Pocket Penetrometer; TV Torvane; PT Standard Proctor Test; P.L. Point Load Strength Index (I_{50}); RQD Rock Quality Designation; SCR Solid Core Recovery; k Permeability; C Consolidation; DS Direct Shear; GS Grain Size Analysis

ELEV / DEPTH (m)	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	RECOVERY (%)	SPT "N" VALUES or RQD	WELL / PIEZOMETER INSTALLATION	DEPTH (m)	ELEVATION (m)	DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100) / MTO VANE (□ INTACT ■ REMOULDED) / NILCON VANE (△ INTACT ▲ REMOULDED) / UNDRAINED SHEAR STRENGTH (kPa) (20 40 60 80 100)	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L / WATER CONTENT (%) (20 40 60)	PERMEABILITY (cm/s)	REMARKS
351.4	Ground surface												
351.2 / 0.3	**TOPSOIL** Dark brown organics, fibrous, rootlets		1A&B	SS	96	14					30 29		Frozen to 0.61m
	Silty CLAY to Clayey SILT Brown silty clay, trace to some sand, trace to some organics, firm to stiff, medium plasticity, occasional rootlets		2	SS	79	9		1	351		37		
349.9 / 1.5	**Silty CLAY** Brown clayey silt, trace to some sand, grey clay lamination (varved), mottled brown lenses, firm, low to medium plasticity, damp [Upper Glaciolacustrine]		3	SS	96	7		2	350		29		
			4	SS	96	9		3	349		21		
	...at 2.43m, sandy, trace gravel, stiff		5	SS	100	8		4	348		24		
	...at 4.6m, sandy, damp to moist		6	SS	100	15		5	347		16		
345.3 / 6.1	**CLAY** Dark grey clay, some silt, trace sand and gravel , stiff, high plasticity, moist [WML Till]		7	SS	100	8		6	346		30		
	...at 7.6m, becoming firm, moist to wet		10	SS	100	5		7	345	46 77 56 72			
			13	SS	100	6		8	344		30		
340.8 / 10.7	**Clayey SILT** Greyish green clayey silt, silt as green lamination (2-3mm) varved, firm, low plasticity, moist to wet [Lower Glaciolacustrine] ...below 10.9m, sandy		16	SS	100	13		9	343	15 62 26 62			...auger grinding at 11m
339.2 / 12.2	**SAND AND GRAVEL** Grey silty sand and gravel, angular to subangular, compact, well graded, wet [Inferred WS Till] ...below 13.1m, boulders		17	SS	50	29		10	342				
336.8 / 14.6								11	341	41 77 51 67	31		
								12	340				
								13	339		13		
								14	338				
								15	337				Switched to NQ coring at 14.64

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RECORD OF BOREHOLE No. BH11-44

PROJECT	Rainy River - Geotechnical Investigation 2011/2012			ENGINEER	MS
PROJECT NO.	TC113921	DRILLER	Marathon Drilling	BORING METHOD	200 mm HSA, NQ Coring	LOGGED BY	SM
CLIENT	Rainy River Resources.	LOCATION	Pinewood River hydro			COMPILED BY	SM
ELEVATION	351.43 m	COORD.	N 5,408,622 E 426,560	BORING DATE	Start: Mar 13, 12 End: Mar 14, 12	CHECKED BY	DGR

SAMPLE TYPES
AU Auger
BU Bulk
DC Dynamic Cone
RC Rock Core
SS Split Spoon
TW Thin Walled Open (Shelby)
WS Wash Sample

ABBREVIATIONS
P.P. Pocket Penetrometer
TV Torvane
PT Standard Proctor Test
P.L. Point Load Strength Index (I_{50})
RQD Rock Quality Designation
SCR Solid Core Recovery
k Permeability
C Consolidation
DS Direct Shear
GS Grain Size Analysis

ELEV / DEPTH (m)	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	RECOVERY (%)	SPT "N" VALUES or RQD	WELL / PIEZOMETER INSTALLATION	DEPTH (m)	ELEVATION (m)	DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100) / MTO VANE (□ INTACT ■ REMOULDED) / NILCON VANE (△ INTACT ▲ REMOULDED) / UNDRAINED SHEAR STRENGTH (kPa) 20 40 60 80 100	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L / WATER CONTENT (%) 20 40 60	PERMEABILITY (cm/s)	REMARKS
	BEDROCK Grey bedrock		18	RC	100	67			336				
	...below 16.2m, highly fractured		19	RC	56	0		16	335				
			20	RC	100	0		17	334				
333.5			21	RC	95	20							
18.0	**End of Borehole** Standpipe installed with flushmounted steel casing. Water level(b.g.s): For Piezometer A (bottom sensing zone) at surface on March 14/12 For Piezometer B (top sensing zone) at surface on March 14/12												

RECORD OF BOREHOLE No. BH11-49

PROJECT	Rainy River - Geotechnical Investigation 2011/2012			ENGINEER	MS
PROJECT NO.	TC113921	DRILLER	Marathon Drilling	BORING METHOD	200 mm HSA, NQ Coring	LOGGED BY	PDR
CLIENT	Rainy River Resources.	LOCATION	Tailings Management Area			COMPILED BY	SM
ELEVATION	353.404 m	COORD.	N 5,411,233 E 419,800	BORING DATE	Start: Mar 19, 12 End: Mar 19, 12	CHECKED BY	DGR

SAMPLE TYPES
AU Auger; BU Bulk; DC Dynamic Cone; RC Rock Core; SS Split Spoon; TW Thin Walled Open (Shelby); WS Wash Sample

ABBREVIATIONS
P.P. Pocket Penetrometer; U.W. Wet Unit Weight; PT Standard Proctor Test; P.L. Point Load Strength Index (I_{50}); RQD Rock Quality Designation; SCR Solid Core Recovery; k Permeability; C Consolidation; DS Direct Shear; GS Grain Size Analysis

ELEV / DEPTH (m)	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	RECOVERY (%)	SPT "N" VALUES or RQD	WELL / PIEZOMETER INSTALLATION	DEPTH (m)	ELEVATION (m)	DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100) / MTO VANE (□ INTACT ■ REMOULDED) / NILCON VANE (△ INTACT ▲ REMOULDED) / UNDRAINED SHEAR STRENGTH (kPa)	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L / WATER CONTENT (%) (20 40 60)	PERMEABILITY (cm/s)	REMARKS
353.4	Ground surface												
0.0	**SILTY CLAY** Brown silty clay, trace gravel, stiff, moist, trace rootlets		1	AS					353		22		
352.5													
0.9	**SILTY CLAY** Dark brown silty clay, trace sand, trace fine gravel, trace silt pockets, stiff, medium to high plasticity, moist [WML Till]		2 A & B	SS	67	16		1	352		15, 25		
	...at 1.5m, some light brown silt lensing, trace fine gravel, oxidized		3	SS	67	13		2	351		28		
			4	SS	92	8		3	350		33, 32		
			5	SS	96	7		4	349				
			6	SS	100	7		5	348	42, 59, 102, 16	39		
	...becoming dark grey below 6.1m		9	SS	100	6		6	347		40		
			12	SS	100	5		7	346	45, 59, 96, 106	42		
			15	SS	100	5		8	345	32, 35, 70, 84			
			18	SS	100			9	344		33		
			21	SS	100	6		10	343	39, 44, 89, 92			
			24	TW	100			11	342		31		
								12	341	31, 34, 82, 89	45		
								13	340	36, 45, 90, 87			
								14	339				...at 14.1m PP=24 KPa Torvane=39 KPa
								15		42, 51, 101, 113			

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RECORD OF BOREHOLE No. BH11-49

PROJECT	Rainy River - Geotechnical Investigation 2011/2012					ENGINEER	MS
PROJECT NO.	TC113921	DRILLER	Marathon Drilling	BORING METHOD	200 mm HSA, NQ Coring	LOGGED BY	PDR
CLIENT	Rainy River Resources.	LOCATION	Tailings Management Area			COMPILED BY	SM
ELEVATION	353.404 m	COORD.	N 5,411,233 E 419,800	BORING DATE	Start: Mar 19, 12 End: Mar 19, 12	CHECKED BY	DGR

SAMPLE TYPES
AU Auger; BU Bulk; DC Dynamic Cone; RC Rock Core; SS Split Spoon; TW Thin Walled Open (Shelby); WS Wash Sample

ABBREVIATIONS
P.P. Pocket Penetrometer; U.W. Wet Unit Weight; PT Standard Proctor Test; P.L. Point Load Strength Index (I_{50}); RQD Rock Quality Designation; SCR Solid Core Recovery; k Permeability; C Consolidation; DS Direct Shear; GS Grain Size Analysis

ELEV / DEPTH (m)	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	RECOVERY (%)	SPT "N" VALUES or RQD	WELL / PIEZOMETER INSTALLATION	DEPTH (m)	ELEVATION (m)	REMARKS
	...varved clay below 15.25m [Lower Glaciolacustrine]		27	TW	100			16	338	...at 15.6m Torvane=59 KPa
337.2										
16.2	**BOULDERS** Boulders [Inferred WS Till]		28	RC				17	337	
								18	336	
334.5									335	
18.9	**Bedrock** Greyish blue, highly fractured and weathered		29	RC	60	0		19		
								20	334	
	...some quartz between 20.4m and 21.95m		30	RC	33	0		21	333	
								22	332	
			31	RC	90	0		23	331	
329.9									330	
23.5	**End of Borehole** at 23.47m Standpipes installed with flush mounted steel casing Water Level (b.g.s): For Piezometer A (bottom sensing zone) at 2 m on March 20/12 For Piezometer B (top sensing zone) at 1.4 m on March 20/12									

DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100)
MTO VANE: □ INTACT ■ REMOULDED
NILCON VANE: △ INTACT ▲ REMOULDED
UNDRAINED SHEAR STRENGTH (kPa) 20 40 60 80 100

PLASTIC LIMIT w_P | NATURAL MOISTURE CONTENT w | LIQUID LIMIT w_L
WATER CONTENT (%) 20 40 60

PERMEABILITY (cm/s)

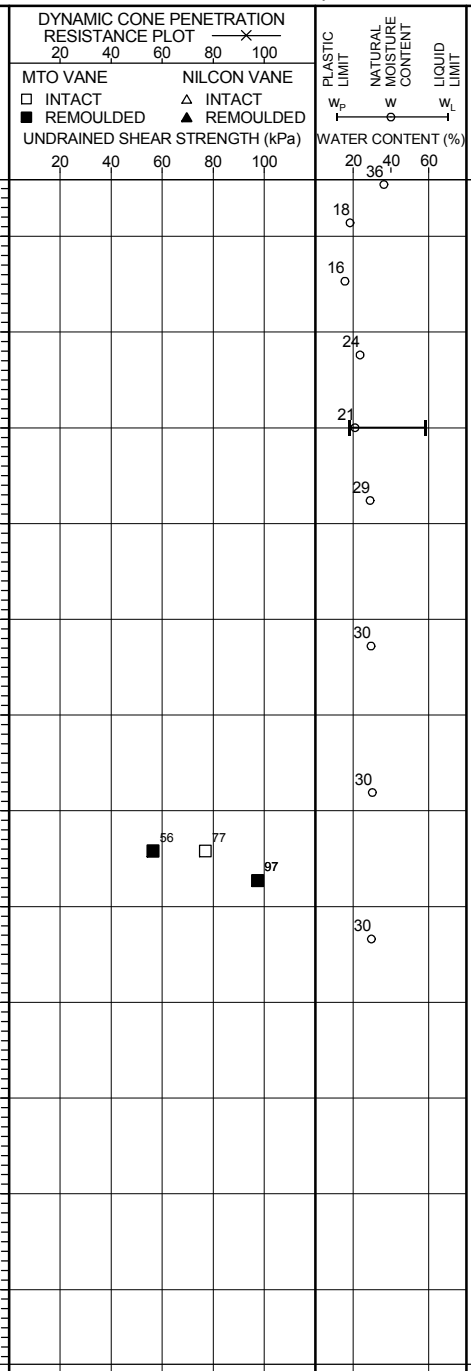
RECORD OF BOREHOLE No. BH11-50

PROJECT	Rainy River - Geotechnical Investigation 2011/2012			ENGINEER	MS
PROJECT NO.	TC113921	DRILLER	Marathon Drilling	BORING METHOD	200 mm HSA, NQ Coring	LOGGED BY	SM
CLIENT	Rainy River Resources.	LOCATION	Tailings Management Area			COMPILED BY	SM
ELEVATION	361.591 m	COORD.	N 5,411,071 E 421,551	BORING DATE	Start: Mar 19, 12 End: Mar 19, 12	CHECKED BY	DGR

SAMPLE TYPES
AU Auger; BU Bulk; DC Dynamic Cone; RC Rock Core; SS Split Spoon; TW Thin Walled Open (Shelby); WS Wash Sample

ABBREVIATIONS
P.P. Pocket Penetrometer; U.W. Wet Unit Weight; PT Standard Proctor Test; P.L. Point Load Strength Index (I_{50}); RQD Rock Quality Designation; SCR Solid Core Recovery; k Permeability; C Consolidation; DS Direct Shear; GS Grain Size Analysis

ELEV / DEPTH (m)	DESCRIPTION	NUMBER	TYPE	RECOVERY (%)	SPT "N" VALUES or RQD	DEPTH (m)	REMARKS
361.6	Ground surface						
361.5 / 0.1	**TOPSOIL** Dark brown organics, fibrous, rootlets	1	SS	92	7		...frozen to 0.6m
360.8 / 0.8	**Clayey SILT** Brown clayey silt, some sand and gravel, medium plasticity, rootlets	2	SS	79	10	1	
	Silty CLAY Light brown silty clay, trace gravel, grey clay lamination (varved), stiff, medium plasticity, damp to moist [Upper Glaciolacustrine]	3	SS	100	10	2	
359.3 / 2.3	...at 1.7 m trace to some sand and gravel	4	SS	79	12		
	Silty CLAY Greyish brown silty clay, trace sand and gravel, firm to stiff, high plasticity, moist. [WML Till] ...mottled brown lenses at the top	5	SS	100	11	3	
	...below 4.6m becoming dark grey	6	SS	100	8	4 5	
		7	SS	100	6	6 7	
	... between 7.62 m and 7.67m, sandy seam	10	SS	92	7	8	
353.2 / 8.4	**Clayey SILT** Greenish grey Clayey silt, sandy, varved. [Possible Lower Glaciolacustrine]	12	AU			9	
352.4 / 9.2	**Bedrock** Greyish green, slightly fractured	12	RC	100	95	10	...at 9.1m switched to NQ coring
		13	RC	100	90	11	
349.2		14	RC	95	98	12	
12.4	**End of Borehole** at12.4m Standpipes installed with flush mounted steel casing Water Level (b.g.s): For Piezometer A (bottom sensing zone) at 0.73 m on March 19/12 For Piezometer B (top sensing zone) at surface on March 19/12						



PERMEABILITY (cm/s)

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RECORD OF BOREHOLE No. BH11-51

PROJECT	Rainy River - Geotechnical Investigation 2011/2012			ENGINEER	MS
PROJECT NO.	TC113921	DRILLER	Marathon Drilling	BORING METHOD	200 mm HSA, NQ Coring	LOGGED BY	SM
CLIENT	Rainy River Resources.	LOCATION	Tailings Management Area			COMPILED BY	SM
ELEVATION	351.539 m	COORD.	N 5,410,423 E 421,543	BORING DATE	Start: Mar 17, 12 End: Mar 17, 12	CHECKED BY	DGR

SAMPLE TYPES
AU Auger; BU Bulk; DC Dynamic Cone; RC Rock Core; SS Split Spoon; TW Thin Walled Open (Shelby); WS Wash Sample

ABBREVIATIONS
P.P. Pocket Penetrometer; U.W. Wet Unit Weight; PT Standard Proctor Test; P.L. Point Load Strength Index (I_{50}); RQD Rock Quality Designation; SCR Solid Core Recovery; k Permeability; C Consolidation; DS Direct Shear; GS Grain Size Analysis

ELEV / DEPTH (m)	DESCRIPTION	NUMBER	TYPE	RECOVERY (%)	SPT "N" VALUES or RQD	REMARKS
351.5	Ground surface					
350.9 0.6	**TOPSOIL** Black organics, fibrous, rootlets	1	SS	75	4	...frozen to 0.6m
	Silty CLAY Light brown silty clay, trace to some sand, trace gravel, trace mottled brown lenses, brown clay lamination (varved), firm, low to medium plasticity, moist [Upper Glacolacustrine]	2	SS	79	12	
		3	SS	100	7	
	...at 2.5m no varving noted	4	SS	83	22	
	...at 3.4m very silty low plasticity	5	SS	88	7	
347.0 4.6	**Silty CLAY** Greyish brown silty clay, trace sand and gravel, stiff, high plasticity, moist [WML Till]	8	SS	100	10	
	... at 6.1m becoming grey	9	SS	100	10	
		10	TW	75		...at 7.62m, PP=122 KPa Torvane=69 KPa
		11	SS	100	7	
	...at 10.7m moist to wet, trace to some sand and gravel	14	SS	100	8	
		17	SS	100	5	...at 12.2m switched to washboring
		20	SS	100	6	

Continued on Next Page

RECORD OF BOREHOLE No. BH11-51

PROJECT Rainy River - Geotechnical Investigation 2011/2012 | ENGINEER MS

PROJECT NO. TC113921 | DRILLER Marathon Drilling | BORING METHOD 200 mm HSA, NQ Coring | LOGGED BY SM

CLIENT Rainy River Resources. | LOCATION Tailings Management Area | COMPILED BY SM

ELEVATION 351.539 m | COORD. N 5,410,423 E 421,543 | BORING DATE Start: Mar 17, 12 End: Mar 17, 12 | CHECKED BY DGR

SAMPLE TYPES
AU Auger; BU Bulk; DC Dynamic Cone; RC Rock Core; SS Split Spoon; TW Thin Walled Open (Shelby); WS Wash Sample

ABBREVIATIONS
P.P. Pocket Penetrometer; U.W. Wet Unit Weight; PT Standard Proctor Test; P.L. Point Load Strength Index (I_{50}); RQD Rock Quality Designation; SCR Solid Core Recovery; k Permeability; C Consolidation; DS Direct Shear; GS Grain Size Analysis

ELEV / DEPTH (m)	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	RECOVERY (%)	SPT "N" VALUES or RQD	WELL / PIEZOMETER INSTALLATION	DEPTH (m)	ELEVATION (m)	DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100); MTO VANE □ INTACT ■ REMOULDED; NILCON VANE △ INTACT ▲ REMOULDED; UNDRAINED SHEAR STRENGTH (kPa) (20 40 60 80 100)	PLASTIC LIMIT w_P	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w_L; WATER CONTENT (%) (20 40 60)	PERMEABILITY (cm/s)	REMARKS
335.8			23	SS	100	8		16	336			21			
15.8	**Silty CLAY** Grey silty clay,varved, firm, medium to high plasticity, moist [Lower Glaciolacustrine]		26	TW	63			17	335	21 ■ 82 □					...at 17.1m, PP=61 KPa Torvane=39 KPa
333.7									334						
17.8	**Bedrock** Green, highly fractured and weathered, red veining		28	RC	95	58		18	333						...at 17.8m switched to NQ coring
330.6			29	RC	100	60		19	332						
20.9	**End of Borehole** at 20.9m Standpipes installed with flush mounted steel casing Water Level (b.g.s): For Piezometer A (bottom sensing zone) at surface on March 18/12 For Piezometer B (top sensing zone) at surface on March 18/12							20	331						

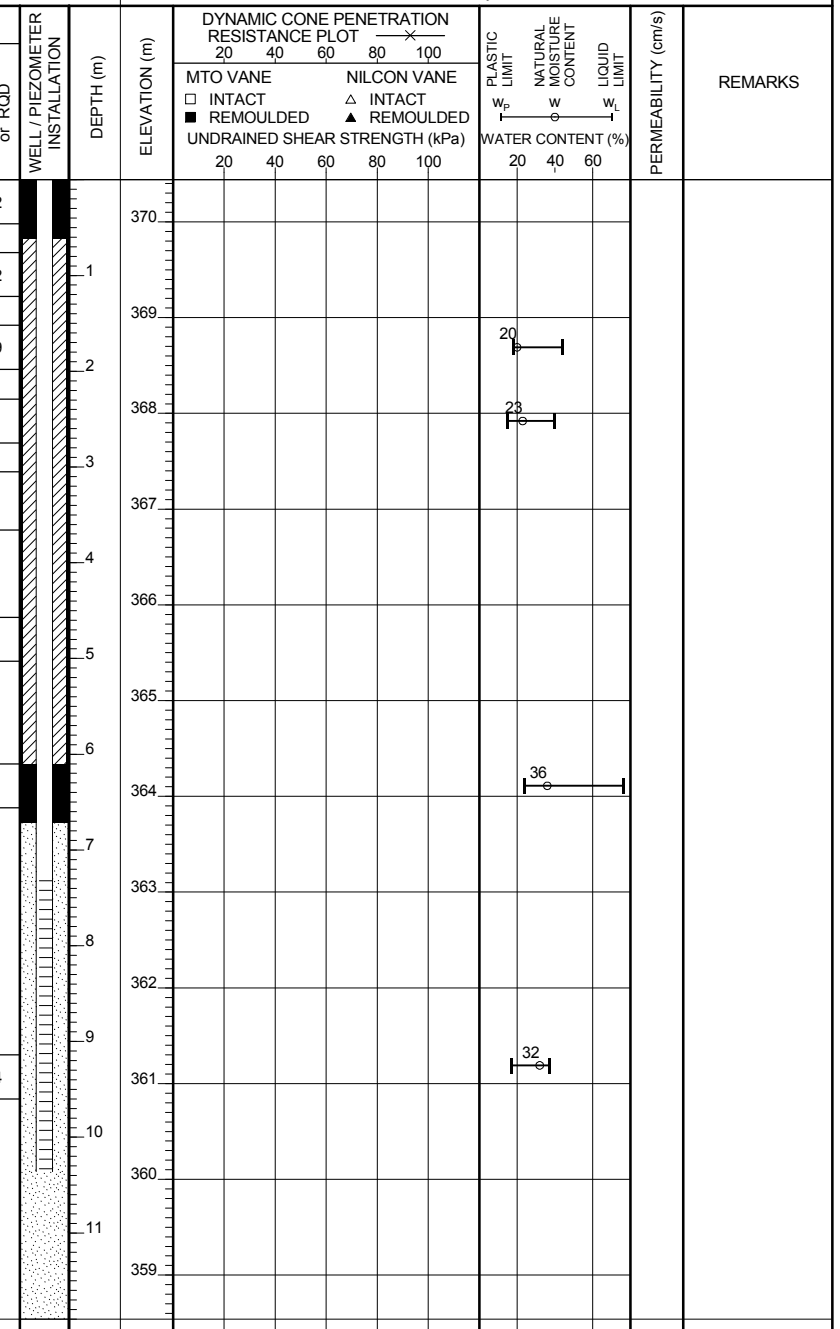
RECORD OF BOREHOLE No. BH12-01

PROJECT	Rainy River Gold Project					ENGINEER	MS
PROJECT NO.	TC113921	DRILLER	Marathon Drilling	BORING METHOD	200 mm HSA, NQ Coring	LOGGED BY	TA
CLIENT	Rainy River Resources.	LOCATION	Tailings Management Area			COMPILED BY	DG
ELEVATION	370.44 m	COORD.	N 5,413,954 E 421,733	BORING DATE	Start: Oct 3, 12 End: Oct 4, 12	CHECKED BY	DGR

SAMPLE TYPES
AU Auger; BU Bulk; DC Dynamic Cone; RC Rock Core; SS Split Spoon; TW Thin Walled Open (Shelby); WS Wash Sample

ABBREVIATIONS
P.P. Pocket Penetrometer; TV Torvane; PT Standard Proctor Test; P.L. Point Load Strength Index (I_{50}); RQD Rock Quality Designation; SCR Solid Core Recovery; k Permeability; C Consolidation; DS Direct Shear; GS Grain Size Analysis

ELEV / DEPTH (m)	DESCRIPTION	NUMBER	TYPE	RECOVERY (%)	SPT "N" VALUES or RQD
370.4	Ground surface				
370.3 / 0.1	**TOPSOIL** Topsoil, organics, rootlets	1	SS	22	12
	Silty CLAY Brown silty clay, trace to some sand, dry, medium plasticity, stiff [Upper Glaciolacustrine]	2	SS	100	22
		3	SS	100	19
	...becoming moist at 2.29m	4	SS	100	21
367.4 / 3.1	**Silty CLAY** Grey silty clay, trace sand, trace gravel, moist, high plasticity, firm to stiff [WML Till]	5	TW	100	
		6	SS	100	9
		7	SS	100	9
361.0 / 9.5	...becoming moist to wet, some sand at 9.14m, possible transition zone	8	SS	83	24
	SAND and GRAVEL Grey sand and gravel, saturated [WS Till]				
358.6 / 11.9	**End of Borehole** at 11.9m [Inferred bedrock] Standpipe installed with 0.6m stick up Water level at surface upon completion				



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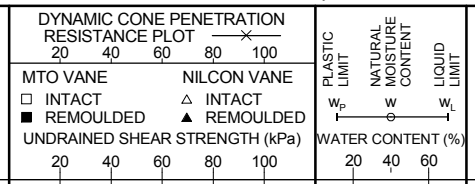
RECORD OF BOREHOLE No. BH12-03

PROJECT	Rainy River Gold Project					ENGINEER	MS
PROJECT NO.	TC113921	DRILLER	Marathon Drilling	BORING METHOD	200 mm HSA, NQ Coring	LOGGED BY	PDR
CLIENT	Rainy River Resources.	LOCATION	Tailings Management Area			COMPILED BY	DG
ELEVATION	362.567 m	COORD.	N 5,411,646 E 420,323	BORING DATE	Start: Sep 14, 12 End: Sep 15, 12	CHECKED BY	DGR

SAMPLE TYPES
AU Auger; BU Bulk; DC Dynamic Cone; RC Rock Core; SS Split Spoon; TW Thin Walled Open (Shelby); WS Wash Sample

ABBREVIATIONS
P.P. Pocket Penetrometer; TV Torvane; PT Standard Proctor Test; P.L. Point Load Strength Index (I_{50}); RQD Rock Quality Designation; SCR Solid Core Recovery; k Permeability; C Consolidation; DS Direct Shear; GS Grain Size Analysis

ELEV / DEPTH (m)	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	RECOVERY (%)	SPT "N" VALUES or RQD	DEPTH (m)	ELEVATION (m)	REMARKS
362.6	Ground surface								
0.0 / 362.3	**TOPSOIL** Dark brown, organics		1	GS					
0.3	**Silty CLAY** Brown silty clay, some sand, moist, varved, medium plasticity, very stiff [Upper Glaciolacustrine] ...occasional rootlets at top		2	SS	37	18	1	362	
			3	SS	58	13	2	361	
			4	SS	71	13	3	360	
359.5									
3.1	**Silty CLAY** Grey silty clay, trace gravel, ocasional silt pockets, moist, firm [WML Till]		5	TW	65		4	359	...at 3.66m PP= 196.1 kPa TV= 134.8 kPa
			8	SS	100	8	5	358	
			11	SS	100	9	6	357	
	...occasionlal silt lensing		14	SS	100	6	7	356	
353.4							8	355	
353.3 / 9.3	**SILT** Grey silt, some clay, wet [Possible Lower Glaciolacustrine]		15	SS	100		9	354	
	BEDROCK Bluish grey bedrock, fractured		16	RC	100	94	10	353	...at 9.3m SPT refusal
			17	RC	100	94	11	352	
			18	RC	100	100	12	351	
349.1							13	350	
13.4	**End of Borehole** at 13.44m Standpipe installed with 0.9m stick up Water level at 5m below ground surface upon installation Water Level at 0.8m below ground								



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RECORD OF BOREHOLE No. BH12-03

PROJECT	Rainy River Gold Project			ENGINEER	MS
PROJECT NO.	TC113921	DRILLER	Marathon Drilling	LOGGED BY	PDR
CLIENT	Rainy River Resources.	LOCATION	Tailings Management Area	COMPILED BY	DG
ELEVATION	362.567 m	COORD.	N 5,411,646 E 420,323	CHECKED BY	DGR
		BORING DATE	Start: Sep 14, 12 End: Sep 15, 12		

SAMPLE TYPES
AU Auger; BU Bulk; DC Dynamic Cone; RC Rock Core; SS Split Spoon; TW Thin Walled Open (Shelby); WS Wash Sample

ABBREVIATIONS
P.P. Pocket Penetrometer; TV Torvane; PT Standard Proctor Test; P.L. Point Load Strength Index (I_{50}); RQD Rock Quality Designation; SCR Solid Core Recovery; k Permeability; C Consolidation; DS Direct Shear; GS Grain Size Analysis

ELEV / DEPTH (m)	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	RECOVERY (%)	SPT "N" VALUES or RQD	WELL / PIEZOMETER INSTALLATION	DEPTH (m)	ELEVATION (m)	DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100); MTO VANE □ INTACT ■ REMOULDED; NILCON VANE △ INTACT ▲ REMOULDED; UNDRAINED SHEAR STRENGTH (kPa) 20 40 60 80 100	PLASTIC LIMIT w_P; NATURAL MOISTURE CONTENT w; LIQUID LIMIT w_L; WATER CONTENT (%) 20 40 60	PERMEABILITY (cm/s)	REMARKS
	surface on Oct. 30, 2012												

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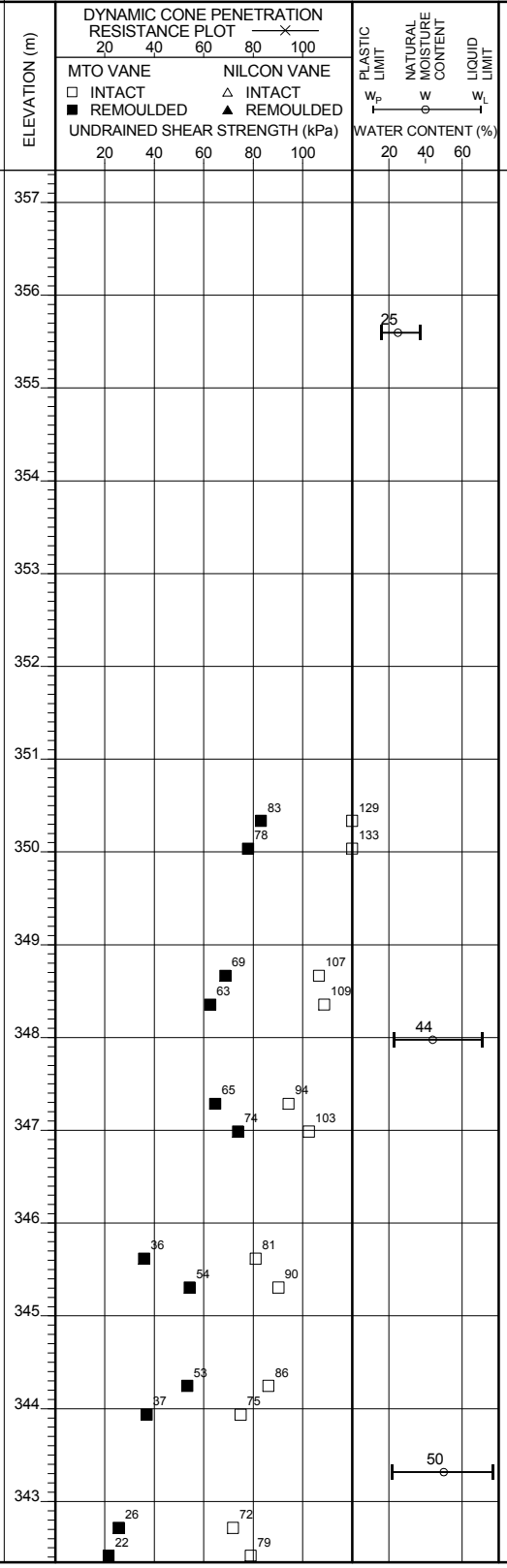
RECORD OF BOREHOLE No. BH12-04

PROJECT	Rainy River Gold Project			ENGINEER	MS
PROJECT NO.	TC113921	DRILLER	Marathon Drilling	BORING METHOD	200 mm HSA, NQ Coring	LOGGED BY	TA
CLIENT	Rainy River Resources.	LOCATION	Talings Management Area			COMPILED BY	DG
ELEVATION	357.346 m	COORD.	N 5,411,848 E 422,926	BORING DATE	Start: Sep 27, 12 End: Sep 29, 12	CHECKED BY	DGR

SAMPLE TYPES
AU Auger; BU Bulk; DC Dynamic Cone; RC Rock Core; SS Split Spoon; TW Thin Walled Open (Shelby); WS Wash Sample

ABBREVIATIONS
P.P. Pocket Penetrometer; TV Torvane; PT Standard Proctor Test; P.L. Point Load Strength Index (I_{50}); RQD Rock Quality Designation; SCR Solid Core Recovery; k Permeability; C Consolidation; DS Direct Shear; GS Grain Size Analysis

ELEV / DEPTH (m)	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	RECOVERY (%)	SPT "N" VALUES or RQD	WELL / PIEZOMETER INSTALLATION
357.3	Ground surface						
357.2 / 0.0	**PEAT**						
0.2	Dark brown peat, fibrous		1	SS	39	6	
	Silty CLAY						
	Brown silty clay, trace to some sand, trace gravel, moist, varved, low plasticity		2	SS	33	9	
	[Upper Glaciolacustrine]		3	SS	100	12	
			4	SS	100	12	
354.3							
3.1	**Silty CLAY**		5	SS	100	13	
	Brown silty clay, trace sand, teace gravel, moist, medium to high plasticity						
	[WML Till]		6	SS	100	10	
			7	SS	5	7	
	...becoming grey below 6.1m		8	TW	100		
			9	SS	100	7	
			10	TW	100		
			11	SS	100	5	
			12	SS	100	7	



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RECORD OF BOREHOLE No. BH12-04

PROJECT	Rainy River Gold Project					ENGINEER	MS
PROJECT NO.	TC113921	DRILLER	Marathon Drilling	BORING METHOD	200 mm HSA, NQ Coring	LOGGED BY	TA
CLIENT	Rainy River Resources.	LOCATION	Talings Management Area			COMPILED BY	DG
ELEVATION	357.346 m	COORD.	N 5,411,848 E 422,926	BORING DATE	Start: Sep 27, 12 End: Sep 29, 12	CHECKED BY	DGR

SAMPLE TYPES
AU Auger; BU Bulk; DC Dynamic Cone; RC Rock Core; SS Split Spoon; TW Thin Walled Open (Shelby); WS Wash Sample

ABBREVIATIONS
P.P. Pocket Penetrometer; TV Torvane; PT Standard Proctor Test; P.L. Point Load Strength Index (I_{50}); RQD Rock Quality Designation; SCR Solid Core Recovery; k Permeability; C Consolidation; DS Direct Shear; GS Grain Size Analysis

ELEV / DEPTH (m)	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	RECOVERY (%)	SPT "N" VALUES or RQD	WELL / PIEZOMETER INSTALLATION	DEPTH (m)	ELEVATION (m)	DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100) / MTO VANE (INTACT, REMOULDED) / NILCON VANE (INTACT, REMOULDED) / UNDRAINED SHEAR STRENGTH (kPa)	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L / WATER CONTENT (%)	PERMEABILITY (cm/s)	REMARKS
	....some sand, trace gravel, medium to high plasticity at 15.24m		13	SS	100	6		16	342				
								17	341	43, 44, 70, 91			
								18	340				
			14	TW	75			19	339				
								20	338	53, 66, 105, 107			
336.0								21	337				
21.3	**Silty CLAY** Greenish grey silty clay, varved, interbedded silt lenses, moist [Lower Glaciolacustrine]		15	SS	100	12		22	336		47		
333.0								23	335				
24.4	**BOULDERS** [Inferred WS Till]							24	334				
331.4								25	333				
25.9	**BEDROCK** Light grey volcanic rock ...weathered rock from 25.9m to 27.3m		16	RC	87	30		26	332				
			17	RC	67	53		27	331				
			18	RC	95	57		28	330				
327.6								29	329				
29.7									328				

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RECORD OF BOREHOLE No. BH12-04

PROJECT	Rainy River Gold Project					ENGINEER	MS
PROJECT NO.	TC113921	DRILLER	Marathon Drilling	BORING METHOD	200 mm HSA, NQ Coring	LOGGED BY	TA
CLIENT	Rainy River Resources.	LOCATION	Talings Management Area			COMPILED BY	DG
ELEVATION	357.346 m	COORD.	N 5,411,848 E 422,926	BORING DATE	Start: Sep 27, 12 End: Sep 29, 12	CHECKED BY	DGR

SAMPLE TYPES
AU Auger
BU Bulk
DC Dynamic Cone
RC Rock Core
SS Split Spoon
TW Thin Walled Open (Shelby)
WS Wash Sample

ABBREVIATIONS
P.P. Pocket Penetrometer
TV Torvane
PT Standard Proctor Test
P.L. Point Load Strength Index (I_{50})
RQD Rock Quality Designation
SCR Solid Core Recovery
k Permeability
C Consolidation
DS Direct Shear
GS Grain Size Analysis

ELEV / DEPTH (m)	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	RECOVERY (%)	SPT "N" VALUES or RQD	WELL / PIEZOMETER INSTALLATION	DEPTH (m)	ELEVATION (m)	DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100); MTO VANE □ INTACT ■ REMOULDED; NILCON VANE △ INTACT ▲ REMOULDED; UNDRAINED SHEAR STRENGTH (kPa) 20 40 60 80 100	PLASTIC LIMIT w_P	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w_L; WATER CONTENT (%) 20 40 60	PERMEABILITY (cm/s)	REMARKS
	End of Borehole at 29.72m Standpipe installed with 0.76m sitck up Water Level 1.2m below ground surface on completion Water Level 1.2m below ground surface on Oct. 31, 2012														

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RECORD OF BOREHOLE No. BH12-07

PROJECT	Rainy River Gold Project					ENGINEER	MS
PROJECT NO.	TC113921	DRILLER	Marathon Drilling	BORING METHOD	200 mm HSA, NQ Coring	LOGGED BY	TA/AD
CLIENT	Rainy River Resources.	LOCATION	Tailings Management Area			COMPILED BY	DG
ELEVATION	371.539 m	COORD.	N 5,412,438 E 424,542	BORING DATE	Start: Oct 4, 12 End: Oct 10, 12	CHECKED BY	DGR

SAMPLE TYPES
AU Auger; BU Bulk; DC Dynamic Cone; RC Rock Core; SS Split Spoon; TW Thin Walled Open (Shelby); WS Wash Sample

ABBREVIATIONS
P.P. Pocket Penetrometer; TV Torvane; PT Standard Proctor Test; P.L. Point Load Strength Index (I_{50}); RQD Rock Quality Designation; SCR Solid Core Recovery; k Permeability; C Consolidation; DS Direct Shear; GS Grain Size Analysis

ELEV / DEPTH (m)	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	RECOVERY (%)	SPT "N" VALUES or RQD	WELL / PIEZOMETER INSTALLATION	DEPTH (m)	ELEVATION (m)	DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100) / MTO VANE (□ INTACT ■ REMOULDED) / NILCON VANE (△ INTACT ▲ REMOULDED) / UNDRAINED SHEAR STRENGTH (kPa) (20 40 60 80 100)	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L — WATER CONTENT (%) (20 40 60)	PERMEABILITY (cm/s)	REMARKS
371.5	Ground surface												
371.4 0.1	**TOPSOIL**												
	Silty CLAY Brown silty clay, trace to some sand, dry, firm, medium to high plasticity [WML Till]		1	SS	94	20		1	371				
			2	SS	94	16		2	370		25		
			3	SS	100	15		3	369		28		
	...brown to grey, trace sand, trace gravel at 3.0m		4	SS	100	17		4	368				
			5	SS	100	11		5	367		33		
			6	SS	100	13		6	366				
			7	SS	100	12		7	365				
								8	364				
								9	363				
								10	362				
								11	361				
359.3 12.2	**Silty CLAY** Dark grey silty clay, trace sand, trace gravel, varved with light grey silt laminations (approximately 3mm thick), damp to moist [Lower Glaciolacustrine]		8	SS	100	9		12	360				
								13	359		32		
								14	358				
								15	357				

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RECORD OF BOREHOLE No. BH12-07

PROJECT	Rainy River Gold Project			ENGINEER	MS
PROJECT NO.	TC113921	DRILLER	Marathon Drilling	BORING METHOD	200 mm HSA, NQ Coring	LOGGED BY	TA/AD
CLIENT	Rainy River Resources.	LOCATION	Tailings Management Area			COMPILED BY	DG
ELEVATION	371.539 m	COORD.	N 5,412,438 E 424,542	BORING DATE	Start: Oct 4, 12 End: Oct 10, 12	CHECKED BY	DGR

SAMPLE TYPES
AU Auger; BU Bulk; DC Dynamic Cone; RC Rock Core; SS Split Spoon; TW Thin Walled Open (Shelby); WS Wash Sample

ABBREVIATIONS
P.P. Pocket Penetrometer; TV Torvane; PT Standard Proctor Test; P.L. Point Load Strength Index (I_{50}); RQD Rock Quality Designation; SCR Solid Core Recovery; k Permeability; C Consolidation; DS Direct Shear; GS Grain Size Analysis

ELEV / DEPTH (m)	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	RECOVERY (%)	SPT "N" VALUES or RQD	WELL / PIEZOMETER INSTALLATION	DEPTH (m)	ELEVATION (m)	DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100); MTO VANE □ INTACT ■ REMOULDED; NILCON VANE △ INTACT ▲ REMOULDED; UNDRAINED SHEAR STRENGTH (kPa) (20 40 60 80 100)	PLASTIC LIMIT w_P; NATURAL MOISTURE CONTENT w; LIQUID LIMIT w_L; WATER CONTENT (%) (20 40 60)	PERMEABILITY (cm/s)	REMARKS
356.3													
15.2 / 355.8	**SAND** Medium to coarse grained sand, some silt, some clay, wet [WS Till]		9	SS	100				356				Sand heave in auger at 15.24m
15.7	**End of Borehole** at 15.7m Standpipe installed with 0.9m stick up Water level at 10.9m below ground surface upon completion Water level at 11m below ground surface on Oct. 31, 2012												

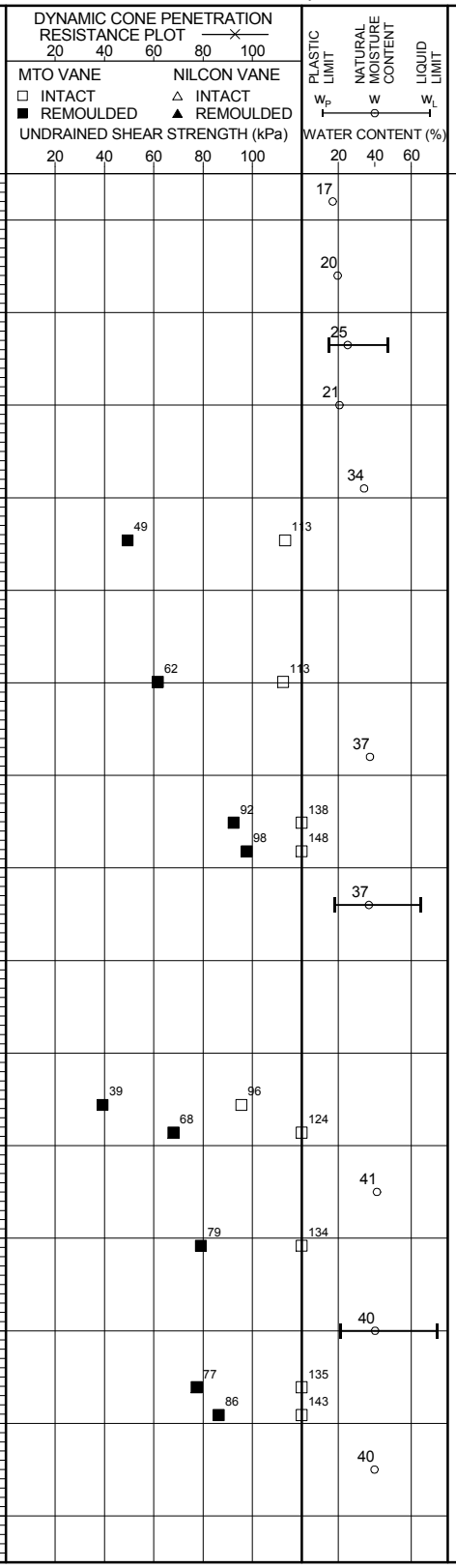
RECORD OF BOREHOLE No. BH12-08

PROJECT	Rainy River Gold Project			ENGINEER	MS
PROJECT NO.	TC113921	DRILLER	Marathon Drilling	LOGGED BY	PDR
CLIENT	Rainy River Resources.	LOCATION	Tailings Management Area	COMPILED BY	DG
ELEVATION	359.5 m	COORD.	N 5,411,603 E 425,109	BORING DATE	Start: Sep 13, 12 End: Sep 13, 12
				CHECKED BY	DGR

SAMPLE TYPES
AU Auger; BU Bulk; DC Dynamic Cone; RC Rock Core; SS Split Spoon; TW Thin Walled Open (Shelby); WS Wash Sample

ABBREVIATIONS
P.P. Pocket Penetrometer; TV Torvane; PT Standard Proctor Test; P.L. Point Load Strength Index (I_{50}); RQD Rock Quality Designation; SCR Solid Core Recovery; k Permeability; C Consolidation; DS Direct Shear; GS Grain Size Analysis

ELEV / DEPTH (m)	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	RECOVERY (%)	SPT "N" VALUES or RQD	WELL / PIEZOMETER INSTALLATION	DEPTH (m)	ELEVATION (m)	REMARKS
359.5	Ground surface									
359.0 / 0.1	**TOPSOIL**									
	Silty CLAY Brown silty clay, trace gravel, trace sand, moist, varved, firm, low to medium plasticity [Upper Glaciolacustrine]		1	SS	25	8			359	
			2	SS	79	13		1		
	...stiff, some oxidized pockets at 0.8m		3	SS	67	12		2	358	
	...dark brown below 2.3m		4	SS	83	14		3	357	
			5	SS	92	7		4	356	
354.9									355	
4.6	**Silty CLAY** Grey silty clay, trace sand, firm, medium to high plasticity, occasional silt pockets [WML Till]		8	TW	83		▽	5	354	...at 5.2m PP= 171.6 kPa TV= 134.8 kPa
			11	SS	96	7		6	353	
	...becoming stiff at 7.6m		14	SS	87	9		7	352	
			17	TW	96			8	351	
			20	SS	100	7		9	350	...at 9.8m PP= 147.1 kPa TV= 110.3 kPa
			23	SS	100	8		10	349	
			26	SS	100	9		11	348	
								12	347	
								13	346	
								14	345	
								15		



PERMEABILITY (cm/s)

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RECORD OF BOREHOLE No. BH12-08

PROJECT	Rainy River Gold Project					ENGINEER	MS
PROJECT NO.	TC113921	DRILLER	Marathon Drilling	BORING METHOD	200 mm HSA, NQ Coring	LOGGED BY	PDR
CLIENT	Rainy River Resources.	LOCATION	Tailings Management Area			COMPILED BY	DG
ELEVATION	359.5 m	COORD.	N 5,411,603 E 425,109	BORING DATE	Start: Sep 13, 12 End: Sep 13, 12	CHECKED BY	DGR

SAMPLE TYPES
AU Auger; BU Bulk; DC Dynamic Cone; RC Rock Core; SS Split Spoon; TW Thin Walled Open (Shelby); WS Wash Sample

ABBREVIATIONS
P.P. Pocket Penetrometer; TV Torvane; PT Standard Proctor Test; P.L. Point Load Strength Index (I_{50}); RQD Rock Quality Designation; SCR Solid Core Recovery; k Permeability; C Consolidation; DS Direct Shear; GS Grain Size Analysis

ELEV / DEPTH (m)	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	RECOVERY (%)	SPT "N" VALUES or RQD	WELL / PIEZOMETER INSTALLATION	DEPTH (m)	ELEVATION (m)	DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100) / MTO VANE (□ INTACT ■ REMOULDED) / NILCON VANE (△ INTACT ▲ REMOULDED) / UNDRAINED SHEAR STRENGTH (kPa) (20 40 60 80 100)	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L / WATER CONTENT (%) (20 40 60)	PERMEABILITY (cm/s)	REMARKS
			27	SS	100	10		16	344		31		
342.9									343				
16.6 342.4	**Silty CLAY** Varved silty clay [Lower Glaciolacustrine]		30	TW	100			17					
17.1 342.1			31	RC					342				
17.4	**BOULDERS** [Inferred WS Till] **BEDROCK** Bluish grey bedrock, moderately fractured		32	RC	93	62		18	341				
	...becoming highly fractured at 19.5m		33	RC	100	83		19 20	340				
338.6			34	RC	100	100			339				
20.9	**End of Borehole** at 20.9m Standpipe installed Water level at 10.9m below ground surface upon completion Water level at 4.8m below ground surface on Oct. 29, 2012												

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RECORD OF BOREHOLE No. BH12-09

PROJECT	Rainy River Gold Project					ENGINEER	MS
PROJECT NO.	TC113921	DRILLER	Marathon Drilling	BORING METHOD	200 mm HSA, NQ Coring	LOGGED BY	AD
CLIENT	Rainy River Resources.	LOCATION	Overburden Stockpile			COMPILED BY	DG
ELEVATION	347.415 m	COORD.	N 5,409,548 E 422,612	BORING DATE	Start: Sep 16, 12 End: Sep 17, 12	CHECKED BY	DGR

SAMPLE TYPES
AU Auger; BU Bulk; DC Dynamic Cone; RC Rock Core; SS Split Spoon; TW Thin Walled Open (Shelby); WS Wash Sample

ABBREVIATIONS
P.P. Pocket Penetrometer; TV Torvane; PT Standard Proctor Test; P.L. Point Load Strength Index (I_{50}); RQD Rock Quality Designation; SCR Solid Core Recovery; k Permeability; C Consolidation; DS Direct Shear; GS Grain Size Analysis

ELEV / DEPTH (m)	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	RECOVERY (%)	SPT "N" VALUES or RQD	DEPTH (m)	ELEVATION (m)	DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100)	PLASTIC LIMIT / NATURAL MOISTURE CONTENT / LIQUID LIMIT (w_P w w_L)	PERMEABILITY (cm/s)	REMARKS
347.4	Ground surface											
347.2 / 0.2	**PEAT** Dark brown peat, some sand, some silt, some clay, fibrous		1	SS	25	2				20		
	Sandy SILT Light brown sandy silt, damp to moist, soft, low plasticity, trace rootlets, trace oxidation, soft to firm		2	SS	92	4	1	347		23		
345.6			3	SS	92	5	2	346		24 / 34 / 38		
1.8	**Silty CLAY** Dark brown silty clay, trace sand, trace gravel, varved, damp to moist, occasional oxidized pockets, soft to firm, low to medium plasticity [Upper Glaciolacustrine] ...light grey laminations of silt with sand and gravel at 2.6m		4	SS	92	7	3	345		23		
			5	TW	96		4	344				...at 3.4m PP= 76 kPa
			6	SS	100	4	5	343		20 / 29		
			7	SS	100	4	6	342		24		
341.3												
6.2 / 340.7	**Silty SAND** Grey silty sand, fine grained, loose, wet [Glacio Fluvial]		8	SS	75	4	7	341		22		
6.7	**Silty CLAY** Dark grey silty clay, trace sand, trace fine gravel, damp to moist, stiff, medium to high plasticity [WML Till]		9	SS	100	8	8	340		33		
338.3							9	339				
9.1	**Silty SAND** Grey silty sand, fine grained, loose, wet [Glacio Fluvial]		10	SS	92		10	338		22		...spoon dropped under weight of hammer at 9.1m; 0.15m of sand heave in auger
	...becoming moist to wet at 10.7m		11	SS	100		11	337		22		...spoon dropped under weight of hammer, likely heaved sand
334.8			12	SS	83	8	12	336		28		
12.6	**Silty CLAY** Dark grey silty clay, trace sand, trace fine gravel, damp to moist, stiff, medium to high plasticity [WML Till]		13	SS	100	4	13	335		36		
332.5							14	334				
							15	333				

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RECORD OF BOREHOLE No. BH12-09

PROJECT	Rainy River Gold Project					ENGINEER	MS
PROJECT NO.	TC113921	DRILLER	Marathon Drilling	BORING METHOD	200 mm HSA, NQ Coring	LOGGED BY	AD
CLIENT	Rainy River Resources.	LOCATION	Overburden Stockpile			COMPILED BY	DG
ELEVATION	347.415 m	COORD.	N 5,409,548 E 422,612	BORING DATE	Start: Sep 16, 12 End: Sep 17, 12	CHECKED BY	DGR

SAMPLE TYPES
AU Auger; BU Bulk; DC Dynamic Cone; RC Rock Core; SS Split Spoon; TW Thin Walled Open (Shelby); WS Wash Sample

ABBREVIATIONS
P.P. Pocket Penetrometer; TV Torvane; PT Standard Proctor Test; P.L. Point Load Strength Index (I_{50}); RQD Rock Quality Designation; SCR Solid Core Recovery; k Permeability; C Consolidation; DS Direct Shear; GS Grain Size Analysis

ELEV / DEPTH (m)	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	RECOVERY (%)	SPT "N" VALUES or RQD	WELL / PIEZOMETER INSTALLATION	DEPTH (m)	ELEVATION (m)	DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100) / MTO VANE (□ INTACT, ■ REMOULDED) / NILCON VANE (△ INTACT, ▲ REMOULDED) / UNDRAINED SHEAR STRENGTH (kPa) (20 40 60 80 100)	PLASTIC LIMIT / NATURAL MOISTURE CONTENT / LIQUID LIMIT (w_P w w_L) / WATER CONTENT (%) (20 40 60)	PERMEABILITY (cm/s)	REMARKS
14.9	**Silty SAND** Grey silty sand, fine grained, loose, wet [Glacio Fluvial]		14	SS	83	12		16	332		20		
331.0													
16.5	**Silty CLAY** Dark grey silty clay, trace sand, trace fine gravel, damp to moist, stiff, medium to high plasticity [WML Till]		15	SS	75	5		17	331		23 34		
			16	SS	62	5		18	330		33		
			17	SS	100	8		19	329		33		
			18	SS	100	8		20	328		32		
324.6								21	327				
22.9	**Silty CLAY** Light grey silty clay with dark grey clay varves [Lower Glaciolacustrine] ...sandier below 23.2m (possible transition zone)		19	SS	100	11		22	326		29		
323.3								23	325				
24.1	**BOULDERS and COBBLES** Black to green boulders and cobbles [Inferred WS Till]		20	RC	35	0		24	324				...at 24.1m, 3.0m sand heave
322.2								25	323				
25.2	**BEDROCK** Reddish green to black bands, silver metallic crystals throughout ...becoming red bedrock with blue to green bands, white intrusions		21	RC	100	100		26	322				
			22	RC	93	80		27	321				
			23	RC	100	81		28	320				...artisian flow observed at 27.1m
318.9									319				
28.5	**End of Borehole** at 28.5m Standpipe installed with 1m stick up, artesian pressure condition upon completion Artesian flow noted on Oct. 30, 2012												

RECORD OF BOREHOLE No. BH12-10

PROJECT	Rainy River Gold Project					ENGINEER	MS
PROJECT NO.	TC113921	DRILLER	Marathon Drilling	BORING METHOD	200 mm HSA, NQ Coring	LOGGED BY	AD
CLIENT	Rainy River Resources.	LOCATION	Overburden Stockpile			COMPILED BY	DG
ELEVATION	345.232 m	COORD.	N 5,409,003 E 424,069	BORING DATE	Start: Aug 24, 12 End: Aug 27, 12	CHECKED BY	DGR

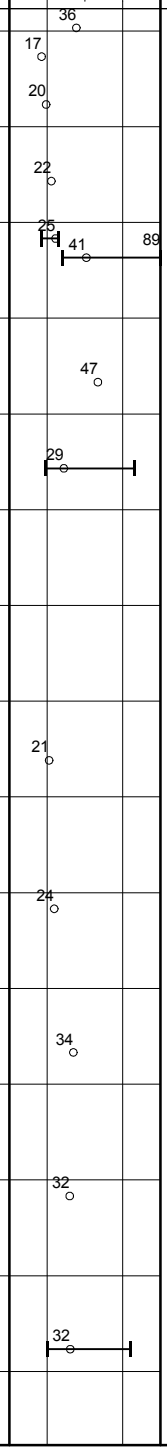
SAMPLE TYPES
AU Auger; BU Bulk; DC Dynamic Cone; RC Rock Core; SS Split Spoon; TW Thin Walled Open (Shelby); WS Wash Sample

ABBREVIATIONS
P.P. Pocket Penetrometer; TV Torvane; PT Standard Proctor Test; P.L. Point Load Strength Index (I_{50}); RQD Rock Quality Designation; SCR Solid Core Recovery; k Permeability; C Consolidation; DS Direct Shear; GS Grain Size Analysis

ELEV / DEPTH (m)	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	RECOVERY (%)	SPT "N" VALUES or RQD	WELL / PIEZOMETER INSTALLATION	DEPTH (m)	ELEVATION (m)	REMARKS
345.2	Ground surface									
345.0 / 0.2	**PEAT** Dark brown, fibrous, dry, some rootlets		1	SS	62	5				
344.8 / 0.4	**Silty CLAY** Some sand, grey to brown, damp, varved, oxidazed staining throughout, firm, occasional rootlets		2	SS	89	6		1	345	
			3	SS	100	6		2	344	
342.7			4	SS	100	3		3	343	
2.5	**Silty CLAY** Trace sand, trace fine gravel, grey, moist, medium to high plasticity, firm [WML Till]		5	TW	62			4	342	
			6	SS	100			5	341	
	...coarse sand seam at 4.9m		7	SS	100	3		6	340	
			8	TW	87			7	339	
			9	SS	89	5		8	338	
			10	SS	100	4		9	337	
			11	SS	100	5		10	336	
			12	SS	100	6		11	335	
			13	SS	100	7		12	334	
								13	333	
								14	332	
								15	331	

DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100)
MTO VANE: □ INTACT ■ REMOULDED
NILCON VANE: △ INTACT ▲ REMOULDED
UNDRAINED SHEAR STRENGTH (kPa) (20 40 60 80 100)

PLASTIC LIMIT w_P | NATURAL MOISTURE CONTENT w | LIQUID LIMIT w_L
WATER CONTENT (%) (20 40 60)



PERMEABILITY (cm/s)

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RECORD OF BOREHOLE No. BH12-10

PROJECT	Rainy River Gold Project			ENGINEER	MS
PROJECT NO.	TC113921	DRILLER	Marathon Drilling	BORING METHOD	200 mm HSA, NQ Coring	LOGGED BY	AD
CLIENT	Rainy River Resources.	LOCATION	Overburden Stockpile			COMPILED BY	DG
ELEVATION	345.232 m	COORD.	N 5,409,003 E 424,069	BORING DATE	Start: Aug 24, 12 End: Aug 27, 12	CHECKED BY	DGR

SAMPLE TYPES
AU Auger; BU Bulk; DC Dynamic Cone; RC Rock Core; SS Split Spoon; TW Thin Walled Open (Shelby); WS Wash Sample

ABBREVIATIONS
P.P. Pocket Penetrometer; TV Torvane; PT Standard Proctor Test; P.L. Point Load Strength Index (I_{50}); RQD Rock Quality Designation; SCR Solid Core Recovery; k Permeability; C Consolidation; DS Direct Shear; GS Grain Size Analysis

ELEV / DEPTH (m)	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	RECOVERY (%)	SPT "N" VALUES or RQD	WELL / PIEZOMETER INSTALLATION	DEPTH (m)	ELEVATION (m)	DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100) / MTO VANE (□ INTACT ■ REMOULDED) / NILCON VANE (△ INTACT ▲ REMOULDED) / UNDRAINED SHEAR STRENGTH (kPa) (20 40 60 80 100)	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L / WATER CONTENT (%) (20 40 60)	PERMEABILITY (cm/s)	REMARKS
			14	SS	100	7		16	330		35		
									329				
			15	SS	100	6		17			35		
									328				
			16	SS	100	6		18					
									327		33		
								19					
	...grey, moist, fine sand seam at 19.5m		17	SS	100	5		20	326		37		
									325				
			18	SS	100	7		21			36		
									324				
			19	SS	100	4		22					
									323		40		
	...possible sand and gravel seam at 23.9m		20	SS	100	5		23					
								24	322				
									321		39		
			21	SS	100			25					
									320		50		...possible slough due to coring at 25.6m
318.1								26	319				
27.1	**Silty CLAY** Grey silty clay, moist, varved with light grey silt lenses, firm [Lower Glaciolacustrine]		22	SS	100	5		27	318		52		...Artisian condition at 27.1m, approximately 4.5m head
316.6								28	317				
28.7	...fine sand, some gravel, wet, soft		23	SS	100	4		29			25		
316.1									316				
29.1	**Silty SAND** Fine grained silty sand, loose, grey to black, wet [Inferred WS Till]							30					

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RECORD OF BOREHOLE No. BH12-10

PROJECT	Rainy River Gold Project					ENGINEER	MS
PROJECT NO.	TC113921	DRILLER	Marathon Drilling	BORING METHOD	200 mm HSA, NQ Coring	LOGGED BY	AD
CLIENT	Rainy River Resources.	LOCATION	Overburden Stockpile			COMPILED BY	DG
ELEVATION	345.232 m	COORD.	N 5,409,003 E 424,069	BORING DATE	Start: Aug 24, 12 End: Aug 27, 12	CHECKED BY	DGR

SAMPLE TYPES
AU Auger; BU Bulk; DC Dynamic Cone; RC Rock Core; SS Split Spoon; TW Thin Walled Open (Shelby); WS Wash Sample

ABBREVIATIONS
P.P. Pocket Penetrometer; TV Torvane; PT Standard Proctor Test; P.L. Point Load Strength Index (I_{50}); RQD Rock Quality Designation; SCR Solid Core Recovery; k Permeability; C Consolidation; DS Direct Shear; GS Grain Size Analysis

ELEV / DEPTH (m)	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	RECOVERY (%)	SPT "N" VALUES or RQD	WELL / PIEZOMETER INSTALLATION	DEPTH (m)	ELEVATION (m)	DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100); MTO VANE □ INTACT ■ REMOULDED; NILCON VANE △ INTACT ▲ REMOULDED; UNDRAINED SHEAR STRENGTH (kPa) (20 40 60 80 100)	PLASTIC LIMIT w_P; NATURAL MOISTURE CONTENT w; LIQUID LIMIT w_L; WATER CONTENT (%) (20 40 60)	PERMEABILITY (cm/s)	REMARKS
								31	315				
314.1													
31.1	**End of Borehole** at 31.1m Standpipe installed with 0.9m stick up Artesian head of 0.7m above ground surface noted on Oct. 31, 2012												

RECORD OF BOREHOLE No. BH12-13

PROJECT	Rainy River Gold Project					ENGINEER	MS
PROJECT NO.	TC113921	DRILLER	Marathon Drilling	BORING METHOD	200 mm HSA, NQ Coring	LOGGED BY	AD
CLIENT	Rainy River Resources.	LOCATION	Open Pit Area			COMPILED BY	DG
ELEVATION	352.625 m	COORD.	N 5,409,437 E 425,767	BORING DATE	Start: Sep 8, 12 End: Sep 9, 12	CHECKED BY	DGR

SAMPLE TYPES
AU Auger; BU Bulk; DC Dynamic Cone; RC Rock Core; SS Split Spoon; TW Thin Walled Open (Shelby); WS Wash Sample

ABBREVIATIONS
P.P. Pocket Penetrometer; TV Torvane; PT Standard Proctor Test; P.L. Point Load Strength Index (I_{50}); RQD Rock Quality Designation; SCR Solid Core Recovery; k Permeability; C Consolidation; DS Direct Shear; GS Grain Size Analysis

ELEV / DEPTH (m)	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	RECOVERY (%)	SPT "N" VALUES or RQD	DEPTH (m)	ELEVATION (m)	PLASTIC LIMIT / NATURAL MOISTURE CONTENT / LIQUID LIMIT (w_P / w / w_L)	PERMEABILITY (cm/s)	REMARKS
352.6	Ground surface										
0.0	**Silty CLAY** Dark brown silty clay, some sand, damp to dry, stiff, trace rootlets		1	SS	46	7			18		
351.9								352			
0.8	**Silty CLAY** Brown silty clay, trace sand, varved, light brown sand and gravel lenses, damp, very stiff [Upper Glaciolacustrine]		2	SS	54	7	1		34		
			3	SS	100		2	351			...102mm diameter split spoon sampler used for SS 3, 4, 5, and, 6
349.6	...oxidized pockets from 2.6m to 3.1m						3	350			
3.1	**Silty CLAY** Grey silty clay, some sand, some gravel, trace cobbles, damp, firm to stiff, trace mottled brown oxidized pockets, medium to high plasticity [WML Till]		4	SS	100		4	349			
			5	SS	100		5	348			
			6	SS	100		6	347			
	...greyish black gravel at 7.8m		7	SS	83	18	7	346			
			8	SS	79	4	8	345			
342.1	...becoming more silty, coarse sand, wet (possible transition zone)						9	344	33		
342.0	**SAND**		9	SS	100	50	10	343	29		
341.9	Coarse grained, angular, some fine gravel, trace grey silty clay, wet [WS Till]		10	RC	33	0	11	342	16		
10.7	**BEDROCK** Greyish black bedrock, green bands along fractures		11	RC	100	63	12	341			
			12	RC	100	87	13	340			
338.7			13	RC	100	82		339			
13.9	**End of Borehole** at 13.9m Standpipe installed with 0.9m stick up Water level at 3.2m below ground										

DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100)
MTO VANE: □ INTACT ■ REMOULDED
NILCON VANE: △ INTACT ▲ REMOULDED
UNDRAINED SHEAR STRENGTH (kPa) 20 40 60 80 100
WATER CONTENT (%) 20 40 60

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RECORD OF BOREHOLE No. BH12-13

PROJECT	Rainy River Gold Project			ENGINEER	MS
PROJECT NO.	TC113921	DRILLER	Marathon Drilling	BORING METHOD	200 mm HSA, NQ Coring	LOGGED BY	AD
CLIENT	Rainy River Resources.	LOCATION	Open Pit Area			COMPILED BY	DG
ELEVATION	352.625 m	COORD.	N 5,409,437 E 425,767	BORING DATE	Start: Sep 8, 12 End: Sep 9, 12	CHECKED BY	DGR

SAMPLE TYPES
AU Auger
BU Bulk
DC Dynamic Cone
RC Rock Core
SS Split Spoon
TW Thin Walled Open (Shelby)
WS Wash Sample

ABBREVIATIONS
P.P. Pocket Penetrometer
TV Torvane
PT Standard Proctor Test
P.L. Point Load Strength Index (I_{50})
RQD Rock Quality Designation
SCR Solid Core Recovery
k Permeability
C Consolidation
DS Direct Shear
GS Grain Size Analysis

ELEV / DEPTH (m)	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	RECOVERY (%)	SPT "N" VALUES or RQD	WELL / PIEZOMETER INSTALLATION	DEPTH (m)	ELEVATION (m)	DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100); MTO VANE □ INTACT ■ REMOULDED; NILCON VANE △ INTACT ▲ REMOULDED; UNDRAINED SHEAR STRENGTH (kPa) 20 40 60 80 100	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L; WATER CONTENT (%) 20 40 60	PERMEABILITY (cm/s)	REMARKS
	surface on installation Water level at 3.0m below ground surface on Oct. 30, 2012												

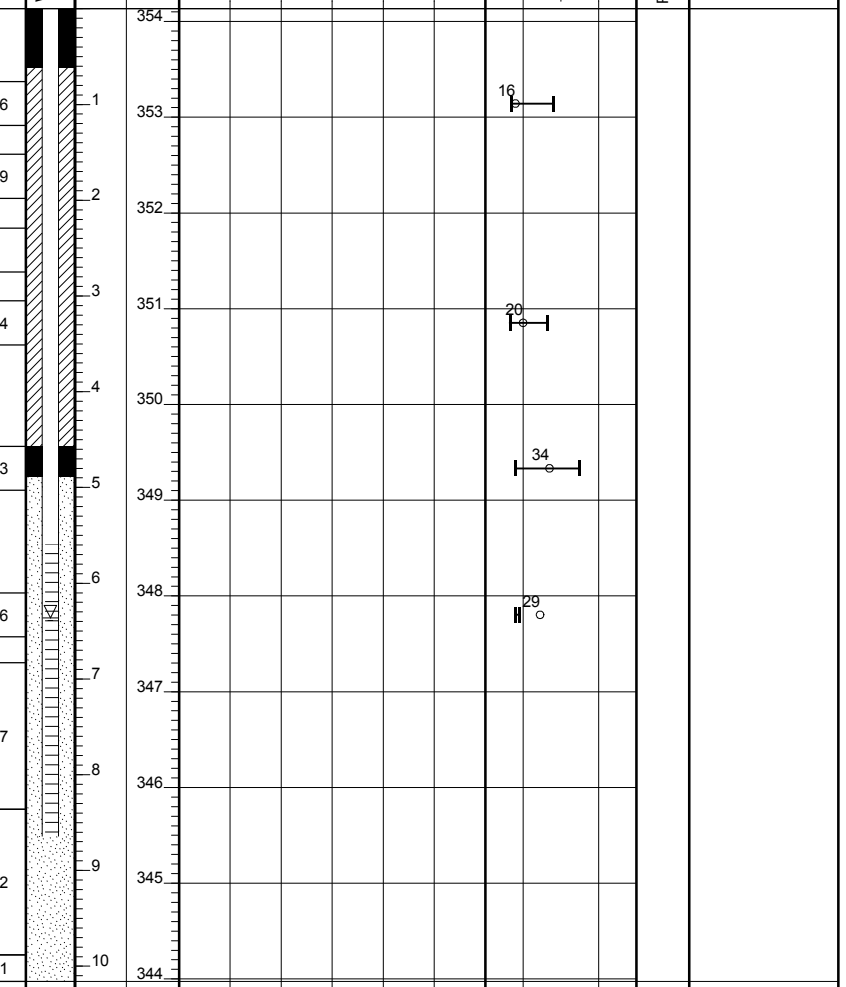
RECORD OF BOREHOLE No. BH12-14

PROJECT	Rainy River Gold Project					ENGINEER	MS
PROJECT NO.	TC113921	DRILLER	Marathon Drilling	BORING METHOD	200 mm HSA, NQ Coring	LOGGED BY	TA
CLIENT	Rainy River Resources.	LOCATION	Open Pit Area			COMPILED BY	DG
ELEVATION	354.133 m	COORD.	N 5,409,536 E 425,420	BORING DATE	Start: Oct 2, 12 End: Oct 2, 12	CHECKED BY	DGR

SAMPLE TYPES
AU Auger; BU Bulk; DC Dynamic Cone; RC Rock Core; SS Split Spoon; TW Thin Walled Open (Shelby); WS Wash Sample

ABBREVIATIONS
P.P. Pocket Penetrometer; TV Torvane; PT Standard Proctor Test; P.L. Point Load Strength Index (I_{50}); RQD Rock Quality Designation; SCR Solid Core Recovery; k Permeability; C Consolidation; DS Direct Shear; GS Grain Size Analysis

ELEV / DEPTH (m)	DESCRIPTION	NUMBER	TYPE	RECOVERY (%)	SPT "N" VALUES or RQD
354.1	Ground surface				
354.0 / 0.2	**TOPSOIL**				
	Silty CLAY Brown silt clay, trace to some sand, moist, occasional silty lenses, low plasticity [Upper Glaciolacustrine]	1	SS	88	16
		2	SS	100	19
	...becoming varved at 2.3m	3	TW	100	
		4	SS	39	24
349.6 / 4.6	**Silty CLAY** Grey silty clay, trace sand, trace gravel, low to medium plasticity, stiff [WML Till]	5	SS	83	23
		6	SS	100	56
347.7 / 6.5	**Sandy SILT** Grey sandy silt to silty sand				
347.3 / 6.8	**BEDROCK** Light grey	7	RC	95	57
		8	RC	95	62
344.0		9	RC	100	91
10.2	**End of Borehole** at 10.2m Standpipe installed with 0.9m stick up Water level 5.4m below ground surface on completion Water level 5.4m below ground surface on Oct. 30, 2012				



REMARKS

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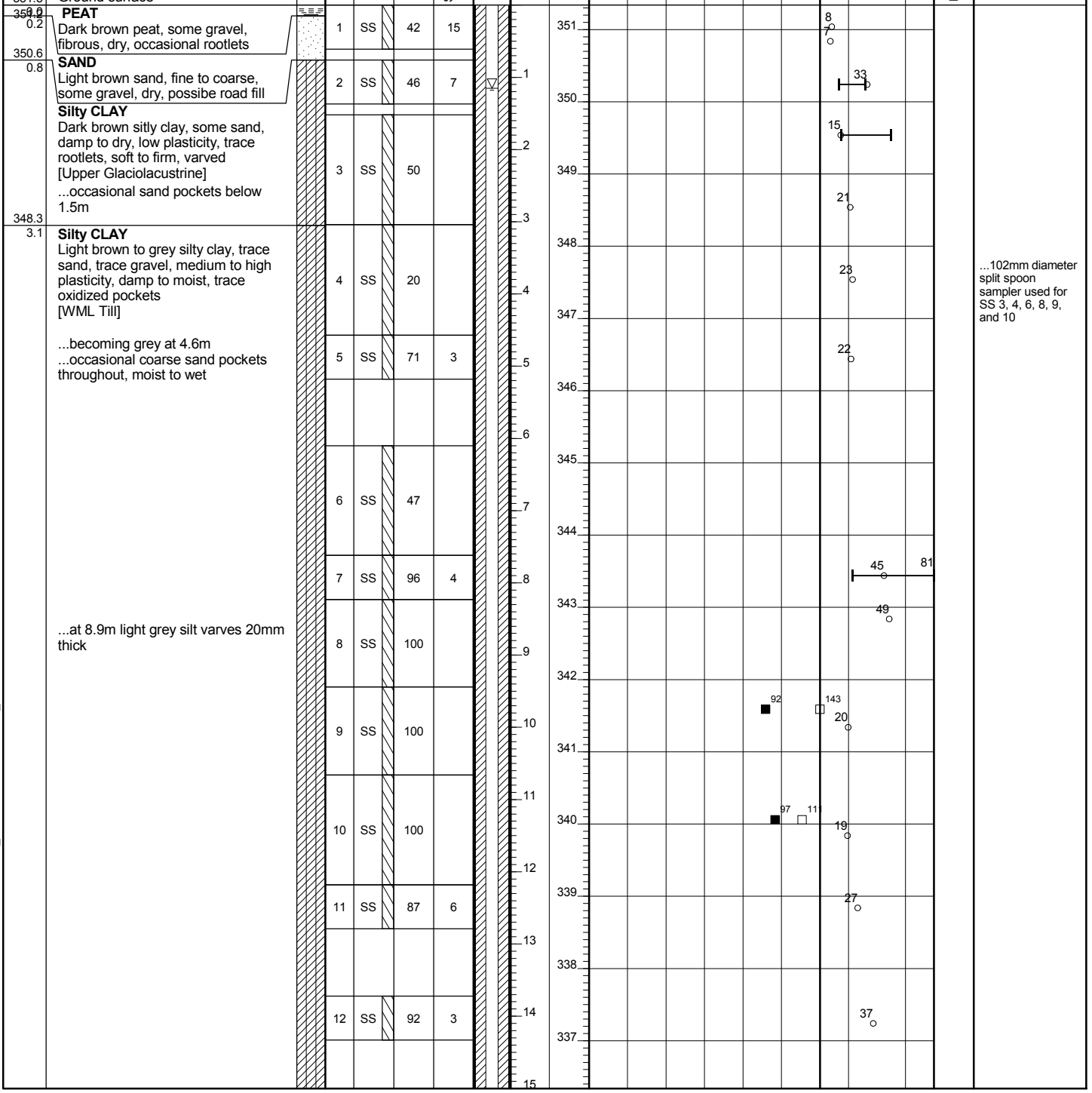
RECORD OF BOREHOLE No. BH12-15

PROJECT	Rainy River Gold Project					ENGINEER	MS
PROJECT NO.	TC113921	DRILLER	Marathon Drilling	BORING METHOD	200 mm HSA, NQ Coring	LOGGED BY	AD
CLIENT	Rainy River Resources.	LOCATION	Open Pit Area			COMPILED BY	DG
ELEVATION	351.339 m	COORD.	N 5,409,732 E 426,116	BORING DATE	Start: Sep 10, 12 End: Sep 13, 12	CHECKED BY	DGR

SAMPLE TYPES
AU Auger; BU Bulk; DC Dynamic Cone; RC Rock Core; SS Split Spoon; TW Thin Walled Open (Shelby); WS Wash Sample

ABBREVIATIONS
P.P. Pocket Penetrometer; TV Torvane; PT Standard Proctor Test; P.L. Point Load Strength Index (I_{50}); RQD Rock Quality Designation; SCR Solid Core Recovery; k Permeability; C Consolidation; DS Direct Shear; GS Grain Size Analysis

ELEV / DEPTH (m)	DESCRIPTION	NUMBER	TYPE	RECOVERY (%)	SPT "N" VALUES or RQD
351.3	Ground surface				
350.9	**PEAT** Dark brown peat, some gravel, fibrous, dry, occasional rootlets	1	SS	42	15
0.2 / 350.6	**SAND** Light brown sand, fine to coarse, some gravel, dry, possibe road fill	2	SS	46	7
0.8	**Silty CLAY** Dark brown sitly clay, some sand, damp to dry, low plasticity, trace rootlets, soft to firm, varved [Upper Glaciolacustrine] ...occasional sand pockets below 1.5m	3	SS	50	
348.3					
3.1	**Silty CLAY** Light brown to grey silty clay, trace sand, trace gravel, medium to high plasticity, damp to moist, trace oxidized pockets [WML Till] ...becoming grey at 4.6m ...occasional coarse sand pockets throughout, moist to wet	4	SS	20	
		5	SS	71	3
		6	SS	47	
		7	SS	96	4
	...at 8.9m light grey silt varves 20mm thick	8	SS	100	
		9	SS	100	
		10	SS	100	
		11	SS	87	6
		12	SS	92	3



PERMEABILITY (cm/s)

REMARKS: ...102mm diameter split spoon sampler used for SS 3, 4, 6, 8, 9, and 10

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RECORD OF BOREHOLE No. BH12-15

PROJECT Rainy River Gold Project | ENGINEER MS

PROJECT NO. TC113921 | DRILLER Marathon Drilling | BORING METHOD 200 mm HSA, NQ Coring | LOGGED BY AD

CLIENT Rainy River Resources. | LOCATION Open Pit Area | COMPILED BY DG

ELEVATION 351.339 m | COORD. N 5,409,732 E 426,116 | BORING DATE Start: Sep 10, 12 End: Sep 13, 12 | CHECKED BY DGR

SAMPLE TYPES
AU Auger; BU Bulk; DC Dynamic Cone; RC Rock Core; SS Split Spoon; TW Thin Walled Open (Shelby); WS Wash Sample

ABBREVIATIONS
P.P. Pocket Penetrometer; TV Torvane; PT Standard Proctor Test; P.L. Point Load Strength Index (I_{50}); RQD Rock Quality Designation; SCR Solid Core Recovery; k Permeability; C Consolidation; DS Direct Shear; GS Grain Size Analysis

ELEV / DEPTH (m)	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	RECOVERY (%)	SPT "N" VALUES or RQD	WELL / PIEZOMETER INSTALLATION	DEPTH (m)	ELEVATION (m)	DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100) / MTO VANE (□ INTACT ■ REMOULDED) / NILCON VANE (△ INTACT ▲ REMOULDED) / UNDRAINED SHEAR STRENGTH (kPa) 20 40 60 80 100	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L — WATER CONTENT (%) 20 40 60	PERMEABILITY (cm/s)	REMARKS
			13	SS		4		16	336		37		
			14	SS	75	6		17	335		41		
			15	SS	92	6		18	334		36		
			16	SS	79	7		19	333		46		
			17	SS	79	8		20	332		24		
			18	SS		12		21	331		27		
			19	SS	83	9		22	330		34		
			20	SS	83	9		23	329		26		
	...trace to some sand, fine gravel below 27.4m		21	SS	100	10		24	328		29		
	...sandy silt seam from 29.1m to 29.4m		22	SS	92	9		25	327		31		
								26	326				
								27	325				
								28	324				
								29	323				
								30	322				

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RECORD OF BOREHOLE No. BH12-15

PROJECT	Rainy River Gold Project					ENGINEER	MS
PROJECT NO.	TC113921	DRILLER	Marathon Drilling	BORING METHOD	200 mm HSA, NQ Coring	LOGGED BY	AD
CLIENT	Rainy River Resources.	LOCATION	Open Pit Area			COMPILED BY	DG
ELEVATION	351.339 m	COORD.	N 5,409,732 E 426,116	BORING DATE	Start: Sep 10, 12 End: Sep 13, 12	CHECKED BY	DGR

SAMPLE TYPES
AU Auger; BU Bulk; DC Dynamic Cone; RC Rock Core; SS Split Spoon; TW Thin Walled Open (Shelby); WS Wash Sample

ABBREVIATIONS
P.P. Pocket Penetrometer; TV Torvane; PT Standard Proctor Test; P.L. Point Load Strength Index (I_{50}); RQD Rock Quality Designation; SCR Solid Core Recovery; k Permeability; C Consolidation; DS Direct Shear; GS Grain Size Analysis

ELEV / DEPTH (m)	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	RECOVERY (%)	SPT "N" VALUES or RQD	WELL / PIEZOMETER INSTALLATION	DEPTH (m)	ELEVATION (m)	REMARKS
			23	SS		11		31	321	
			24	SS		9		32	320	
	...increasing silt and sand content below 33.2m		25	SS	29	14		33	319	
			26	SS		10		34	318	
	...becoming light grey, wet, firm		27	SS	100	9		35	317	
313.5								36	316	
37.9	**Silty SAND** Grey silty sand, fine to coarse grained, wet [WS Till] ...frequent boulders		28	SS		50		37	315	
			29	RC	100	0		38	314	...heaving sand at 37.9m
			30	RC	10	0		39	313	
311.4								40	312	
39.9	**BEDROCK** Grey bedrock, black banding, highly weathered, soft, faintly cemented		31	RC	45	11		41	311	
			32	RC	58	13		42	310	
			33	RC	38	0		43	309	
			34	RC	100	21		44	308	
								45	307	

DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100)
MTO VANE: □ INTACT ■ REMOULDED
NILCON VANE: △ INTACT ▲ REMOULDED
UNDRAINED SHEAR STRENGTH (kPa) 20 40 60 80 100

PLASTIC LIMIT w_P | NATURAL MOISTURE CONTENT w | LIQUID LIMIT w_L
WATER CONTENT (%) 20 40 60

PERMEABILITY (cm/s)

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RECORD OF BOREHOLE No. BH12-15

PROJECT	Rainy River Gold Project			ENGINEER	MS
PROJECT NO.	TC113921	DRILLER	Marathon Drilling	BORING METHOD	200 mm HSA, NQ Coring	LOGGED BY	AD
CLIENT	Rainy River Resources.	LOCATION	Open Pit Area			COMPILED BY	DG
ELEVATION	351.339 m	COORD.	N 5,409,732 E 426,116	BORING DATE	Start: Sep 10, 12 End: Sep 13, 12	CHECKED BY	DGR

SAMPLE TYPES
AU Auger; BU Bulk; DC Dynamic Cone; RC Rock Core; SS Split Spoon; TW Thin Walled Open (Shelby); WS Wash Sample

ABBREVIATIONS
P.P. Pocket Penetrometer; TV Torvane; PT Standard Proctor Test; P.L. Point Load Strength Index (I_{50}); RQD Rock Quality Designation; SCR Solid Core Recovery; k Permeability; C Consolidation; DS Direct Shear; GS Grain Size Analysis

ELEV / DEPTH (m)	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	RECOVERY (%)	SPT "N" VALUES or RQD	WELL / PIEZOMETER INSTALLATION	DEPTH (m)	ELEVATION (m)	DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100) / MTO VANE (□ INTACT ■ REMOULDED) / NILCON VANE (△ INTACT ▲ REMOULDED) / UNDRAINED SHEAR STRENGTH (kPa) (20 40 60 80 100)	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L / WATER CONTENT (%) (20 40 60)	PERMEABILITY (cm/s)	REMARKS
									306				
			35	RC	58	0		46	305				
304.5													
46.8	**End of Borehole** at 46.8m Standpipe installed wiht 0.9m stick up Water level 1.2m below ground surface on completion Water level 1.1m below ground surface on Oct. 30, 2012												

RECORD OF BOREHOLE No. BH12-17

PROJECT	Rainy River Gold Project			ENGINEER	MS
PROJECT NO.	TC113921	DRILLER	Marathon Drilling	BORING METHOD	200 mm HSA, NQ Coring	LOGGED BY	AD
CLIENT	Rainy River Resources.	LOCATION	Open Pit Area			COMPILED BY	DG
ELEVATION	346.592 m	COORD.	N 5,409,329 E 424,634	BORING DATE	Start: Aug 28, 12 End: Sep 7, 12	CHECKED BY	DGR

SAMPLE TYPES
AU Auger; BU Bulk; DC Dynamic Cone; RC Rock Core; SS Split Spoon; TW Thin Walled Open (Shelby); WS Wash Sample

ABBREVIATIONS
P.P. Pocket Penetrometer; TV Torvane; PT Standard Proctor Test; P.L. Point Load Strength Index (I_{50}); RQD Rock Quality Designation; SCR Solid Core Recovery; k Permeability; C Consolidation; DS Direct Shear; GS Grain Size Analysis

ELEV / DEPTH (m)	DESCRIPTION	NUMBER	TYPE	RECOVERY (%)	SPT "N" VALUES or RQD	REMARKS
346.6	Ground surface					
0.0 / 345.8	**PEAT** Dark brown peat, trace rootlets, fibrous, damp	1	SS	8	0	
0.8 / 345.1	**Clayey SILT** Greyish brown clayey silt, trace sand, damp to moist, low plasticity, soft, trace organics, trace oxidized pockets	2	SS	78	3	
1.5	**Silty CLAY** Dark grey silty clay, varved (with light grey silt), soft to firm, moist [Upper Glaciolacustrine]	3	SS	100	3	
		4	SS	100	2	
342.8		5	TW	100		
3.8	**Silty CLAY** Light grey silty clay, trace fine gravel, firm, damp to moist, medium to high plasticity [WML Till]	6	SS	100	6	...at 3.7m PP= 118kPa
		7	SS	100	6	
	...dark grey below 6.1m	8	SS	78	9	
	...becoming moist to wet at 7.6m	9	SS	100	4	
		10	SS	100	4	
		11	TW	100		...at 11.3m PP= 147kPa
		12	SS	100	9	
		13	SS	100	6	

DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100)
MTO VANE: □ INTACT ■ REMOULDED
NILCON VANE: △ INTACT ▲ REMOULDED
UNDRAINED SHEAR STRENGTH (kPa) 20 40 60 80 100

PLASTIC LIMIT w_P — NATURAL MOISTURE CONTENT w — LIQUID LIMIT w_L
WATER CONTENT (%) 20 40 60

Plotted values: 315, 34, 27, 29, 36, 36, 27, 10, 27, 19, 16, 32

PERMEABILITY (cm/s)

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RECORD OF BOREHOLE No. BH12-17

PROJECT	Rainy River Gold Project			ENGINEER	MS
PROJECT NO.	TC113921	DRILLER	Marathon Drilling	BORING METHOD	200 mm HSA, NQ Coring	LOGGED BY	AD
CLIENT	Rainy River Resources.	LOCATION	Open Pit Area			COMPILED BY	DG
ELEVATION	346.592 m	COORD.	N 5,409,329 E 424,634	BORING DATE	Start: Aug 28, 12 End: Sep 7, 12	CHECKED BY	DGR

SAMPLE TYPES
AU Auger; BU Bulk; DC Dynamic Cone; RC Rock Core; SS Split Spoon; TW Thin Walled Open (Shelby); WS Wash Sample

ABBREVIATIONS
P.P. Pocket Penetrometer; TV Torvane; PT Standard Proctor Test; P.L. Point Load Strength Index (I_{50}); RQD Rock Quality Designation; SCR Solid Core Recovery; k Permeability; C Consolidation; DS Direct Shear; GS Grain Size Analysis

ELEV / DEPTH (m)	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	RECOVERY (%)	SPT "N" VALUES or RQD	DEPTH (m)	ELEVATION (m)	PLASTIC LIMIT / NATURAL MOISTURE CONTENT / LIQUID LIMIT (w_P, w, w_L)	PERMEABILITY (cm/s)	REMARKS
	...sandy layer between 16.8m to 17.2m		14	SS	100	7	16	331	27		
			15	SS	100	6	17	330	28		
			16	SS	100	6	18	329	26		
			17	SS	100	7	19	328	38		
			18	SS	100	4	20	327	43		
			19	SS	100	6	21	326	39		
	...occasional pockets of light grey silty sand below 24.1m		20	SS	100	7	22	325	40		
320.7			21	SS	100	6	23	324	55		
25.9	**Silty CLAY** Grey silty clay, trace sand and gravel, light grey silt laminations, low plasticity, moist [Lower Glaciolacustrine]						24	323			
319.5							25	322			
27.1	**SAND and GRAVEL** Coarse grained, some silt, angular to semiangular, wet [Inferred WS Till] ....boulders suspected below 28m		22	SS	39	16	26	321			
							27	320			
							28	319	17		...approximately 6m of sand heave at 27.1m
							29	318			
							30	317			

DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100)
MTO VANE: □ INTACT ■ REMOULDED
NILCON VANE: △ INTACT ▲ REMOULDED
UNDRAINED SHEAR STRENGTH (kPa) 20 40 60 80 100
WATER CONTENT (%) 20 40 60

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RECORD OF BOREHOLE No. BH12-17

PROJECT	Rainy River Gold Project					ENGINEER	MS
PROJECT NO.	TC113921	DRILLER	Marathon Drilling	BORING METHOD	200 mm HSA, NQ Coring	LOGGED BY	AD
CLIENT	Rainy River Resources.	LOCATION	Open Pit Area			COMPILED BY	DG
ELEVATION	346.592 m	COORD.	N 5,409,329 E 424,634	BORING DATE	Start: Aug 28, 12 End: Sep 7, 12	CHECKED BY	DGR

SAMPLE TYPES
AU Auger; BU Bulk; DC Dynamic Cone; RC Rock Core; SS Split Spoon; TW Thin Walled Open (Shelby); WS Wash Sample

ABBREVIATIONS
P.P. Pocket Penetrometer; TV Torvane; PT Standard Proctor Test; P.L. Point Load Strength Index (I_{50}); RQD Rock Quality Designation; SCR Solid Core Recovery; k Permeability; C Consolidation; DS Direct Shear; GS Grain Size Analysis

ELEV / DEPTH (m)	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	RECOVERY (%)	SPT "N" VALUES or RQD	WELL / PIEZOMETER INSTALLATION	DEPTH (m)	ELEVATION (m)	DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100) / MTO VANE (□ INTACT ■ REMOULDED) / NILCON VANE (△ INTACT ▲ REMOULDED) / UNDRAINED SHEAR STRENGTH (kPa) 20 40 60 80 100	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L — WATER CONTENT (%) 20 40 60	PERMEABILITY (cm/s)	REMARKS
313.4								31	316				
								32	315				
								33	314				
33.2	**BEDROCK** Greyish black to black bedrock		23	RC	71	42		34	313				
	...fractures (shards) from 34.7m to 35.1m		24	RC	87	0		35	312				
309.9			25	RC	100	73		36	311				
36.7	**End of Borehole** at 36.7m Standpipe installed with 1.5m stick up; artesian condition upon completion Artesian head of 2.3m above ground surface noted on Oct. 30, 2012								310				

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RECORD OF BOREHOLE No. BH12-18

PROJECT Rainy River Gold Project | ENGINEER MS

PROJECT NO. TC113921 | DRILLER Marathon Drilling | BORING METHOD 200 mm HSA, NQ Coring | LOGGED BY TA

CLIENT Rainy River Resources. | LOCATION Open Pit Area | COMPILED BY DG

ELEVATION 348.384 m | COORD. N 5,409,745 E 424,521 | BORING DATE Start: Aug 11, 12 End: Aug 13, 12 | CHECKED BY DGR

SAMPLE TYPES
AU Auger; BU Bulk; DC Dynamic Cone; RC Rock Core; SS Split Spoon; TW Thin Walled Open (Shelby); WS Wash Sample

ABBREVIATIONS
P.P. Pocket Penetrometer; TV Torvane; PT Standard Proctor Test; P.L. Point Load Strength Index (I_{50}); RQD Rock Quality Designation; SCR Solid Core Recovery; k Permeability; C Consolidation; DS Direct Shear; GS Grain Size Analysis

ELEV / DEPTH (m)	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	RECOVERY (%)	SPT "N" VALUES or RQD	WELL / PIEZOMETER INSTALLATION	DEPTH (m)	ELEVATION (m)	DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100) / MTO VANE (□ INTACT ■ REMOULDED) / NILCON VANE (△ INTACT ▲ REMOULDED) / UNDRAINED SHEAR STRENGTH (kPa) (20 40 60 80 100)	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L — WATER CONTENT (%) (20 40 60)	PERMEABILITY (cm/s)	REMARKS
348.4	Ground surface												
0.0 / 347.8	**TOPSOIL**		1	SS	0	6			348		41		
0.6 / 345.9	**Silty CLAY** Brown silty clay, trace sand, trace gravel, varved, medium plasticity, firm [Upper Glaciolacustrine]		2	SS	100	5		1	347		25		
			3	SS	100	6		2			33		
2.4	**Silty CLAY** Grey silty clay, trace sand, trace greavel, medium to high plasticity, firm [WML Till]		4	TW	96			3	346				
			5	SS	100	7			345		36		
			6	SS	100	7		4			39		
	...sand seam at 4.8m, 30mm thick		7	SS	100	6		5	344		18		
			8	SS	100	4		6	343				
			9	TW	100			7	342		19		
			10	SS	100	5		8	341				
			11	SS	100	5		9	340		40		
			12	TW	100			10	339				
			13	SS	100	5		11	338		37		
								12	337				
								13	336				
								14	335		36		
								15	334				

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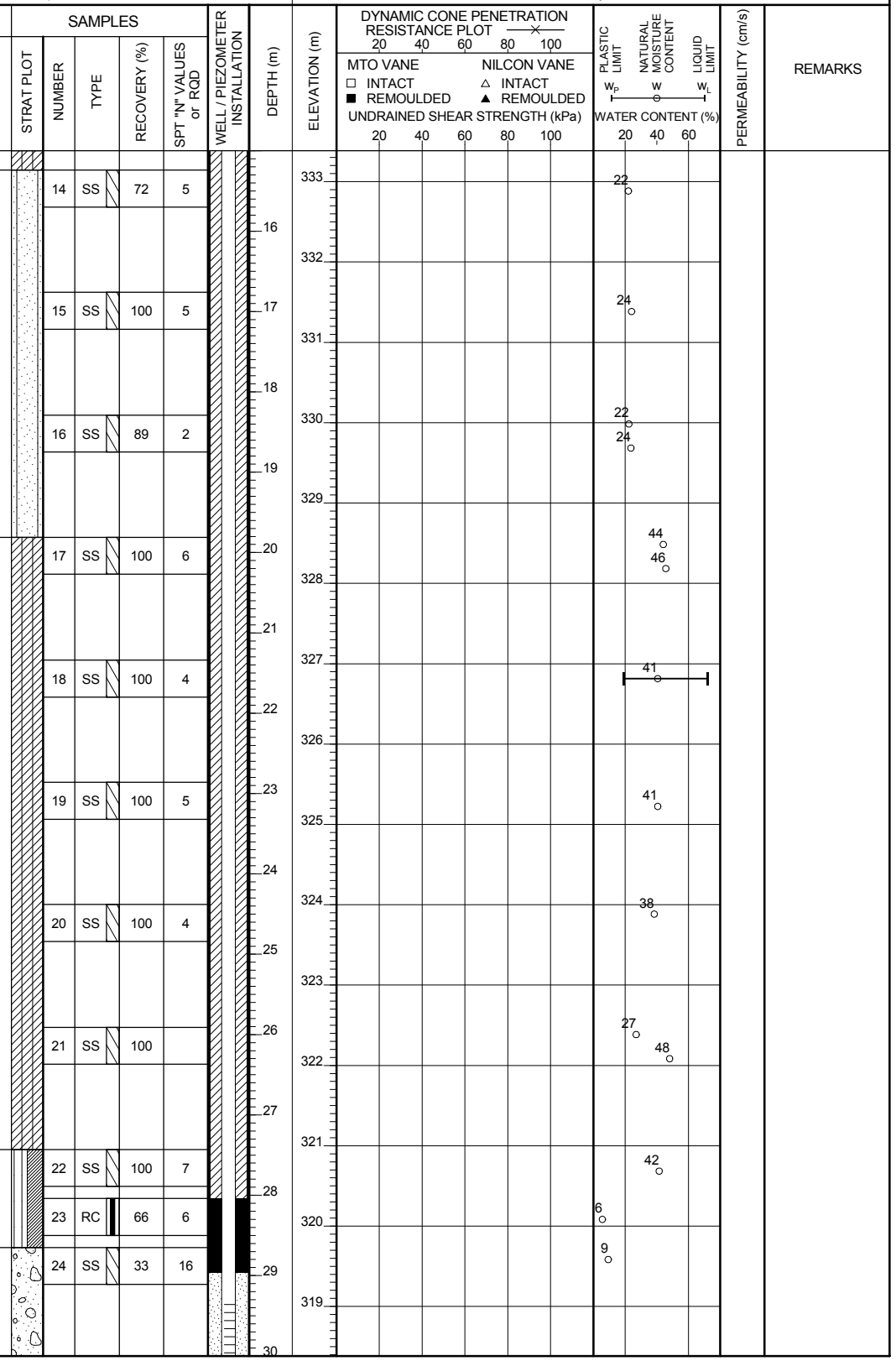
RECORD OF BOREHOLE No. BH12-18

PROJECT	Rainy River Gold Project			ENGINEER	MS
PROJECT NO.	TC113921	DRILLER	Marathon Drilling	BORING METHOD	200 mm HSA, NQ Coring	LOGGED BY	TA
CLIENT	Rainy River Resources.	LOCATION	Open Pit Area			COMPILED BY	DG
ELEVATION	348.384 m	COORD.	N 5,409,745 E 424,521	BORING DATE	Start: Aug 11, 12 End: Aug 13, 12	CHECKED BY	DGR

SAMPLE TYPES
AU Auger; BU Bulk; DC Dynamic Cone; RC Rock Core; SS Split Spoon; TW Thin Walled Open (Shelby); WS Wash Sample

ABBREVIATIONS
P.P. Pocket Penetrometer; TV Torvane; PT Standard Proctor Test; P.L. Point Load Strength Index (I_{50}); RQD Rock Quality Designation; SCR Solid Core Recovery; k Permeability; C Consolidation; DS Direct Shear; GS Grain Size Analysis

ELEV / DEPTH (m)	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	RECOVERY (%)	SPT "N" VALUES or RQD	DEPTH (m)	ELEVATION (m)	REMARKS
333.1									
15.2	**Silty SAND** Grey silty sand to sandy silt, fine grained, trace clay lenses, saturated, loose [Glacio Fluvial]		14	SS	72	5			
			15	SS	100	5			
	...silty clay with fine sand at 17m								
			16	SS	89	2			
	...clayey sand below 18.6m								
328.6									
19.8	**Silty CLAY** Grey silty clay, some sand, occasional sand and silt seams, high plasticity, firm [WML Till]		17	SS	100	6			
			18	SS	100	4			
			19	SS	100	5			
			20	SS	100	4			
			21	SS	100				
321.0									
27.4	**Clayey SILT** Light grey to green clayey silt, trace to some sand, trace gravel, varved [Lower Glaciolacustrine]		22	SS	100	7			
			23	RC	66	6			
319.7									
28.7	**SAND and GRAVEL** Coarse grained, trace silt, grey [Inferred WS Till]		24	SS	33	16			



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RECORD OF BOREHOLE No. BH12-18

PROJECT	Rainy River Gold Project			ENGINEER	MS
PROJECT NO.	TC113921	DRILLER	Marathon Drilling	BORING METHOD	200 mm HSA, NQ Coring	LOGGED BY	TA
CLIENT	Rainy River Resources.	LOCATION	Open Pit Area			COMPILED BY	DG
ELEVATION	348.384 m	COORD.	N 5,409,745 E 424,521	BORING DATE	Start: Aug 11, 12 End: Aug 13, 12	CHECKED BY	DGR

SAMPLE TYPES
AU Auger; BU Bulk; DC Dynamic Cone; RC Rock Core; SS Split Spoon; TW Thin Walled Open (Shelby); WS Wash Sample

ABBREVIATIONS
P.P. Pocket Penetrometer; TV Torvane; PT Standard Proctor Test; P.L. Point Load Strength Index (I_{50}); RQD Rock Quality Designation; SCR Solid Core Recovery; k Permeability; C Consolidation; DS Direct Shear; GS Grain Size Analysis

ELEV / DEPTH (m)	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	RECOVERY (%)	SPT "N" VALUES or RQD	WELL / PIEZOMETER INSTALLATION	DEPTH (m)	ELEVATION (m)	DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100) / MTO VANE □ INTACT ■ REMOULDED / NILCON VANE △ INTACT ▲ REMOULDED / UNDRAINED SHEAR STRENGTH (kPa) (20 40 60 80 100)	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L / WATER CONTENT (%) (20 40 60)	PERMEABILITY (cm/s)	REMARKS
			25	SS	0	14		31	318				
									317				
			26	SS	61	24		32					
									316				
								33					
314.7			27	SS	33	13			315				
33.7	**End of Borehole** at 33.7m, no refusal Standpipe installed with 1.0m stick up Water level 2.7m below ground surface on installation. Artesian head 0.4m above ground surface noted on Oct. 20, 2012												

RECORD OF BOREHOLE No. BH12-19

PROJECT	Rainy River Gold Project					ENGINEER	MS
PROJECT NO.	TC113921	DRILLER	Marathon Drilling	BORING METHOD	200 mm HSA, NQ Coring	LOGGED BY	TA
CLIENT	Rainy River Resources.	LOCATION	Open Pit Area			COMPILED BY	DG
ELEVATION	351.189 m	COORD.	N 5,410,368 E 425,255	BORING DATE	Start: Aug 21, 12 End: Aug 23, 12	CHECKED BY	DGR

SAMPLE TYPES
AU Auger; BU Bulk; DC Dynamic Cone; RC Rock Core; SS Split Spoon; TW Thin Walled Open (Shelby); WS Wash Sample

ABBREVIATIONS
P.P. Pocket Penetrometer; TV Torvane; PT Standard Proctor Test; P.L. Point Load Strength Index (I_{50}); RQD Rock Quality Designation; SCR Solid Core Recovery; k Permeability; C Consolidation; DS Direct Shear; GS Grain Size Analysis

ELEV / DEPTH (m)	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	RECOVERY (%)	SPT "N" VALUES or RQD	WELL / PIEZOMETER INSTALLATION	DEPTH (m)	ELEVATION (m)	DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100) / MTO VANE (□ INTACT ■ REMOULDED) / NILCON VANE (△ INTACT ▲ REMOULDED) / UNDRAINED SHEAR STRENGTH (kPa) (20 40 60 80 100)	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L — WATER CONTENT (%) (20 40 60)	PERMEABILITY (cm/s)	REMARKS
351.2	Ground surface												
351.0 / 0.2	**PEAT** Dark brown peat, fibrous		1	SS	100	6					12 25		
	Silty SAND Brown fine grained silty sand, some organics, trace rootlets ...silty clay at 0.8m		2	SS	39	6		1	350		20 12		
349.7 / 1.5	**Silty CLAY** Brown to grey silty clay, varved, moist [Upper Glaciolacustrine]		3	SS	94	6		2	349		27 89		
			4	TW	77			3	348		34		
347.7			5	SS	100	5							
3.5	**Silty CLAY** Grey silty clay, trace sand, trace gravel, medium to high plasticity, moist, occasional sand seams [WML Till]		6	SS	100	3		4	347		21		
			7	SS	100	3		5	346		25		
			8	TW	83			6	345		35		
			9	SS	100	4		7	344		32		
			10	SS	100	5		8	343				
			11	SS	100	4		9	342		35		
			12	TW	96			10	341		34		
	...grey sandy silt, some clay, wet at 13.7m		13	SS	100	5		11	340				
								12	339		28		
								13	338				
								14	337		22		
								15					

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RECORD OF BOREHOLE No. BH12-19

PROJECT Rainy River Gold Project | ENGINEER MS

PROJECT NO. TC113921 | DRILLER Marathon Drilling | BORING METHOD 200 mm HSA, NQ Coring | LOGGED BY TA

CLIENT Rainy River Resources. | LOCATION Open Pit Area | COMPILED BY DG

ELEVATION 351.189 m | COORD. N 5,410,368 E 425,255 | BORING DATE Start: Aug 21, 12 End: Aug 23, 12 | CHECKED BY DGR

SAMPLE TYPES
AU Auger; BU Bulk; DC Dynamic Cone; RC Rock Core; SS Split Spoon; TW Thin Walled Open (Shelby); WS Wash Sample

ABBREVIATIONS
P.P. Pocket Penetrometer; TV Torvane; PT Standard Proctor Test; P.L. Point Load Strength Index (I_{50}); RQD Rock Quality Designation; SCR Solid Core Recovery; k Permeability; C Consolidation; DS Direct Shear; GS Grain Size Analysis

ELEV / DEPTH (m)	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	RECOVERY (%)	SPT "N" VALUES or RQD	WELL / PIEZOMETER INSTALLATION	DEPTH (m)	ELEVATION (m)	DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100) / MTO VANE (□ INTACT ■ REMOULDED) / NILCON VANE (△ INTACT ▲ REMOULDED) / UNDRAINED SHEAR STRENGTH (kPa) 20 40 60 80 100	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L — WATER CONTENT (%) 20 40 60	PERMEABILITY (cm/s)	REMARKS
	...with trace silt lenses from 16.8m to 18.3m		14	SS	100	3		16	336		27		
			15	SS	100	3		17	335				
			16	SS	100	3		18	334		27		
			17	SS	100	3		19	333		41		
			18	SS	100	3		20	332				
			19	SS	100	4		21	331		45		
			20	SS	100	4		22	330		46		
325.3								23	329				
25.9	**Silty CLAY** grey silty clay,trace sand, medium plasticity, varved, moist [Lower Glaciolacustrine]		21	SS	100	7		24	328		43		
			22	SS	100	11		25	327		46		
	...sandy below 27.4m, wet							26	326				
322.7								27	325		51	82	
28.5	**SAND TILL** [Inferred WS Till]		23	RC	53			28	324		26		
			24	RC	22			29	323				
								30	322				

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RECORD OF BOREHOLE No. BH12-19

PROJECT	Rainy River Gold Project			ENGINEER	MS
PROJECT NO.	TC113921	DRILLER	Marathon Drilling	BORING METHOD	200 mm HSA, NQ Coring	LOGGED BY	TA
CLIENT	Rainy River Resources.	LOCATION	Open Pit Area			COMPILED BY	DG
ELEVATION	351.189 m	COORD.	N 5,410,368 E 425,255	BORING DATE	Start: Aug 21, 12 End: Aug 23, 12	CHECKED BY	DGR

SAMPLE TYPES
AU Auger; BU Bulk; DC Dynamic Cone; RC Rock Core; SS Split Spoon; TW Thin Walled Open (Shelby); WS Wash Sample

ABBREVIATIONS
P.P. Pocket Penetrometer; TV Torvane; PT Standard Proctor Test; P.L. Point Load Strength Index (I_{50}); RQD Rock Quality Designation; SCR Solid Core Recovery; k Permeability; C Consolidation; DS Direct Shear; GS Grain Size Analysis

ELEV / DEPTH (m)	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	RECOVERY (%)	SPT "N" VALUES or RQD	WELL / PIEZOMETER INSTALLATION	DEPTH (m)	ELEVATION (m)	DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100) / MTO VANE (□ INTACT ■ REMOULDED) / NILCON VANE (△ INTACT ▲ REMOULDED) / UNDRAINED SHEAR STRENGTH (kPa) 20 40 60 80 100	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L / WATER CONTENT (%) 20 40 60	PERMEABILITY (cm/s)	REMARKS
			25	RC	100				321				
320.2			26	RC	31			31					
31.0	**BEDROCK** ...0.10m seam at 31.3m		27	RC	87	12			320				
			28	RC	100	98		32	319				
			29	RC	100	36		33	318				
316.9								34	317				
34.3	**End of Borehole** at 34.3m Stand pipe installed with 0.6m stickup Water level at 0.3m below ground upon completion Water level at 0.04m below ground on Oct. 30, 2012												

RECORD OF BOREHOLE No. BH12-20

PROJECT	Rainy River Gold Project			ENGINEER	MS
PROJECT NO.	TC113921	DRILLER	Marathon Drilling	LOGGED BY	TA
CLIENT	Rainy River Resources.	LOCATION	Tailings Management Area	COMPILED BY	DG
ELEVATION	362.401 m	COORD.	N 5,411,780 E 421,225	CHECKED BY	DGR
		BORING METHOD	200 mm HSA, NQ Coring		
		BORING DATE	Start: Sep 30, 12 End: Oct 1, 12		

SAMPLE TYPES
AU Auger; BU Bulk; DC Dynamic Cone; RC Rock Core; SS Split Spoon; TW Thin Walled Open (Shelby); WS Wash Sample

ABBREVIATIONS
P.P. Pocket Penetrometer; TV Torvane; PT Standard Proctor Test; P.L. Point Load Strength Index (I_{50}); RQD Rock Quality Designation; SCR Solid Core Recovery; k Permeability; C Consolidation; DS Direct Shear; GS Grain Size Analysis

ELEV / DEPTH (m)	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	RECOVERY (%)	SPT "N" VALUES or RQD	WELL / PIEZOMETER INSTALLATION	DEPTH (m)	ELEVATION (m)	DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100) / MTO VANE (□ INTACT ■ REMOULDED) / NILCON VANE (△ INTACT ▲ REMOULDED) / UNDRAINED SHEAR STRENGTH (kPa) (20 40 60 80 100)	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L — WATER CONTENT (%) (20 40 60)	PERMEABILITY (cm/s)	REMARKS
362.4	Ground surface												
0.0	**PEAT** Dark brown peat, fibrous		1	SS	22	6			362				
361.5													
0.9	**Silty CLAY** Brown silty clay, some sand, moist, occasional rootlets		2	SS	0	10		1	361				
360.9													
1.5	**Silty CLAY** Brown silty clay, trace sand, low plasticity, varved, moist [Upper Glaciolacustrine]		3	SS	100	15		2					
			4	SS	100	14			360		20		...additional sample taken (thin wall) between 2.1m and 2.7m (TW 22, 0.46m recovery) ...at 3.0m, SPT sampler hit possible cobble
			5	SS	11	18		3	359				
357.8								4	358				
4.6	**Silty CLAY** Grey silty clay, trace sand, trace gravel, moist, medium plasticity [WML Till]		6	SS	100	12		5			30		
			7	TW	100			6	357				
	...with interbedded silt lenses between 7.6m and 9.1m		8	SS	100	11		7	356				
353.3								8	355		34		
9.1	**Sandy SILT** Greenish grey fine sandy silt, trace clay, moist to wet [Lower Glaciolacustrine]		9	SS	100	22		9	354				
			10	SS	100	31		10	353		21		
	...trace to some clay, moist at 12.2m		11	SS	100	25		11	352				
	...becoming wet, non-plastic, trace clay at 13.7m ...thin stone layer at 13.9m		12	SS	100	62		12	351				
								13	350				
								14	349				
								15	348				

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RECORD OF BOREHOLE No. BH12-20

PROJECT	Rainy River Gold Project			ENGINEER	MS
PROJECT NO.	TC113921	DRILLER	Marathon Drilling	BORING METHOD	200 mm HSA, NQ Coring	LOGGED BY	TA
CLIENT	Rainy River Resources.	LOCATION	Tailings Management Area			COMPILED BY	DG
ELEVATION	362.401 m	COORD.	N 5,411,780 E 421,225	BORING DATE	Start: Sep 30, 12 End: Oct 1, 12	CHECKED BY	DGR

SAMPLE TYPES
AU Auger; BU Bulk; DC Dynamic Cone; RC Rock Core; SS Split Spoon; TW Thin Walled Open (Shelby); WS Wash Sample

ABBREVIATIONS
P.P. Pocket Penetrometer; TV Torvane; PT Standard Proctor Test; P.L. Point Load Strength Index (I_{50}); RQD Rock Quality Designation; SCR Solid Core Recovery; k Permeability; C Consolidation; DS Direct Shear; GS Grain Size Analysis

ELEV / DEPTH (m)	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	RECOVERY (%)	SPT "N" VALUES or RQD	WELL / PIEZOMETER INSTALLATION	DEPTH (m)	ELEVATION (m)	REMARKS
347.2										
15.2	**BOULDERS and COBBLES** Boulders and cobbles with greenish grey sand and silt [WS Till]		13	RC	0			16	347	
			14	RC	12			17	346	
			15	RC	0			18	345	
			16	RC	0	0		19	344	
			17	RC	3			20	343	
			18	RC	0			21	342	
338.6								22	341	
23.9	**BEDROCK** Greenish grey bedrock, highly weathered, very soft		19	RC	87	0		23	340	
			20	RC	93	0		24	339	
			21	RC	100	12		25	338	
334.0								26	337	
28.4	**End of Borehole** at 28.42 m Standpipe installed with 0.9m stick up Artesian condition- Water level 0.4m above ground surface at completion Water level 0.8m above ground surface on Oct. 30, 2012							27	336	
								28	335	
									334	

DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100)
MTO VANE: □ INTACT ■ REMOULDED
NILCON VANE: △ INTACT ▲ REMOULDED
UNDRAINED SHEAR STRENGTH (kPa) 20 40 60 80 100

PLASTIC LIMIT w_P — NATURAL MOISTURE CONTENT w — LIQUID LIMIT w_L
WATER CONTENT (%) 20 40 60

PERMEABILITY (cm/s)

RECORD OF BOREHOLE No. BH12-21

PROJECT	Rainy River Gold Project					ENGINEER	MS
PROJECT NO.	TC113921	DRILLER	Marathon Drilling	BORING METHOD	200 mm HSA, NQ Coring	LOGGED BY	PDR
CLIENT	Rainy River Resources.	LOCATION	Mine Rock Area			COMPILED BY	DG
ELEVATION	372.765 m	COORD.	N 5,409,431 E 427,995	BORING DATE	Start: Sep 10, 12 End: Sep 10, 12	CHECKED BY	DGR

SAMPLE TYPES
AU Auger; BU Bulk; DC Dynamic Cone; RC Rock Core; SS Split Spoon; TW Thin Walled Open (Shelby); WS Wash Sample

ABBREVIATIONS
P.P. Pocket Penetrometer; TV Torvane; PT Standard Proctor Test; P.L. Point Load Strength Index (I_{50}); RQD Rock Quality Designation; SCR Solid Core Recovery; k Permeability; C Consolidation; DS Direct Shear; GS Grain Size Analysis

ELEV / DEPTH (m)	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	RECOVERY (%)	SPT "N" VALUES or RQD	WELL / PIEZOMETER INSTALLATION	DEPTH (m)	ELEVATION (m)	DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100) / MTO VANE (□ INTACT ■ REMOULDED) / NILCON VANE (△ INTACT ▲ REMOULDED) / UNDRAINED SHEAR STRENGTH (kPa) (20 40 60 80 100)	PLASTIC LIMIT / NATURAL MOISTURE CONTENT / LIQUID LIMIT (w_P w w_L) / WATER CONTENT (%) (20 40 60)	PERMEABILITY (cm/s)	REMARKS
372.8	Ground surface												
372.7	**TOPSOIL**												
0.1	**Silty CLAY** Brown silty clay, trace sand, trace gravel, moist, varved, stiff, some rootlets [Upper Glaciolacustrine]		1	SS	42	9		1	372		20 20		
			2	SS	92	17		2	371		21		
			3	SS	92	13		3	370		25		
	...very stiff, trace gravelly sand lensing below 2.3m		4	SS	100	19		4	369		18		
			5	SS	0	50		5	368		27		
	...boulder at 3.2m		6	RC	0			6	367				
			7	SS	100	12		7	366				
366.5			8	SS	67	30		8	365				
366.4	...sand and gravel below 6.1m, possible transition zone		9	RC	67			9	364				
6.4	**BOULDERS** [WS Till]												
	BEDROCK Pink granite bedrock, slightly fractured		10	RC	100	83							
			11	RC	85	63							
363.3													
9.5	**End of Borehole** at 9.5m Standpipe installed with flush mounted steel casing Water level at 5.6m below ground level upon completion Water level at 7.5m below ground surface on Oct. 3, 2012												

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RECORD OF BOREHOLE No. BH12-22

PROJECT	Rainy River Gold Project					ENGINEER	MS
PROJECT NO.	TC113921	DRILLER	Marathon Drilling	BORING METHOD	200 mm HSA, NQ Coring	LOGGED BY	PDR
CLIENT	Rainy River Resources.	LOCATION	Mine Rock Area			COMPILED BY	DG
ELEVATION	379.373 m	COORD.	N 5,410,257 E 428,190	BORING DATE	Start: Sep 9, 12 End: Sep 9, 12	CHECKED BY	DGR

SAMPLE TYPES
AU Auger; BU Bulk; DC Dynamic Cone; RC Rock Core; SS Split Spoon; TW Thin Walled Open (Shelby); WS Wash Sample

ABBREVIATIONS
P.P. Pocket Penetrometer; TV Torvane; PT Standard Proctor Test; P.L. Point Load Strength Index (I_{50}); RQD Rock Quality Designation; SCR Solid Core Recovery; k Permeability; C Consolidation; DS Direct Shear; GS Grain Size Analysis

ELEV / DEPTH (m)	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	RECOVERY (%)	SPT "N" VALUES or RQD	WELL / PIEZOMETER INSTALLATION	DEPTH (m)	ELEVATION (m)	DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100) / MTO VANE (□ INTACT ■ REMOULDED) / NILCON VANE (△ INTACT ▲ REMOULDED) / UNDRAINED SHEAR STRENGTH (kPa) (20 40 60 80 100)	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L / WATER CONTENT (%) (20 40 60)	PERMEABILITY (cm/s)	REMARKS
379.4	Ground surface												
379.0 / 0.4	**TOPSOIL**												
	Silty CLAY Brown silty clay, some sand, moist, varved, trace rootlets, firm to stiff, low plasticity [Upper Glaciolacustrine]		1	AS	58	6							
			2	SS	75	12		1	378		31		
	...becoming stiff, with trace sand, trace fine gravel at 0.8m		3	SS	96	12		2			18		
	...with trace sand and trace oxidized pockets at 1.5m		4	SS	100	15		3	377		21		
			5	TW	83			4	376				...at 3.7m PP= 367.7 KPa TV= 171.6 KPa
374.8									375				
4.6	**Silty CLAY** Dark grey silty clay, trace sand, trace gravel, medium plasticity, very stiff, moist [WML Till]		6	SS	83	15		5	374		20		
			7	TW	75			6	373				
			8	SS	79	14		7	372		19		...at 6.7m PP= 318.7 KPa TV= 171.6 KPa
			9	TW	83			8	371				
	...trace silty pockets, laminated, stiff at 10.7m		10	SS	100	13		9	370				
367.1								10	369		33		...at 9.8m PP= 220.6 KPa TV= 164.3 KPa
12.2 / 366.8	**Silty CLAY** Grey silty clay, varved, wet [Lower Glaciolacustrine]		11	SS	100	19		11	368				
12.6	**Silty SAND** wet							12	367		32		
366.0								13	366				
13.4	**BEDROCK** Pink to grey bedrock, highly fractured, weathering and oxidation in joints		12	RC	100	40		14	365				
								15					

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RECORD OF BOREHOLE No. BH12-22

PROJECT	Rainy River Gold Project					ENGINEER	MS
PROJECT NO.	TC113921	DRILLER	Marathon Drilling	BORING METHOD	200 mm HSA, NQ Coring	LOGGED BY	PDR
CLIENT	Rainy River Resources.	LOCATION	Mine Rock Area			COMPILED BY	DG
ELEVATION	379.373 m	COORD.	N 5,410,257 E 428,190	BORING DATE	Start: Sep 9, 12 End: Sep 9, 12	CHECKED BY	DGR

SAMPLE TYPES
AU Auger; BU Bulk; DC Dynamic Cone; RC Rock Core; SS Split Spoon; TW Thin Walled Open (Shelby); WS Wash Sample

ABBREVIATIONS
P.P. Pocket Penetrometer; TV Torvane; PT Standard Proctor Test; P.L. Point Load Strength Index (I_{50}); RQD Rock Quality Designation; SCR Solid Core Recovery; k Permeability; C Consolidation; DS Direct Shear; GS Grain Size Analysis

ELEV / DEPTH (m)	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	RECOVERY (%)	SPT "N" VALUES or RQD	WELL / PIEZOMETER INSTALLATION	DEPTH (m)	ELEVATION (m)	DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100) / MTO VANE (□ INTACT ■ REMOULDED) / NILCON VANE (△ INTACT ▲ REMOULDED) / UNDRAINED SHEAR STRENGTH (kPa) (20 40 60 80 100)	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L / WATER CONTENT (%) (20 40 60)	PERMEABILITY (cm/s)	REMARKS
	...becoming moderately fractured, trace oxidized pockets		13	RC				16	364				
362.9									363				
16.5	**End of Borehole** at 16.5m Standppipe installed with flush mounted steel casing Water level at 9.6m below ground upon completion Water level at 7.4m below ground surface on Oct. 3, 2012												

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RECORD OF BOREHOLE No. BBAF-BH-2002

PROJECT	Rainy River Gold Project					ENGINEER	MS
PROJECT NO.	TC113921	DRILLER	Marathon Drilling	BORING METHOD	200 mm HSA, NQ Coring	LOGGED BY	ARM
CLIENT	Rainy River Resources.	LOCATION	Plant Site Area			COMPILED BY	DG
ELEVATION	369.759 m	COORD.	N 5,410,217 E 426,778	BORING DATE	Start: Aug 28, 12 End: Aug 28, 12	CHECKED BY	DGR

SAMPLE TYPES
AU Auger; BU Bulk; DC Dynamic Cone; RC Rock Core; SS Split Spoon; TW Thin Walled Open (Shelby); WS Wash Sample

ABBREVIATIONS
P.P. Pocket Penetrometer; TV Torvane; PT Standard Proctor Test; P.L. Point Load Strength Index (I_{50}); RQD Rock Quality Designation; SCR Solid Core Recovery; k Permeability; C Consolidation; DS Direct Shear; GS Grain Size Analysis

ELEV / DEPTH (m)	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	RECOVERY (%)	SPT "N" VALUES or RQD	WELL / PIEZOMETER INSTALLATION	DEPTH (m)	ELEVATION (m)	DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100); MTO VANE □ INTACT ■ REMOULDED; NILCON VANE △ INTACT ▲ REMOULDED; UNDRAINED SHEAR STRENGTH (kPa) (20 40 60 80 100)	PLASTIC LIMIT w_P; NATURAL MOISTURE CONTENT w; LIQUID LIMIT w_L; WATER CONTENT (%) (20 40 60)	PERMEABILITY (cm/s)	REMARKS
369.8	Ground surface												
0.0	**TOPSOIL**		1	AS									
369.0 / 0.8	**Silty CLAY** Light brown silty clay, trace sand, medium plasticity, very stiff [Upper Glaciolacustrine]		2	SS	67	17		1	369		19		
			3	SS	75	20		2	368		17		
367.6 / 2.1	**Silty CLAY** Light to dark brown silty clay, trace sand, trace gravel, high plasticity, stiff		4	SS	83	12			367		28		
366.6	[WML Till]		5	SS	100	50		3			25		
3.2	**BEDROCK**		6	RC	100	70		4	366				...SPT refusal at 3.2m
			7	RC	100	81		5	365				
363.5								6	364				
6.3	**End of Borehole** at 6.3m Standpipe installed with 0.9 m stick up Water level 2.4 m below ground surface on Sept 15, 2012												

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RECORD OF BOREHOLE No. BBAF-BH-2015

PROJECT	Rainy River Gold Project					ENGINEER	MS
PROJECT NO.	TC113921	DRILLER	Marathon Drilling	BORING METHOD	200 mm HSA, NQ Coring	LOGGED BY	PDR
CLIENT	Rainy River Resources.	LOCATION	Plant Site Area			COMPILED BY	AD
ELEVATION	368.446 m	COORD.	N 5,410,507 E 426,591	BORING DATE	Start: Aug 11, 12 End: Aug 12, 12	CHECKED BY	DGR

SAMPLE TYPES
AU Auger; BU Bulk; DC Dynamic Cone; RC Rock Core; SS Split Spoon; TW Thin Walled Open (Shelby); WS Wash Sample

ABBREVIATIONS
P.P. Pocket Penetrometer; TV Torvane; PT Standard Proctor Test; P.L. Point Load Strength Index (I_{50}); RQD Rock Quality Designation; SCR Solid Core Recovery; k Permeability; C Consolidation; DS Direct Shear; GS Grain Size Analysis

ELEV / DEPTH (m)	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	RECOVERY (%)	SPT "N" VALUES or RQD	WELL / PIEZOMETER INSTALLATION	DEPTH (m)	ELEVATION (m)	DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100) / MTO VANE (□ INTACT ■ REMOULDED) / NILCON VANE (△ INTACT ▲ REMOULDED) / UNDRAINED SHEAR STRENGTH (kPa) (20 40 60 80 100)	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L / WATER CONTENT (%) (20 40 60)	PERMEABILITY (cm/s)	REMARKS
368.4	Ground surface												
368.4 0.0	**TOPSOIL**												
	Silty CLAY Brown silty clay, varved, firm, trace sand, medium plasticity, trace roots, moist [Upper Glaciolacustrine]		1	SS	33	7		1	368		16		
			2	SS	71	10					15		
			3	SS	100	10		2	367		27		
			4	SS	100	10			366		30 21		
365.5 2.9	... moist to wet, occasional silt pockets at 2.6m		5	SS	100			3					
365.3 3.1	**Silty SAND** Brown silty sand, wet, trace clay. [WS Till]		6	RC	100	64			365				... at 3.0m SPT refusal
	BEDROCK Moderately to highly fractured		7	RC	100	0		4	364				
			8	RC	100	36		5					
362.3			9	RC	100	0		6	363				
6.1	**End of Borehole** at 6.1m Stand pipe installed with 0.9m stick up Water level at 2.6 m below ground on Sept. 15, 2012												

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RECORD OF BOREHOLE No. BBAF-BH-2051

PROJECT Rainy River Gold Project | ENGINEER MS

PROJECT NO. TC113921 | DRILLER Marathon Drilling | BORING METHOD 200 mm HSA, NQ Coring | LOGGED BY PDR

CLIENT Rainy River Resources. | LOCATION Plant Site Area | COMPILED BY AD

ELEVATION 368.505 m | COORD. N 5,410,538 E 426,591 | BORING DATE Start: Aug 11, 12 End: Aug 11, 12 | CHECKED BY DGR

SAMPLE TYPES
AU Auger; BU Bulk; DC Dynamic Cone; RC Rock Core; SS Split Spoon; TW Thin Walled Open (Shelby); WS Wash Sample

ABBREVIATIONS
P.P. Pocket Penetrometer; TV Torvane; PT Standard Proctor Test; P.L. Point Load Strength Index (I_{50}); RQD Rock Quality Designation; SCR Solid Core Recovery; k Permeability; C Consolidation; DS Direct Shear; GS Grain Size Analysis

ELEV / DEPTH (m)	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	RECOVERY (%)	SPT "N" VALUES or RQD	WELL / PIEZOMETER INSTALLATION	DEPTH (m)	ELEVATION (m)	DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100) / MTO VANE (□ INTACT ■ REMOULDED) / NILCON VANE (△ INTACT ▲ REMOULDED) / UNDRAINED SHEAR STRENGTH (kPa) 20 40 60 80 100	PLASTIC LIMIT / NATURAL MOISTURE CONTENT / LIQUID LIMIT (w_P w w_L) / WATER CONTENT (%) 20 40 60	PERMEABILITY (cm/s)	REMARKS
368.5	Ground surface												
368.4 / 0.1	**TOPSOIL**												
367.9 / 0.6	**Silty CLAY** Brown silty clay, varved, stiff, medium plasticity, moist, trace roots [Upper Glaciolacustrine]		1	SS	58	13			368		16 16 11		
367.7 / 0.8			2	SS	67	50							
			3	RC	100	21		1					
	Silty SAND Reddish brown silty sand, trace fine gravel, very dense, moist [WS Till]		4	RC	100	33		2	367				
	BEDROCK Greenish black bedrock, highly fractured		5	RC	100	17							
	...dark grey below 2.8m		6	RC	97	88		3	366				
364.5			7	RC	100	30			365				
4.0	**End of Borehole** at 3.96m Stand pipe installed with 0.9m stick up Water level at 1.6 m below ground surface on Sept. 15, 2012												

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RECORD OF BOREHOLE No. BBAF-BH-2054

PROJECT Rainy River Gold Project | ENGINEER MS

PROJECT NO. TC113921 | DRILLER Marathon Drilling | BORING METHOD 200 mm HSA, NQ Coring | LOGGED BY PDR

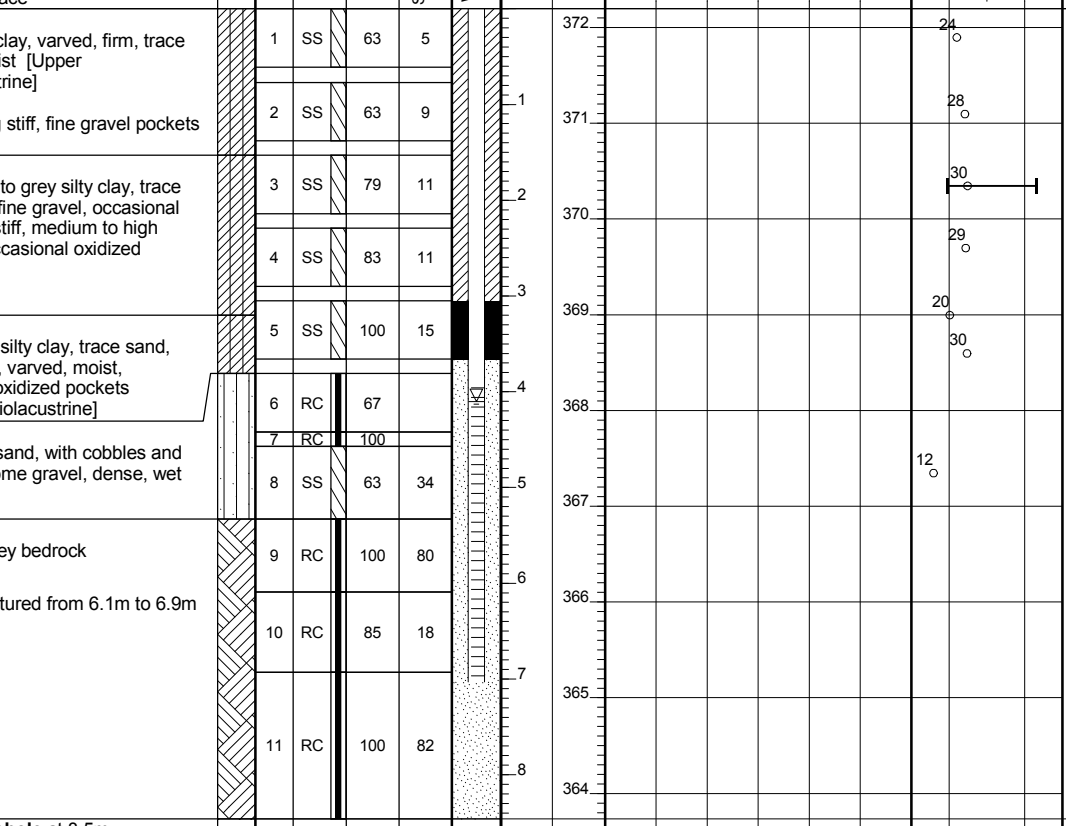
CLIENT Rainy River Resources. | LOCATION Plant Site Area | COMPILED BY AD

ELEVATION 372.196 m | COORD. N 5,410,874 E 426,572 | BORING DATE Start: Aug 10, 12 End: Aug 11, 12 | CHECKED BY DGR

SAMPLE TYPES
AU Auger; BU Bulk; DC Dynamic Cone; RC Rock Core; SS Split Spoon; TW Thin Walled Open (Shelby); WS Wash Sample

ABBREVIATIONS
P.P. Pocket Penetrometer; TV Torvane; PT Standard Proctor Test; P.L. Point Load Strength Index (I_{50}); RQD Rock Quality Designation; SCR Solid Core Recovery; k Permeability; C Consolidation; DS Direct Shear; GS Grain Size Analysis

ELEV / DEPTH (m)	DESCRIPTION	NUMBER	TYPE	RECOVERY (%)	SPT "N" VALUES or RQD	REMARKS
372.2	Ground surface					
0.0	**Silty CLAY** Brown silty clay, varved, firm, trace rootlets, moist [Upper Glaciolacustrine]	1	SS	63	5	
		2	SS	63	9	
370.7	... becoming stiff, fine gravel pockets					
1.5	**Silty CLAY** Dark brown to grey silty clay, trace sand, trace fine gravel, occasional silt lenses, stiff, medium to high plasticity, occasional oxidized pockets [WML Till]	3	SS	79	11	
		4	SS	83	11	
369.0						
3.2	**Silty CLAY** Dark brown silty clay, trace sand, trace gravel, varved, moist, occasional oxidized pockets [Lower Glaciolacustrine]	5	SS	100	15	
368.4						
3.8		6	RC	67		
	Silty SAND Brown silty sand, with cobbles and boulders, some gravel, dense, wet [WS Till]	7	RC	100		
		8	SS	63	34	
366.9						
5.3	**BEDROCK** Greenish grey bedrock	9	RC	100	80	
	...highly fractured from 6.1m to 6.9m	10	RC	85	18	
		11	RC	100	82	
363.7						
8.5	**End of Borehole** at 8.5m Stand pipe installed with 0.9m stick up Water level 4.1m below ground surface on Sept. 15, 2012					



PERMEABILITY (cm/s)

WELL / PIEZOMETER INSTALLATION

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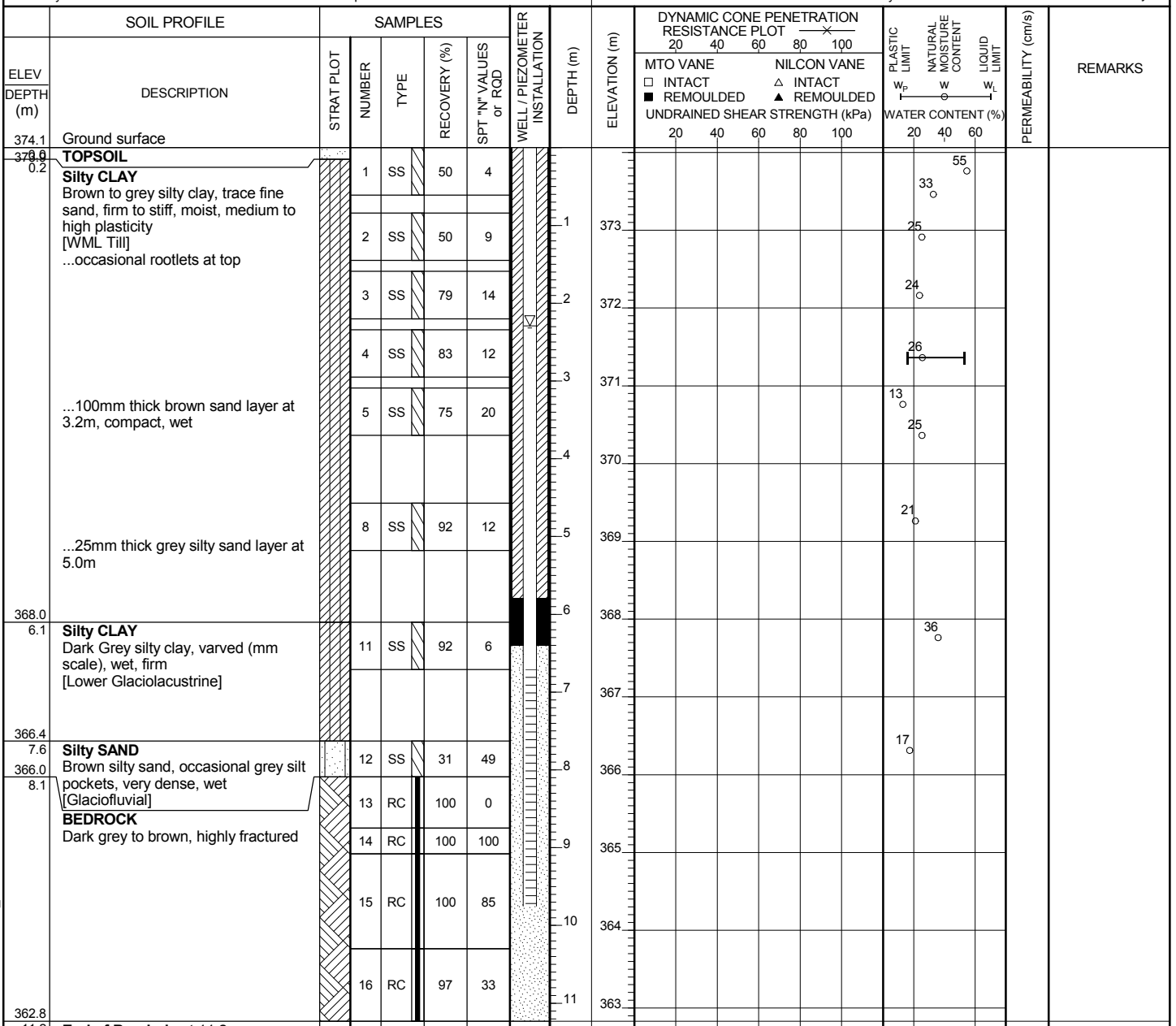
RECORD OF BOREHOLE No. BBAF-BH-2061

PROJECT	Rainy River Gold Project					ENGINEER	MS
PROJECT NO.	TC113921	DRILLER	Marathon Drilling	BORING METHOD	200 mm HSA, NQ Coring	LOGGED BY	PDR
CLIENT	Rainy River Resources.	LOCATION	Plant Site Area			COMPILED BY	DG
ELEVATION	374.062 m	COORD.	N 5,411,001 E 426,687	BORING DATE	Start: Aug 14, 12 End: Aug 14, 12	CHECKED BY	DGR

SAMPLE TYPES
AU Auger; BU Bulk; DC Dynamic Cone; RC Rock Core; SS Split Spoon; TW Thin Walled Open (Shelby); WS Wash Sample

ABBREVIATIONS
P.P. Pocket Penetrometer; TV Torvane; PT Standard Proctor Test; P.L. Point Load Strength Index (I_{50}); RQD Rock Quality Designation; SCR Solid Core Recovery; k Permeability; C Consolidation; DS Direct Shear; GS Grain Size Analysis

ELEV / DEPTH (m)	DESCRIPTION	NUMBER	TYPE	RECOVERY (%)	SPT "N" VALUES or RQD
374.1	Ground surface				
374.0	**TOPSOIL**				
0.2	**Silty CLAY** Brown to grey silty clay, trace fine sand, firm to stiff, moist, medium to high plasticity [WML Till] ...occasional rootlets at top	1	SS	50	4
		2	SS	50	9
		3	SS	79	14
		4	SS	83	12
	...100mm thick brown sand layer at 3.2m, compact, wet	5	SS	75	20
		8	SS	92	12
368.0	...25mm thick grey silty sand layer at 5.0m				
6.1	**Silty CLAY** Dark Grey silty clay, varved (mm scale), wet, firm [Lower Glaciolacustrine]	11	SS	92	6
366.4					
7.6	**Silty SAND** Brown silty sand, occasional grey silt pockets, very dense, wet [Glaciofluvial]	12	SS	31	49
366.0					
8.1	**BEDROCK** Dark grey to brown, highly fractured	13	RC	100	0
		14	RC	100	100
		15	RC	100	85
		16	RC	97	33
362.8					
11.2	**End of Borehole** at 11.2m Standpipe installed with 0.9m stick up. Water level at 2.2m below ground surface on Sept. 15, 2012				



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RECORD OF BOREHOLE No. BBAF-BH-2063

PROJECT	Rainy River Gold Project					ENGINEER	MS
PROJECT NO.	TC113921	DRILLER	Marathon Drilling	BORING METHOD	200 mm HSA, NQ Coring	LOGGED BY	PDR
CLIENT	Rainy River Resources.	LOCATION	Plant Site Area			COMPILED BY	AD
ELEVATION	372.395 m	COORD.	N 5,411,008 E 426,562	BORING DATE	Start: Aug 13, 12 End: Aug 13, 12	CHECKED BY	DGR

SAMPLE TYPES
AU Auger; BU Bulk; DC Dynamic Cone; RC Rock Core; SS Split Spoon; TW Thin Walled Open (Shelby); WS Wash Sample

ABBREVIATIONS
P.P. Pocket Penetrometer; TV Torvane; PT Standard Proctor Test; P.L. Point Load Strength Index (I_{50}); RQD Rock Quality Designation; SCR Solid Core Recovery; k Permeability; C Consolidation; DS Direct Shear; GS Grain Size Analysis

ELEV / DEPTH (m)	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	RECOVERY (%)	SPT "N" VALUES or RQD	WELL / PIEZOMETER INSTALLATION	DEPTH (m)	ELEVATION (m)	DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100) / MTO VANE (□ INTACT ■ REMOULDED) / NILCON VANE (△ INTACT ▲ REMOULDED) / UNDRAINED SHEAR STRENGTH (kPa) 20 40 60 80 100	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L — WATER CONTENT (%) 20 40 60	PERMEABILITY (cm/s)	REMARKS
372.4	Ground surface												
372.0 0.0	**TOPSOIL**												
	Silty CLAY Brown silty clay, firm, trace sand and gravel, moist, occasional rootlets [Upper Glaciolacustrine]		1	SS	50	7			372		29		
			2	SS	81	50		1			23 7		
371.1 1.3	..becoming sandy, dry at 0.8 m **BEDROCK** Bluish grey, moderately fractured		3	RC	100	87		2	371				
			4	RC	87	58		3	370				
368.1								4	369				
4.3	**End of Borehole** at 4.3m Stand pipe installed with 0.9m stick up Water level at 2.46 m on Sept. 15 2012												

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RECORD OF BOREHOLE No. BBAF-BH-2065

PROJECT	Rainy River Gold Project					ENGINEER	MS
PROJECT NO.	TC113921	DRILLER	Marathon Drilling	BORING METHOD	200 mm HSA, NQ Coring	LOGGED BY	PDR
CLIENT	Rainy River Resources.	LOCATION	Plant Site Area			COMPILED BY	DG
ELEVATION	375.942 m	COORD.	N 5,411,099 E 426,758	BORING DATE	Start: Aug 14, 12 End: Aug 14, 12	CHECKED BY	DGR

SAMPLE TYPES
AU Auger; BU Bulk; DC Dynamic Cone; RC Rock Core; SS Split Spoon; TW Thin Walled Open (Shelby); WS Wash Sample

ABBREVIATIONS
P.P. Pocket Penetrometer; TV Torvane; PT Standard Proctor Test; P.L. Point Load Strength Index (I_{50}); RQD Rock Quality Designation; SCR Solid Core Recovery; k Permeability; C Consolidation; DS Direct Shear; GS Grain Size Analysis

ELEV / DEPTH (m)	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	RECOVERY (%)	SPT "N" VALUES or RQD	WELL / PIEZOMETER INSTALLATION	DEPTH (m)	ELEVATION (m)	DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100) / MTO VANE (□ INTACT ■ REMOULDED) / NILCON VANE (△ INTACT ▲ REMOULDED) / UNDRAINED SHEAR STRENGTH (kPa) 20 40 60 80 100	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L — WATER CONTENT (%) 20 40 60	PERMEABILITY (cm/s)	REMARKS
375.9	Ground surface												
375.8 / 0.1	**TOPSOIL**												
0.9	**Silty CLAY** Brown silty clay, trace sand, moist, varved, stiff, occasional rootlets [Upper Glaciolacustrine]		1	SS	66	8		1	375		17, 24		
			2	SS	58	13					28		
374.4								2	374		32		
1.5	**Silty CLAY** Brown silty clay, trace fine gravel, trace sand, moist, occasional oxidized pockets, medium plasticity, stiff [WML Till]		3	SS	79	12							
			6	SS	96	14	▽	3	373		29		
371.4								4	372				
4.6	**Silty SAND** Brown silty sand, well graded, compact, very wet [Possible Glaciofluvial Sand]		9	SS	58	10		5	371		25		
369.8			10	SS	100	12		6	370		20		
6.2	**BEDROCK** Dark grey, highly fractured		11	RC	95	0							
			12	RC	100	42		7	369				
			13	RC	100	44		8	368				
366.8			14	RC	100	73		9	367				
9.2	**End of Borehole** at 9.2m Standpipe installed with 0.9m stick up Water Level at 4 m below ground on Sept. 15, 2012												

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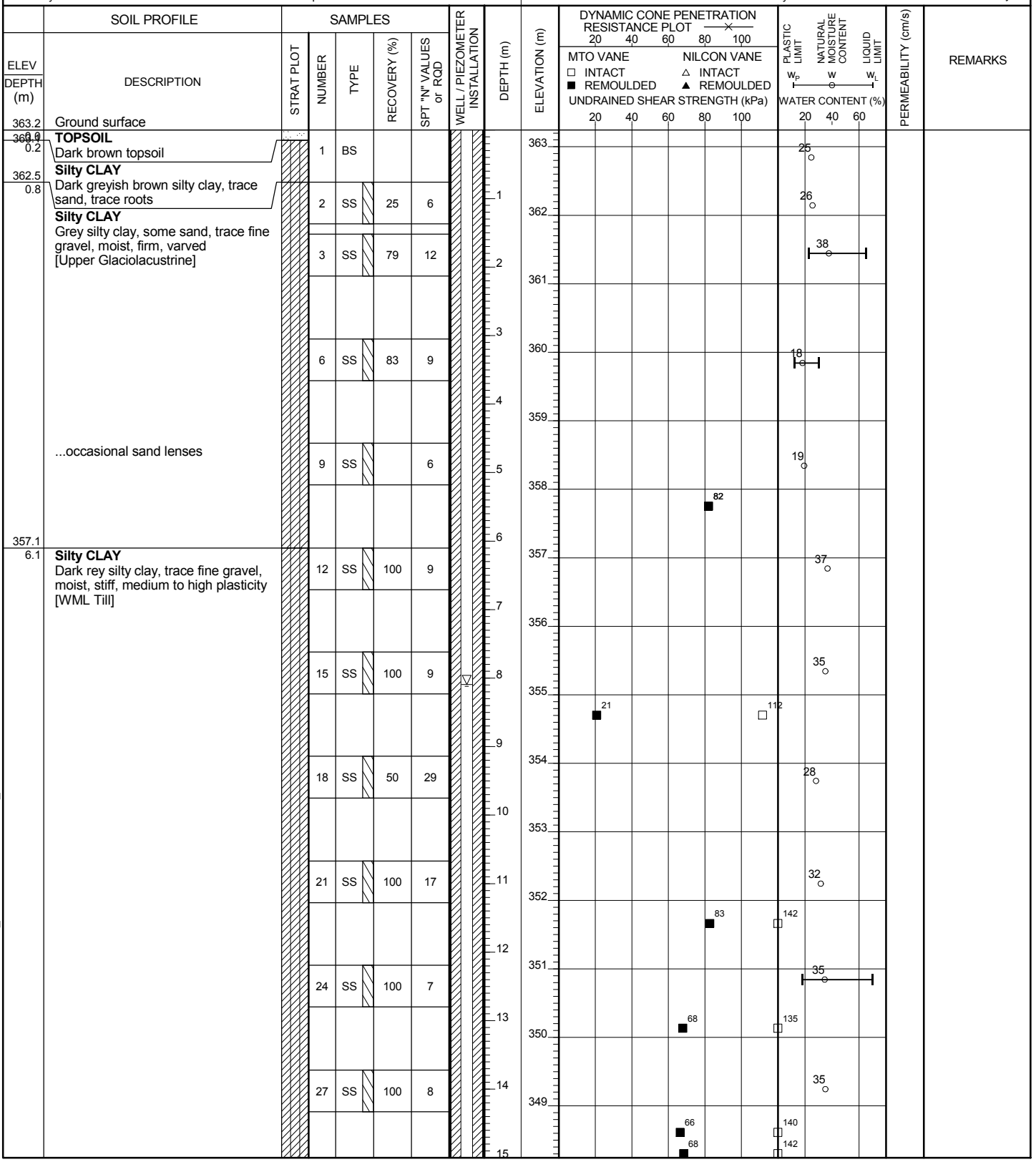
RECORD OF BOREHOLE No. BBAF-BH-2069

PROJECT	Rainy River Gold Project					ENGINEER	MS
PROJECT NO.	TC113921	DRILLER	Marathon Drilling	BORING METHOD	200 mm HSA, NQ Coring	LOGGED BY	PDR
CLIENT	Rainy River Resources.	LOCATION	Plant Site Area			COMPILED BY	DG
ELEVATION	363.244 m	COORD.	N 5,411,089 E 426,442	BORING DATE		CHECKED BY	DGR

SAMPLE TYPES
AU Auger; BU Bulk; DC Dynamic Cone; RC Rock Core; SS Split Spoon; TW Thin Walled Open (Shelby); WS Wash Sample

ABBREVIATIONS
P.P. Pocket Penetrometer; TV Torvane; PT Standard Proctor Test; P.L. Point Load Strength Index (I_{50}); RQD Rock Quality Designation; SCR Solid Core Recovery; k Permeability; C Consolidation; DS Direct Shear; GS Grain Size Analysis

ELEV / DEPTH (m)	DESCRIPTION	NUMBER	TYPE	RECOVERY (%)	SPT "N" VALUES or RQD
363.2	Ground surface				
363.0 / 0.2	**TOPSOIL** Dark brown topsoil	1	BS		
362.5 / 0.8	**Silty CLAY** Dark greyish brown silty clay, trace sand, trace roots	2	SS	25	6
	Silty CLAY Grey silty clay, some sand, trace fine gravel, moist, firm, varved [Upper Glaciolacustrine]	3	SS	79	12
		6	SS	83	9
	...occasional sand lenses	9	SS		6
357.1 / 6.1	**Silty CLAY** Dark rey silty clay, trace fine gravel, moist, stiff, medium to high plasticity [WML Till]	12	SS	100	9
		15	SS	100	9
		18	SS	50	29
		21	SS	100	17
		24	SS	100	7
		27	SS	100	8



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RECORD OF BOREHOLE No. BBAF-BH-2069

PROJECT	Rainy River Gold Project					ENGINEER	MS
PROJECT NO.	TC113921	DRILLER	Marathon Drilling	BORING METHOD	200 mm HSA, NQ Coring	LOGGED BY	PDR
CLIENT	Rainy River Resources.	LOCATION	Plant Site Area			COMPILED BY	DG
ELEVATION	363.244 m	COORD.	N 5,411,089 E 426,442	BORING DATE		CHECKED BY	DGR

SAMPLE TYPES
AU Auger; BU Bulk; DC Dynamic Cone; RC Rock Core; SS Split Spoon; TW Thin Walled Open (Shelby); WS Wash Sample

ABBREVIATIONS
P.P. Pocket Penetrometer; TV Torvane; PT Standard Proctor Test; P.L. Point Load Strength Index (I_{50}); RQD Rock Quality Designation; SCR Solid Core Recovery; k Permeability; C Consolidation; DS Direct Shear; GS Grain Size Analysis

ELEV / DEPTH (m)	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	RECOVERY (%)	SPT "N" VALUES or RQD	WELL / PIEZOMETER INSTALLATION	DEPTH (m)	ELEVATION (m)	DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100); MTO VANE: □ INTACT ■ REMOULDED; NILCON VANE: △ INTACT ▲ REMOULDED; UNDRAINED SHEAR STRENGTH (kPa) (20 40 60 80 100)	PLASTIC LIMIT w_P; NATURAL MOISTURE CONTENT w; LIQUID LIMIT w_L; WATER CONTENT (%) (20 40 60)	PERMEABILITY (cm/s)	REMARKS
			30	SS	100	10		16	348		31		
									347				
			33	SS	100	12		17	346		35		
								18	345				
			36	SS	100	14		19			33		
									344				
								20	343				
	...ocassional fine sand lenses at 21.3m							21	342				
			37	SS	100	13		22			27		
339.6									341				
23.6 / 339.2	**SAND TILL** [Inferred WS Till]		38	RC	100	33		24	340				
24.1	**BEDROCK**								339				
			39	RC	100	50		25	338				
			40	RC	100	44		26	337				
336.1								27					
27.1	**End of Borehole** at 27.1m Standpipe installed with 0.8m stick up Water level 8.0 m below ground surface on Sept. 15, 2012												

RECORD OF BOREHOLE No. BBAF-BH-2073

PROJECT	Rainy River Gold Project					ENGINEER	MS
PROJECT NO.	TC113921	DRILLER	Marathon Drilling	BORING METHOD	200 mm HSA, NQ Coring	LOGGED BY	PDR
CLIENT	Rainy River Resources.	LOCATION	Plant Site Area			COMPILED BY	DG
ELEVATION	367.505 m	COORD.	N 5,411,158 E 426,547	BORING DATE	Start: Aug 15, 12 End: Aug 17, 12	CHECKED BY	DGR

SAMPLE TYPES
AU Auger; BU Bulk; DC Dynamic Cone; RC Rock Core; SS Split Spoon; TW Thin Walled Open (Shelby); WS Wash Sample

ABBREVIATIONS
P.P. Pocket Penetrometer; TV Torvane; PT Standard Proctor Test; P.L. Point Load Strength Index (I_{50}); RQD Rock Quality Designation; SCR Solid Core Recovery; k Permeability; C Consolidation; DS Direct Shear; GS Grain Size Analysis

ELEV / DEPTH (m)	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	RECOVERY (%)	SPT "N" VALUES or RQD	DEPTH (m)	ELEVATION (m)	DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100)	MTO VANE: INTACT / REMOULDED; NILCON VANE: INTACT / REMOULDED; UNDRAINED SHEAR STRENGTH (kPa) (20 40 60 80 100)	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L; WATER CONTENT (%) (20 40 60)	PERMEABILITY (cm/s)	REMARKS
367.5	Ground surface												
367.4 / 0.1	**TOPSOIL**												
	Silty CLAY Brown silty clay, trace gravel, occasional oxidized pockets, moist, varved, medium plasticity, stiff [Upper Glaciolacustrine]		1	SS	54	7					22		
			2	SS	66	15	1	367			27		
			3	TW	37						26		
							2	366					
							3	365					
			6	SS	100	11					22		
							4	364					
362.9													
4.6	**Silty CLAY** Dark grey silty clay, moist, firm to stiff [WML Till]		9	TW	75		5	363					...at 4.6m PP=167.4 kPa TV=71.8 kPa
							6	362					
			12	TW	75								...at 6.1m PP=191.3 kPa TV=62.2 kPa
							7	361		99	140		
			15	SS	100	6	8	360			39		
							9	359					
			18	SS	100	8					30		
							10	358					
			21	TW	75		11	357					...at 10.7m PP=191.3 kPa TV=119.6 kPa
							12	356					
			24	SS	100	11					36		
							13	355					
353.8								354					
13.7	**BEDROCK** Greenish grey, moderately fractured		28	RC	93	86	14						
							15	353					

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RECORD OF BOREHOLE No. BBAF-BH-2073

PROJECT	Rainy River Gold Project					ENGINEER	MS
PROJECT NO.	TC113921	DRILLER	Marathon Drilling	BORING METHOD	200 mm HSA, NQ Coring	LOGGED BY	PDR
CLIENT	Rainy River Resources.	LOCATION	Plant Site Area			COMPILED BY	DG
ELEVATION	367.505 m	COORD.	N 5,411,158 E 426,547	BORING DATE	Start: Aug 15, 12 End: Aug 17, 12	CHECKED BY	DGR

SAMPLE TYPES
AU Auger; BU Bulk; DC Dynamic Cone; RC Rock Core; SS Split Spoon; TW Thin Walled Open (Shelby); WS Wash Sample

ABBREVIATIONS
P.P. Pocket Penetrometer; TV Torvane; PT Standard Proctor Test; P.L. Point Load Strength Index (I_{50}); RQD Rock Quality Designation; SCR Solid Core Recovery; k Permeability; C Consolidation; DS Direct Shear; GS Grain Size Analysis

ELEV / DEPTH (m)	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	RECOVERY (%)	SPT "N" VALUES or RQD	WELL / PIEZOMETER INSTALLATION	DEPTH (m)	ELEVATION (m)	DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100) / MTO VANE (□ INTACT ■ REMOULDED) / NILCON VANE (△ INTACT ▲ REMOULDED) / UNDRAINED SHEAR STRENGTH (kPa) (20 40 60 80 100)	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L / WATER CONTENT (%) (20 40 60)	PERMEABILITY (cm/s)	REMARKS
									352				
			29	RC	93	84		16					
350.6									351				
16.9	**End of Borehole** at 16.9m Stand pipe installed with 0.9m stick up Water level at 11 m below ground on Sept. 15, 2012												

RECORD OF BOREHOLE No. BBAF-BH-2076

PROJECT	Rainy River Gold Project					ENGINEER	MS
PROJECT NO.	TC113921	DRILLER	Marathon Drilling	BORING METHOD	200 mm HSA, NQ Coring	LOGGED BY	ARM
CLIENT	Rainy River Resources.	LOCATION	Plant Site Area			COMPILED BY	DG
ELEVATION	365.064 m	COORD.	N 5,410,335 E 426,698	BORING DATE	Start: Aug 26, 12 End: Aug 27, 12	CHECKED BY	DGR

SAMPLE TYPES
AU Auger; BU Bulk; DC Dynamic Cone; RC Rock Core; SS Split Spoon; TW Thin Walled Open (Shelby); WS Wash Sample

ABBREVIATIONS
P.P. Pocket Penetrometer; TV Torvane; PT Standard Proctor Test; P.L. Point Load Strength Index (I_{50}); RQD Rock Quality Designation; SCR Solid Core Recovery; k Permeability; C Consolidation; DS Direct Shear; GS Grain Size Analysis

ELEV / DEPTH (m)	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	RECOVERY (%)	SPT "N" VALUES or RQD	WELL / PIEZOMETER INSTALLATION	DEPTH (m)	ELEVATION (m)	DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100) / MTO VANE (□ INTACT ■ REMOULDED) / NILCON VANE (△ INTACT ▲ REMOULDED) / UNDRAINED SHEAR STRENGTH (kPa) 20 40 60 80 100	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L WATER CONTENT (%) 20 40 60	PERMEABILITY (cm/s)	REMARKS
365.1	Ground surface												
0.0	**Topsoil**		1	AS									...water flowing from installation
364.3								1	364				
0.8	**Sandy SILT** Brown sandy silt, trace clay, varved, stiff [Upper Glaciolacustrine]		2	SS	54	15							
			3	TW	66			2	363				
362.8													
2.3	**Silty CLAY** Dark brown silty clay, trace sand, trace gravel, stiff [WML Till]		4	SS	83	15		3	362				
			5	SS	100	16							
			6	SS	100	11		4	361				
			7	SS	100	6		5	360				
								6	359				
			10	SS	100	8							
								7	358				
			13	SS	100	10		8	357				
								9	356				
			14	TW	100			10	355				
			17	SS	100	10		11	354				
								12	353				
	...increased sand content, gravelly below 12.2m [Possible transition zone to WS Till]		18	SS	100	21							
								13	352				
								14	351				...SPt refusal at 13.7m
350.6													
14.5	**COBBLES and BOULDERS** [Inferred WS Till]		19	RC	0			15					

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RECORD OF BOREHOLE No. BBAF-BH-2076

PROJECT	Rainy River Gold Project					ENGINEER	MS
PROJECT NO.	TC113921	DRILLER	Marathon Drilling	BORING METHOD	200 mm HSA, NQ Coring	LOGGED BY	ARM
CLIENT	Rainy River Resources.	LOCATION	Plant Site Area			COMPILED BY	DG
ELEVATION	365.064 m	COORD.	N 5,410,335 E 426,698	BORING DATE	Start: Aug 26, 12 End: Aug 27, 12	CHECKED BY	DGR

SAMPLE TYPES
AU Auger; BU Bulk; DC Dynamic Cone; RC Rock Core; SS Split Spoon; TW Thin Walled Open (Shelby); WS Wash Sample

ABBREVIATIONS
P.P. Pocket Penetrometer; TV Torvane; PT Standard Proctor Test; P.L. Point Load Strength Index (I_{50}); RQD Rock Quality Designation; SCR Solid Core Recovery; k Permeability; C Consolidation; DS Direct Shear; GS Grain Size Analysis

ELEV / DEPTH (m)	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	RECOVERY (%)	SPT "N" VALUES or RQD	WELL / PIEZOMETER INSTALLATION	DEPTH (m)	ELEVATION (m)	REMARKS
348.6			20	RC	0			16	349	
16.5	**BEDROCK** ...subvertical fracture from 16.6m to 17.0m		21	RC	100	67		17	348	
346.0			22	RC	100	90		18	347	
19.1	**End of Borehole** at 19.05m Standpipe installed with 0.9m stick up Artesian flow observed from the well on Sept. 15, 2012							19		

DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100)
MTO VANE: □ INTACT ■ REMOULDED
NILCON VANE: △ INTACT ▲ REMOULDED
UNDRAINED SHEAR STRENGTH (kPa) 20 40 60 80 100

PLASTIC LIMIT w_P — NATURAL MOISTURE CONTENT w — LIQUID LIMIT w_L
WATER CONTENT (%) 20 40 60

PERMEABILITY (cm/s)

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RECORD OF BOREHOLE No. BH-4

PROJECT	Rainy River Gold Project					ENGINEER	MS
PROJECT NO.	TC113921	DRILLER	Marathon Drilling	BORING METHOD	200 mm HSA, NQ Coring	LOGGED BY	AD
CLIENT	Rainy River Resources.	LOCATION	Plant Site Area			COMPILED BY	DG
ELEVATION	369.078 m	COORD.	N 5,410,181 E 426,759	BORING DATE	Start: Oct 13, 12 End: Oct 14, 12	CHECKED BY	DGR

SAMPLE TYPES
AU Auger; BU Bulk; DC Dynamic Cone; RC Rock Core; SS Split Spoon; TW Thin Walled Open (Shelby); WS Wash Sample

ABBREVIATIONS
P.P. Pocket Penetrometer; TV Torvane; PT Standard Proctor Test; P.L. Point Load Strength Index (I_{50}); RQD Rock Quality Designation; SCR Solid Core Recovery; k Permeability; C Consolidation; DS Direct Shear; GS Grain Size Analysis

ELEV / DEPTH (m)	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	RECOVERY (%)	SPT "N" VALUES or RQD	WELL / PIEZOMETER INSTALLATION	DEPTH (m)	ELEVATION (m)	REMARKS
369.1	Ground surface									
0.0 / 368.5	**PEAT** Black peat, fiberous, damp to moist, some rootlets									
0.6	**Silty CLAY** Light brown silty clay, some sand, trace gravel, stiff, dry to damp, varved, occasional oxidized pockets [Upper Glaciolacustrine]		1	SS	46	15		1	368	
			2	SS	100	13		2	367	
			3	SS	100	12		3	366	
	...trace sand, trace gravel, sand seams at 3.1m		4	SS	100	11		4	365	
364.5										
4.6	**Silty CLAY** Dark grey silty clay, trace sand, trace gravel, firm, damp, medium plasticity [WML Till]		5	SS	62	12		5	364	
	...becoming stiffer at 6.1m		6	SS	100	9		6	363	
			7	SS	100	8		7	362	
			8	SS	100	10		8	361	
356.9								9	360	
12.2	**Silty CLAY** Dark grey silty clay, trace sand, trace gravel, varved, soft to firm, damp to moist [Lower Glaciolacustrine]		9	SS	100	9		10	359	
								11	358	
								12	357	
								13	356	
								14	355	
354.1								15		

DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100)
MTO VANE: □ INTACT ■ REMOULDED
NILCON VANE: △ INTACT ▲ REMOULDED
UNDRAINED SHEAR STRENGTH (kPa) 20 40 60 80 100

PLASTIC LIMIT w_P | NATURAL MOISTURE CONTENT w | LIQUID LIMIT w_L
WATER CONTENT (%) 20 40 60

21 (367 m); 27 (363 m); 25 (360 m); 34 (356 m)

PERMEABILITY (cm/s)

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RECORD OF BOREHOLE No. BH-4

PROJECT	Rainy River Gold Project			ENGINEER	MS
PROJECT NO.	TC113921	DRILLER	Marathon Drilling	BORING METHOD	200 mm HSA, NQ Coring	LOGGED BY	AD
CLIENT	Rainy River Resources.	LOCATION	Plant Site Area			COMPILED BY	DG
ELEVATION	369.078 m	COORD.	N 5,410,181 E 426,759	BORING DATE	Start: Oct 13, 12 End: Oct 14, 12	CHECKED BY	DGR

SAMPLE TYPES
AU Auger; BU Bulk; DC Dynamic Cone; RC Rock Core; SS Split Spoon; TW Thin Walled Open (Shelby); WS Wash Sample

ABBREVIATIONS
P.P. Pocket Penetrometer; TV Torvane; PT Standard Proctor Test; P.L. Point Load Strength Index (I_{50}); RQD Rock Quality Designation; SCR Solid Core Recovery; k Permeability; C Consolidation; DS Direct Shear; GS Grain Size Analysis

ELEV / DEPTH (m)	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	RECOVERY (%)	SPT "N" VALUES or RQD	WELL / PIEZOMETER INSTALLATION	DEPTH (m)	ELEVATION (m)	DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100); MTO VANE □ INTACT ■ REMOULDED; NILCON VANE △ INTACT ▲ REMOULDED; UNDRAINED SHEAR STRENGTH (kPa) (20 40 60 80 100)	PLASTIC LIMIT w_P; NATURAL MOISTURE CONTENT w; LIQUID LIMIT w_L; WATER CONTENT (%) (20 40 60)	PERMEABILITY (cm/s)	REMARKS
14.9	**Silty SAND** Coarse grained silty sand, some silt, wet [WS Till] ...boulders and cobbles below 15.5m		10	SS	100								...heaving sand at 14.9m
			11	RC	52	0		16	353				
352.3			12	RC	71	0							
16.7	**BEDROCK** Grey bedrock		13	RC	100	68		17	352				
			14	RC	92	28		18	351				
			15	RC	100	75		19	350				
349.1			16	RC	100	80							
19.9	**End of Borehole** at 19.9m Standpipe installed with flush-mounted steel casing Water level at 1.4m below ground surface upon completion												

RECORD OF BOREHOLE No. BH-5

PROJECT	Rainy River Gold Project					ENGINEER	MS
PROJECT NO.	TC113921	DRILLER	Marathon Drilling	BORING METHOD	200 mm HSA, NQ Coring	LOGGED BY	AD
CLIENT	Rainy River Resources.	LOCATION	Plant Site Area			COMPILED BY	DG
ELEVATION	370.995 m	COORD.	N 5,410,210 E 426,804	BORING DATE	Start: Oct 11, 12 End: Oct 12, 12	CHECKED BY	DGR

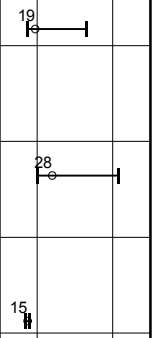
SAMPLE TYPES
AU Auger; BU Bulk; DC Dynamic Cone; RC Rock Core; SS Split Spoon; TW Thin Walled Open (Shelby); WS Wash Sample

ABBREVIATIONS
P.P. Pocket Penetrometer; TV Torvane; PT Standard Proctor Test; P.L. Point Load Strength Index (I_{50}); RQD Rock Quality Designation; SCR Solid Core Recovery; k Permeability; C Consolidation; DS Direct Shear; GS Grain Size Analysis

ELEV / DEPTH (m)	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	RECOVERY (%)	SPT "N" VALUES or RQD	WELL / PIEZOMETER INSTALLATION	DEPTH (m)	ELEVATION (m)	REMARKS
371.0	Ground surface									
0.0 370.4	**Topsoil**									
0.6 368.7	**Silty CLAY** Brown silty clay, some sand, some gravel, varved, stiff, damp [Upper Glaciolacustrine]		1	SS	62	14		1	370	
			2	SS	79	15		2	369	
2.3 366.4	**Silty CLAY** Dark brown silty clay, trace sand, trave gravel, stiff, damp [WML Till]		3	SS	71	15		3	368	
			4	SS	100	11		4	367	
4.6 365.8	**Silty SAND** Grey silt and sand, trace gravel, varved, firm, moist, wet [Lower Glaciolacustrine]		5	SS	46	37		5	366	
5.2	...cobbles at 5.1m		6	RC	61	61		6	365	
	BEDROCK Grey to black bedrock		7	RC	25	12		7	364	
			8	RC	90	53		8	363	
			9	RC	100	46		9	362	
361.4			10	RC	94	23				
9.6	**End of Borehole** at 9.6m Standpipe installed with 0.9m stick up Water level at 3.4 m below ground surface upon completion									

DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100)
MTO VANE: □ INTACT ■ REMOULDED
NILCON VANE: △ INTACT ▲ REMOULDED
UNDRAINED SHEAR STRENGTH (kPa) 20 40 60 80 100

PLASTIC LIMIT w_P | NATURAL MOISTURE CONTENT w | LIQUID LIMIT w_L
WATER CONTENT (%) 20 40 60



PERMEABILITY (cm/s)

RECORD OF BOREHOLE No. BH-7

PROJECT	Rainy River Gold Project			ENGINEER	MS
PROJECT NO.	TC113921	DRILLER	Marathon Drilling	BORING METHOD	200 mm HSA, NQ Coring	LOGGED BY	AD
CLIENT	Rainy River Resources.	LOCATION	Plant Site Area			COMPILED BY	DG
ELEVATION	369.494 m	COORD.	N 5,410,185 E 426,807	BORING DATE	Start: Oct 12, 12 End: Oct 13, 12	CHECKED BY	DGR

SAMPLE TYPES
AU Auger; BU Bulk; DC Dynamic Cone; RC Rock Core; SS Split Spoon; TW Thin Walled Open (Shelby); WS Wash Sample

ABBREVIATIONS
P.P. Pocket Penetrometer; TV Torvane; PT Standard Proctor Test; P.L. Point Load Strength Index (I_{50}); RQD Rock Quality Designation; SCR Solid Core Recovery; k Permeability; C Consolidation; DS Direct Shear; GS Grain Size Analysis

ELEV / DEPTH (m)	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	RECOVERY (%)	SPT "N" VALUES or RQD	WELL / PIEZOMETER INSTALLATION	DEPTH (m)	ELEVATION (m)	REMARKS
369.5	Ground surface									
0.0 368.9	**TOPSOIL**									
0.6	**Silty CLAY** Brown silty clay, some sand, trace gravel, occasional light grey silt pockets, firm to stiff, dry to damp, trace organics [Upper Glaciolacustrine]		1	SS	67	13		1	369	
			2	SS	87	16		2	368	
	...occasional sand seams below 2.4m		3	SS	100	14		3	367	
364.9			4	SS	100	9	▽	4	366	
4.6 363.4	**Silty CLAY** Dark grey silty clay, trace sand, trace gravel, stiff, high plasticity, becoming varved, more silty, soft to firm, damp, below 4.83m		5	SS	100	11		5	365	
6.1	**Silty CLAY** Dark grey silty clay, trave gravel, firm to stiff, damp, medium to high plasticity [WML Till]		6	SS	100	13		6	364	
			7	SS	100	13		7	363	
			8	SS	100	14		8	362	
357.3								9	361	
12.2	**Silty CLAY** Dark brown silty clay, trace sand, trace gravel, varved, occasional brown silty sand pockets, soft to firm, damp [Lower Glaciolacustrine]		9	SS	100	11		10	360	
								11	359	
								12	358	
								13	357	
								14	356	
								15	355	

DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100)
MTO VANE: □ INTACT ■ REMOULDED
NILCON VANE: △ INTACT ▲ REMOULDED
UNDRAINED SHEAR STRENGTH (kPa) 20 40 60 80 100

PLASTIC LIMIT w_P | NATURAL MOISTURE CONTENT w | LIQUID LIMIT w_L
WATER CONTENT (%) 20 40 60

16 (PLASTIC LIMIT) | 19 (NATURAL MOISTURE CONTENT) | 23 (LIQUID LIMIT) | 27

PERMEABILITY (cm/s)

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RECORD OF BOREHOLE No. BH-7

PROJECT	Rainy River Gold Project			ENGINEER	MS
PROJECT NO.	TC113921	DRILLER	Marathon Drilling	BORING METHOD	200 mm HSA, NQ Coring	LOGGED BY	AD
CLIENT	Rainy River Resources.	LOCATION	Plant Site Area			COMPILED BY	DG
ELEVATION	369.494 m	COORD.	N 5,410,185 E 426,807	BORING DATE	Start: Oct 12, 12 End: Oct 13, 12	CHECKED BY	DGR

SAMPLE TYPES
AU Auger; BU Bulk; DC Dynamic Cone; RC Rock Core; SS Split Spoon; TW Thin Walled Open (Shelby); WS Wash Sample

ABBREVIATIONS
P.P. Pocket Penetrometer; TV Torvane; PT Standard Proctor Test; P.L. Point Load Strength Index (I_{50}); RQD Rock Quality Designation; SCR Solid Core Recovery; k Permeability; C Consolidation; DS Direct Shear; GS Grain Size Analysis

ELEV / DEPTH (m)	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	RECOVERY (%)	SPT "N" VALUES or RQD	WELL / PIEZOMETER INSTALLATION	DEPTH (m)	ELEVATION (m)	REMARKS
354.3										
15.2	**BOULDERS** [Inferred WS Till]		10	RC	42	0		16	354	
352.9			11	RC	47	0			353	
16.6	**BEDROCK** Grey to black bedrock, fractured		12	RC	100	83		17	352	
	...vertical fracture from 18.3m to the end of the core		13	RC	100	80		18	351	Vertical fracture running from 18.3m to the end of borehole at 20.0m
349.5			14	RC	100	46		19	350	
20.0	**End of Borehole** at 20.02m Standpipe installed with 0.9m stickup Water level 3.4m below ground surface upon completion							20		

DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100)
MTO VANE: □ INTACT ■ REMOULDED
NILCON VANE: △ INTACT ▲ REMOULDED
UNDRAINED SHEAR STRENGTH (kPa) 20 40 60 80 100

PLASTIC LIMIT w_P — NATURAL MOISTURE CONTENT w — LIQUID LIMIT w_L
WATER CONTENT (%) 20 40 60

PERMEABILITY (cm/s)

RECORD OF BOREHOLE No. BH13-17

PROJECT	Rainy River Project - 2013/2014 Geotechnical Investigation			ENGINEER	MS
PROJECT NO.	TC133921	DRILLER	Marathon Drilling	BORING METHOD	200 mm HSA, NW/NQ Coring
CLIENT	New Gold Inc.	LOCATION	Tailings Management Area	COMPILED BY	MV
ELEVATION	359.81 m	COORD.	N 5,411,974 E 423,956	BORING DATE	Start: 31 Aug 13 End: 1 Sep 13
LOGGED BY	ARM	CHECKED BY	DGR		

SAMPLE TYPES
AU Auger; BU Bulk; DC Dynamic Cone; RC Rock Core; SS Split Spoon; TW Thin Walled Open (Shelby); WS Wash Sample

ABBREVIATIONS
P.P. Pocket Penetrometer; TV Torvane; PT Standard Proctor Test; P.L. Point Load Strength Index (I_{50}); RQD Rock Quality Designation; SCR Solid Core Recovery; k Permeability; C Consolidation; DS Direct Shear; GS Grain Size Analysis

ELEV / DEPTH (m)	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	RECOVERY (%)	SPT "N" VALUES or RQD	WELL / PIEZOMETER INSTALLATION	DEPTH (m)	ELEVATION (m)	DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100) / MTO VANE (□ INTACT, ■ REMOULDED) / NILCON VANE (△ INTACT, ▲ REMOULDED) / UNDRAINED SHEAR STRENGTH (kPa) (20 40 60 80 100)	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L / WATER CONTENT (%) (20 40 60)	PERMEABILITY (cm/s)	REMARKS
359.8	Ground surface												
359.8 / 0.1	**ORGANICS/TOPSOIL**												
	SILTY CLAY Grey to dark grey silty clay, trace to some silt, trace gravel, high plasticity, firm to stiff, moist to wet [WML Till] ...from 0.1m to 1.5m light brown silty sandy clay		1	SS	71	7					19		
			2	SS	87	8		1	359		19		
			3	SS	96	9		2	358		28		
			4	SS	100	10		3	357		30		...sieve/hydrometer test done on SS4.
			5	SS	100	9					52		
			6	SS	100	8		4	356		30		
			7	SS	100	7		5	355		35		
			8	TW	100			6	354				
			9	SS	100	6		7	353				
			10	SS	100	8		8	352		37		
			11	SS	54	6		9	351				
348.5 / 11.3	**SAND & GRAVEL** Grey silty sand and gravel, wet, compact [WS Till]							10	350	14, 27, 74, 101	37		
			12	SS	29	50/0.03		11	349		33		
	...boulders and cobbles below 12.8 m		13	RC				12	348		10		
345.5 / 14.3	**BEDROCK** Mafic volcanic, strong chloritic		14	RC	97	78		13	347				
								14	346				
								15	345				

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RECORD OF BOREHOLE No. BH13-17

PROJECT	Rainy River Project - 2013/2014 Geotechnical Investigation					ENGINEER	MS
PROJECT NO.	TC133921	DRILLER	Marathon Drilling	BORING METHOD	200 mm HSA, NW/NQ Coring	LOGGED BY	ARM
CLIENT	New Gold Inc.	LOCATION	Tailings Management Area			COMPILED BY	MV
ELEVATION	359.81 m	COORD.	N 5,411,974 E 423,956	BORING DATE	Start: 31 Aug 13 End: 1 Sep 13	CHECKED BY	DGR

SAMPLE TYPES
AU Auger; BU Bulk; DC Dynamic Cone; RC Rock Core; SS Split Spoon; TW Thin Walled Open (Shelby); WS Wash Sample

ABBREVIATIONS
P.P. Pocket Penetrometer; TV Torvane; PT Standard Proctor Test; P.L. Point Load Strength Index (I_{50}); RQD Rock Quality Designation; SCR Solid Core Recovery; k Permeability; C Consolidation; DS Direct Shear; GS Grain Size Analysis

ELEV / DEPTH (m)	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	RECOVERY (%)	SPT "N" VALUES or RQD	WELL / PIEZOMETER INSTALLATION	DEPTH (m)	ELEVATION (m)	DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100) / MTO VANE (□ INTACT, ■ REMOULDED) / NILCON VANE (△ INTACT, ▲ REMOULDED) / UNDRAINED SHEAR STRENGTH (kPa) 20 40 60 80 100	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L — WATER CONTENT (%) 20 40 60	PERMEABILITY (cm/s)	REMARKS
	...felsic, mafic metavolcanic		15	RC	100	80		16	344				
			16	RC	100	94		17	343				
341.7								18	342				
18.1	**END OF BOREHOLE** STANDPIPE INSTALLATION 2.5 cm PVC pipe, flushmount steel well protector Screen: 11.3 to 12.8 m Riser: 0 to 11.3 m Sand: 10.7 to 12.8 m Bentonite: 12.8 to 18.4 m and 10.1 m to 10.7 m Grout: 0 to 10.7 m WATER LEVELS (bgs) 1.2 m on 03-Sep-2013												

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RECORD OF BOREHOLE No. BH13-18

PROJECT	Rainy River Project - 2013/2014 Geotechnical Investigation					ENGINEER	MS
PROJECT NO.	TC133921	DRILLER	Marathon Drilling	BORING METHOD	200 mm HSA, NW/NQ Coring	LOGGED BY	ARM
CLIENT	New Gold Inc.	LOCATION	Tailings Management Area			COMPILED BY	MV
ELEVATION	364.83 m	COORD.	N 5,412,057 E 422,688	BORING DATE	Start: 14 Sep 13 End: 15 Sep 13	CHECKED BY	DGR

SAMPLE TYPES
AU Auger; BU Bulk; DC Dynamic Cone; RC Rock Core; SS Split Spoon; TW Thin Walled Open (Shelby); WS Wash Sample

ABBREVIATIONS
P.P. Pocket Penetrometer; TV Torvane; PT Standard Proctor Test; P.L. Point Load Strength Index (I_{50}); RQD Rock Quality Designation; SCR Solid Core Recovery; k Permeability; C Consolidation; DS Direct Shear; GS Grain Size Analysis

ELEV / DEPTH (m)	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	RECOVERY (%)	SPT "N" VALUES or RQD	WELL / PIEZOMETER INSTALLATION	DEPTH (m)	ELEVATION (m)	DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100) / MTO VANE (□ INTACT ■ REMOULDED) / NILCON VANE (△ INTACT ▲ REMOULDED) / UNDRAINED SHEAR STRENGTH (kPa) (20 40 60 80 100)	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L — WATER CONTENT (%) (20 40 60)	PERMEABILITY (cm/s)	REMARKS
364.8	Ground surface												
364.6	**ORGANICS/TOPSOIL**												
0.2	**CLAYEY/SANDY SILT** Brown to light brown clayey/sandy silt, trace gravel, moist, firm		1	SS	54	7							
364.1									364				
0.8	**SILTY CLAY** Brown to light brown silty clay, moist, varved, very stiff/compact [Upper Glaciolacustrine]		2	SS	58	23		1					...sieve/hydrometer test done on SS2.
362.9	...becoming grey mottled with brown		3	SS	83	18		2	363				
2.0	**SILTY CLAY** Dark grey silty clay, trace silt, trace gravel, high plasticity, moist, very stiff [WML Till]		4	SS	92	18		3	362				...sieve/hydrometer test done on SS4.
361.5			5	SS	54	16							
3.4	...silt lens at 3.4m												
361.2													
3.7	**SANDY GRAVEL** [WS Till] ...boulders and cobbles		6	RC	32			4	361				...switched to coring at 3.7m
359.7								5	360				
5.2	**BEDROCK** Quartz feldspar		7	RC	97	65		6	359				
			8	RC	97	68		7	358				
356.6								8	357				
8.2	**END OF BOREHOLE** STANDPIPE INSTALLATION 2.5 cm PVC pipe, upright steel well protector, 0.84m stick-up Screen: 4.0 to 5.5 m Riser: 0 to 4.0 m Sand: 3.4 to 5.5 m Bentonite: 0 to 3.4 m and 5.5 to 8.2 m WATER LEVELS (bgs) 4.9 m on 17-Sep-2013 4.4 m on 25-Oct-2013												

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RECORD OF BOREHOLE No. BH13-21

PROJECT	Rainy River Project - 2013/2014 Geotechnical Investigation			ENGINEER	MS
PROJECT NO.	TC133921	DRILLER	Marathon Drilling	BORING METHOD	200 mm HSA, NW/NQ Coring
LOGGED BY	ARM	CLIENT	New Gold Inc.	LOCATION	Tailings Management Area / Water Management Pond
COMPILED BY	MV	ELEVATION	362.53 m	COORD.	N 5,412,068 E 421,298
BORING DATE	Start: 4 Sep 13 End: 14 Sep 13	CHECKED BY	DGR		

SAMPLE TYPES
AU Auger; BU Bulk; DC Dynamic Cone; RC Rock Core; SS Split Spoon; TW Thin Walled Open (Shelby); WS Wash Sample

ABBREVIATIONS
P.P. Pocket Penetrometer; TV Torvane; PT Standard Proctor Test; P.L. Point Load Strength Index (I_{50}); RQD Rock Quality Designation; SCR Solid Core Recovery; k Permeability; C Consolidation; DS Direct Shear; GS Grain Size Analysis

ELEV / DEPTH (m)	DESCRIPTION	NUMBER	TYPE	RECOVERY (%)	SPT "N" VALUES or RQD	DEPTH (m)	REMARKS
362.5	Ground surface						
362.0	**ORGANICS/TOPSOIL**						
0.2	**SILTY CLAY** Light to dark brown silty clay, trace sand, moist, medium to high plasticity, firm	1	SS	42	3		
		2	SS	75	5	1	
360.6		3	SS	100	10	2	
2.0	**SANDY SILT AND CLAY** Light brown to brown sandy silt and clay, trace gravel, moist, varved, medium to high plasticity, stiff [Upper Glaciolacustrine] ...becoming dark brown/orange	4	SS	100	11	3	...sieve/hydrometer test done on SS4.
358.7		5	SS	100	9		
3.8	**SILTY CLAY** Dark brown to grey silty clay, some sand, trace gravel, moist, high plasticity, stiff [WML Till] ...light brown silt and sand lens/layer from 4.6m to 4.8m ...becoming dark grey below 4.8m	6	SS	100	11	4	
		7	SS	100	9	5	
		8	SS	62	6	6	
		9	TW	100		7	
		10	SS	100	6	8	...sieve/hydrometer test done on SS10.
		11	SS	100	9	9	
349.9	...becoming sandy clayey silt, loose, wet at 12.2m	12	SS	100	8	10	
12.6	**SILT AND CLAY** Light grey to grey silt and clay, wet, varved, firm [Lower Glaciolacustrine]					11	
348.8						12	
13.7	**SANDY GRAVEL** Grey sandy gravel, some clay, wet [WS Till] ...clayey from 13.7m to 14.3m	13	SS	12	25	13	...artesian pressures encountered at 13.7 m ...large gravel at spoon tip
						14	
						15	

DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100)
MTO VANE: □ INTACT ■ REMOULDED
NILCON VANE: △ INTACT ▲ REMOULDED
UNDRAINED SHEAR STRENGTH (kPa) (20 40 60 80 100)

ELEVATION (m): 362 361 360 359 358 357 356 355 354 353 352 351 350 349 348

PLASTIC LIMIT w_P | NATURAL MOISTURE CONTENT w | LIQUID LIMIT w_L
WATER CONTENT (%) (20 40 60)

29 33 32 31 17 15 17 16 10 33 39 23 14 19

□ 103

PERMEABILITY (cm/s)

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RECORD OF BOREHOLE No. BH13-21

PROJECT	Rainy River Project - 2013/2014 Geotechnical Investigation			ENGINEER	MS
PROJECT NO.	TC133921	DRILLER	Marathon Drilling	BORING METHOD	200 mm HSA, NW/NQ Coring
CLIENT	New Gold Inc.	LOCATION	Tailings Management Area / Water Management Pond	COMPILED BY	MV
ELEVATION	362.53 m	COORD.	N 5,412,068 E 421,298	BORING DATE	Start: 4 Sep 13 End: 14 Sep 13
				CHECKED BY	DGR

SAMPLE TYPES
AU Auger; BU Bulk; DC Dynamic Cone; RC Rock Core; SS Split Spoon; TW Thin Walled Open (Shelby); WS Wash Sample

ABBREVIATIONS
P.P. Pocket Penetrometer; TV Torvane; PT Standard Proctor Test; P.L. Point Load Strength Index (I_{50}); RQD Rock Quality Designation; SCR Solid Core Recovery; k Permeability; C Consolidation; DS Direct Shear; GS Grain Size Analysis

ELEV / DEPTH (m)	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	RECOVERY (%)	SPT "N" VALUES or RQD	WELL / PIEZOMETER INSTALLATION	DEPTH (m)	ELEVATION (m)	REMARKS
	...gravel and cobbles below 15.3 m									
			14	RC	30			16	347	
			15	RC	20			17	346	
			16	RC	40			18	345	
			17	RC	4			19	344	
341.2	...wet sand below 19.8m							20	343	
21.3	**BEDROCK** Mafic flow with weak carbonate alteration		18	RC	95	53		21	342	
			19	RC	58	27		22	341	
			20	RC	97	97		23	340	
			21	RC	100	88		24	339	
			22	RC	100	100		25	338	
			23	RC	100	67		26	337	
								27	336	
								28	335	
								29	334	
								30	333	

DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100)
MTO VANE: □ INTACT ■ REMOULDED
NILCON VANE: △ INTACT ▲ REMOULDED
UNDRAINED SHEAR STRENGTH (kPa) (20 40 60 80 100)

PLASTIC LIMIT (w_P) — NATURAL MOISTURE CONTENT (w) — LIQUID LIMIT (w_L)
WATER CONTENT (%) (20 40 60)

PERMEABILITY (cm/s)

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RECORD OF BOREHOLE No. BH13-21

PROJECT	Rainy River Project - 2013/2014 Geotechnical Investigation			ENGINEER	MS
PROJECT NO.	TC133921	DRILLER	Marathon Drilling	BORING METHOD	200 mm HSA, NW/NQ Coring
CLIENT	New Gold Inc.	LOCATION	Tailings Management Area / Water Management Pond	LOGGED BY	ARM
ELEVATION	362.53 m	COORD.	N 5,412,068 E 421,298	BORING DATE	Start: 4 Sep 13 End: 14 Sep 13
				COMPILED BY	MV
				CHECKED BY	DGR

SAMPLE TYPES
AU Auger; BU Bulk; DC Dynamic Cone; RC Rock Core; SS Split Spoon; TW Thin Walled Open (Shelby); WS Wash Sample

ABBREVIATIONS
P.P. Pocket Penetrometer; TV Torvane; PT Standard Proctor Test; P.L. Point Load Strength Index (I_{50}); RQD Rock Quality Designation; SCR Solid Core Recovery; k Permeability; C Consolidation; DS Direct Shear; GS Grain Size Analysis

ELEV / DEPTH (m)	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	RECOVERY (%)	SPT "N" VALUES or RQD	WELL / PIEZOMETER INSTALLATION	DEPTH (m)	ELEVATION (m)	REMARKS
								31	332	
			24	RC	100	67		32	331	
			25	RC	100	67		33	330	
			26	RC	100	100		34	329	
			27	RC	100	97		35	328	
325.9								36	327	
36.7	**END OF BOREHOLE** STANDPIPE INSTALLATION 2.5 cm PVC pipe, upright steel well protector, 0.84m stick-up Screen: 16.8 to 18.3 m Riser: 0 to 16.8 m Sand: 16.2 to 18.3 Bentonite: 15.5 to 16.2 m and 18.3 to 36.7 m Grout: 0 to 15.5 m WATER LEVEL (bgs) Flowing on 14-Sep-2013 Flowing on 31-Mar-2014								326	

DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100)
MTO VANE: □ INTACT ■ REMOULDED
NILCON VANE: △ INTACT ▲ REMOULDED
UNDRAINED SHEAR STRENGTH (kPa) 20 40 60 80 100

PLASTIC LIMIT w_P — NATURAL MOISTURE CONTENT w — LIQUID LIMIT w_L
WATER CONTENT (%) 20 40 60

PERMEABILITY (cm/s)

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RECORD OF BOREHOLE No. BH13-24

PROJECT	Rainy River Project - 2013/2014 Geotechnical Investigation			ENGINEER	MS
PROJECT NO.	TC133921	DRILLER	Marathon Drilling	BORING METHOD	200 mm HSA, NW/NQ Coring
LOGGED BY	ARM				
CLIENT	New Gold Inc.	LOCATION	Tailings Management Area / Water Management Pond	COMPILED BY	MV
ELEVATION	360.09 m	COORD.	N 5,412,020 E 420,132	BORING DATE	Start: 16 Sep 13 End: 17 Sep 13
CHECKED BY	DGR				

SAMPLE TYPES
AU Auger; BU Bulk; DC Dynamic Cone; RC Rock Core; SS Split Spoon; TW Thin Walled Open (Shelby); WS Wash Sample

ABBREVIATIONS
P.P. Pocket Penetrometer; TV Torvane; PT Standard Proctor Test; P.L. Point Load Strength Index (I_{50}); RQD Rock Quality Designation; SCR Solid Core Recovery; k Permeability; C Consolidation; DS Direct Shear; GS Grain Size Analysis

ELEV / DEPTH (m)	DESCRIPTION	NUMBER	TYPE	RECOVERY (%)	SPT "N" VALUES or RQD	DEPTH (m)	ELEVATION (m)	REMARKS
360.1	Ground surface							
359.9 0.0	**ORGANICS/TOPSOIL**							
0.2 359.3	**SANDY CLAYEY SILT** Brown to dark brown sandy clayey silt, moist, trace organics, soft	1	SS	25	3			
0.8 358.8 1.3	**SILTY CLAY** Brown to dark brown silty clay, some sand, trace gravel, wet, varved, medium plasticity, firm [Upper Glaciolacustrine]	2	SS	100	7	1	359	...sieve/hydrometer test done on SS2A.
		3	SS	92	6	2	358	
357.8 2.3	...sand lens at 1.3 m **SILTY CLAY** Grey mottled with brown silty clay, trace to some sand, trace gravel, moist, high plasticity, stiff [WML Till]	4	SS	92	11			
		5	SS	96	10	3	357	
	...becoming dark grey, trace sand, trace gravel at 3 m	6	TW	58		4	356	
		7	SS	92	8	5	355	...sieve/hydrometer test done on SS7.
		8	SS	100	10	6	354	
352.5						7	353	
352.2 7.8	**SILT** Grey/green silt, trace sand, trace clay, varved, wet, soft [Lower Glaciolacustrine]	9	SS	83	6	8	352	...artesian pressure encountered at 7.9m
351.8 8.3	**SAND** Brown sand, coarse, wet	10	RC	100	100	9	351	
	BEDROCK Mafic flow with weak carbonate alteration, greenish grey	11	RC	98	98	10	350	
		12	RC	100	100	11	349	
		13	RC	100	93	12	348	
		14	RC	100	93	13	347	
						14	346	
						15		

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RECORD OF BOREHOLE No. BH13-24

PROJECT	Rainy River Project - 2013/2014 Geotechnical Investigation			ENGINEER	MS
PROJECT NO.	TC133921	DRILLER	Marathon Drilling	BORING METHOD	200 mm HSA, NW/NQ Coring
LOGGED BY	ARM				
CLIENT	New Gold Inc.	LOCATION	Tailings Management Area / Water Management Pond	COMPILED BY	MV
ELEVATION	360.09 m	COORD.	N 5,412,020 E 420,132	BORING DATE	Start: 16 Sep 13 End: 17 Sep 13
CHECKED BY	DGR				

SAMPLE TYPES
AU Auger; BU Bulk; DC Dynamic Cone; RC Rock Core; SS Split Spoon; TW Thin Walled Open (Shelby); WS Wash Sample

ABBREVIATIONS
P.P. Pocket Penetrometer; TV Torvane; PT Standard Proctor Test; P.L. Point Load Strength Index (I_{50}); RQD Rock Quality Designation; SCR Solid Core Recovery; k Permeability; C Consolidation; DS Direct Shear; GS Grain Size Analysis

ELEV / DEPTH (m)	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	RECOVERY (%)	SPT "N" VALUES or RQD	WELL / PIEZOMETER INSTALLATION	DEPTH (m)	ELEVATION (m)	REMARKS
			15	RC	97	97		16	344	
			16	RC	100	73		17	343	
			17	RC	98	93		18	342	
			18	RC	100	90		19	341	
			19	RC	100	83		20	340	
			20	RC	100	95		21	339	
335.6								22	338	
24.5	**END OF BOREHOLE** STANDPIPE INSTALLATION 2.5 cm PVC pipe, upright steel well protector, 0.86 m stick-up Screen: 6.8 to 8.3 m Riser: 0 to 6.8 m Sand: 6.2 to 8.3 m Bentonite: 0 to 6.2 m and 8.3 m to 24.5 m WATER LEVELS (bgs) Artesian flow first encountered when drilling at depth 7.9 m Flowing on 17-Sep-2013 Flowing on 31-Mar-2014							23	337	
								24	336	

DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100)
MTO VANE: □ INTACT ■ REMOULDED
NILCON VANE: △ INTACT ▲ REMOULDED
UNDRAINED SHEAR STRENGTH (kPa) (20 40 60 80 100)

PLASTIC LIMIT w_P — NATURAL MOISTURE CONTENT w — LIQUID LIMIT w_L
WATER CONTENT (%) (20 40 60)

PERMEABILITY (cm/s)

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RECORD OF BOREHOLE No. BH13-26

PROJECT	Rainy River Project - 2013/2014 Geotechnical Investigation					ENGINEER	MS
PROJECT NO.	TC133921	DRILLER	Marathon Drilling	BORING METHOD	200 mm HSA, NW/NQ Coring	LOGGED BY	MA
CLIENT	New Gold Inc.	LOCATION	Tailings Management Area			COMPILED BY	AD
ELEVATION	364.02 m	COORD.	N 5,412,547 E 420,489	BORING DATE	Start: 18 Mar 14 End: 18 Mar 14	CHECKED BY	DGR

SAMPLE TYPES
AU Auger; BU Bulk; DC Dynamic Cone; RC Rock Core; SS Split Spoon; TW Thin Walled Open (Shelby); WS Wash Sample

ABBREVIATIONS
P.P. Pocket Penetrometer; TV Torvane; PT Standard Proctor Test; P.L. Point Load Strength Index (I_{50}); RQD Rock Quality Designation; SCR Solid Core Recovery; k Permeability; C Consolidation; DS Direct Shear; GS Grain Size Analysis

ELEV / DEPTH (m)	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	RECOVERY (%)	SPT "N" VALUES or RQD	WELL / PIEZOMETER INSTALLATION	DEPTH (m)	ELEVATION (m)	DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100) / MTO VANE (□ INTACT ■ REMOULDED) / NILCON VANE (△ INTACT ▲ REMOULDED) / UNDRAINED SHEAR STRENGTH (kPa) 20 40 60 80 100	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L — WATER CONTENT (%) 20 40 60	PERMEABILITY (cm/s)	REMARKS
364.0	Ground surface												
363.9 / 0.1	**ORGANICS/TOPSOIL** Frozen												
	CLAYEY SILT Light grey to brown, trace sand, medium plasticity, soft to firm, trace roots [Upper Glaciolacustrine]		01	SS	50	2		1	363		40		
			02	SS	83	5		2	362		25		...sieve/hydrometer test done on SS2.
	... becoming sandy, low plasticity		03	SS	100	14		3	361		18		
360.8	... silty fine sand varved with 10mm thick grey silty clay												
3.3	**SILTY CLAY** Dark grey, trace gravel, trace sand, medium to high plasticity, firm to stiff [WML TIII]		04	SS	100	9					15		
			05	TW	50			4	360		37		
			06	SS	100	18		5	359		36		...sieve/hydrometer test done on SS6.
			07	SS	75	10		6	358		45		
			07A	TW	83			7	357		138 158		TW07A sample collected from hole 1.5 m west of original hole
356.1			08	SS	100	6		8	356		45		...sieve/hydrometer test done on SS8.
357.9 / 8.1	**CLAYEY SILT** Greenish grey, varved with thin (<1 mm) grey clay layers, high plasticity, firm [Lower Glaciolacustrine]		09	RC	100	100		9	355				
	BEDROCK Tuff Greenish grey, calcite in veins		10	RC	100	100		10	354				
352.5			11	RC	100	100		11	353				
11.5	**END OF BOREHOLE** STANDPIPE INSTALLATION flushmount well protector Screen: 6.1 to 7.6 m Riser: 0 to 6.1 m Sand: 5.5 to 7.6 m Bentonite: 7.6 to 11.5 m Grout: 0 to 5.5 m WATER LEVELS (bgs) 0.2 m on 18-Mar-2014 flowing on 31-Mar-2014												

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RECORD OF BOREHOLE No. BH13-27

PROJECT	Rainy River Project - 2013/2014 Geotechnical Investigation			ENGINEER	MS
PROJECT NO.	TC133921	DRILLER	Marathon Drilling	BORING METHOD	200 mm HSA, NW/NQ Coring
CLIENT	New Gold Inc.	LOCATION	West Creek Pond	COMPILED BY	MV
ELEVATION	364.86 m	COORD.	N 5,411,062 E 425,700	BORING DATE	Start: 30 Aug 13 End: 30 Aug 13
				CHECKED BY	DGR

SAMPLE TYPES
AU Auger; BU Bulk; DC Dynamic Cone; RC Rock Core; SS Split Spoon; TW Thin Walled Open (Shelby); WS Wash Sample

ABBREVIATIONS
P.P. Pocket Penetrometer; TV Torvane; PT Standard Proctor Test; P.L. Point Load Strength Index (I_{50}); RQD Rock Quality Designation; SCR Solid Core Recovery; k Permeability; C Consolidation; DS Direct Shear; GS Grain Size Analysis

ELEV / DEPTH (m)	DESCRIPTION	NUMBER	TYPE	RECOVERY (%)	SPT "N" VALUES or RQD
364.9	Ground surface				
364.9 / 0.0	**ORGANICS/PEAT**				
0.1	**SANDY/CLAYEY SILT** Brown sandy/clayey silt, trace gravel, moist, varved, low to medium plasticity, firm to very stiff [Upper Glaciolacustrine]	1	SS	79	7
		2	SS	67	17
		3	SS	83	14
362.6					
2.3	**SILTY/SANDY CLAY** Brown to dark grey silty/sandy clay, moist, high plasticity, firm to stiff [WML Till]	4	SS	83	10
		5	SS	100	11
	...0.15m seam of orange sand with silt and clay, coarse at 3.5m	6	SS	100	6
	...becoming dark grey at 4.6m, trace sand, trace gravel	7	SS	8	8
		8	TW	92	
		9	SS	100	6
355.4		10	SS	100	8
9.5	**SANDY/SILTY CLAY** Grey sandy/silty clay, wet, varved, high plasticity, firm [Lower Glaciolacustrine]				
354.2					
10.7	**SAND** Brown to grey sand, some silt, fine to mediam, wet [Possible Glacial Fluvial]	11	SS	54	7
	...becoming medium to fine at 12.4m	12	SS	67	16
		13	SS	54	21

DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100)
MTO VANE: □ INTACT ■ REMOULDED
NILCON VANE: △ INTACT ▲ REMOULDED
UNDRAINED SHEAR STRENGTH (kPa) 20 40 60 80 100

PLASTIC LIMIT w_P | NATURAL MOISTURE CONTENT w | LIQUID LIMIT w_L
WATER CONTENT (%) 20 40 60

DEPTH (m)	ELEVATION (m)	w_P	w	w_L
0	364		17	
1			16	
2	363		21	
3	362		29	
4			34	
5	361		33	83
6	360		35	
7	359			
8	358			
9	357		40	
10	356			
11	355		39 / 32	
12	354		20	
13	353			
14	352		22 / 20	
15	351		14	
	350			

PERMEABILITY (cm/s)

REMARKS
...sieve/hydrometer test done on SS3.
...sieve/hydrometer test done on SS6.

Continued on Next Page

RECORD OF BOREHOLE No. BH13-27

PROJECT	Rainy River Project - 2013/2014 Geotechnical Investigation					ENGINEER	MS
PROJECT NO.	TC133921	DRILLER	Marathon Drilling	BORING METHOD	200 mm HSA, NW/NQ Coring	LOGGED BY	ARM
CLIENT	New Gold Inc.	LOCATION	West Creek Pond			COMPILED BY	MV
ELEVATION	364.86 m	COORD.	N 5,411,062 E 425,700	BORING DATE	Start: 30 Aug 13 End: 30 Aug 13	CHECKED BY	DGR

SAMPLE TYPES
AU Auger; BU Bulk; DC Dynamic Cone; RC Rock Core; SS Split Spoon; TW Thin Walled Open (Shelby); WS Wash Sample

ABBREVIATIONS
P.P. Pocket Penetrometer; TV Torvane; PT Standard Proctor Test; P.L. Point Load Strength Index (I_{50}); RQD Rock Quality Designation; SCR Solid Core Recovery; k Permeability; C Consolidation; DS Direct Shear; GS Grain Size Analysis

ELEV / DEPTH (m)	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	RECOVERY (%)	SPT "N" VALUES or RQD	WELL / PIEZOMETER INSTALLATION	DEPTH (m)	ELEVATION (m)	DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100) / MTO VANE (□ INTACT ■ REMOULDED) / NILCON VANE (△ INTACT ▲ REMOULDED) / UNDRAINED SHEAR STRENGTH (kPa) (20 40 60 80 100)	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L — WATER CONTENT (%) (20 40 60)	PERMEABILITY (cm/s)	REMARKS
			14	SS	40	20		16	349		15		
348.7													
16.2	**BOULDERS AND COBBLES** Grey sandy gravel and cobbles [WS Till]		15	RC	62			17	348		25		
			16	RC							4		...heaving sand blew up into casing from 18.5m to 17.4m during drilling
			17	RC				18	347		29		
	...boulders and cobbles		18	RC				19	346		2		
345.4													
19.5	**BEDROCK** Weak sericite, medium/strong silica alterations		19	RC	100	67		20	345				
			20	RC	88	82		21	344				
342.7								22	343				
22.2	**END OF BOREHOLE** STANDPIPE INSTALLATION 2.5 cm PVC pipe, steel upright well protector, 0.83m stick-up Screen: 17.1 to 18.6 m Riser: 0 to 17.1 m Sand: 16.5 to 18.6 m Bentonite: 15.9 to 16.5 m and 18.6 to 22.2 m Grout: 0 to 15.9m WATER LEVELS (bgs) 5.9 m on 10-Sep-2013 5.1 m on 31-Mar-2014												

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RECORD OF BOREHOLE No. BH13-29

PROJECT	Rainy River Project - 2013/2014 Geotechnical Investigation					ENGINEER	MS
PROJECT NO.	TC133921	DRILLER	Marathon Drilling	BORING METHOD	200 mm HSA, NW/NQ Coring	LOGGED BY	ARM
CLIENT	New Gold Inc.	LOCATION	Mine Rock Stockpile Pond			COMPILED BY	AD
ELEVATION	357.52 m	COORD.	N 5,408,940 E 426,669	BORING DATE	Start: 26 Aug 13 End: 26 Aug 13	CHECKED BY	DGR

SAMPLE TYPES
AU Auger; BU Bulk; DC Dynamic Cone; RC Rock Core; SS Split Spoon; TW Thin Walled Open (Shelby); WS Wash Sample

ABBREVIATIONS
P.P. Pocket Penetrometer; TV Torvane; PT Standard Proctor Test; P.L. Point Load Strength Index (I_{50}); RQD Rock Quality Designation; SCR Solid Core Recovery; k Permeability; C Consolidation; DS Direct Shear; GS Grain Size Analysis

ELEV / DEPTH (m)	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	RECOVERY (%)	SPT "N" VALUES or RQD	WELL / PIEZOMETER INSTALLATION	DEPTH (m)	ELEVATION (m)	DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100) / MTO VANE (□ INTACT ■ REMOULDED) / NILCON VANE (△ INTACT ▲ REMOULDED) / UNDRAINED SHEAR STRENGTH (kPa) (20 40 60 80 100)	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L / WATER CONTENT (%) (20 40 60)	PERMEABILITY (cm/s)	REMARKS
357.5	Ground surface												
357.4 / 0.1	**ORGANICS/TOPSOIL**												
	SILTY SAND Brown silty sand, trace gravel, loose, moist		01	SS	29	6			357		16		
356.8 / 0.8	**SILTY CLAY** Brown clayey silt, some sand, trace gravel, moist, soft to firm		02	SS	75	23		1			23		...sieve/hydrometer test done on SS2A.
356.3 / 1.2			03	RC					356		3		
355.7 / 1.8	**SAND AND GRAVEL** Light brown sand and gravel, with cobbles, compact to dense							2					
	BEDROCK Weak sericite, medium/strong silica alteration		04	RC	85	67		3	355				
			05	RC	97	40		4	354				
352.8 / 4.7	**END OF BOREHOLE**								353				

STANDPIPE INSTALLATION
Two standpipes installed, 2.5 cm PVC pipes, flushmount well protector
Screen: 0.6 to 1.5 m and 3.2 to 4.7 m
Riser: 0 to 0.6 m and 0 to 3.2 m

Sand: 0.3 to 1.5 m and 2.7 to 4.7 m
Bentonite: 0 to 0.3 m and 1.5 to 2.7 m

WATER LEVELS (bgs)
Standpipe with screen bottom at 1.5m:
Dry on 20-Oct-2013

Standpipe with screen bottom at 4.7m:
Dry on 20-Oct-2013

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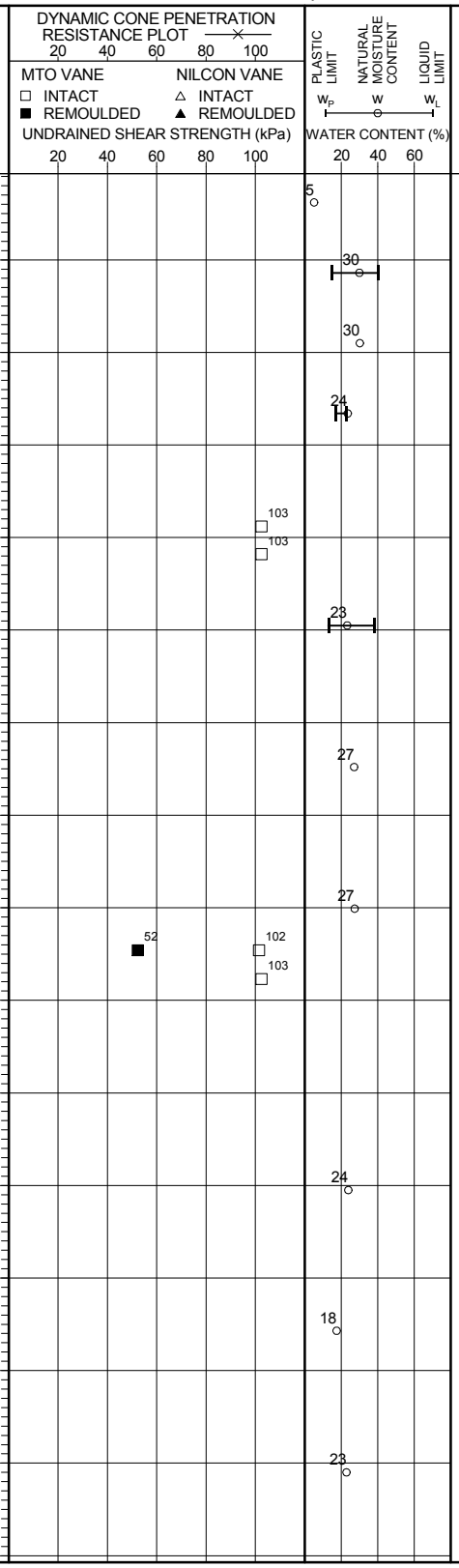
RECORD OF BOREHOLE No. BH13-30

PROJECT	Rainy River Project - 2013/2014 Geotechnical Investigation					ENGINEER	MS
PROJECT NO.	TC133921	DRILLER	Marathon Drilling	BORING METHOD	200 mm HSA, NW/NQ Coring	LOGGED BY	ARM
CLIENT	New Gold Inc.	LOCATION	Mine Rock Stockpile Pond			COMPILED BY	AD
ELEVATION	355.93 m	COORD.	N 5,408,522 E 427,656	BORING DATE	Start: 23 Aug 13 End: 25 Aug 13	CHECKED BY	DGR

SAMPLE TYPES
AU Auger; BU Bulk; DC Dynamic Cone; RC Rock Core; SS Split Spoon; TW Thin Walled Open (Shelby); WS Wash Sample

ABBREVIATIONS
P.P. Pocket Penetrometer; TV Torvane; PT Standard Proctor Test; P.L. Point Load Strength Index (I_{50}); RQD Rock Quality Designation; SCR Solid Core Recovery; k Permeability; C Consolidation; DS Direct Shear; GS Grain Size Analysis

ELEV / DEPTH (m)	DESCRIPTION	NUMBER	TYPE	RECOVERY (%)	SPT "N" VALUES or RQD	REMARKS
355.9	Ground surface					
0.0	**SAND AND GRAVEL** Brown sand and gravel, trace organics, loose to compact, moist [Probably Fill]	01	SS	42	12	
355.2 / 0.8	**SILTY/SANDY CLAY** Brown silty/sandy clay, moist to wet, soft to firm [Upper Glaciolacustrine]	02	SS	71	8	...sieve/hydrometer test done on SS2.
		03	SS	100	6	
	...trace sand below 2.3m	04	SS	100	5	...sieve/hydrometer test done on SS4.
352.6 / 3.4	**SILTY CLAY** Dark grey silty clay, trace to some silt, medium to high plasticity, firm to stiff, moist [WML Till]	05	TW	100		
	...frequent light grey silty clay laminae/layers	08	SS	100	6	...sieve/hydrometer test done on SS8.
		09	SS	100	7	
		10	SS	100	6	
		13	TW	100		
		14	SS	100	10	
	...trace to some sand below 12.2m	15	SS	100	9	
		16	SS	100	13	



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RECORD OF BOREHOLE No. BH13-30

PROJECT	Rainy River Project - 2013/2014 Geotechnical Investigation			ENGINEER	MS
PROJECT NO.	TC133921	DRILLER	Marathon Drilling	BORING METHOD	200 mm HSA, NW/NQ Coring
CLIENT	New Gold Inc.	LOCATION	Mine Rock Stockpile Pond	COMPILED BY	AD
ELEVATION	355.93 m	COORD.	N 5,408,522 E 427,656	BORING DATE	Start: 23 Aug 13 End: 25 Aug 13
				CHECKED BY	DGR

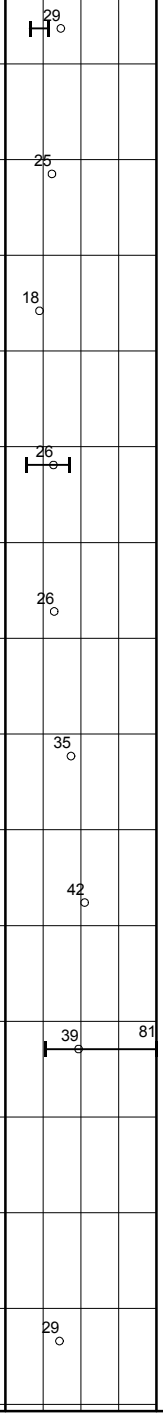
SAMPLE TYPES
AU Auger; BU Bulk; DC Dynamic Cone; RC Rock Core; SS Split Spoon; TW Thin Walled Open (Shelby); WS Wash Sample

ABBREVIATIONS
P.P. Pocket Penetrometer; TV Torvane; PT Standard Proctor Test; P.L. Point Load Strength Index (I_{50}); RQD Rock Quality Designation; SCR Solid Core Recovery; k Permeability; C Consolidation; DS Direct Shear; GS Grain Size Analysis

ELEV / DEPTH (m)	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	RECOVERY (%)	SPT "N" VALUES or RQD	WELL / PIEZOMETER INSTALLATION	DEPTH (m)	ELEVATION (m)	REMARKS
340.7										
15.3	**SILTY SAND** Grey silty sand, trace clay, trace silt, compact to dense, wet		17	SS	100	15		16	340	...sieve/hydrometer test done on SS17.
			18	SS	100	43		17	339	
			19	SS	100	24		18	338	
			20	SS	100	12		19	337	
334.6								20	336	...sieve/hydrometer test done on SS20.
21.3	**SILTY CLAY** Dark grey silty clay, trace gravel, high plasticity, stiff, moist [WML Till] ...coarse sand and gravel at 21.6m		21	SS	100	11		21	335	
			22	TW	100			22	334	
			25	SS	100	13		23	333	
			26	SS	100	12		24	332	
			27	SS	100	13		25	331	
								26	330	...sieve/hydrometer test done on SS26.
								27	329	
								28	328	
								29	327	
								30	326	

DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100)
MTO VANE: □ INTACT ■ REMOULDED
NILCON VANE: △ INTACT ▲ REMOULDED
UNDRAINED SHEAR STRENGTH (kPa) (20 40 60 80 100)

PLASTIC LIMIT (w_P) NATURAL MOISTURE CONTENT (w) LIQUID LIMIT (w_L)
WATER CONTENT (%) (20 40 60)



PERMEABILITY (cm/s)

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RECORD OF BOREHOLE No. BH13-32

PROJECT	Rainy River Project - 2013/2014 Geotechnical Investigation					ENGINEER	MS
PROJECT NO.	TC133921	DRILLER	Marathon Drilling	BORING METHOD	200 mm HSA, NW/NQ Coring	LOGGED BY	AD
CLIENT	New Gold Inc.	LOCATION	Plant Site - Substation			COMPILED BY	AD
ELEVATION	373.53 m	COORD.	N 5,411,212 E 426,708	BORING DATE	Start: 16 Nov 13 End: 16 Nov 13	CHECKED BY	DGR

SAMPLE TYPES
AU Auger; BU Bulk; DC Dynamic Cone; RC Rock Core; SS Split Spoon; TW Thin Walled Open (Shelby); WS Wash Sample

ABBREVIATIONS
P.P. Pocket Penetrometer; TV Torvane; PT Standard Proctor Test; P.L. Point Load Strength Index (I_{50}); RQD Rock Quality Designation; SCR Solid Core Recovery; k Permeability; C Consolidation; DS Direct Shear; GS Grain Size Analysis

ELEV / DEPTH (m)	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	RECOVERY (%)	SPT "N" VALUES or RQD	WELL / PIEZOMETER INSTALLATION	DEPTH (m)	ELEVATION (m)	DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100) / MTO VANE (□ INTACT ■ REMOULDED) / NILCON VANE (△ INTACT ▲ REMOULDED) / UNDRAINED SHEAR STRENGTH (kPa) (20 40 60 80 100)	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L — WATER CONTENT (%) (20 40 60)	PERMEABILITY (cm/s)	REMARKS
373.5	Ground surface												
373.4	**ORGANICS/TOPSOIL**												
0.1	**SILTY CLAY** Reddish Brown, trace to some sand, trace gravel, damp to moist, occasional grey silt laminations (3-6mm thick), low to medium plasticity, firm [Upper Glaciolacustrine] ...rootlets and organics from 0 to 0.8m		01	SS	54	6					20		
			02	SS	100	7		1	373		18		
			03	SS	100	9		2	372		22		...sieve/hydrometer test done on SS3.
			04	SS	100	7			371		22		
370.5								3					
3.0	**SANDY SILT** Light brown, some clay, trace gravel, low plasticity, firm ... 100mm thick sand pocket at 3.4m		05	SS	100	9			370		17		
369.3			06	TW	94			4			23		
4.3	...Dark grey silty clay, trace sand, trace gravel, moist, high plasticity, firm to stiff [WML Till]								369				TW06 Hit refusal on hard material at 4.26m, tube was not damaged
	BOULDERS AND COBBLES [Inferred WS Till]		07	RC	24	0		5					
367.9									368				
5.6	**BEDROCK** Mafic Flow, Fractures, 20° and 40° (measured from vertical axis)		08	RC	100	86		6					
			09	RC	85	67			367				
			10	RC	96	74		7	366				
			11	RC	100	100		8	365				RC sample taken from 8.36m to 8.71m for compression test
364.3								9					
9.3	**END OF BOREHOLE** STANDPIPE INSTALLATION 2.5 cm PVC pipe, upright steel well protector, 0.97 m stick-up Screen: 4 to 5.5 m Riser: 0 to 4 m Sand: 3.1 to 5.5 m Bentonite: 2.7 to 3.1 m and 5.5 to 9.3 m Grout: 0 to 2.7 m WATER LEVELS (bgs) 1.1m on 08-Nov-2013 1.5m on 31-Mar-2014												

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RECORD OF BOREHOLE No. BH13-35

PROJECT	Rainy River Project - 2013/2014 Geotechnical Investigation			ENGINEER	MS
PROJECT NO.	TC133921	DRILLER	Marathon Drilling	BORING METHOD	200 mm HSA, NW/NQ Coring
LOGGED BY	DPD				
CLIENT	New Gold Inc.	LOCATION	Plant Site - Leach Tanks	COMPILED BY	JAC
ELEVATION	367.46 m	COORD.	N 5,411,078 E 426,496	BORING DATE	Start: 6 Dec 13 End: 9 Dec 13
CHECKED BY	DGR				

SAMPLE TYPES
AU Auger; BU Bulk; DC Dynamic Cone; RC Rock Core; SS Split Spoon; TW Thin Walled Open (Shelby); WS Wash Sample

ABBREVIATIONS
P.P. Pocket Penetrometer; TV Torvane; PT Standard Proctor Test; P.L. Point Load Strength Index (I_{50}); RQD Rock Quality Designation; SCR Solid Core Recovery; k Permeability; C Consolidation; DS Direct Shear; GS Grain Size Analysis

ELEV / DEPTH (m)	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	RECOVERY (%)	SPT "N" VALUES or RQD	WELL / PIEZOMETER INSTALLATION	DEPTH (m)	ELEVATION (m)	REMARKS
367.5 / 0.0	Ground surface									
367.3 / 0.2	**ORGANICS/TOPSOIL**									
	CLAYEY SILT Brown, trace angular medium and coarse sand, damp to moist, firm [Upper Glaciolacustrine]		01	SS	100	8		1	367	
	Laminated in ~0.5 mm thick layers of silt and sand, stiff		02	SS	100	11		2	366	
365.2 / 2.3	**SILTY CLAY** Brown mottled with light brown, some angular gravel, damp, stiff		03	SS	100	11		3	365	sieve/hydrometer test done on SS03
			04	SS	100	13		4	364	
363.7 / 3.8	... possible boulder or cobbles **SILTY CLAY** Brown to grey, trace sand, trace gravel, moist, stiff [WML Till]		05	SS	100	11		5	363	
	... below 4.6 m, dark grey, medium to high plasticity		06	SS	100	12		6	362	
			07	SS	100	12		7	361	
			08	SS	100	12		8	360	
			09	SS	100	9		9	359	
			10	SS	100	9		10	358	
			11	SS	100	9		11	357	sieve/hydrometer test done on SS11
			12	SS	21	25		12	356	
353.1 / 14.3	**BOULDERS AND COBBLES** Gravel, possible boulders or weathered rock [WS Till]							13	355	
								14	354	
								15	353	

DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100)
MTO VANE: □ INTACT ■ REMOULDED
NILCON VANE: △ INTACT ▲ REMOULDED
UNDRAINED SHEAR STRENGTH (kPa) 20 40 60 80 100

PLASTIC LIMIT w_P — NATURAL MOISTURE CONTENT w — LIQUID LIMIT w_L
WATER CONTENT (%) 20 40 60

PERMEABILITY (cm/s)

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RECORD OF BOREHOLE No. BH14-02

PROJECT	Rainy River Project - 2013/2014 Geotechnical Investigation					ENGINEER	MS
PROJECT NO.	TC133921	DRILLER	Marathon Drilling	BORING METHOD	200 mm HSA, NW/NQ Coring	LOGGED BY	HWP/MA
CLIENT	New Gold Inc.	LOCATION	Road crossing - Loslo Creek			COMPILED BY	AD
ELEVATION	359.27 m	COORD.	N 5,411,350 E 423,682	BORING DATE	Start: 10 Mar 14 End: 11 Mar 14	CHECKED BY	

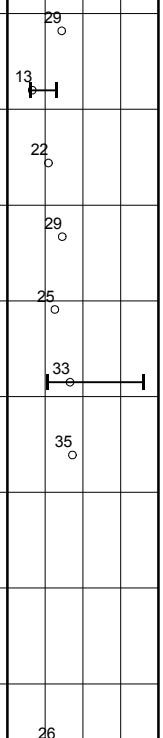
SAMPLE TYPES
AU Auger; BU Bulk; DC Dynamic Cone; RC Rock Core; SS Split Spoon; TW Thin Walled Open (Shelby); WS Wash Sample

ABBREVIATIONS
P.P. Pocket Penetrometer; TV Torvane; PT Standard Proctor Test; P.L. Point Load Strength Index (I_{50}); RQD Rock Quality Designation; SCR Solid Core Recovery; k Permeability; C Consolidation; DS Direct Shear; GS Grain Size Analysis

ELEV / DEPTH (m)	DESCRIPTION	NUMBER	TYPE	RECOVERY (%)	SPT "N" VALUES or RQD	DEPTH (m)	ELEVATION (m)	REMARKS
359.3	Ground surface							
359.2 / 0.1	**ORGANICS/TOPSOIL**							
0.4	**SILTY CLAY** Brown, trace sand, trace gravel, occasional grey silt inclusions, moist, medium to high plasticity, firm to stiff, occasional oxidation [Upper Glaciolacustrine]	01	GS					
		02	SS	100	9	1	358	...sieve/hydrometer test done on SS2.
	... at 1.2 m, occasional medium grained sand pockets, 10mm thick	03	SS	21	15	2	357	
357.0								
2.3	**SILTY CLAY** Grey, trace gravel, trace sand, damp to moist, high plasticity, firm to stiff, occasional oxidation [WML Till]	04	SS	100	11	3	356	
	... at 3.1 m, 80 mm thick brown silty clay layer	05	SS	100	10			
		06	SS	100	10	4	355	...sieve/hydrometer test done on SS6.
		07	SS	100	8	5	354	
	... at 5 m, 15 mm thick sand layer/lens, medium grained, light grey					6	353	
		08	TW	73				
351.7						7	352	
7.6	**SAND** Dark grey, medium to coarse grained, very dense, wet	09	SS	83	61	8	351	
350.7								
8.5	**GRAVEL, COBBLES AND BOULDERS** [Inferred WS Till]	10	RC			9	350	
		11	RC			10	349	
		12	RC			11	348	
347.7								
11.6	**BEDROCK** Intermediate Tuff, Greenish grey, foliated	13	RC	92	84	12	347	
		14	RC	93	87	13	346	
344.6						14	345	
14.7								

DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100)
MTO VANE: □ INTACT ■ REMOULDED
NILCON VANE: △ INTACT ▲ REMOULDED
UNDRAINED SHEAR STRENGTH (kPa) (20 40 60 80 100)

PLASTIC LIMIT w_P | NATURAL MOISTURE CONTENT w | LIQUID LIMIT w_L
WATER CONTENT (%) (20 40 60)



PERMEABILITY (cm/s)

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RECORD OF BOREHOLE No. BH14-02

PROJECT	Rainy River Project - 2013/2014 Geotechnical Investigation					ENGINEER	MS
PROJECT NO.	TC133921	DRILLER	Marathon Drilling	BORING METHOD	200 mm HSA, NW/NQ Coring	LOGGED BY	HWP/MA
CLIENT	New Gold Inc.	LOCATION	Road crossing - Loslo Creek			COMPILED BY	AD
ELEVATION	359.27 m	COORD.	N 5,411,350 E 423,682	BORING DATE	Start: 10 Mar 14 End: 11 Mar 14	CHECKED BY	

SAMPLE TYPES
AU Auger
BU Bulk
DC Dynamic Cone
RC Rock Core
SS Split Spoon
TW Thin Walled Open (Shelby)
WS Wash Sample

ABBREVIATIONS
P.P. Pocket Penetrometer
TV Torvane
PT Standard Proctor Test
P.L. Point Load Strength Index (I_{50})
RQD Rock Quality Designation
SCR Solid Core Recovery
k Permeability
C Consolidation
DS Direct Shear
GS Grain Size Analysis

ELEV / DEPTH (m)	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	RECOVERY (%)	SPT "N" VALUES or RQD	WELL / PIEZOMETER INSTALLATION	DEPTH (m)	ELEVATION (m)	DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100); MTO VANE □ INTACT ■ REMOULDED; NILCON VANE △ INTACT ▲ REMOULDED; UNDRAINED SHEAR STRENGTH (kPa) (20 40 60 80 100)	PLASTIC LIMIT w_P	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w_L; WATER CONTENT (%) (20 40 60)	PERMEABILITY (cm/s)	REMARKS
	END OF BOREHOLE STANDPIPE INSTALLATION 2.5 cm PVC pipe, flushmount well protector Screen: 10.1 to 11.6 m Riser: 0 to 10.1 m Sand: 9.8 to 11.6 m Grout/bentonite: 0 to 9.8 m WATER LEVELS (bgs) 0.3 m on 25-Mar-2014														

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RECORD OF BOREHOLE No. BH14-04

PROJECT	Rainy River Project - 2013/2014 Geotechnical Investigation			ENGINEER	MS
PROJECT NO.	TC133921	DRILLER	Marathon Drilling	BORING METHOD	200 mm HSA, NW/NQ Coring
CLIENT	New Gold Inc.	LOCATION	West Creek Pond	COMPILED BY	AD
ELEVATION	356.72 m	COORD.	N 5,411,031 E 425,752	BORING DATE	Start: 19 Feb 14 End: 20 Feb 14
				CHECKED BY	DGR

SAMPLE TYPES
AU Auger; BU Bulk; DC Dynamic Cone; RC Rock Core; SS Split Spoon; TW Thin Walled Open (Shelby); WS Wash Sample

ABBREVIATIONS
P.P. Pocket Penetrometer; TV Torvane; PT Standard Proctor Test; P.L. Point Load Strength Index (I_{50}); RQD Rock Quality Designation; SCR Solid Core Recovery; k Permeability; C Consolidation; DS Direct Shear; GS Grain Size Analysis

ELEV / DEPTH (m)	DESCRIPTION	NUMBER	TYPE	RECOVERY (%)	SPT "N" VALUES or RQD	DEPTH (m)	ELEVATION (m)	REMARKS
356.7	Ground surface							
356.6 / 0.0	**ORGANICS/TOPSOIL**							
0.2	**CLAYEY SILT** Light brown to grey, some sand, trace gravel, varved (up to 10 mm thick) with silty fine sand [Upper Glaciolacustrine]	01	GS					
		02	SS	88	8	1	356	
		03	SS	92	9	2	355	...sieve/hydrometer test done on SS3.
		04	SS	100	10	3	354	
353.2		05	SS	100	9			
3.5	**SILTY CLAY** Dark grey, trace sand, trace gravel, moist, medium to high plasticity, firm to stiff [WML Till]	06	SS	100	8	4	353	
		07	SS	100	9	5	352	...sieve/hydrometer test done on SS7.
		08	SS	100	9	6	351	
	... becoming moist to wet, firm, less sandy	09	SS	25	10	7	350	
		10	SS	100	7	8	349	
		11	SS	100	7	9	348	
		12	TW	100		10	347	
		13	SS	100	9	11	346	
						12	345	
						13	344	
						14	343	
						15	342	

DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100)
MTO VANE: □ INTACT ■ REMOULDED
NILCON VANE: △ INTACT ▲ REMOULDED
UNDRAINED SHEAR STRENGTH (kPa) (20 40 60 80 100)

PLASTIC LIMIT w_P | NATURAL MOISTURE CONTENT w | LIQUID LIMIT w_L
WATER CONTENT (%) (20 40 60)

PERMEABILITY (cm/s)

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RECORD OF BOREHOLE No. BH14-04

PROJECT	Rainy River Project - 2013/2014 Geotechnical Investigation					ENGINEER	MS
PROJECT NO.	TC133921	DRILLER	Marathon Drilling	BORING METHOD	200 mm HSA, NW/NQ Coring	LOGGED BY	ARM
CLIENT	New Gold Inc.	LOCATION	West Creek Pond			COMPILED BY	AD
ELEVATION	356.72 m	COORD.	N 5,411,031 E 425,752	BORING DATE	Start: 19 Feb 14 End: 20 Feb 14	CHECKED BY	DGR

SAMPLE TYPES
AU Auger; BU Bulk; DC Dynamic Cone; RC Rock Core; SS Split Spoon; TW Thin Walled Open (Shelby); WS Wash Sample

ABBREVIATIONS
P.P. Pocket Penetrometer; TV Torvane; PT Standard Proctor Test; P.L. Point Load Strength Index (I_{50}); RQD Rock Quality Designation; SCR Solid Core Recovery; k Permeability; C Consolidation; DS Direct Shear; GS Grain Size Analysis

ELEV / DEPTH (m)	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	RECOVERY (%)	SPT "N" VALUES or RQD	WELL / PIEZOMETER INSTALLATION	DEPTH (m)	ELEVATION (m)	DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100); MTO VANE □ INTACT ■ REMOULDED; NILCON VANE △ INTACT ▲ REMOULDED; UNDRAINED SHEAR STRENGTH (kPa) 20 40 60 80 100	PLASTIC LIMIT w_P; NATURAL MOISTURE CONTENT w; LIQUID LIMIT w_L; WATER CONTENT (%) 20 40 60	PERMEABILITY (cm/s)	REMARKS
			14	SS	83	8		16	341				
								17	340	103			
								18	339				
			15	SS	79	11		19	338		32		...sieve/hydrometer test done on SS15.
335.9								20	337				
20.8	**BEDROCK**							21	336				
			16	RC	85	38		22	335				
			17	RC	88	73		23	334				
332.2			18	RC	92	89		24	333				
24.5	**END OF BOREHOLE** STANDPIPE INSTALLATION 2.5 cm PVC pipe, upright steel well protector, 0.85 m stickup Screen: 19.2 to 20.7 m Riser: 0 to 19.2 m Sand: 18.6 to 20.7 m Bentonite: 20.7 to 24.5 m Grout/bentonite: 0 to 18.6 m WATER LEVELS (bgs) 2.6 m on 25-Mar-2014												

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RECORD OF BOREHOLE No. BH14-05

PROJECT	Rainy River Project - 2013/2014 Geotechnical Investigation			ENGINEER	MS
PROJECT NO.	TC133921	DRILLER	Marathon Drilling	BORING METHOD	200 mm HSA, NW/NQ Coring
LOGGED BY	ARM	CLIENT	New Gold Inc.	LOCATION	West Creek Pond
COMPILED BY	AD	ELEVATION	358.81 m	COORD.	N 5,410,955 E 425,803
BORING DATE	Start: 12 Feb 14 End: 15 Feb 14	CHECKED BY			

SAMPLE TYPES
AU Auger; BU Bulk; DC Dynamic Cone; RC Rock Core; SS Split Spoon; TW Thin Walled Open (Shelby); WS Wash Sample

ABBREVIATIONS
P.P. Pocket Penetrometer; TV Torvane; PT Standard Proctor Test; P.L. Point Load Strength Index (I_{50}); RQD Rock Quality Designation; SCR Solid Core Recovery; k Permeability; C Consolidation; DS Direct Shear; GS Grain Size Analysis

ELEV / DEPTH (m)	DESCRIPTION	NUMBER	TYPE	RECOVERY (%)	SPT "N" VALUES or RQD	DEPTH (m)	REMARKS
358.8	Ground surface						
0.0	**SANDY SILT AND SILTY CLAY** Brown, trace to some gravel, trace clay, occasional grey mottling, trace organics [Upper Glaciolacustrine]	01	GS				
		02	SS	92	11	1	
		03	SS	100	13	2	
	... below 2.3 m, some dark brown pockets, occasional orange staining	04	SS	100	10	3	...sieve/hydrometer test done on SS4.
355.8							
3.1	**SILTY CLAY** Dark grey, some sand, trace gravel, moist [WML Till]	05	SS	100	8		
		06	SS	100	10	4	
		07	SS	100	8	5	
		08	TW	100		6	
		09	SS	100	6	7	
	... occasional sand lenses/pockets	10	SS	75	6	8	
		11	SS	100	5	9	
		12	SS	100	6	10	
345.1						11	
13.7	**SILTY CLAYEY SAND** Brown to grey, fine, moist to wet, firm to stiff [Keewatin fluvial]	13	SS	67	7	12	...sieve/hydrometer test done on SS13.
						13	
						14	
						15	

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RECORD OF BOREHOLE No. BH14-05

PROJECT	Rainy River Project - 2013/2014 Geotechnical Investigation					ENGINEER	MS
PROJECT NO.	TC133921	DRILLER	Marathon Drilling	BORING METHOD	200 mm HSA, NW/NQ Coring	LOGGED BY	ARM
CLIENT	New Gold Inc.	LOCATION	West Creek Pond			COMPILED BY	AD
ELEVATION	358.81 m	COORD.	N 5,410,955 E 425,803	BORING DATE	Start: 12 Feb 14 End: 15 Feb 14	CHECKED BY	

SAMPLE TYPES
AU Auger; BU Bulk; DC Dynamic Cone; RC Rock Core; SS Split Spoon; TW Thin Walled Open (Shelby); WS Wash Sample

ABBREVIATIONS
P.P. Pocket Penetrometer; TV Torvane; PT Standard Proctor Test; P.L. Point Load Strength Index (I_{50}); RQD Rock Quality Designation; SCR Solid Core Recovery; k Permeability; C Consolidation; DS Direct Shear; GS Grain Size Analysis

ELEV / DEPTH (m)	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	RECOVERY (%)	SPT "N" VALUES or RQD	WELL / PIEZOMETER INSTALLATION	DEPTH (m)	ELEVATION (m)	DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100) / MTO VANE (□ INTACT, ■ REMOULDED) / NILCON VANE (△ INTACT, ▲ REMOULDED) / UNDRAINED SHEAR STRENGTH (kPa) (20 40 60 80 100)	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L / WATER CONTENT (%) (20 40 60)	PERMEABILITY (cm/s)	REMARKS
	... possible cobbles/boulders from 16.8 m to 18.3 m		14	SS	71	11		16	343		24		
								17	342				
								18	341				
340.1			15	SS	100	8		19	340	103 103	20 34		...sieve/hydrometer test done on SS15.
18.8	**SILTY CLAY** Dark grey, trace sand, trace gravel, moist, medium to high plasticity [WML Till]		16	SS	100	9		20	339		45		
								21	338	48 102 103			
			17	SS	100	9		22	337		41		
								23	336				
								24	335				
			18	SS	54	9		25	334		43		
								26	333				
331.4								27	332				
27.4	**SILTY SAND** Grey, fine grained, trace clay, compact, wet to saturated [Glacial Sand]		19	SS	54	22		28	331		20		
								29	330				
								30	329				

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RECORD OF BOREHOLE No. BH14-05

PROJECT	Rainy River Project - 2013/2014 Geotechnical Investigation					ENGINEER	MS
PROJECT NO.	TC133921	DRILLER	Marathon Drilling	BORING METHOD	200 mm HSA, NW/NQ Coring	LOGGED BY	ARM
CLIENT	New Gold Inc.	LOCATION	West Creek Pond			COMPILED BY	AD
ELEVATION	358.81 m	COORD.	N 5,410,955 E 425,803	BORING DATE	Start: 12 Feb 14 End: 15 Feb 14	CHECKED BY	

SAMPLE TYPES
AU Auger; BU Bulk; DC Dynamic Cone; RC Rock Core; SS Split Spoon; TW Thin Walled Open (Shelby); WS Wash Sample

ABBREVIATIONS
P.P. Pocket Penetrometer; TV Torvane; PT Standard Proctor Test; P.L. Point Load Strength Index (I_{50}); RQD Rock Quality Designation; SCR Solid Core Recovery; k Permeability; C Consolidation; DS Direct Shear; GS Grain Size Analysis

ELEV / DEPTH (m)	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	RECOVERY (%)	SPT "N" VALUES or RQD	WELL / PIEZOMETER INSTALLATION	DEPTH (m)	ELEVATION (m)	DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100) / MTO VANE (□ INTACT ■ REMOULDED) / NILCON VANE (△ INTACT ▲ REMOULDED) / UNDRAINED SHEAR STRENGTH (kPa) 20 40 60 80 100	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L — WATER CONTENT (%) 20 40 60	PERMEABILITY (cm/s)	REMARKS
			20	SS	50	27		31	328		19		...sieve/hydrometer test done on SS20. Non- Plastic
325.3								32	327				
33.5	**COBBLES AND BOULDERS** [Inferred WS Till]		21	RC	29	0		33	326				
324.3								34	325				
34.5	**BEDROCK**		22	RC	92	28		35	324				
			23	RC	95	21		36	323				
			24	RC	89	0		37	322				
320.4								38	321				
38.5	**END OF BOREHOLE** STANDPIPE INSTALLATION 2.5 cm PVC pipe, flushmount protector Screen: 31.7 to 33.2 m Riser: 0 to 31.7 m Sand: 31.1 m to 33.2 m Bentonite: 33.2 to 38.5 m Grout/bentonite: 0 to 31.1 m WATER LEVELS (bgs) 4.1 m on 16-Feb-2014 4.3 m on 31-Mar-2014												

RECORD OF BOREHOLE No. BH14-06

PROJECT	Rainy River Project - 2013/2014 Geotechnical Investigation					ENGINEER	MS
PROJECT NO.	TC133921	DRILLER	Marathon Drilling	BORING METHOD	200 mm HSA, NW/NQ Coring	LOGGED BY	HWP
CLIENT	New Gold Inc.	LOCATION	Mine Rock Stockpile Pond			COMPILED BY	BT
ELEVATION	356.64 m	COORD.	N 5,408,576 E 426,818	BORING DATE	Start: 22 Feb 14 End: 23 Feb 14	CHECKED BY	DGR

SAMPLE TYPES
AU Auger; BU Bulk; DC Dynamic Cone; RC Rock Core; SS Split Spoon; TW Thin Walled Open (Shelby); WS Wash Sample

ABBREVIATIONS
P.P. Pocket Penetrometer; TV Torvane; PT Standard Proctor Test; P.L. Point Load Strength Index (I_{50}); RQD Rock Quality Designation; SCR Solid Core Recovery; k Permeability; C Consolidation; DS Direct Shear; GS Grain Size Analysis

ELEV / DEPTH (m)	DESCRIPTION	NUMBER	TYPE	RECOVERY (%)	SPT "N" VALUES or RQD	WELL / PIEZOMETER INSTALLATION	REMARKS
356.6	Ground surface						
0.0	**SILTY CLAY** Brown, moist, medium to low plasticity, stiff, trace rootlets, varved [Upper Glaciolacustrine]	01	GS				
		02	SS	63	16		
		03	SS	80	21		
		04	SS	88	15		...sieve/hydrometer test done on SS4.
		05	SS	100	10		
352.5		06	SS	92	4		
4.1	**SILTY CLAY** Dark grey, trace gravel, moist, high plasticity, stiff [WML Till]						
352.0							
4.7	... light grey, rock chips below 4.6 m **SANDY TILL** Boulders & cobbles [WS Till]	08	RC	30			... SPT refusal at 9.6 m
		09	RC	30			
		10	RC	5			
347.7		11	SS	33	50/0.1		
9.0	**BEDROCK**	12	RC	20	0		
		13	RC	93	43		
343.5		14	RC	100	84		
13.2	**END OF BOREHOLE** STANDPIPE INSTALLATION flushmount protector Screen: 6.6 to 8.1 m Riser: 0 to 6.6 m Sand: 5.2 m to 8.1 m Bentonite: 4.6 to 5.2, 8.1 to 13.2 m Grout: 0 to 4.6 m						

DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100)
MTO VANE: □ INTACT ■ REMOULDED
NILCON VANE: △ INTACT ▲ REMOULDED
UNDRAINED SHEAR STRENGTH (kPa) (20 40 60 80 100)

PLASTIC LIMIT w_P | NATURAL MOISTURE CONTENT w | LIQUID LIMIT w_L
WATER CONTENT (%) (20 40 60)

Plotted values: 36, 25, 15, 21, 31, 24, 9, 15

PERMEABILITY (cm/s)

DEPTH (m): 1 2 3 4 5 6 7 8 9 10 11 12 13
ELEVATION (m): 356 355 354 353 352 351 350 349 348 347 346 345 344

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RECORD OF BOREHOLE No. BH14-11

PROJECT	Rainy River Project - 2013/2014 Geotechnical Investigation			ENGINEER	MS
PROJECT NO.	TC133921	DRILLER	Marathon Drilling	BORING METHOD	200 mm HSA, NW/NQ Coring
LOGGED BY	MA				
CLIENT	New Gold Inc.	LOCATION	Mill Foundation	COMPILED BY	AD
ELEVATION	374.07 m	COORD.	N 5,410,956 E 426,600	BORING DATE	Start: 15 Feb 14 End: 16 Feb 14
CHECKED BY					

SAMPLE TYPES
AU Auger; BU Bulk; DC Dynamic Cone; RC Rock Core; SS Split Spoon; TW Thin Walled Open (Shelby); WS Wash Sample

ABBREVIATIONS
P.P. Pocket Penetrometer; TV Torvane; PT Standard Proctor Test; P.L. Point Load Strength Index (I_{50}); RQD Rock Quality Designation; SCR Solid Core Recovery; k Permeability; C Consolidation; DS Direct Shear; GS Grain Size Analysis

ELEV / DEPTH (m)	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	RECOVERY (%)	SPT "N" VALUES or RQD	WELL / PIEZOMETER INSTALLATION	DEPTH (m)	ELEVATION (m)	DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100) / MTO VANE (□ INTACT ■ REMOULDED) / NILCON VANE (△ INTACT ▲ REMOULDED) / UNDRAINED SHEAR STRENGTH (kPa) (20 40 60 80 100)	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L / WATER CONTENT (%) (20 40 60)	PERMEABILITY (cm/s)	REMARKS
374.1	Ground surface												
0.0 373.8	**ORGANICS/TOPSOIL**		01	SS	100	50/0.15					51		
0.3	**BEDROCK** Mafic Volcanic Dark greenish grey to black, quartz and calcite veins, some iron staining on fractures		02	RC	100	91		1	373				
			03	RC	100	93		2	372				
			04	RC	100	98		3	371				
			05	RC	99	93		4	370				
	... highly fractured core from 5.3 m to 5.4 m, some sub-vertical fractures		06	RC	100	86		5	369				
			07	RC	100	100		6	368				
			08	RC	100	67		7	367				UCS sample taken from 6.5 m to 6.9 m
	... at 10.5 m, becoming dark grey to black		09	RC	100	92		8	366				
			10	RC	100	85		9	365				
			11	RC	100	89		10	364				
								11	363				
								12	362				
								13	361				
								14	360				
								15					

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RECORD OF BOREHOLE No. BH14-11

PROJECT	Rainy River Project - 2013/2014 Geotechnical Investigation					ENGINEER	MS
PROJECT NO.	TC133921	DRILLER	Marathon Drilling	BORING METHOD	200 mm HSA, NW/NQ Coring	LOGGED BY	MA
CLIENT	New Gold Inc.	LOCATION	Mill Foundation			COMPILED BY	AD
ELEVATION	374.07 m	COORD.	N 5,410,956 E 426,600	BORING DATE	Start: 15 Feb 14 End: 16 Feb 14	CHECKED BY	

SAMPLE TYPES
AU Auger; BU Bulk; DC Dynamic Cone; RC Rock Core; SS Split Spoon; TW Thin Walled Open (Shelby); WS Wash Sample

ABBREVIATIONS
P.P. Pocket Penetrometer; TV Torvane; PT Standard Proctor Test; P.L. Point Load Strength Index (I_{50}); RQD Rock Quality Designation; SCR Solid Core Recovery; k Permeability; C Consolidation; DS Direct Shear; GS Grain Size Analysis

ELEV / DEPTH (m)	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	RECOVERY (%)	SPT "N" VALUES or RQD	WELL / PIEZOMETER INSTALLATION	DEPTH (m)	ELEVATION (m)	DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100); MTO VANE □ INTACT ■ REMOULDED; NILCON VANE △ INTACT ▲ REMOULDED; UNDRAINED SHEAR STRENGTH (kPa) (20 40 60 80 100)	PLASTIC LIMIT w_P; NATURAL MOISTURE CONTENT w; LIQUID LIMIT w_L; WATER CONTENT (%) (20 40 60)	PERMEABILITY (cm/s)	REMARKS
357.9			12	RC	100	100		16	358				
16.2	**END OF BOREHOLE** STANDPIPE INSTALLATION flushmount well protector Screen: 11.7 to 14.8 m Riser: 0 to 11.7 m Sand: 11 to 14.8 m Bentonite: 14.8 to 16.2 m Grout/bentonite: 0 to 11 m WATER LEVELS (bgs) 0.3 m on 31-Mar-2014 1.0 m on 04-Apr-2014												

RECORD OF BOREHOLE No. BH503

PROJECT	Rainy River Project - 2013/2014 Geotechnical Investigation			ENGINEER	MS
PROJECT NO.	TC133921	DRILLER	Marathon Drilling	BORING METHOD	200 mm HSA, NW/NQ Coring
LOGGED BY	AD	CLIENT	New Gold Inc.	LOCATION	Plant Site - Crusher Pad/MSE Wall
COMPILED BY	JAC	ELEVATION	371.00 m	COORD.	N 5,410,189 E 426,830
BORING DATE	Start: 16 Oct 13 End: 17 Oct 13	CHECKED BY	DGR		

SAMPLE TYPES
AU Auger; BU Bulk; DC Dynamic Cone; RC Rock Core; SS Split Spoon; TW Thin Walled Open (Shelby); WS Wash Sample

ABBREVIATIONS
P.P. Pocket Penetrometer; TV Torvane; PT Standard Proctor Test; P.L. Point Load Strength Index (I_{50}); RQD Rock Quality Designation; SCR Solid Core Recovery; k Permeability; C Consolidation; DS Direct Shear; GS Grain Size Analysis

ELEV / DEPTH (m)	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	RECOVERY (%)	SPT "N" VALUES or RQD	WELL / PIEZOMETER INSTALLATION	DEPTH (m)	ELEVATION (m)	DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100) / MTO VANE (□ INTACT ■ REMOULDED) / NILCON VANE (△ INTACT ▲ REMOULDED) / UNDRAINED SHEAR STRENGTH (kPa) 20 40 60 80 100	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L — WATER CONTENT (%) 20 40 60	PERMEABILITY (cm/s)	REMARKS
371.0	Ground surface												
370.9 / 0.1	**ORGANICS/TOPSOIL**												
	SILT AND CLAY Brown and grey, trace sand, trace gravel, damp to moist, occasional mottled red oxidation [Upper Glaciolacustrine]		01	SS	71	4		1	370		28		
			02	SS	92	6		2	369		28		
368.7													
2.3	**SILTY CLAY** Dark brown to grey, trace sand, trace gravel, moist, high plasticity, firm to stiff [WML Till]		03	SS	100	10		3	368		18		
			04	SS	100	8					24		
			05	SS	100	8	▽	4	367		21		
			06	SS	100	10		5	366		18		...sieve/hydrometer test done on SS6.
								6	365				
			07	SS	100	7		7	364		22		Started NW washboreing at 6.1m
			08	SS	100	15		8	363		22		
								9	362				
			09	SS	100	12					24		
360.5								10	361				
10.5	**GRAVELLY SAND**		10	RC	75	0		11	360				
			11	RC	15	0							
	...Silty sand and gravel with boulders, grey, trace clay, well graded, dense to very dense, angular, wet [WS Till]		12	SS	50	74		12	359		9		
357.8			13	RC	69	0		13	358				
13.2	**BEDROCK** Felsic Tuff		14	RC	100	94		14	357				
			15	RC	97	78		15	356				

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RECORD OF BOREHOLE No. BH503

PROJECT	Rainy River Project - 2013/2014 Geotechnical Investigation			ENGINEER	MS
PROJECT NO.	TC133921	DRILLER	Marathon Drilling	BORING METHOD	200 mm HSA, NW/NQ Coring
LOGGED BY	AD				
CLIENT	New Gold Inc.	LOCATION	Plant Site - Crusher Pad/MSE Wall	COMPILED BY	JAC
ELEVATION	371.00 m	COORD.	N 5,410,189 E 426,830	BORING DATE	Start: 16 Oct 13 End: 17 Oct 13
CHECKED BY	DGR				

SAMPLE TYPES
AU Auger
BU Bulk
DC Dynamic Cone
RC Rock Core
SS Split Spoon
TW Thin Walled Open (Shelby)
WS Wash Sample

ABBREVIATIONS
P.P. Pocket Penetrometer
TV Torvane
PT Standard Proctor Test
P.L. Point Load Strength Index (I_{50})
RQD Rock Quality Designation
SCR Solid Core Recovery
k Permeability
C Consolidation
DS Direct Shear
GS Grain Size Analysis

ELEV / DEPTH (m)	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	RECOVERY (%)	SPT "N" VALUES or RQD	WELL / PIEZOMETER INSTALLATION	DEPTH (m)	ELEVATION (m)	DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100) / MTO VANE (□ INTACT ■ REMOULDED) / NILCON VANE (△ INTACT ▲ REMOULDED) / UNDRAINED SHEAR STRENGTH (kPa) (20 40 60 80 100)	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L / WATER CONTENT (%) (20 40 60)	PERMEABILITY (cm/s)	REMARKS
			16	RC	97	81		16	355				
354.0													
17.0	**END OF BOREHOLE** STANDPIPE INSTALLATION 2.5 cm PVC pipe, upright steel well protector, 0.81 m stick-up Screen: 8.2 to 9.8 m Riser: 0 to 8.2 m Sand: 3.8 to 5.6 m Bentonite: 3.5 to 3.8 m and 5.6 to 8.9 m Grout: 0 to 3.5 m WATER LEVELS (bgs) 2.6 m on 17-Oct-2013 (at completion) 2.9 m on 22-Oct-2013 4.0 m on 31-Mar-2014												

RECORD OF BOREHOLE No. BH505

PROJECT	Rainy River Project - 2013/2014 Geotechnical Investigation			ENGINEER	MS
PROJECT NO.	TC133921	DRILLER	Marathon Drilling	BORING METHOD	200 mm HSA, NW/NQ Coring
LOGGED BY	AD	CLIENT	New Gold Inc.	LOCATION	Plant Site - Crusher Pad/MSE Wall
COMPILED BY	JAC	ELEVATION	367.14 m	COORD.	N 5,410,284 E 426,745
BORING DATE	Start: 20 Oct 13 End: 21 Oct 13	CHECKED BY	DGR		

SAMPLE TYPES
AU Auger; BU Bulk; DC Dynamic Cone; RC Rock Core; SS Split Spoon; TW Thin Walled Open (Shelby); WS Wash Sample

ABBREVIATIONS
P.P. Pocket Penetrometer; TV Torvane; PT Standard Proctor Test; P.L. Point Load Strength Index (I_{50}); RQD Rock Quality Designation; SCR Solid Core Recovery; k Permeability; C Consolidation; DS Direct Shear; GS Grain Size Analysis

ELEV / DEPTH (m)	DESCRIPTION	NUMBER	TYPE	RECOVERY (%)	SPT "N" VALUES or RQD	DEPTH (m)	ELEVATION (m)	PLASTIC LIMIT / NATURAL MOISTURE CONTENT / LIQUID LIMIT (w_P / w / w_L)	PERMEABILITY (cm/s)	REMARKS
367.1	Ground surface									
367.0 / 0.1	**ORGANICS/TOPSOIL**									
	SILTY CLAY Brown to grey, trace sand, trace gravel, moist, low plasticity, soft to firm, trace organics [Upper Glaciolacustrine]	01	SS	75	3					
		02	SS	92	9	1	366			
365.2		03	SS	100	12					
1.9	**SILTY CLAY** Dark brown to dark grey, trace to some sand, trace gravel, damp to moist, high plasticity, firm to stiff [WML Till]	04	SS	100	14	2	365			
		05	SS	100	8	3	364			
	... soft below 3.8m	06	SS	100	4	4	363			
363.0 / 4.2	**SILTY CLAY** Grey, trace sand, trace gravel, moist, varved with light grey-green silt (1-5 mm thick) [Lower Glaciolacustrine]	07A	SS	70	13					
362.1 / 5.0		07B	SS			5	362			
5.2	**SAND AND GRAVEL** Grey, some silt, angular, some pyrite [WS Till]	08	RC	85	71					SPT refusal at 5.2m
	BEDROCK Intermediate tuff					6	361			
		09	RC	94	90	7	360			
358.2		10	RC	96	96	8	359			
8.9	**END OF BOREHOLE** STANDPIPE INSTALLATION 3.8 cm PVC pipe, upright steel well protector, 0.79 m stick-up Screen: 4.1 to 5.6 m Riser: 0 to 4.1 m Sand: 3.8 to 5.6 m Bentonite: 3.5 to 3.8 m and 5.6 to 8.9 m Grout: 0 to 3.5 m WATER LEVELS (bgs) 0.4 m above ground on 28-Oct-2013 0.6 m above ground on 31-Mar-2014									

DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100)
MTO VANE: □ INTACT ■ REMOULDED; NILCON VANE: △ INTACT ▲ REMOULDED
UNDRAINED SHEAR STRENGTH (kPa) 20 40 60 80 100
WATER CONTENT (%) 20 40 60

Plotted values: 32, 20, 18, 19, 33, 56, 33, 9

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RECORD OF BOREHOLE No. BH516

PROJECT	Rainy River Project - 2013/2014 Geotechnical Investigation			ENGINEER	MS
PROJECT NO.	TC133921	DRILLER	Marathon Drilling	BORING METHOD	200 mm HSA, NW/NQ Coring
LOGGED BY	AD				
CLIENT	New Gold Inc.	LOCATION	Plant Site - Crusher Pad/MSE Wall	COMPILED BY	JAC
ELEVATION	365.95 m	COORD.	N 5,410,187 E 426,721	BORING DATE	Start: 29 Oct 13 End: 30 Oct 13
CHECKED BY	DGR				

SAMPLE TYPES
AU Auger; BU Bulk; DC Dynamic Cone; RC Rock Core; SS Split Spoon; TW Thin Walled Open (Shelby); WS Wash Sample

ABBREVIATIONS
P.P. Pocket Penetrometer; TV Torvane; PT Standard Proctor Test; P.L. Point Load Strength Index (I_{50}); RQD Rock Quality Designation; SCR Solid Core Recovery; k Permeability; C Consolidation; DS Direct Shear; GS Grain Size Analysis

ELEV / DEPTH (m)	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	RECOVERY (%)	SPT "N" VALUES or RQD	WELL / PIEZOMETER INSTALLATION	DEPTH (m)	ELEVATION (m)	DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100) / MTO VANE (□ INTACT ■ REMOULDED) / NILCON VANE (△ INTACT ▲ REMOULDED) / UNDRAINED SHEAR STRENGTH (kPa) 20 40 60 80 100	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L WATER CONTENT (%) 20 40 60	PERMEABILITY (cm/s)	REMARKS
366.0	Ground surface												
365.8	**ORGANICS/TOPSOIL**												
0.2	**SILTY CLAY** Brown to grey, trace sand, damp, low to medium plasticity, firm [Upper Glaciolacustrine]		01	SS	88	5		1	365		19		
	... firm to stiff below 1.5 m		02	SS	38	16		2	364		20		
			03	SS	100	11		3	363		37		
			04	SS	100	12					18		
362.1								4	362				
3.8	**SILTY CLAY** Dark grey, trace sand, trace gravel, damp, high plasticity, firm to stiff [WML Till]		05	SS	100	11					24		
	... light grey silty seam, 8 cm thick at 4.6 m		06	SS	100	10		5	361		26		
			07	SS	100	10		6	360		30		
			08	SS	100	10		7	359		26		...sieve/hydrometer test done on SS8.
	... light grey silty fine sand seam, trace gravel, 100mm thick, at 9.4 m		09	SS	100	8		8	358		46		switched to NW washboring at 9.7m
355.3								9	357				artesian pressure at 10.4m
10.7	**SILTY CLAY** Dark grey, trace sand, becoming varved with grey-green silt at 10.8 m, 1 to 5 mm thick varves, moist, medium plasticity, firm to stiff [Lower Glaciolacustrine]		10	SS	100	15		10	356		35		
354.4			11	RC	167	44		11	355				switched to NQ coring at 11.6 m
11.6	**BEDROCK** Intermediate Tuff fractures at 35° and 25° (measured from vertical axis)		12	RC	85	85		12	354				
			13	RC	106	96		13	353				
			14	RC	97	94		14	352				
								15	351				

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RECORD OF BOREHOLE No. BH516

PROJECT	Rainy River Project - 2013/2014 Geotechnical Investigation			ENGINEER	MS
PROJECT NO.	TC133921	DRILLER	Marathon Drilling	BORING METHOD	200 mm HSA, NW/NQ Coring	LOGGED BY	AD
CLIENT	New Gold Inc.	LOCATION	Plant Site - Crusher Pad/MSE Wall			COMPILED BY	JAC
ELEVATION	365.95 m	COORD.	N 5,410,187 E 426,721	BORING DATE	Start: 29 Oct 13 End: 30 Oct 13	CHECKED BY	DGR

SAMPLE TYPES
AU Auger
BU Bulk
DC Dynamic Cone
RC Rock Core
SS Split Spoon
TW Thin Walled Open (Shelby)
WS Wash Sample

ABBREVIATIONS
P.P. Pocket Penetrometer
TV Torvane
PT Standard Proctor Test
P.L. Point Load Strength Index (I_{50})
RQD Rock Quality Designation
SCR Solid Core Recovery
k Permeability
C Consolidation
DS Direct Shear
GS Grain Size Analysis

ELEV / DEPTH (m)	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	RECOVERY (%)	SPT "N" VALUES or RQD	WELL / PIEZOMETER INSTALLATION	DEPTH (m)	ELEVATION (m)	DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100) / MTO VANE □ INTACT ■ REMOULDED / NILCON VANE △ INTACT ▲ REMOULDED / UNDRAINED SHEAR STRENGTH (kPa) 20 40 60 80 100	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L / WATER CONTENT (%) 20 40 60	PERMEABILITY (cm/s)	REMARKS
350.8													
15.2	**END OF BOREHOLE** STANDPIPE INSTALLATION 3.8 cm PVC pipe, steel upright well protector, 0.97 m stick-up Screen: 8.8 to 10.4 m Riser: 0 to 8.8 m Sand: 8.5 to 10.4 m Bentonite: 7.9 to 8.5 m and 10.4 to 15.2 m Grout: 0 to 7.9 m WATER LEVELS (bgs) 0.2 m above ground surface (artesian) on 30-Oct-2013 0.3m above ground surface on 31-Mar-2014												

RECORD OF BOREHOLE No. BH520

PROJECT	Rainy River Project - 2013/2014 Geotechnical Investigation					ENGINEER	MS
PROJECT NO.	TC133921	DRILLER	Marathon Drilling	BORING METHOD	200 mm HSA, NW/NQ Coring	LOGGED BY	AD
CLIENT	New Gold Inc.	LOCATION	Plant Site - Crusher			COMPILED BY	AD
ELEVATION	369.26 m	COORD.	N 5,410,161 E 426,778	BORING DATE	Start: 12 Nov 13 End: 13 Nov 13	CHECKED BY	DGR

SAMPLE TYPES
AU Auger; BU Bulk; DC Dynamic Cone; RC Rock Core; SS Split Spoon; TW Thin Walled Open (Shelby); WS Wash Sample

ABBREVIATIONS
P.P. Pocket Penetrometer; TV Torvane; PT Standard Proctor Test; P.L. Point Load Strength Index (I_{50}); RQD Rock Quality Designation; SCR Solid Core Recovery; k Permeability; C Consolidation; DS Direct Shear; GS Grain Size Analysis

ELEV / DEPTH (m)	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	RECOVERY (%)	SPT "N" VALUES or RQD	WELL / PIEZOMETER INSTALLATION	DEPTH (m)	ELEVATION (m)	DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100) / MTO VANE (□ INTACT ■ REMOULDED) / NILCON VANE (△ INTACT ▲ REMOULDED) / UNDRAINED SHEAR STRENGTH (kPa) (20 40 60 80 100)	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L — WATER CONTENT (%) (20 40 60)	PERMEABILITY (cm/s)	REMARKS
369.3	Ground surface												
369.2 / 0.1	**ORGANICS/TOPSOIL**												
	SILTY CLAY Brown to grey, trace sand, damp, low plasticity, soft to firm, occasional red oxidized staining [Upper Glaciolacustrine]		01	SS	75	7		1	369		23		
	...small pockets of white silt/sand, cemented, from 0.76m to 0.9m		02	SS	100	8		2	368		22		...sieve/hydrometer test done on SS2.
	...from 1.7m to 2.1m, laminations of grey clay with white cemented silt pockets, 5 to 10 mm thick		03	SS	100	7	▽	3	367		20		
			04	SS	100	9		4	366		19		
365.5 / 3.8	**SILTY CLAY** Dark grey, trace sand, trace gravel, moist, medium plasticity, firm to stiff [WML Till]		05	SS	100	10		5	365		18		...sieve/hydrometer test done on SS5.
	..becoming stiff, high plasticity		06	SS	100	8		6	364		19		
			07	SS	100	8		7	363		22		
			08	SS	100	20		8	362		20		
			09	SS	83	12		9	361		24		switched to NW washboring at 9.8 m
			10	SS	100	11		10	360		20		
			11	SS	71	11		11	359		21		
	...at 13.9m, 130 mm thick sand seam, trace gravel		12	SS	100	7		12	358		22		
								13	357				
								14	356				
								15	355				

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RECORD OF BOREHOLE No. BH520

PROJECT	Rainy River Project - 2013/2014 Geotechnical Investigation					ENGINEER	MS
PROJECT NO.	TC133921	DRILLER	Marathon Drilling	BORING METHOD	200 mm HSA, NW/NQ Coring	LOGGED BY	AD
CLIENT	New Gold Inc.	LOCATION	Plant Site - Crusher			COMPILED BY	AD
ELEVATION	369.26 m	COORD.	N 5,410,161 E 426,778	BORING DATE	Start: 12 Nov 13 End: 13 Nov 13	CHECKED BY	DGR

SAMPLE TYPES
AU Auger; BU Bulk; DC Dynamic Cone; RC Rock Core; SS Split Spoon; TW Thin Walled Open (Shelby); WS Wash Sample

ABBREVIATIONS
P.P. Pocket Penetrometer; TV Torvane; PT Standard Proctor Test; P.L. Point Load Strength Index (I_{50}); RQD Rock Quality Designation; SCR Solid Core Recovery; k Permeability; C Consolidation; DS Direct Shear; GS Grain Size Analysis

ELEV / DEPTH (m)	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	RECOVERY (%)	SPT "N" VALUES or RQD	WELL / PIEZOMETER INSTALLATION	DEPTH (m)	ELEVATION (m)	DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100) / MTO VANE (□ INTACT ■ REMOULDED) / NILCON VANE (△ INTACT ▲ REMOULDED) / UNDRAINED SHEAR STRENGTH (kPa) (20 40 60 80 100)	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L — WATER CONTENT (%) (20 40 60)	PERMEABILITY (cm/s)	REMARKS
354.0													
15.3	**SILTY CLAY** Dark grey, trace sand, moist, varved with greenish grey silt (1-3mm thick), medium to high plasticity, firm to stiff [Lower Glaciolacustrine]		13	SS	100	14		16	353		33		
352.4			14	SS	0	50/0.08		17	352				SPT refusal at 16.8m
16.8	**BOULDERS AND COBBLES** [Inferred WS Till]		15	RC	26	8		18	351				
349.9			16	RC	64	44		19	350				
19.4	**BEDROCK** Intermediate Flow, fractures at 30° and 40° (measured from vertical axis)		17	RC	100	67		20	349				
347.0			18	RC	98	88		21 22	348				
22.3	**END OF BOREHOLE** STANDPIPE INSTALLATION 2.5 cm PVC pipe, upright steel well protector, 0.86 m stick-up Screen: 17.4 to 18.9 m Riser: 0 to 17.4 m Sand: 15.5 to 18.9 m Bentonite: 15.2 to 15.5 m and 18.9 m to 22.3 m Grout: 0 to 15.2 m WATER LEVELS (bgs) 1.8m on 13-Nov-2013 (at completion) 2.7m on 31-Mar-2014												

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RECORD OF BOREHOLE No. BH532

PROJECT	Rainy River Project - 2013/2014 Geotechnical Investigation					ENGINEER	MS
PROJECT NO.	TC133921	DRILLER	Marathon Drilling	BORING METHOD	200 mm HSA, NW/NQ Coring	LOGGED BY	AD
CLIENT	New Gold Inc.	LOCATION	Plant Site - Truck Shop			COMPILED BY	AD
ELEVATION	369.45 m	COORD.	N 5,410,839 E 426,387	BORING DATE	Start: 15 Nov 13 End: 15 Nov 13	CHECKED BY	DGR

SAMPLE TYPES
AU Auger; BU Bulk; DC Dynamic Cone; RC Rock Core; SS Split Spoon; TW Thin Walled Open (Shelby); WS Wash Sample

ABBREVIATIONS
P.P. Pocket Penetrometer; TV Torvane; PT Standard Proctor Test; P.L. Point Load Strength Index (I_{50}); RQD Rock Quality Designation; SCR Solid Core Recovery; k Permeability; C Consolidation; DS Direct Shear; GS Grain Size Analysis

ELEV / DEPTH (m)	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	RECOVERY (%)	SPT "N" VALUES or RQD	WELL / PIEZOMETER INSTALLATION	DEPTH (m)	ELEVATION (m)	DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100) / MTO VANE: □ INTACT ■ REMOULDED / NILCON VANE: △ INTACT ▲ REMOULDED / UNDRAINED SHEAR STRENGTH (kPa) 20 40 60 80 100	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L — WATER CONTENT (%) 20 40 60	PERMEABILITY (cm/s)	REMARKS
369.5	Ground surface												
369.3 / 0.2	**ORGANICS/TOPSOIL**												
	CLAYEY SILT Light brown, some sand, damp, occasional pockets of grey silt and fine sand, non to low plasticity, soft to firm, trace organics [Upper Glaciolacustrine]		01	SS	100	7		1	369		19		
			02	SS	100	12		2	368		18		...sieve/hydrometer test done on SS2.
			03	SS	100	13		3	367		18		
	...below 3.1m, sandy silt, varved		04	SS	100	18					28		
365.9									366				
3.5 / 365.4	**BOULDERS AND COBBLES** [Inferred WS Till]		05	RC	42	0		4					SPT refusal at 3.5m
4.0	**BEDROCK** Mafic Flow, fractures at 50° and low angle (measured from vertical axis)		06	RC	98	85		5	365				
			07	RC	100	78		6	364				
362.3								7	363				
7.1	**END OF BOREHOLE** STANDPIPE INSTALLATION 3.8 cm PVC pipe, upright steel well protector, 0.84 m stick-up, Screen: 1.8 m to 3.3 m Riser: 0 to 1.8 m Sand: 1.5 to 3.3 m Bentonite: 1.2 to 1.5 m and 3.3 to 7.1 m Grout: 0 to 1.5 m WATER LEVELS (bgs) 2.8m on 17-Nov-2013 dry on 31-Mar-2014												

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RECORD OF BOREHOLE No. BH540

PROJECT	Rainy River Project - 2013/2014 Geotechnical Investigation					ENGINEER	MS
PROJECT NO.	TC133921	DRILLER	Marathon Drilling	BORING METHOD	200 mm HSA, NW/NQ Coring	LOGGED BY	ARM
CLIENT	New Gold Inc.	LOCATION	Coarse Ore Storage			COMPILED BY	AD
ELEVATION	371.07 m	COORD.	N 5,410,633 E 426,615	BORING DATE	Start: 8 Feb 14 End: 10 Feb 14	CHECKED BY	

SAMPLE TYPES
AU Auger; BU Bulk; DC Dynamic Cone; RC Rock Core; SS Split Spoon; TW Thin Walled Open (Shelby); WS Wash Sample

ABBREVIATIONS
P.P. Pocket Penetrometer; TV Torvane; PT Standard Proctor Test; P.L. Point Load Strength Index (I_{50}); RQD Rock Quality Designation; SCR Solid Core Recovery; k Permeability; C Consolidation; DS Direct Shear; GS Grain Size Analysis

ELEV / DEPTH (m)	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	RECOVERY (%)	SPT "N" VALUES or RQD	WELL / PIEZOMETER INSTALLATION	DEPTH (m)	ELEVATION (m)	DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100) / MTO VANE: □ INTACT ■ REMOULDED / NILCON VANE: △ INTACT ▲ REMOULDED / UNDRAINED SHEAR STRENGTH (kPa) (20 40 60 80 100)	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L — WATER CONTENT (%) (20 40 60)	PERMEABILITY (cm/s)	REMARKS
371.1	Ground surface												
0.0	**SILTY SANDY CLAY** Brown to grey, trace roots, moist		01	SS	21	8		1	370		33		Frozen ground to 0.6 m
369.6													
1.5	**CLAYEY SILT** Brown, some fine sand, trace gravel, moist to wet, occasional light grey silty laminations [Upper Glaciolacustrine]		02	SS	100	6		2	369		22		
			03	SS	100	7		3	368		15		sieve/hydrometer test done on SS03
	... below 3m, more clayey, orange streaks, mottled with grey		04	SS	100	10					18		
			05	SS	100	9	▽	4	367		21		sieve/hydrometer test done on SS05
			06	SS	100	13		5	366		18		
365.0								6	365				
6.1	**SILTY SAND** Brown, trace gravel, compact, wet		07	SS	42	17					19		sieve/hydrometer test done on SS07
363.8								7	364				
7.3	**BEDROCK**		08	RC	98	78		8	363				
			09	RC	100	85		9	362				
			10	RC	100	77		10	361				
359.9								11	360				
11.2	**END OF BOREHOLE** STANDPIPE INSTALLATION PVC pipe, flushmount well protector Screen: 5.8 to 7.3 m Riser: 0 to 5.8 m Sand: 5.3 to 7.3 m Bentonite: 7.3 to 11.2 m Grout/bentonite: 0 to 5.3 m WATER LEVELS (bgs) 4.0 m on 11-Feb-2014 4.5 m on 25-Mar-2014												

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APPENDIX D

HISTORICAL GROUNDWATER CHEMISTRY AND WATER LEVEL DATA

HISTORICAL GROUNDWATER QUALITY (2011 to 2013)- RAINY RIVER PROJECT

Station	Date Sampled	pH	Conductivity	TDS	Turbidity	Colour	Total Ammonia-N	Total Kjeldahl Nitrogen	Dissolved Chloride	Fluoride	Orthophosphate	Nitrate	Nitrite	Nitrate + Nitrite	Alkalinity	Acidity as CaCO3	Total Cyanide (CN)	WAD Cyanide	Total BOD	Total COD	TOC	D. Aluminum	T. Aluminum	D. Antimony	T. Antimony	D. Arsenic	T. Arsenic	D. Barium	T. Barium	D. Beryllium	T. Beryllium
NR-08-240	24-Oct-2011	8.10	845	456	174	<1.0	0.159	0.41	44.1	0.160	<0.0050	<0.030	<0.020	<0.030	386	8.2	<0.0020	<0.0020	<2.0	<3.0	3.1	<0.0010	0.169	<0.00020	<0.000030	0.000634	0.00428	0.0464	0.0745	<0.000060	<0.000040
NR-08-240	16-Jan-2012	7.56	834	424	135	2.3	0.400	0.424	56.6	0.128	<0.0050	<0.030	<0.020	<0.030	392	6.4	<0.0020	<0.0020	11.7	31.8	3.3	<0.030	2.82	<0.0010	<0.00010	<0.0010	0.00478	0.0495	0.155	<0.00060	<0.000060
NR-08-240	25-Apr-2012	7.83	766	407	168	<1.0	0.247	0.351	59.4	0.059	<0.0050	<0.030	<0.020	<0.030	312	9.6	<0.0020	<0.0020	9.8	40.3	6.1	<0.0030	0.0905	<0.00010	<0.00010	0.00018	0.00065	0.0434	0.0714	<0.000060	<0.000060
NR-08-240	10-Jul-2012	8.00	673	376	64.5	<1.0	0.196	0.424	60.1	<0.030	<0.0050	<0.030	<0.020	<0.030	268	7.2	<0.0020	<0.0020	15.6	36.5	16.8	<0.0050	0.0594	<0.00060	<0.00060	<0.0010	0.0015	0.180	0.154	<0.0010	<0.0010
NR-09-367	24-Oct-2011	8.12	788	436	37.3	<1.0	0.137	0.45	20.6	0.163	<0.0050	<0.030	<0.020	<0.030	396	7.2	<0.0020	<0.0020	<2.0	<3.0	3.0	<0.0010	0.0032	<0.00020	0.000086	0.00158	0.00312	0.0495	0.0587	<0.000060	<0.000040
NR-09-367	16-Jan-2012	7.62	707	358	165	3.0	0.137	0.640	20.9	0.202	<0.0050	<0.030	<0.020	<0.030	377	7.0	<0.0020	<0.0020	70.7	108	3.7	<0.030	0.148	<0.0010	0.00042	<0.0010	0.0315	0.0208	0.0798	<0.00060	<0.000060
NR-09-367	25-Apr-2012	7.52	741	422	37.3	<1.0	0.137	0.332	10.1	0.209	<0.0050	<0.030	<0.020	<0.030	370	15.4	<0.0020	<0.0020	<2.0	3.5	2.2	<0.0030	0.0237	<0.00010	<0.00010	0.00166	0.00359	0.0511	0.0583	<0.000060	<0.000060
NR-09-367	10-Jul-2012	7.67	703	410	143	<1.0	0.147	0.422	0.17	<0.030	<0.0050	<0.030	<0.020	<0.030	380	13.6	<0.0020	<0.0020	<2.0	4.4	2.9	<0.0050	0.0110	<0.00060	<0.00060	<0.0010	0.0032	0.038	0.056	<0.0010	<0.0010
NH-09-428	24-Oct-2011	8.20	713	385	166	<1.0	0.348	0.49	14.7	0.707	<0.0050	<0.030	<0.020	<0.030	386	7.0	<0.0020	<0.0020	7.3	19.1	5.8	<0.0010	0.571	<0.00020	0.000290	0.000819	0.00957	0.0129	0.0332	<0.000060	<0.000040
NR-09-428	25-Apr-2012	7.66	773	440	157	1.6	0.224	0.524	10.5	0.146	<0.0050	<0.030	<0.020	<0.030	387	15.6	<0.0020	<0.0020	<2.0	9.8	3.2	<0.0030	0.0533	<0.00010	0.00019	0.00232	0.0154	0.0252	0.0397	<0.000060	<0.000060
NR-09-428	10-Jul-2012	8.06	594	304	70.8	<1.0	0.227	0.466	14.9	<0.030	<0.0050	<0.030	<0.020	<0.030	305	6.2	<0.0020	<0.0020	11.6	20.0	7.7	<0.0050	0.0112	<0.00060	<0.00060	<0.0010	0.0028	<0.010	0.013	<0.0010	<0.0010
NH-10-12	25-Apr-2012	7.57	758	451	47.0	<1.0	0.241	0.437	2.19	0.162	<0.0050	<0.030	<0.020	<0.030	389	15.2	<0.0020	<0.0020	<2.0	<3.0	2.4	<0.0030	0.0139	<0.00010	<0.00010	0.00593	0.00888	0.0678	0.0765	<0.000060	<0.000060
RR-09-213A	24-Oct-2011	8.03	765	452	244	<1.0	0.210	0.42	7.86	0.081	<0.0050	<0.030	<0.020	<0.030	404	7.8	<0.0020	<0.0020	<2.0	<3.0	3.3	<0.0010	0.337	0.00187	0.00592	0.00287	0.00697	0.0502	0.0590	<0.000060	0.000054
RR-09-213A	25-Apr-2012	7.61	784	457	70.3	1.2	0.234	0.528	8.14	0.178	<0.0050	<0.030	<0.020	<0.030	398	15.6	<0.0020	<0.0020	<2.0	<3.0	2.8	<0.0030	0.638	0.00117	0.00407	0.00248	0.0126	0.0603	0.0656	<0.000060	0.000108
RR-09-213A	10-Jul-2012	7.72	761	442	57.0	2.5	0.230	0.947	7.03	0.117	0.0061	<0.030	<0.020	<0.030	399	16.0	<0.0020	<0.0020	<2.0	10.6	2.9	<0.0050	0.268	0.00123	0.00168	0.0045	0.0103	0.056	0.064	<0.0010	<0.0010
RR-09-214	24-Oct-2011	8.04	753	443	23.7	<1.0	0.190	0.45	5.16	0.085	<0.0050	<0.030	<0.020	<0.030	400	6.8	<0.0020	<0.0020	<2.0	<3.0	3.4	<0.0010	0.0206	<0.00020	0.000077	0.00267	0.00469	0.0735	0.0859	<0.000060	<0.000040
RR-09-214	25-Apr-2012	7.65	763	429	21.7	<1.0	0.196	0.488	5.54	0.136	<0.0050	<0.030	<0.020	<0.030	394	16.4	<0.0020	<0.0020	<2.0	<3.0	2.7	<0.0030	0.0156	<0.00010	<0.00010	0.00265	0.00427	0.0886	0.0922	<0.000060	<0.000060
BH-10-04	24-Oct-2011	8.21	771	446	19.1	<1.0	0.165	0.32	1.34	0.251	<0.0050	<0.030	<0.020	<0.030	417	4.4	<0.0020	<0.0020	<2.0	<3.0	2.8	0.0015	0.127	<0.00020	0.000129	0.0195	0.0244	0.0685	0.0727	<0.000060	<0.000040
BH-10-04	16-Jan-2012	7.50	729	436	12.0	<1.0	0.147	0.365	0.58	0.279	<0.0050	<0.030	<0.020	<0.030	406	6.6	<0.0020	<0.0020	<2.0	5.3	3.2	<0.030	0.0560	<0.0010	<0.00010	0.0188	0.0260	0.0713	0.0796	<0.00060	<0.000060
BH-10-04	25-Apr-2012	7.87	797	458	13.4	<1.0	0.189	0.338	0.56	0.254	0.0074	<0.030	<0.020	<0.030	414	15.4	<0.0020	<0.0020	<2.0	5.1	1.9	<0.0030	0.103	<0.00010	<0.00010	0.0222	0.0318	0.0740	0.0725	<0.000060	<0.000060
BH-10-04	10-Jul-2012	7.83	777	463	13.3	1.0	0.193	0.389	0.57	0.201	<0.0050	<0.030	<0.020	<0.030	416	16.0	<0.0020	<0.0020	<2.0	4.9	2.3	<0.0050	0.118	<0.00060	<0.00060	0.0200	0.0328	0.068	0.075	<0.0010	<0.0010
BH-10-05	24-Oct-2011	8.03	1020	630	1485	2.0	0.075	0.78	1.11	0.288	<0.0050	0.073	<0.020	0.073	465	6.4	<0.0020	<0.0020	<2.0	11.4	3.5	0.0032	17.9	0.00026	0.000329	0.00141	0.0136	0.0492	0.230	<0.000060	0.000986
BH-10-05	16-Jan-2012	7.62	981	692	983	2.5	<0.020	0.642	0.46	0.258	<0.0050	0.080	<0.020	0.080	489	15.2	<0.0020	<0.0020	<2.0	16.3	4.7	<0.030	6.04	<0.0010	0.00020	<0.0010	0.00498	0.0394	0.116	<0.00060	0.000356
BH-10-05	25-Apr-2012	7.49	1050	701	87.8	1.0	<0.020	0.367	0.25	0.226	<0.0050	<0.030	<0.020	<0.030	483	21.2	<0.0020	<0.0020	<2.0	7.1	2.4	<0.0030	1.81	0.00010	0.00012	0.00090	0.00179	0.0422	0.0723	<0.000060	0.000102
BH-10-05	10-Jul-2012	7.70	1030	718	426	3.9	0.044	0.523	0.35	0.125	<0.0050	0.043	<0.020	0.043	486	23.0	<0.0020	<0.0020	<2.0	9.0	3.1	<0.0050	4.74	<0.00060	<0.00060	<0.0010	0.0033	0.045	0.091	<0.0010	<0.0010
BH-10-05	06-Jun-2013	7.69	1000	713	605	<1.0	0.097	0.979	0.54	0.174	<0.0050	<0.030	<0.020	<0.030	463	34.2	<0.0020	<0.0020	2.5	7.9	3.8	<0.0050	14.8	<0.00060	<0.00060	<0.0010	0.0083	0.043	0.184	<0.0010	<0.0010
BH-10-05	22-Oct-2013	7.41	968	653	530	12.4	0.097	0.555	0.45	0.152	<0.0050	0.046	<0.020		499	20.0	<0.0020	<0.0020	<2.0	21.6		0.0016	5.64	0.00010	0.00036	0.00074	0.00465	0.0464	0.103	<0.00050	<0.00050
BH-10-7A	24-Oct-2011	8.01	581	320	16.3	<1.0	0.099	0.34	1.00	0.058	0.0124	<0.030	<0.020	<0.030	293	4.4	<0.0020	<0.0020	<2.0	3.9	2.2	<0.0010	0.654	<0.00020	0.000084	0.00619	0.0118	0.0569	0.0742	<0.000060	<0.000040
BH-10-7A	25-Apr-2012	7.63	570	337	15.6	1.1	0.118	0.372	0.53	0.121	<0.0050	<0.030	<0.020	<0.030	275	7.4	<0.0020	<0.0020	<2.0	7.9	1.7	<0.0030	1.49	<0.00010	<0.00010	0.00666	0.0155	0.0647	0.0754	<0.000060	<0.000060
BH-10-7A	10-Jul-2012	7.79	606	366	36.0	1.5	0.193	1.83	0.58	0.113	<0.0050	<0.030	<0.020	<0.030	300	12.0	<0.0020	<0.0020	<2.0	35.7	2.9	<0.0050	0.570	<0.00060	<0.00060	0.0103	0.0579	0.076	0.091	<0.0010	<0.0010
BH-10-7A	06-Jun-2013	7.83	561	503	12.5	1.4	0.146	0.286	0.55	0.122	<0.0050	<0.030	<0.020	<0.030	278	18.8	<0.0020	<0.0020	<2.0	5.1	2.4	<0.0050	0.0350	<0.00060	<0.00060	0.0088	0.0107	0.064	0.065	<0.0010	<0.0010
BH-10-7A	23-Oct-2013	7.41	550	361	51.8	<1.0	0.161	0.777	0.56	0.123	<0.0050	0.191	<0.020		295	12.0	<0.0020	<0.0020	2.5	24.4	3.9	0.0019	1.29	<0.00010	<0.00010	0.00190	0.0153	0.0577	0.0707	<0.00050	<0.00050
BH-10-11A	24-Oct-2011	7.86	686	402	>4000	<1.0	0.423	51.5	2.15	0.093	<0.0050	<0.030	<0.020	<0.030	447	5.0	<0.0020	<0.0020	12.8	20.5	3.4	0.0011	643	0.00028	0.000242	0.00349	0.180	0.116	9.55	<0.000060	0.00597
BH-10-11A	25-Apr-2012	7.86	732	488	>4000	2.6	0.202	1.08	1.78	0.170	<0.0050	<0.030	<0.020	<0.030	444	10.0	<0.0020	<0.0020	16.0	25.2	3.5	<0.0030	26.6	0.00016	0.00027	0.00478	0.0214	0.118	0.340	<0.000060	0.00115
BH-10-11A	10-Jul-2012	7.74	707	484	>4000	1.8	0.697	18.6	1.72	0.125	<0.0050	0.030	<0.020	0.030	392	8.8	<0.0020	<0.0020	7.6	107	<5.0	0.0052	61.8	<0.00060	<0.00060	0.0031	0.0377	0.126	0.868	<0.0010	0.0028
BH-10-12A	24-Oct-2011	8.08	767	424	27.8	<1.0	0.325	0.64	2.53	0.169	<0.0050	<0.030	<0.020	<0.030	412	6.2	<0.0020	<0.0020	<2.0	<3.0	2.7	<0.0010	0.0077	<0.00020	0.000103	0.00320	0.0191	0.0587	0.0819	<0.000060	<0.000040
BH-10-12A	10-Jul-2012	7.67	753	452	54.1	2.8	0.316	0.513	<0.10	<0.030	<0.0050	<0.030	<0.020	<0.030	393	14.4	<0.0020	<0.0020	2.0	<3.0	2.8	<0.0050	0.0390	<0.00060	<0.00060	0.0046	0.0113	0.069	0.079	<0.0010	<0.0010
BH-10-14	24-Oct-2011	8.13	795	457	32.4	<1.0	0.305	0.52	4.51	0.100	<0.0050	<0.030	<0.020	<0.030	434	9.8	<0.0020	<0.0020	<2.0	<3.0	2.8	0.0011	0.0057	<0.00020	<0.000030	0.00911	0.0150	0.0687	0.0789	<0.000060	<0.000040
BH-10-14	25-Apr-2012	7.77	836	471	32.7	<1.0	0.314	0.526	4.48	0.152	<0.0050	<0.030	<0.020	<0.030	414	16.2	<0.0020	<0.0020	<2.0	3.8	2.2	<0.0030	0.0113	<0.00010	<0.00010	0.0114	0.0187	0.0770	0.0853	<0.000060	<0.000060
BH-10-14	10-Jul-2012	7.86	782	470	32.0	2.0	0.309	0.524	3.83	0.136	<0.0050	<0.030	<0.020	<0.030	425	16.0	<0.0020	<0.0020	<2.0	7.3	2.8	<0.0050	0.0105	<0.00060	<0.00060	0.0104	0.0178	0.073	0.087	<0.0010	<0.0010
BH-10-20	24-Oct-2011	8.07	765	434	922	<1.0	0.224	0.38	7.68	0.182	<0.0050	<0.030	<0.020	<0.030	405	9.0	<0.0020	<0.0020	<2.0	<3.0	2.7	<0.0010	2.23	0.00290	0.00257	0.00253	0.00936	0.0531	0.0810	<0.000060	0.000454
BH-10-20	16-Jan-2012	7.58	826	516	150	<1.0	0.303	0.479	56.4	0.126	<0.0050	<0.030	<0.020	<0.030	388	9.0	<0.0020	<0.0020	16.8	60.6	4.4	<0.030	0.999	<0.0010	<0.00010	<0.0010	0.00456	0.0860	0.290	<0.00060	<0.000060
BH-10-20	10-Jul-2012	7.82	703	406	135	4.2	0.153	0.349	3.70	0.086	<0.0050	<0.030	<0.020	<0.030	379	16.0	<0.0020	<0.0020	<2.0	7.3	2.4	<0.0050	0.0104	<0.00060	<0.00060	<0.0010	0.0034	0.040	0.058	<0.0010	<0.0010
TRIP BLANK	24-Oct-2011	5.67	<3.0	<10	<0.10	<1.0	<0.020	<0.25	<0.10	<0.030	<0.0050	<0.030	<0.020	<0.030	<5.0	<2.0	<0.0020	<0.0020	<2.0	<3.0	<1.0	<0.0010	<0.0020	<0.00020	<0.000030	<0.000030	<0.000020	<0.000060	<0.00030	<0.000060	<0.000040
TRIP BLANK	16-Jan-2012	5.92	<3.0	<10	<0.10	<1.0	<0.020	<0.050	<0.10	<0.030	<0.0050	<0.030	<0.020	<0.030	<5.0	<2.0	<0.0020	<0.0020	<2.0	<3.0	<1.0	<0.0030	<0.0030	<0.00010	<0.00010	<0.00010	<0.00010	<0.00030	<0.00030	<0.000060	<0.000060
TRIP BLANK	25-Apr-2012	5.47	<3.0	<10	<0.10	<1.0	<0.020	<0.050	<0.10	<0.030	<0.0050	<0.030	<0.020	<0.030	<5.0	<2.0	<0.0020	<0.0020	<2.0	<3.0	<1.0	0.0038	0.0042	<0.00010	<0.00010	<0.00010	<0.00010	<0.00030	<0.00030	<0.000060	<0.000060
TRIP BLANK	10-Jul-2012	5.60	<3.0	<10	<0.10	<1.0	<0.020	<0.050	<0.10	<0.030	<0.0050	<0.030	<0.020	<0.030	<5.0	<2.0	<0.0020	<0.0020	<2.0	<3.0	<1.0	<0.0050		<0.00060	<0.00060	<0.0010	<0.0010	<0.010	<0.010	<0.0010	<0.0010
TRIP BLANK	01-Nov-2012	5.73	<3.0	<10	<0.10	<1.0	<0.020	<0.050	<0.10	<0.030	<0.0050	<0.030	<0.020	<0.030	<5.0	<2.0	<0.0020	<0.0020	<2.0	<3.0	<1.0	<0.0050	<0.0050	<0.00060	<0.00060	<0.0010	<0.0010	<0.010	<0.010	<0.0010	<0.0010
TRIP BLANK	06-Jun-2013	5.71	<3.0	<10	<0.10	<1.0	<0.020	<0.050	<0.10	<0.030	<0.0050	<0.030	<0.020	<0.030	<5.0	<2.0	<0.0020	<0.0020	<2.0	<3.0	<1.0	<0.0050	0.0082	<0.00060	<0.00060	<0.0010	<0.0010	<0.010	<0.010	<0.0010	<0.0010
TRIP BLANK	02-Apr-2014	5.81	<3.0	<10	<0.10	<2.0	<0.020	<0.050	<0.10	<0.030	<0.0030	<0.030	<0.020		<10	<1.0	<0.0020	<0.0020	<2.0	<10	<1.0	0.0104	<0.0050	<0.00060	<0.00060	<0.0010	<0.0010	<0.010	<0.010	<0.0010	<0.0010
BH11-44A	01-Nov-2012	7.82	673	394	406	2.7	0.307	0.864	4.15	0.284	<0.0050	<0.030	<0.020	<0.030	342	18.8	<0.0020	<0.0020	<2.0	14.3	3.8	<0.050	14.2	<0.00060	<0.00060	0.0061	0.0179	0.056	0.297	<0.010	<0.0010
BH11-44A	06-Jun-2013	7.76	654	432	7.49	2.8	0.028	0.489	4.09	0.274	<0.0050	<0.030	<0.020	<0.030	351	30.0	<0.0020	<0.0020	<2.0	7.3	3.5	<0.0050	0.149	<0.00060	<0.00060	0.0076	0.0124	0.059	0.062	<0.0010	<0.0010
BH11-44A	23-Oct-2013	7.30	633	394	17.4	<1.0	0.252	0.416	3.94	0.265	<0.0050	<0.030	<0.020		369	21.0	<0.0020	<0.0020	<2.0	9.2	4.2	0.401	0.0918	<0.00010	<0.00010	0.0126	0.0114	0.0626	0.0590	<0.00050	<0.00050
BH11-41	01-Nov-2012	7.74	737	407	1890	3.1	0.327	0.763	2.03	0.177	<0.0050	<0.030	<0.020	<0.030	390	19.6	<0.0020	<0.0020	<2.0	8.8	3.1	<0.050	17.7	0.00116	0.00216	0.0077	0.0233	0.053	0.176	<0.010	<0.0010
BH11-13A	01-Nov-2012	7.94	726	452	39.1	2.6	0.205	0.343	1.80	0.098	<0.0050	<0.030	<0.020	<0.030	348	16.6	<0.0020	<0.0020	<2.5	6.0	3.1	<0.050	0.277	<0.00060	<0.00060	0.0031	0.0061	0.061	0.071	<0.010	<0.0010
BH11-51A	01-Nov-2012	7.91	906	531	>4000	2.6	0.516	2.62	1.02	0.091	<0.0050	<0.030	<0.020	<0.030	469	13.6	<0.0020	<0.0020	<2.0	87.9	4.2	<0.050	108	<0.0060	<0.0060	<0.010	0.0364	<0.10	0.652	<0.010	0.0016
BH11-51A	06-Jun-2013	7.85	864	573	40.7	<1.0	0.448	1.01	0.83	0.121	<0.0050	<0.030	<0.020	<0.030	462	25.2	<0.0020	<0.0020	<2.0	7.3	3.4	<0.0050	4.80	<0.00060	<0.00060	0.0057	0.0096	0.058	0.083	<0.0010	<0.0010
BH11-51A	21-Oct-2013	7.97	850	507	47.9	8.4	0.447	0.605	0.79	0.116	<0.0050	<0.030	<0.020		488	36.0	<0.0020	<0.0020	<2.0	9.1	3.1	<0.0010	0.444	<0.00010	<0.00010	0.00534	0.00887	0.0583	0.0658	<0.00050	<0.00050
BH12-20	01-Nov-2012	8.21	500	328	>4000	3.5	0.762	11.8	0.84	0.120	<0.0050	<0.030	<0.020	<0.030	261	4.6	<0.0020	<0.0020	4.1	82.3	7.3	0.0078	152	<0.00060	<0.00060	<0.0010	0.0151	0.051	0.560	<0.0010	0.0022
BH11-01B	06-Jun-2013	7.87	969	718	>4000	3.9	0.658	7.86	2.31	0.160	<0.0050	<0.030	<0.020	<0.030	357	14.4	<0.020	<0.020	9.4	8.0	7.7	<0.0050	304	0.00154	<0.0060	0.0183	0.235	0.033	4.14	<0.0010	0.017
BH11-01B	22-Oct-2013	7.87	898	650	>4000	5.1	0.788	16.7	2.22	0.125	0.0058	0.033	<0.020		345	14.0	<0.020	<0.020	11.0	473		<0.0010	206	0.00182	<0.0010	0.00356	0.154	0.0264	3.83	<0.00050	0.0217
BH11-44B	06-Jun-2013	7.98	876	577	>4000	4.8	0.541	30.9	4.50	0.307	<0.0050	<0.030	<0.020	<0.030	458	21.0	<0.020	<0.020	13.9	13.5	5.9	<0.0050	588	<0.00060	<0.0060	0.0095	0.165	0.140	6.61	<0.0010	0.019
BH11-44B	23-Oct-2013	7.42	793	522	>4000	3.8	0.411	3.63	3.71	0.187	0.0079	0.063	<0.020		431	20.0	<0.0020	<0.0020	2.8	109		0.0096	53.5	<0.00010	<0.00050	0.00450	0.0231	0.135	0.781	<0.00050	<0.0025
BH11-49A	06-Jun-2013	7.72	1690	1240	>4000	5.2	0.789	44.9	98.7	0.142	<0.0050	2.64	<0.020	2.64	519	159	<0.020	<0.020	18.8	16.4	4.9	<0.0050	678	0.00088	<0.0060	0.0052	0.232	0.023	8.22	<0.0010	0.030
BH11-49A	22-Oct-2013	7.98	621	378	1610	15.6	0.280	0.667	1.01	0.111	<0.0050	<0.030	<0.020		341	12.0	<0.0020	<0.0020	<2.0	24.3		0.0022	32.1	<0.00010	<0.00050	0.00085	0.00603	0.0477	0.139	<0.00050	<0.0025
BH11-49B	06-Jun-2013	7.97	584	394	12.5	15.8	0.164	0.791	6.50	0.158	<0.0050	1.66	0.157	1.82	262	9.0	<0.0020	<0.0020	<2.0	18.7	6.2	0.104	0.629	0.00064	0.00065	<0.0010	<0.0010	0.065	0.073	<0.0010	<0.0010
BH11-49B	22-Oct-2013	7.52	1510	1180	>4000	35.2	0.893	53.6	44.6	0.123	<0.0050	0.257	0.031		349	28.0	<0.020	<0.020	24.9	584	830	0.0077	301	0.00096	<0.00050	0.00088	0.119	0.0183	5.10	<0.0025	0.0257
BH11-51B	06-Jun-2013	7.83	1200	915	>4000	7.2	0.560	22.0	2.65	0.163	<0.0050	<0.030	<0.020	<0.030	407	20.6	<0.020	<0.020	14.1	6.0	7.0	<0.0050	362	0.00111	<0.0060	0.0125	0.222	0.038	4.40	<0.0010	0.015
BH11-51B	22-Oct-2013	7.89	1200	874	>4000	8.4	0.795	30.8	2.75	0.123	<0.0050	<0.030	<0.020		393	17.0	<0.020	<0.020	12.4	586	353	<0.0010	271	0.00086	<0.00050	0.00552	0.161	0.0379	4.27	<0.00050	0.0159
BH12-08	06-Jun-2013	7.73	806	543	>4000	<1.0	0.173	3.26	2.34	0.174	<0.0050	<0.030	<0.020	<0.030	404	31.8	<0.0020	<0.0020	<2.0	13.7	<5.0	<0.0050	131	<0.00060	<0.00060	0.0019	0.0366	0.065	0.602	<0.0010	0.0014
BH12-08	23-Oct-2013	7.29	775	503	2560	<1.0	0.352	1.16	2.21	0.179	<0.0050	<0.030	<0.020		411	20.0	<0.0020	<0.0020	<2.0	42.3		0.0058	54.2	<0.00010	<0.00050	0.00362	0.0187	0.0593	0.382	<0.00050	<0.0025
BH11-01A	22-Oct-2013	7.74	432	283	22.2	17.4	0.437	0.672	0.54	0.118	0.0133	<0.030	<0.020		254	8.0	<0.0020	<0.0020	<2.0	21.6	5.3	0.0052	6.66	<0.00010	<0.00010	0.0131	0.0167	0.0576	0.100	<0.00050	<0.00050
P16	22-Oct-2013	7.86	703	437	0.32	5.9	0.145	0.320	12.0	0.241	<0.0050	0.137	<0.020		332	10.0	<0.0020	<0.0020	<2.0	12.6	4.3	<0.0010	0.0054	0.00021	0.00021	<0.00010	0.00012	0.0112	0.0117	<0.00050	<0.00050
3880	21-Oct-2013	7.49	890	525	7.40	4.6	0.058	0.300	11.1	0.206	<0.0050	0.064	<0.020		536	49.0	<0.0020	<0.0020	<2.0	10.5	5.6	<0.0010	0.0040	<0.00010	<0.00010	0.00080	0.00257	0.0914	0.0906	<0.00050	<0.00050
3221	21-Oct-2013	7.78	977	582	2.76	5.5	0.265	0.365	5.90	0.113	<0.0050	<0.030	<0.020		540	51.0	<0.0020	<0.0020	<2.0	<3.0	3.6	<0.0010	<0.0030	<0.00010	<0.00010	0.00043	0.00063	0.0237	0.0249	<0.00050	<0.00050
3226	21-Oct-2013	7.70	905	526	18.5	5.7	0.183	0.332	1.32	0.114	<0.0050	<0.030	<0.020		541	50.0	<0.0020	<0.0020	<2.0	3.8	3.2	<0.0010	<0.0030	<0.00010	<0.00010	0.00180	0.00252	0.0563	0.0597	<0.00050	<0.00050
3443-1	23-Oct-2014	7.48	776	479	21.9	1.1	0.206	0.424	22.5	0.145	<0.0050	<0.030	<0.020		406	17.0	<0.0020	<0.0020	<2.0	6.4	5.1	0.0027	0.0056	<0.00010	<0.00010	0.00405	0.00371	0.0481	0.0494	<0.00050	<0.00050

HISTORICAL GROUNDWATER QUALITY (2011 to 2013)- RAINY RIVER PROJECT

Station	Date Sampled	D. Bismuth	T. Bismuth	D. Boron	T. Boron	D. Cadmium	T. Cadmium	D. Calcium	T. Calcium	D. Chromium	T. Chromium	D. Cobalt	T. Cobalt	D. Copper	T. Copper	D. Iron	T. Iron	D. Lead	T. Lead	D. Lithium	T. Lithium	D. Magnesium	T. Magnesium	D. Manganese	T. Manganese	D. Molybdenum	T. Molybdenum	D. Nickel	T. Nickel
NR-08-240	24-Oct-2011	<0.00010	<0.000020	0.115	0.116	<0.000030	0.0000277	100	98.3	<0.00020	<0.00090	<0.000030	<0.000020	<0.00040	<0.00070	0.0275	14.9	<0.00010	0.000118	0.0223	0.0256	33.5	39.1	0.158	0.218	0.00799	0.00949	0.00115	<0.0010
NR-08-240	16-Jan-2012	<0.0020	<0.00020	0.145	0.129	<0.00010	0.000024	94.9	98.8	<0.0050	0.0267	<0.00050	0.000330	<0.0070	0.00403	0.55	41.2	<0.0010	0.00581	0.023	0.0239	38.0	36.1	0.214	0.258	0.0144	0.0122	<0.010	<0.0010
NR-08-240	25-Apr-2012	<0.00020	<0.00020	0.115	0.128	0.000014	0.000016	70.5	73.7	<0.00050	0.00169	<0.000050	<0.000050	<0.00070	0.00076	<0.010	14.1	<0.00010	0.00196	0.0228	0.0248	39.5	42.1	0.250	0.272	0.0156	0.0160	<0.0010	<0.0010
NR-08-240	10-Jul-2012	<0.0010	<0.0010	0.123	0.122	<0.000017	0.000019	51.8	55.6	<0.0010	0.0036	<0.00050	<0.00050	<0.0010	<0.0010	<0.020	8.80	<0.0010	0.0013	<0.050	<0.050	39.7	39.7	0.152	0.209	0.0333	0.0263	<0.0020	<0.0020
NR-09-367	24-Oct-2011	<0.00010	<0.000020	0.0757	0.0787	<0.000030	0.0000114	96.0	91.1	<0.00020	<0.00090	<0.000030	<0.000020	<0.00040	0.00326	0.0329	3.25	<0.00010	<0.000060	0.0340	0.0367	39.7	42.7	0.122	0.153	0.00348	0.00378	0.00165	<0.0010
NR-09-367	16-Jan-2012	<0.0020	<0.00020	0.059	0.0750	0.00019	0.000161	76.9	91.5	<0.0050	0.851	0.00158	0.00349	<0.0070	0.0632	0.91	59.0	<0.0010	0.0305	0.026	0.0341	35.6	41.1	0.191	0.339	0.0684	0.437	<0.010	0.0155
NR-09-367	25-Apr-2012	<0.00020	<0.00020	0.0642	0.0691	0.000012	0.000027	92.9	92.3	0.00052	0.0352	<0.000050	<0.000050	<0.00070	0.00119	<0.010	3.88	<0.00010	0.00042	0.0349	0.0379	45.1	44.0	0.147	0.147	0.00378	0.00690	<0.0010	0.0011
NR-09-367	10-Jul-2012	<0.0010	<0.0010	0.059	0.061	<0.000017	0.000022	90.1	90.3	<0.0010	<0.0010	<0.00050	<0.00050	<0.0010	<0.0010	<0.020	11.3	<0.0010	<0.0010	<0.050	<0.050	43.9	43.3	0.195	0.207	0.0046	0.0046	<0.0020	<0.0020
NH-09-428	24-Oct-2011	<0.00010	<0.000020	0.130	0.134	<0.000030	<0.0000090	67.4	86.9	<0.00020	0.0181	<0.000030	0.000596	<0.00040	0.00370	0.0306	31.8	<0.00010	0.00408	0.0267	0.0281	32.7	39.0	0.171	0.295	0.00718	0.0110	0.00117	0.0022
NR-09-428	25-Apr-2012	<0.00020	<0.00020	0.103	0.115	0.000010	0.000231	100	103	0.00050	0.0162	<0.000050	0.000074	<0.00070	0.00864	0.054	19.3	<0.00010	0.00527	0.0291	0.0329	40.1	41.9	0.301	0.337	0.00290	0.00650	<0.0010	0.0025
NR-09-428	10-Jul-2012	<0.0010	<0.0010	0.126	0.125	0.000021	0.000094	49.3	36.9	<0.0010	<0.0010	<0.00050	<0.00050	<0.0010	<0.0010	<0.020	10.5	<0.0010	<0.0010	<0.050	<0.050	37.6	35.9	0.128	0.157	0.0659	0.159	<0.0020	<0.0020
NH-10-12	25-Apr-2012	<0.00020	<0.00020	0.0657	0.0706	<0.000010	0.000012	98.4	103	0.00062	<0.00050	<0.000050	<0.000050	<0.00070	<0.00070	0.533	4.18	<0.00010	<0.00010	0.0358	0.0403	44.4	45.6	0.180	0.183	0.00272	0.00271	<0.0010	<0.0010
RR-09-213A	24-Oct-2011	<0.00010	<0.000020	0.0785	0.0751	<0.000030	0.000407	91.6	95.3	<0.00020	<0.00090	0.000727	0.000852	<0.00040	0.00139	0.0309	2.62	0.00060	0.0404	0.0299	0.0327	37.2	42.6	0.175	0.272	0.00291	0.00316	0.00193	0.0010
RR-09-213A	25-Apr-2012	<0.00020	<0.00020	0.0768	0.0801	0.000024	0.000800	99.1	97.3	<0.00050	0.00156	0.000575	0.000881	<0.00070	0.00374	<0.010	4.08	0.00016	0.0645	0.0370	0.0384	44.9	44.7	0.251	0.332	0.00290	0.00299	0.0013	0.0023
RR-09-213A	10-Jul-2012	<0.0010	<0.0010	0.079	0.080	<0.000017	0.000550	99.9	104	<0.0010	<0.0010	0.00055	0.00082	<0.0010	<0.0010	<0.020	3.65	<0.0010	0.0489	<0.050	<0.050	46.2	46.2	0.202	0.444	0.0029	0.0028	<0.0020	<0.0020
RR-09-214	24-Oct-2011	<0.00010	<0.000020	0.0701	0.0704	<0.000030	0.0000195	91.5	87.7	<0.00020	<0.00090	0.00800	0.00858	<0.00040	<0.00070	0.0298	2.76	<0.00010	0.000283	0.0330	0.0348	36.5	41.5	0.143	0.177	0.00535	0.00588	0.00169	<0.0010
RR-09-214	25-Apr-2012	<0.00020	<0.00020	0.0678	0.0782	0.000018	0.000026	95.6	94.4	<0.00050	<0.00050	0.00689	0.00667	<0.00070	<0.00070	<0.010	2.57	<0.00010	0.00052	0.0365	0.0391	40.7	43.0	0.188	0.185	0.00532	0.00561	0.0021	0.0025
BH-10-04	24-Oct-2011	<0.00010	<0.000020	0.175	0.173	<0.000030	0.0000266	64.3	79.1	<0.00020	<0.00090	0.000670	0.000773	0.00050	<0.00070	0.0278	0.784	<0.00010	0.000315	0.0727	0.0810	46.5	48.7	0.103	0.129	0.00596	0.00617	0.00181	0.0012
BH-10-04	16-Jan-2012	<0.0020	<0.00020	0.186	0.176	<0.00010	0.000033	72.5	73.6	<0.0050	0.00079	0.00075	0.000767	<0.0070	<0.00070	<0.10	0.677	<0.0010	0.00044	0.076	0.0812	52.1	48.3	0.0967	0.104	0.0058	0.00581	<0.010	0.0011
BH-10-04	25-Apr-2012	<0.00020	<0.00020	0.176	0.192	0.000018	0.000025	81.9	80.3	<0.00050	<0.00050	0.000723	0.000808	<0.00070	0.00091	<0.010	0.761	<0.00010	0.00020	0.0803	0.0852	53.0	54.5	0.114	0.117	0.00538	0.00522	0.0012	0.0020
BH-10-04	10-Jul-2012	<0.0010	<0.0010	0.193	0.196	0.000020	0.000035	78.4	87.8	<0.0010	<0.0010	0.00072	0.00087	<0.0010	<0.0010	<0.020	0.822	<0.0010	<0.0010	0.079	0.076	52.8	57.2	0.103	0.116	0.0053	0.0055	<0.0020	<0.0020
BH-10-05	24-Oct-2011	<0.00010	0.000235	0.187	0.239	0.000036	0.000391	119	204	<0.00020	0.0497	0.000946	0.0137	0.00072	0.0322	0.0377	30.1	<0.00010	0.0143	0.107	0.156	68.2	93.4	0.152	0.891	0.00639	0.00695	0.00378	0.0356
BH-10-05	16-Jan-2012	<0.0020	<0.00020	0.164	0.145	<0.00010	0.000193	113	145	<0.0050	0.0162	<0.00050	0.00506	<0.0070	0.0120	<0.10	8.89	<0.0010	0.00531	0.095	0.0998	73.3	79.7	0.0267	0.319	0.0070	0.00518	<0.010	0.0148
BH-10-05	25-Apr-2012	<0.00020	<0.00020	0.106	0.0814	0.000026	0.000065	121	132	0.00051	0.00433	<0.000050	0.00169	0.00193	0.00533	<0.010	2.48	<0.00010	0.00166	0.0872	0.0886	79.8	85.9	0.0578	0.160	0.00394	0.00360	0.0028	0.0062
BH-10-05	10-Jul-2012	<0.0010	<0.0010	0.131	0.166	0.000033	0.000147	118	144	<0.0010	0.0102	<0.00050	0.00395	<0.0010	0.0077	<0.020	5.77	<0.0010	0.0034	0.090	0.097	78.0	90.2	0.0439	0.322	0.0040	0.0043	<0.0020	0.0109
BH-10-05	06-Jun-2013	<0.0010	<0.0010	0.171	0.187	0.000205	0.000785	127	213	<0.0010	0.0325	<0.00050	0.0137	<0.0010	0.0229	<0.020	17.3	<0.0010	0.0110	0.095	0.120	74.2	105	0.0995	1.06	0.0041	0.0056	<0.0020	0.0288
BH-10-05	22-Oct-2013	<0.000050	0.000093	0.146	0.143	0.000157	0.000543	114	142	<0.00010	0.0140	<0.00010	0.00493	0.00042	0.0084	<0.010	7.99	<0.000050	0.00515	0.0844	0.0903	65.9	76.1	0.0363	0.391	0.00429	0.00475	0.00176	0.0126
BH-10-7A	24-Oct-2011	<0.00010	<0.000020	0.0493	0.0502	<0.000030	0.0000145	64.9	82.4	<0.00020	0.00148	0.000052	0.000521	<0.00040	0.00121	0.0255	2.52	<0.00010	0.000309	0.0310	0.0330	24.2	25.7	0.209	0.274	0.00157	0.00174	0.00086	0.0012
BH-10-7A	25-Apr-2012	<0.00020	<0.00020	0.0495	0.0507	<0.000010	0.000027	80.1	76.3	<0.00050	0.00426	<0.000050	0.00125	<0.00070	0.00360	<0.010	3.87	<0.00010	0.00100	0.0327	0.0343	27.1	25.5	0.263	0.289	0.00175	0.00168	<0.0010	0.0035
BH-10-7A	10-Jul-2012	<0.0010	<0.0010	0.103	0.106	<0.000017	0.000045	82.8	83.8	<0.0010	0.0014	<0.00050	0.00081	<0.0010	0.0020	<0.020	4.32	<0.0010	<0.0010	<0.050	<0.050	27.7	28.2	0.315	0.446	0.0026	0.0024	<0.0020	<0.0020
BH-10-7A	06-Jun-2013	<0.0010	<0.0010	0.064	0.065	<0.000017	<0.000017	83.9	79.4	<0.0010	<0.0010	<0.00050	<0.00050	<0.0010	<0.0010	<0.020	0.925	<0.0010	<0.0010	<0.050	<0.050	26.1	24.1	0.250	0.241	0.0019	0.0020	<0.0020	<0.0020
BH-10-7A	23-Oct-2013	<0.000050	<0.000050	0.059	0.052	<0.000010	0.000018	73.9	77.1	<0.00010	0.00400	<0.00010	0.00128	<0.00010	0.0021	<0.010	3.32	<0.000050	0.000571	0.0351	0.0355	22.8	23.7	0.154	0.300	0.00199	0.00191	0.00028	0.00302
BH-10-11A	24-Oct-2011	<0.00010	0.00668	0.0652	0.107	<0.000030	0.0182	96.5	3290	<0.00020	0.519	0.000135	0.187	<0.00040	2.38	0.0403	280	<0.00010	0.648	0.0325	0.318	34.2	1120	0.135	9.47	0.00467	0.0253	0.00154	2.33
BH-10-11A	25-Apr-2012	<0.00020	0.00052	0.0603	0.0971	0.000017	0.000600	97.4	193	0.00050	0.0692	0.000113	0.0220	<0.00070	0.0674	<0.010	43.1	<0.00010	0.0193	0.0339	0.0793	40.4	77.8	0.206	1.31	0.00413	0.00492	0.0012	0.0650
BH-10-11A	10-Jul-2012	<0.0010	0.0014	0.058	0.119	<0.000017	0.00139	96.8	697	<0.0010	0.154	<0.00050	0.0499	<0.0010	0.162	<0.020	96.2	<0.0010	0.0470	<0.050	0.122	40.5	138	0.156	4.40	0.0042	0.0057	<0.0020	0.160
BH-10-12A	24-Oct-2011	<0.00010	0.000022	0.0784	0.0885	<0.000030	0.0000144	85.4	94.4	<0.00020	<0.00090	<0.000030	<0.000020	<0.00040	<0.00070	<0.0050	5.03	<0.00010	0.000187	0.0412	0.0489	35.6	39.7	0.154	0.212	0.00325	0.00389	0.00101	<0.0010
BH-10-12A	10-Jul-2012	<0.0010	<0.0010	0.086	0.084	<0.000017	0.000017	92.9	95.8	<0.0010	<0.0010	<0.00050	<0.00050	<0.0010	<0.0010	<0.020	4.23	<0.0010	<0.0010	<0.050	<0.050	41.2	41.2	0.206	0.216	0.0028	0.0029	<0.0020	<0.0020
BH-10-14	24-Oct-2011	<0.00010	<0.000020	0.103	0.103	<0.000030	0.0000114	96.4	97.7	<0.00020	<0.00090	<0.000030	<0.000020	0.00066	<0.00070	0.0230	2.41	<0.00010	<0.000060	0.0331	0.0343	37.3	41.0	0.158	0.189	0.00365	0.00402	0.00109	<0.0010
BH-10-14	25-Apr-2012	<0.00020	<0.00020	0.0982	0.118	0.000013	0.000015	108	104	<0.00050	<0.00050	<0.000050	<0.000050	<0.00070	<0.00070	<0.010	2.73	<0.00010	<0.00010	0.0348	0.0406	39.4	45.0	0.202	0.208	0.00379	0.00400	<0.0010	0.0012
BH-10-14	10-Jul-2012	<0.0010	<0.0010	0.110	0.110	<0.000017	0.000023	94.9	108	<0.0010	<0.0010	<0.00050	<0.00050	<0.0010	<0.0010	<0.020	2.77	<0.0010	<0.0010	<0.050	<0.050	40.5	43.7	0.179	0.207	0.0037	0.0039	<0.0020	<0.0020
BH-10-20	24-Oct-2011	<0.00010	0.000063	0.0809	0.0811	<0.000030	0.00102	94.0	107	<0.00020	0.00187	0.000829	0.00200	0.00052	0.00412	0.0274	5.32	0.00031	0.0695	0.0327	0.0365	39.2	42.8	0.182	0.739	0.00289	0.00280	0.00167	0.0028
BH-10-20	16-Jan-2012	<0.0020	<0.00020	0.137	0.130	<0.00010	0.000021	94.9	100	<0.0050	0.0564	<0.00050	0.000733	<0.0070	0.00381	2.21	43.1	<0.0010	0.00540	0.019	0.0227	37.6	35.5	0.228	0.272	0.0179	0.0198	<0.010	0.0021
BH-10-20	10-Jul-2012	<0.0010	<0.0010	0.063	0.062	<0.000017	0.000023	92.7	93.5	<0.0010	<0.0010	<0.00050	<0.00050	<0.0010	<0.0010	0.257	11.5	<0.0010	<0.0010	<0.050	<0.050	43.2	44.1	0.190	0.213	0.0044	0.0049	<0.0020	<0.0020
TRIP BLANK	24-Oct-2011	<0.00010	<0.000020	<0.0010	<0.00090	<0.000030	<0.0000090	<0.020	<0.020	<0.00020	<0.00090	<0.000030	<0.000020	<0.00040	<0.00070	<0.0050	<0.0060	<0.00010	<0.000060	<0.00090	<0.00050	<0.0010	<0.00050	<0.00010	<0.00010	<0.000090	<0.000090	<0.00020	<0.0010
TRIP BLANK	16-Jan-2012	<0.00020	<0.00020	<0.0020	<0.0020	<0.000010	<0.000010	<0.10	<0.10	<0.00050	<0.00050	<0.000050	<0.000050	<0.00070	<0.00070	<0.010	<0.010	<0.00010	<0.00010	<0.0010	<0.0010	<0.010	<0.010	<0.00050	<0.00050	<0.00020	<0.00020	<0.0010	<0.0010
TRIP BLANK	25-Apr-2012	<0.00020	<0.00020	<0.0020	<0.0020	<0.000010	<0.000010	<0.10	<0.10	<0.00050	<0.00050	<0.000050	<0.000050	<0.00070	<0.00070	<0.010	<0.010	<0.00010	<0.00010	<0.0010	<0.0010	<0.020	<0.020	<0.00050	<0.00050	<0.00020	<0.00020	<0.0010	<0.0010
TRIP BLANK	10-Jul-2012	<0.0010	<0.0010	<0.050	<0.050	<0.000017	<0.000017	<0.20	<0.20	<0.0010	<0.0010	<0.00050	<0.00050	<0.0010	<0.0010	<0.020	<0.020	<0.0010	<0.0010	<0.050	<0.050	<0.020	<0.020	<0.0010	<0.0010	<0.0010	<0.0010	<0.0020	<0.0020
TRIP BLANK	01-Nov-2012	<0.0010	<0.0010	<0.050	<0.050	<0.000017	<0.000017	<0.20	<0.20	<0.0010	<0.0010	<0.00050	<0.00050	<0.0010	<0.0010	<0.020	<0.020	<0.0010	<0.0010	<0.050	<0.050	<0.020	<0.020	<0.0010	<0.0010	<0.0010	<0.0010	<0.0020	<0.0020
TRIP BLANK	06-Jun-2013	<0.0010	<0.0010	<0.050	<0.050	<0.000017	<0.000017	<0.20	<0.20	<0.0010	<0.0010	<0.00050	<0.00050	<0.0010	<0.0010	<0.020	<0.020	<0.0010	<0.0010	<0.050	<0.050	<0.020	<0.020	<0.0010	<0.0010	<0.0010	<0.0010	<0.0020	<0.0020
TRIP BLANK	02-Apr-2014	<0.0010	<0.0010	<0.050	<0.050	<0.000017	<0.000017	<0.20	<0.20	<0.0010	<0.0010	<0.00050	<0.00050	0.0052	<0.0010	<0.020	<0.020	<0.0010	<0.0010	<0.050	<0.050	<0.020	<0.020	<0.0010	<0.0010	<0.0010	<0.0010	<0.0020	<0.0020
BH11-44A	01-Nov-2012	<0.0010	<0.0010	<0.50	0.081	<0.000017	0.000061	90.5	93.8	<0.0010	0.0168	<0.00050	0.0103	<0.0010	0.0463	<0.020	15.8	<0.0010	0.0149	<0.50	<0.050	28.7	36.5	0.283	0.563	0.0023	0.0029	<0.0020	0.0150
BH11-44A	06-Jun-2013	<0.0010	<0.0010	0.068	0.065	<0.000017	<0.000017	94.1	89.5	<0.0010	<0.0010	<0.00050	<0.00050	<0.0010	<0.0010	<0.020	2.27	<0.0010	<0.0010	<0.050	<0.050	32.0	29.5	0.284	0.276	0.0034	0.0036	<0.0020	<0.0020
BH11-44A	23-Oct-2013	<0.000050	<0.000050	0.061	0.058	<0.000010	<0.000010	86.9	84.5	<0.00010	0.00011	0.00031	0.00033	<0.00010	0.00039	2.26	2.14	0.000155	0.000178	0.0241	0.0209	28.0	28.9	0.266	0.270	0.00356	0.00367	0.00032	0.00038
BH11-41	01-Nov-2012	<0.0010	<0.0010	<0.50	<0.050	0.000199	0.00190	98.3	111	<0.0010	0.0516	0.00085	0.0154	0.0015	0.110	<0.020	32.6	<0.0010	0.0321	<0.50	<0.050	42.3	44.4	0.131	1.68	0.0056	0.0055	0.0063	0.0405
BH11-13A	01-Nov-2012	<0.0010	<0.0010	<0.50	0.056	<0.000017	<0.000017	99.4	96.6	<0.0010	<0.0010	<0.00050	<0.00050	<0.0010	<0.0010	<0.020	3.62	<0.0010	<0.0010	<0.50	<0.050	30.6	34.6	0.229	0.251	0.0016	0.0017	<0.0020	<0.0020
BH11-51A	01-Nov-2012	<0.010	<0.0010	<0.50	0.099	<0.00017	0.000916	109	312	<0.010	0.180	<0.0050	0.0758	<0.010	0.415	<0.20	198	<0.010	0.0366	<0.50	0.142	45.4	145	0.277	4.23	<0.010	0.0032	<0.020	0.235
BH11-51A	06-Jun-2013	<0.0010	<0.0010	0.128	0.125	<0.000017	0.000029	120	117	<0.0010	0.0105	<0.00050	0.00388	<0.0010	0.0124	<0.020	8.59	<0.0010	0.0013	<0.050	<0.050	47.1	45.1	0.354	0.457	0.0021	0.0020	<0.0020	0.0083
BH11-51A	21-Oct-2013	<0.000050	<0.000050	0.115	0.127	<0.000010	<0.000010	116	111	<0.00010	0.00113	0.00012	0.00052	0.00015	0.00174	<0.010	2.64	<0.000050	0.000175	0.0636	0.0535	43.4	39.2	0.371	0.363	0.00218	0.00198	0.00018	0.00104
BH12-20	01-Nov-2012	<0.0010	<0.0010	<0.050	<0.050	<0.000017	0.000170	61.9	116	<0.0010	0.152	<0.00050	0.146	<0.0010	0.214	<0.020	321	<0.0010	0.0327	<0.050	0.133	20.0	111	0.180	1.51	0.0031	0.0058	0.0021	0.280
BH11-01B	06-Jun-2013	<0.0010	<0.010	0.614	0.85	0.000024	0.00830	104	1790	<0.0010	0.610	0.00054	0.219	<0.0010	0.770	<0.020	375	<0.0010	0.334	0.143	0.54	33.7	497	0.169	10.4	0.0085	0.021	<0.0020	0.787
BH11-01B	22-Oct-2013	<0.000050	0.00797	0.473	0.86	0.000011	0.00883	98.1	1560	<0.00010	0.414	0.00040	0.203	0.00011	0.457	<0.010	323	<0.000050	0.316	0.145	0.545	31.9	429	0.0707	10.5	0.0107	0.00939	0.00144	0.590
BH11-44B	06-Jun-2013	<0.0010	<0.010	0.329	0.55	<0.000017	0.00867	84.0	1840	<0.0010	1.16	0.00130	0.350	<0.0010	1.79	<0.020	652	<0.0010	0.415	0.075	0.84	35.6	639	0.453	14.1	0.0145	0.026	0.0035	1.30
BH11-44B	23-Oct-2013	<0.000050	0.00097	0.255	0.308	<0.000010	0.000868	85.9	226	<0.00010	0.140	0.00121	0.0436	0.00057	0.161	0.362	79.6	<0.000050	0.0383	0.0791	0.191	34.6	89.0	0.452	2.09	0.0105	0.00766	0.00343	0.121
BH11-49A	06-Jun-2013	<0.0010	<0.010	0.311	0.64	<0.000017	0.0241	183	4990	<0.0010	1.66	0.00054	0.560	0.0010	2.59	0.021	947	<0.0010	0.700	0.152	1.01	69.4	1640	0.183	27.2	0.0131	0.029	0.0023	2.26
BH11-49A	22-Oct-2013	<0.000050	<0.00025	0.089	0.096	<0.000010	0.000105	79.6	102	<0.00010	0.271	0.00012	0.0263	0.00017	0.161	<0.010	102	<0.000050	0.00502	0.0321	0.058	22.8	36.4	0.262	1.13	0.00976	0.00748	0.00110	0.0739
BH11-49B	06-Jun-2013	<0.0010	<0.0010	0.095	0.092	0.000045	0.000068	61.0	60.4	<0.0010	0.0014	<0.00050	0.00072	0.0101	0.0122	0.164	0.752	<0.0010	0.0013	<0.050	<0.050	21.7	20.0	0.136	0.151	0.0174	0.0178	0.0021	0.0027
BH11-49B	22-Oct-2013	<0.00025	0.00342	0.455	0.884	<0.000050	0.0178	175	4210	<0.00050	0.917	0.00163	0.489	0.00092	1.11	<0.010	596	<0.00025	0.464	0.190	0.869	61.5	1120	0.160	26.8	0.0133	0.0244	0.00340	1.32
BH11-51B	06-Jun-2013	<0.0010	<0.010	0.260	0.58	<0.000017	0.00918	105	2440	<0.0010	0.774	0.00074	0.304	<0.0010	1.03	<0.020	483	<0.0010	0.297	0.079	0.59	37.9	756	0.177	14.5	0.0140	0.032	0.0022	1.01
BH11-51B	22-Oct-2013	<0.000050	0.00615	0.371	0.702	0.000014	0.0103	120	2520	<0.00010	0.707	0.00134	0.349	0.00048	0.873	<0.010	490	<0.000050	0.317	0.123	0.626	43.8	720	0.189	17.6	0.0147	0.0157	0.00314	0.923
BH12-08	06-Jun-2013	<0.0010	<0.0010	0.070	0.072	<0.000017	0.00109	108	433	<0.0010	0.189	<0.00050	0.0900	<0.0010	0.490	<0.020	215	<0.0010	0.0320	<0.050	0.119	48.7	131	0.173	3.69	0.0042	0.0074	<0.0020	0.260
BH12-08	23-Oct-2013	<0.000050	0.00050	0.068	0.085	<0.000010	0.000536	99.5	220	<0.00010	0.137	0.00017	0.0587	0.00053	0.187	1.61	97.5	<0.000050	0.0168	0.0414	0.132	44.6	84.0	0.155	2.29	0.00343	0.00489	0.00064	0.124
BH11-01A	22-Oct-2013	<0.000050	0.000089	0.124	0.124	<0.000010	0.000053	50.9	64.6	<0.00010	0.0162	0.00011	0.00482	0.00022	0.0126	<0.010	8.74	<0.000050	0.00248	0.0281	0.0433	17.8	23.2	0.153	0.352	0.00149	0.00164	0.00032	0.0124
P16	22-Oct-2013	<0.000050	<0.000050	0.249	0.301	<0.000010	<0.000010	25.8	25.8	<0.00010	0.00014	0.00086	0.00086	0.00645	0.00792	<0.010	0.185	0.000060	0.000324	0.0130	0.0127	9.50	8.69	0.0594	0.0597	0.00134	0.00137	0.00324	0.00330
3880	21-Oct-2013	<0.000050	<0.000050	0.055	0.050	<0.000010	<0.000010	117	110	<0.00010	<0.00010	0.00010	0.00011	0.00923	0.0119	<0.010	0.748	<0.000050	0.000617	0.0361	0.0391	52.4	50.3	0.105	0.110	0.00319	0.00310	0.00100	0.00104
3221	21-Oct-2013	<0.000050	<0.000050	0.072	0.082	0.000049	0.000044	133	125	<0.00010	<0.00010	0.00239	0.00226	0.00259	0.00432	<0.010	0.295	<0.000050	<0.000050	0.0616	0.0526	58.3	53.3	0.975	0.936	0.00146	0.00136	0.00061	0.00060
3226	21-Oct-2013	<0.000050	<0.000050	0.053	0.059	<0.000010	<0.000010	127	126	<0.00010	<0.00010	0.00171	0.00160	0.00031	0.00075	0.017	1.41	<0.000050	0.000149	0.0549	0.0482	50.6	47.5	0.600	0.570	0.00144	0.00144	0.00050	0.00046
3443-1	23-Oct-2014	<0.000050	<0.000050	0.084	0.081	<0.000010	<0.000010	99.8	96.7	<0.00010	<0.00010	<0.00010	<0.00010	0.00039	0.00064	2.14	2.16	0.000051	0.000082	0.0371	0.0346	41.3	40.1	0.277	0.281	0.00220	0.00236	0.00037	0.00035

HISTORICAL GROUNDWATER QUALITY (2011 to 2013)- RAINY RIVER PROJECT

Station	Date Sampled	D. Phosphorus	D. Potassium	T. Potassium	D. Selenium	T. Selenium	D. Silver	T. Silver	D. Sodium	T. Sodium	D. Strontium	T. Strontium	D. Tellurium	T. Tellurium	D. Thallium	T. Thallium	D. Tin	T. Tin	D. Titanium	T. Titanium	D. Tungsten	T. Tungsten	D. Uranium	T. Uranium	D. Vanadium	T. Vanadium	D. Zinc
NR-08-240	24-Oct-2011	<0.0050	4.52	4.47	<0.0010	<0.0020	<0.000010	<0.0000070	26.3	24.5	0.579	0.725	<0.000070	<0.000060	<0.000010	<0.0000040	<0.00010	0.000056	<0.00050	0.00103	0.000494	0.000965	0.000362	0.000320	0.00010	0.000077	<0.0020
NR-08-240	16-Jan-2012	<0.0100	4.48	4.50	<0.0050	<0.00050	<0.00050	0.000052	30.2	30.3	0.761	0.825	<0.00070	<0.000070	<0.00030	<0.00030	<0.00010	<0.00010	<0.0050	0.00167	<0.0010	0.00143	0.00042	0.00128	<0.0020	0.00053	<0.020
NR-08-240	25-Apr-2012	0.0064	5.03	5.06	<0.00050	<0.00050	<0.000050	<0.000050	34.2	35.6	0.503	0.509	<0.000070	<0.000070	<0.000030	<0.000030	<0.00010	<0.00010	<0.00050	0.00061	0.00073	0.00123	0.000027	0.000042	<0.00020	<0.00020	<0.0020
NR-08-240	10-Jul-2012	0.0113	4.78	4.87	<0.0010	<0.0010	<0.00010	<0.00010	32.9	33.2	0.352	0.382	<0.0010	<0.0010	<0.0030	<0.00030	<0.0010	<0.0010	<0.0020	<0.0020	<0.010	<0.010	<0.0050	<0.0050	<0.0010	<0.0010	<0.0030
NR-09-367	24-Oct-2011	<0.0050	3.57	3.33	<0.0010	<0.0020	<0.000010	<0.0000070	15.0	14.2	0.420	0.480	<0.000070	<0.000060	<0.000010	<0.0000040	<0.00010	0.000072	0.00071	<0.00060	0.000415	0.000547	0.000556	0.000510	<0.00010	0.000078	<0.0020
NR-09-367	16-Jan-2012	<0.0100	3.18	3.65	<0.0050	<0.00050	<0.00050	0.00172	12.3	15.1	0.379	0.486	<0.00070	<0.000070	<0.00030	<0.00030	<0.0010	0.00189	<0.0050	<0.00050	<0.0010	0.0113	0.00055	0.00204	<0.0020	0.00446	<0.020
NR-09-367	25-Apr-2012	<0.0050	3.79	3.73	<0.00050	<0.00050	<0.000050	<0.000050	12.8	12.5	0.417	0.422	<0.000070	<0.000070	<0.000030	<0.000030	<0.00010	<0.00010	0.00067	0.00071	0.00032	0.00039	0.000496	0.000523	<0.00020	0.00027	<0.0020
NR-09-367	10-Jul-2012	<0.0050	3.76	3.61	<0.0010	<0.0010	<0.00010	<0.00010	10.6	10.4	0.389	0.396	<0.0010	<0.0010	<0.0030	<0.00030	<0.0010	<0.0010	<0.0020	<0.0020	<0.010	<0.010	<0.0050	<0.0050	<0.0010	<0.0010	<0.0030
NH-09-428	24-Oct-2011	<0.0050	3.55	3.53	<0.0010	<0.0020	<0.000010	0.000114	19.3	18.4	0.424	0.534	<0.000070	<0.000060	<0.000010	0.0000102	<0.00010	<0.000040	<0.00050	0.00539	0.00271	0.00605	0.0000393	0.000200	<0.00010	0.00139	<0.0020
NR-09-428	25-Apr-2012	<0.0050	3.84	3.88	<0.00050	<0.00050	<0.000050	0.000221	17.7	18.5	0.558	0.602	<0.000070	<0.000070	<0.000030	<0.000030	<0.00010	<0.00010	0.00052	0.00261	0.00193	0.00503	0.000144	0.000178	<0.00020	0.00037	0.0038
NR-09-428	10-Jul-2012	0.0050	3.67	3.78	<0.0010	<0.0010	<0.00010	<0.00010	20.7	20.7	0.257	0.197	<0.0010	<0.0010	<0.00030	<0.00030	<0.0010	<0.0010	<0.0020	<0.0020	<0.010	<0.010	<0.0050	<0.0050	<0.0010	<0.0010	<0.0030
NH-10-12	25-Apr-2012	<0.0050	5.07	5.15	<0.00050	<0.00050	<0.000050	<0.000050	12.3	12.7	0.380	0.391	<0.000070	<0.000070	<0.000030	<0.000030	<0.00010	<0.00010	0.00075	0.00178	0.00053	0.00059	0.000160	0.000161	<0.00020	<0.00020	<0.0020
RR-09-213A	24-Oct-2011	<0.0050	3.33	3.17	<0.0010	<0.0020	<0.000010	0.0000168	13.4	12.1	0.393	0.452	<0.000070	<0.000060	<0.000010	0.0000305	<0.00010	0.000110	<0.00050	0.00481	0.000533	0.000419	0.000570	0.000579	<0.00010	0.000499	0.0035
RR-09-213A	25-Apr-2012	<0.0050	3.71	3.70	<0.00050	0.00059	<0.000050	<0.000050	14.0	13.9	0.448	0.451	<0.000070	<0.000070	<0.000030	0.000042	<0.00010	0.00035	0.00059	0.0138	0.00020	0.00036	0.000497	0.000583	<0.00020	0.00099	0.0097
RR-09-213A	10-Jul-2012	<0.0050	3.66	3.66	<0.0010	<0.0010	<0.00010	<0.00010	13.5	13.5	0.465	0.480	<0.0010	<0.0010	<0.00030	<0.00030	<0.0010	<0.0010	<0.0020	0.0054	<0.010	<0.010	<0.0050	<0.0050	<0.0010	<0.0010	0.0067
RR-09-214	24-Oct-2011	<0.0050	4.68	4.30	<0.0010	<0.0020	<0.000010	0.0000075	15.2	13.7	0.340	0.397	<0.000070	<0.000060	<0.000010	<0.0000040	<0.00010	0.000508	<0.00050	0.00110	0.0449	0.0549	0.00142	0.00129	<0.00010	0.000666	<0.0020
RR-09-214	25-Apr-2012	<0.0050	5.13	5.14	<0.00050	<0.00050	<0.000050	<0.000050	16.3	17.5	0.384	0.391	<0.000070	<0.000070	<0.000030	<0.000030	<0.00010	0.00037	<0.00050	0.00126	0.0491	0.0544	0.00136	0.00132	<0.00020	0.00042	<0.0020
BH-10-04	24-Oct-2011	<0.0050	3.62	3.43	<0.0010	<0.0020	<0.000010	<0.0000070	22.3	18.8	0.435	0.480	<0.000070	<0.000060	<0.000010	0.0000113	<0.00010	0.000171	0.00061	0.00624	0.000111	0.000153	0.00960	0.00878	<0.00010	0.000454	0.0039
BH-10-04	16-Jan-2012	<0.0100	3.66	3.60	<0.0050	<0.00050	<0.00050	<0.000050	19.6	18.9	0.495	0.500	<0.00070	<0.000070	<0.00030	<0.00030	<0.0010	0.00013	<0.0050	0.00388	<0.0010	0.00020	0.00888	0.00902	<0.0020	<0.00020	<0.020
BH-10-04	25-Apr-2012	0.0075	3.89	3.80	<0.00050	0.00065	<0.000050	<0.000050	19.9	20.9	0.506	0.482	<0.000070	<0.000070	<0.000030	<0.000030	<0.00010	<0.00010	0.00072	0.00508	<0.00010	<0.00010	0.0103	0.00970	<0.00020	0.00039	<0.0020
BH-10-04	10-Jul-2012	0.0076	3.64	3.88	<0.0010	<0.0010	<0.00010	<0.00010	18.4	20.2	0.500	0.541	<0.0010	<0.0010	<0.00030	<0.00030	<0.0010	<0.0010	<0.0020	0.0048	<0.010	<0.010	0.0102	0.0110	<0.0010	<0.0010	<0.0030
BH-10-05	24-Oct-2011	<0.0050	3.54	8.97	<0.0010	<0.0020	<0.000010	0.000253	19.4	21.4	0.620	0.828	<0.000070	0.000080	<0.000010	0.000352	<0.00010	0.000316	0.00273	0.566	0.00145	0.00125	0.0186	0.0193	0.00075	0.0646	<0.0020
BH-10-05	16-Jan-2012	<0.0100	2.87	4.39	<0.0050	0.00083	<0.00050	0.000119	16.1	15.2	0.664	0.644	<0.00070	<0.000070	<0.00030	0.000132	<0.0010	0.00021	<0.0050	0.232	<0.0010	0.00103	0.0145	0.0145	<0.0020	0.0212	<0.020
BH-10-05	25-Apr-2012	0.0052	2.73	2.69	<0.00050	<0.00050	<0.000050	0.000052	16.0	14.2	0.623	0.602	<0.000070	<0.000070	<0.000030	0.000044	<0.00010	0.00015	0.00275	0.0708	0.00049	0.00066	0.0152	0.0143	0.00054	0.00599	<0.0020
BH-10-05	10-Jul-2012	<0.0050	2.87	4.54	<0.0010	<0.0010	<0.00010	<0.00010	15.5	18.6	0.633	0.694	<0.0010	<0.0010	<0.00030	<0.00030	<0.0010	<0.0010	0.0031	0.163	<0.010	<0.010	0.0162	0.0170	<0.0010	0.0149	<0.0030
BH-10-05	06-Jun-2013	<0.0050	3.30	7.23	<0.0010	<0.0010	<0.00010	0.00096	18.4	18.2	0.674	0.786	<0.0010	<0.0010	<0.00030	<0.00030	<0.0010	<0.0010	0.0029	0.482	<0.010	<0.010	0.0161	0.0178	<0.0010	0.0481	<0.0030
BH-10-05	22-Oct-2013	<0.0050	2.96	4.97	<0.00010	0.00026	<0.000010	0.000126	15.3	16.2	0.670	0.728	<0.00060	<0.00060	<0.000050	0.000103	<0.00010	0.00043	<0.00030	0.162			0.0141	0.0166	0.00042	0.0194	<0.0050
BH-10-7A	24-Oct-2011	<0.0050	3.90	3.52	<0.0010	<0.0020	<0.000010	<0.0000070	9.32	8.81	0.217	0.271	<0.000070	<0.000060	<0.000010	0.0000071	<0.00010	0.000544	0.00060	0.0415	0.000142	0.000176	0.00139	0.00138	<0.00010	0.00153	<0.0020
BH-10-7A	25-Apr-2012	<0.0050	4.02	4.19	0.00054	0.00068	<0.000050	<0.000050	9.18	8.86	0.267	0.249	<0.000070	<0.000070	<0.000030	<0.000030	<0.00010	0.00037	0.00075	0.100	0.00033	0.00033	0.00155	0.00153	<0.00020	0.00382	<0.0020
BH-10-7A	10-Jul-2012	<0.0050	4.06	4.09	<0.0010	<0.0010	<0.00010	<0.00010	13.6	13.5	0.367	0.360	<0.0010	<0.0010	<0.00030	<0.00030	<0.0010	<0.0010	<0.0020	0.0319	<0.010	<0.010	<0.0050	<0.0050	<0.0010	0.0016	<0.0030
BH-10-7A	06-Jun-2013	<0.0050	3.99	3.88	<0.0010	<0.0010	<0.00010	<0.00010	10.0	9.40	0.283	0.294	<0.0010	<0.0010	<0.00030	<0.00030	<0.0010	<0.0010	<0.0020	0.0030	<0.010	<0.010	<0.0050	<0.0050	<0.0010	<0.0010	<0.0030
BH-10-7A	23-Oct-2013	<0.0050	3.71	4.18	<0.00010	<0.00010	<0.000010	0.000015	8.81	8.89	0.279	0.293	<0.00060	<0.00060	<0.000050	<0.000050	<0.00010	0.00013	<0.00030	0.0827			0.00150	0.00169	<0.00010	0.00380	<0.0050
BH-10-11A	24-Oct-2011	<0.0050	5.79	135	<0.0010	0.0346	<0.000010	0.00148	10.5	24.6	0.350	5.28	<0.000070	0.000661	<0.000010	0.0158	<0.00010	0.000305	<0.00050	1.01	0.000068	0.000647	0.00237	0.128	0.00069	0.416	<0.0020
BH-10-11A	25-Apr-2012	<0.0050	5.59	12.0	<0.00050	0.00304	<0.000050	0.000305	10.5	12.5	0.393	0.534	<0.000070	0.000096	<0.000030	0.000522	<0.00010	0.00077	0.00067	0.724	<0.00010	0.00022	0.00107	0.00432	0.00046	0.0827	<0.0020
BH-10-11A	10-Jul-2012	<0.0050	6.12	19.8	<0.0010	<0.0010	<0.00010	0.00057	10.2	12.1	0.385	1.15	<0.0010	<0.0010	<0.00030	0.00130	<0.0010	<0.0010	<0.0020	1.21	<0.010	<0.010	<0.0050	0.0140	0.0010	0.165	<0.0030
BH-10-12A	24-Oct-2011	<0.0050	4.63	4.39	<0.0010	<0.0020	<0.000010	0.0000156	19.2	20.3	0.343	0.413	<0.000070	<0.000060	<0.000010	<0.0000040	<0.00010	0.000224	0.00052	0.00130	0.000431	0.000598	0.000526	0.000583	<0.00010	0.000096	<0.0020
BH-10-12A	10-Jul-2012	<0.0050	4.81	4.72	<0.0010	<0.0010	<0.00010	<0.00010	15.7	16.1	0.404	0.401	<0.0010	<0.0010	<0.00030	<0.00030	<0.0010	<0.0010	<0.0020	0.0030	<0.010	<0.010	<0.0050	<0.0050	<0.0010	<0.0010	<0.0030
BH-10-14	24-Oct-2011	<0.0050	4.59	4.19	<0.0010	<0.0020	<0.000010	<0.0000070	17.1	15.9	0.426	0.490	<0.000070	<0.000060	<0.000010	<0.0000040	<0.00010	<0.000040	<0.00050	<0.00060	0.000152	0.000136	0.000740	0.000697	<0.00010	0.000035	<0.0020
BH-10-14	25-Apr-2012	<0.0050	4.73	5.03	0.00056	<0.00050	<0.000050	<0.000050	16.8	19.1	0.536	0.509	<0.000070	<0.000070	<0.000030	<0.000030	<0.00010	<0.00010	0.00052	0.00110	<0.00010	<0.00010	0.000719	0.000741	<0.00020	<0.00020	<0.0020
BH-10-14	10-Jul-2012	<0.0050	4.45	4.89	<0.0010	<0.0010	<0.00010	<0.00010	16.2	18.0	0.476	0.548	<0.0010	<0.0010	<0.00030	<0.00030	<0.0010	<0.0010	<0.0020	<0.0020	<0.010	<0.010	<0.0050	<0.0050	<0.0010	<0.0010	<0.0030
BH-10-20	24-Oct-2011	<0.0050	3.52	3.59	<0.0010	<0.0020	<0.000010	0.0000489	14.0	11.9	0.393	0.463	<0.000070	<0.000060	0.000019	0.0000979	<0.00010	0.000177	<0.00050	0.0305	0.000659	0.000615	0.000605	0.00117	<0.00010	0.00308	0.0051
BH-10-20	16-Jan-2012	<0.0100	4.61	4.52	<0.0050	<0.00050	<0.00050	<0.000050	29.9	30.3	0.784	0.817	<0.00070	<0.000070	<0.00030	<0.00030	<0.0010	0.00010	<0.0050	0.00137	<0.0010	0.00163	0.00031	0.00101	<0.0020	0.00073	<0.020
BH-10-20	10-Jul-2012	<0.0050	3.74	3.75	<0.0010	<0.0010	<0.00010	<0.00010	10.2	10.5	0.385	0.417	<0.0010	<0.0010	<0.00030	<0.00030	<0.0010	<0.0010	<0.0020	<0.0020	<0.010	<0.010	<0.0050	<0.0050	<0.0010	<0.0010	<0.0030
TRIP BLANK	24-Oct-2011	<0.0050	<0.013	<0.020	<0.0010	<0.0020	<0.000010	<0.0000070	<0.050	<0.0040	<0.000060	<0.000030	<0.000070	<0.000060	<0.000010	<0.0000040	<0.00010	<0.000040	<0.00050	<0.00060	<0.000010	<0.000040	<0.0000030	<0.0000030	<0.00010	<0.000030	<0.0020
TRIP BLANK	16-Jan-2012	<0.0050	<0.050	<0.050	<0.00050	<0.00050	<0.000050	<0.000050	<0.060	<0.060	<0.00030	<0.00030	<0.000070	<0.000070	<0.000030	<0.000030	<0.00010	<0.00010	<0.00050	<0.00050	<0.00010	<0.00010	<0.000010	<0.000010	<0.00020	<0.00020	<0.0020
TRIP BLANK	25-Apr-2012	<0.0050	<0.050	<0.050	<0.00050	<0.00050	<0.000050	<0.000050	<0.060	<0.060	<0.00030	<0.00030	<0.000070	<0.000070	<0.000030	<0.000030	<0.00010	<0.00010	<0.00050	<0.00050	<0.00010	<0.00010	<0.000010	<0.000010	<0.00020	<0.00020	<0.0020
TRIP BLANK	10-Jul-2012	<0.0050	<0.50	<0.50	<0.0010	<0.0010	<0.00010	<0.00010	<0.10	<0.10	<0.0010	<0.0010	<0.0010	<0.0010	<0.00030	<0.00030	<0.0010	<0.0010	<0.0020	<0.0020	<0.010	<0.010	<0.0050	<0.0050	<0.0010	<0.0010	<0.0030
TRIP BLANK	01-Nov-2012	<0.0050	<0.50	<0.50	<0.0010	<0.0010	<0.00010	<0.00010	<0.10	<0.10	<0.0010	<0.0010	<0.0010	<0.0010	<0.00030	<0.00030	<0.0010	<0.0010	<0.0020	<0.0020	<0.010	<0.010	<0.0050	<0.0050	<0.0010	<0.0010	<0.0030
TRIP BLANK	06-Jun-2013	<0.0050	<0.50	<0.50	<0.0010	<0.0010	<0.00010	<0.00010	<0.10	<0.10	<0.0010	<0.0010	<0.0010	<0.0010	<0.00030	<0.00030	<0.0010	<0.0010	<0.0020	<0.0020	<0.010	<0.010	<0.0050	<0.0050	<0.0010	<0.0010	<0.0030
TRIP BLANK	02-Apr-2014	<0.0030	<0.50	<0.50	<0.0010	<0.0010	<0.00010	<0.00010	<0.10	<0.10	<0.0010	<0.0010	<0.0010	<0.0010	<0.00030	<0.00030	0.0012	<0.0010	<0.0020	<0.0020	<0.010	<0.010	<0.0050	<0.0050	<0.0010	<0.0010	0.0104
BH11-44A	01-Nov-2012	<0.0050	2.30	5.40	<0.0010	<0.0010	<0.00010	0.00150	9.0	12.1	0.360	0.479	<0.0010	<0.0010	<0.00030	<0.00030	<0.0010	<0.0010	<0.0020	0.287	<0.010	<0.010	<0.0050	0.0051	<0.0010	0.0181	<0.0030
BH11-44A	06-Jun-2013	<0.0050	2.85	2.80	<0.0010	<0.0010	<0.00010	<0.00010	15.5	15.5	0.382	0.390	<0.0010	<0.0010	<0.00030	<0.00030	<0.0010	<0.0010	<0.0020	0.0032	<0.010	<0.010	<0.0050	<0.0050	<0.0010	<0.0010	<0.0030
BH11-44A	23-Oct-2013	<0.0050	2.67	2.65	0.00032	<0.00010	<0.000010	<0.000010	15.2	15.2	0.362	0.358	<0.00060	<0.00060	<0.000050	<0.000050	0.00038	0.00039	0.00381	0.00200			0.00158	0.00166	0.00017	0.00028	<0.0050
BH11-41	01-Nov-2012	<0.0050	4.77	6.99	<0.0010	<0.0010	<0.00010	0.0292	7.9	8.41	0.320	0.335	<0.0010	<0.0010	<0.00030	<0.00030	<0.0010	<0.0010	<0.0020	0.468	0.068	0.086	<0.0050	<0.0050	<0.0010	0.0315	0.0126
BH11-13A	01-Nov-2012	<0.0050	4.12	4.52	<0.0010	<0.0010	<0.00010	<0.00010	9.3	10.9	0.341	0.358	<0.0010	<0.0010	<0.00030	<0.00030	<0.0010	<0.0010	<0.0020	0.0201	<0.010	<0.010	<0.0050	<0.0050	<0.0010	<0.0010	<0.0030
BH11-51A	01-Nov-2012	<0.0050	<5.0	17.4	<0.010	<0.0010	<0.0010	0.0118	28.0	23.7	0.686	1.15	<0.010	<0.0010	<0.0030	0.00093	<0.010	<0.0010	<0.020	2.53	<0.10	0.018	<0.050	0.0061	<0.010	0.190	<0.030
BH11-51A	06-Jun-2013	<0.0050	4.78	5.29	<0.0010	<0.0010	<0.00010	0.00038	28.9	27.9	0.666	0.698	<0.0010	<0.0010	<0.00030	<0.00030	<0.0010	<0.0010	<0.0020	0.255	<0.010	<0.010	<0.0050	<0.0050	<0.0010	0.0124	<0.0030
BH11-51A	21-Oct-2013	<0.0050	4.80	4.30	<0.00010	<0.00010	<0.000010	0.000049	27.2	24.8	0.660	0.652	<0.00060	<0.00060	<0.000050	<0.000050	<0.00010	0.00011	<0.00030	0.0199			0.00105	0.00113	<0.00010	0.00132	<0.0050
BH12-20	01-Nov-2012	<0.0050	4.36	73.1	<0.0010	<0.0010	<0.00010	0.0232	16.0	15.3	0.464	0.828	<0.0010	<0.0010	<0.00030	0.00049	<0.0010	<0.0010	<0.0020	0.136	0.040	0.043	<0.0050	<0.0050	<0.0010	0.0703	<0.0030
BH11-01B	06-Jun-2013	0.0059	4.13	71.7	<0.0010	0.034	<0.00010	0.0050	76.8	80.0	0.658	3.70	<0.0010	<0.010	<0.00030	0.0066	<0.0010	<0.010	0.0034	2.42	<0.010	<0.10	0.0214	0.134	0.0012	0.794	<0.0030
BH11-01B	22-Oct-2013	0.0091	3.57	57.3	0.00168	0.0090	<0.000010	0.00365	72.5	89.5	0.672	3.41	<0.00060	<0.0060	<0.000050	0.00476	<0.00010	<0.0010	<0.00030	0.469			0.0157	0.110	0.00149	0.455	<0.0050
BH11-44B	06-Jun-2013	0.0068	4.41	92.3	<0.0010	0.043	<0.00010	0.0077	76.1	78.5	0.497	3.46	<0.0010	<0.010	<0.00030	0.0099	<0.0010	<0.010	<0.0020	3.57	<0.010	<0.10	0.0134	0.100	0.0021	1.03	<0.0030
BH11-44B	23-Oct-2013	0.0167	3.75	15.5	<0.00010	0.00115	<0.000010	0.00152	47.0	47.3	0.511	0.745	<0.00060	<0.0030	<0.000050	0.00096	<0.00010	0.00139	<0.00030	1.08			0.0125	0.0184	0.00064	0.141	0.0058
BH11-49A	06-Jun-2013	<0.0050	8.68	123	0.0027	0.067	<0.00010	0.0038	154	161	1.20	7.75	<0.0010	<0.010	<0.00030	0.0143	<0.0010	<0.010	0.0071	0.938	<0.010	<0.10	0.0231	0.214	0.0014	1.43	<0.0030
BH11-49A	22-Oct-2013	<0.0050	3.70	6.21	<0.00010	<0.00050	<0.000010	0.00277	23.8	26.4	0.506	0.568	<0.00060	<0.0030	<0.000050	<0.00025	<0.00010	0.00195	<0.00030	0.670			0.000821	0.00149	0.00070	0.325	<0.0050
BH11-49B	06-Jun-2013	<0.0050	3.25	3.31	<0.0010	0.0011	<0.00010	<0.00010	45.5	43.3	0.353	0.352	<0.0010	<0.0010	<0.00030	<0.00030	0.0018	0.0038	0.0043	0.0172	0.015	0.017	0.0050	0.0051	0.0011	0.0026	0.0052
BH11-49B	22-Oct-2013	<0.0050	7.51	93.0	0.00096	0.00575	<0.000050	0.00445	111	104	1.20	6.16	<0.0030	<0.0030	<0.00025	0.00820	<0.00050	0.00094	<0.0015	0.291			0.0168	0.131	0.00089	1.01	<0.025
BH11-51B	06-Jun-2013	<0.0050	5.05	79.6	<0.0010	0.034	<0.00010	0.0316	68.8	80.4	0.625	3.60	<0.0010	<0.010	<0.00030	0.0072	<0.0010	<0.010	0.0031	2.64	0.016	<0.10	0.0145	0.091	0.0015	0.826	<0.0030
BH11-51B	22-Oct-2013	<0.0050	5.63	77.4	0.00065	0.00895	<0.000010	0.0447	95.9	110	0.826	3.81	<0.00060	<0.0030	<0.000050	0.00713	<0.00010	0.00109	<0.00030	0.756			0.0185	0.0850	0.00191	0.671	<0.0050
BH12-08	06-Jun-2013	<0.0050	4.65	12.8	<0.0010	0.0058	<0.00010	0.0123	11.4	11.9	0.374	0.828	<0.0010	<0.0010	<0.00030	0.00099	<0.0010	<0.0010	<0.0020	4.45	<0.010	0.016	<0.0050	0.0147	<0.0010	0.398	<0.0030
BH12-08	23-Oct-2013	<0.0050	4.11	12.8	0.00010	0.00063	<0.000010	0.00480	11.3	15.9	0.354	0.577	<0.00060	<0.0030	<0.000050	0.00056	<0.00010	0.00114	<0.00030	2.60			0.00355	0.0104	0.00018	0.211	<0.0050
BH11-01A	22-Oct-2013	0.0226	3.13	4.57	<0.00010	<0.00010	<0.000010	0.000096	14.2	15.2	0.387	0.421	<0.00060	<0.00060	<0.000050	0.000091	<0.00010	0.00076	0.00054	0.377			0.000645	0.00105	0.00041	0.0178	<0.0050
P16	22-Oct-2013	<0.0050	1.68	1.57	<0.00010	<0.00010	<0.000010	<0.000010	132	127	0.339	0.334	<0.00060	<0.00060	<0.000050	<0.000050	<0.00010	<0.00010	<0.00030	<0.00030			0.000374	0.000429	<0.00010	0.00020	0.0079
3880	21-Oct-2013	<0.0050	2.81	2.56	0.00014	0.00011	<0.000010	<0.000010	14.0	13.2	0.387	0.370	<0.00060	<0.00060	<0.000050	<0.000050	<0.00010	<0.00010	<0.00030	<0.00030			0.00443	0.00471	0.00013	0.00049	0.0226
3221	21-Oct-2013	<0.0050	4.66	4.07	<0.00010	<0.00010	<0.000010	<0.000010	18.2	16.7	0.722	0.694	<0.00060	<0.00060	<0.000050	<0.000050	<0.00010	<0.00010	<0.00030	<0.00030			0.00382	0.00408	<0.00010	0.00025	<0.0050
3226	21-Oct-2013	<0.0050	4.32	3.83	<0.00010	<0.00010	<0.000010	<0.000010	12.8	11.5	0.610	0.619	<0.00060	<0.00060	<0.000050	<0.000050	<0.00010	<0.00010	<0.00030	<0.00030			0.00183	0.00213	<0.00010	0.00019	<0.0050
3443-1	23-Oct-2014	0.0135	3.39	3.28	<0.00010	<0.00010	<0.000010	<0.000010	19.8	19.5	0.497	0.500	<0.00060	<0.00060	<0.000050	<0.000050	<0.00010	<0.00010	<0.00030	0.00063			0.00203	0.00217	<0.00010	0.00015	0.0061
DUP	06-Jun-2013	0.0144	3.43	5.42	<0.0010	<0.0010	<0.00010	0.00011	15.1	15.2	0.369	0.417	<0.0010	<0.0010	<0.00030	<0.00030	<0.0010	<0.0010	<0.0020	0.743	<0.010	<0.010	<0.0050	<0.0050	<0.0010	0.0266	<0.0030
DUP	01-Nov-2012	<0.0050	4.18	4.37	<0.0010	<0.0010	<0.00010	<0.00010	10.8	10.6	0.350	0.357	<0.0010	<0.0010	<0.00030	<0.00030	<0.0010	<0.0010	<0.0020	0.0066	<0.010	<0.010	<0.0050	<0.0050	<0.0010	<0.0010	<0.0030
BH11-27	01-Nov-2012	<0.0050	3.49	7.17	<0.0010	0.0029	<0.00010	0.0145	17.8	20.3	0.495	0.703	<0.0010	<0.0010	<0.00030	<0.00030	<0.0010	<0.0010	<0.0020	1.21	0.063	0.086	<0.0050	<0.0050	<0.0010	0.0554	<0.0030
JOHNSON 1	02-Apr-2014	<0.0030	2.23	2.55	<0.010	<0.0010	<0.0010	<0.00010	90.9	112	0.780	0.958	<0.0010	<0.0010	<0.00030	<0.00030	<0.0010	<0.0010	<0.0020	<0.0020	<0.010	<0.010	<0.0050	<0.0050	<0.0010	<0.0010	0.0035
JOHNSON 2	02-Apr-2014	<0.0030	2.24	2.53	<0.0010	<0.0010	<0.00010	<0.00010	91.9	113	0.773	0.957	<0.

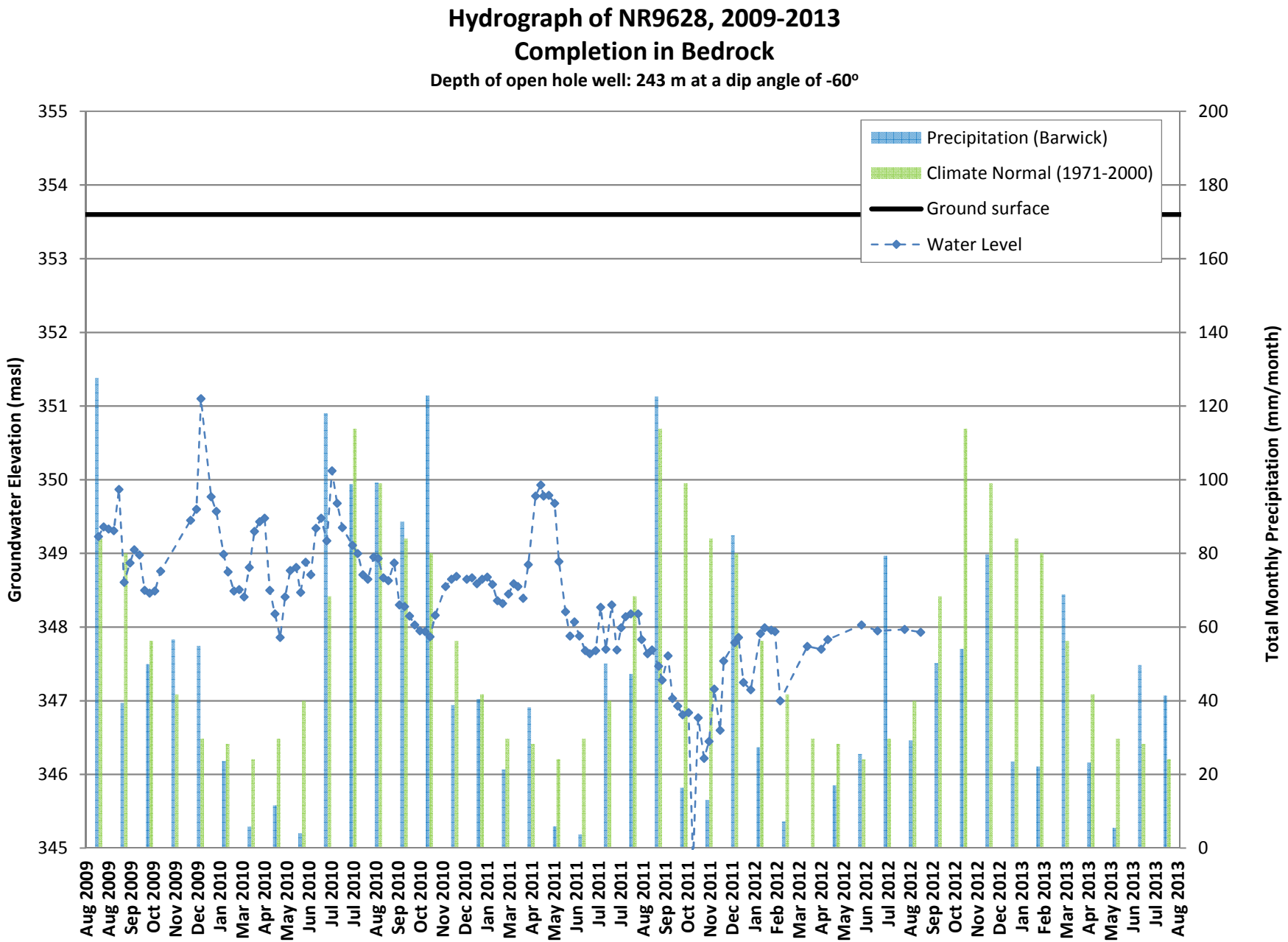
HISTORICAL GROUNDWATER QUALITY (2011 to 2013)- RAINY RIVER PROJECT

Station	Date Sampled	T. Zinc	D. Zirconium	T. Zirconium	D. Mercury	T. Mercury	Hardness	T. Phosphorous	Silca, Reactive	Bicarbonate Alk	Carbonate Alk	Hydroxide Alk
NR-08-240	24-Oct-2011	<0.0030	0.000043	<0.00020	<0.000020	<0.000010		0.0099	14.6	465	<5.0	<5.0
NR-08-240	16-Jan-2012	0.103	<0.0010	0.00031	<0.000010	<0.000010	395	0.0304	12.4	477	<5.0	<5.0
NR-08-240	25-Apr-2012	0.0282	<0.00010	<0.00010	<0.000010	<0.000010		0.0203	3.92	381	<5.0	<5.0
NR-08-240	10-Jul-2012	0.0194	<0.0010	<0.0010	<0.000010	<0.000010		0.0163	2.52			
NR-09-367	24-Oct-2011	<0.0030	0.000065	<0.00020	<0.000020	<0.000010		0.0099	24.6	477	<5.0	<5.0
NR-09-367	16-Jan-2012	0.0204	<0.0010	0.00038	<0.000010	<0.000010	398	0.0818	14.3	458	<5.0	<5.0
NR-09-367	25-Apr-2012	0.0027	<0.00010	0.00017	0.000028	<0.000010		0.0126	16.4	451	<5.0	<5.0
NR-09-367	10-Jul-2012	<0.0030	<0.0010	<0.0010	<0.000010	<0.000010		0.0102	15.8			
NH-09-428	24-Oct-2011	0.0374	<0.000020	<0.00020	<0.000020	<0.000010		0.0180	11.1	463	<5.0	<5.0
NR-09-428	25-Apr-2012	0.843	<0.00010	0.00019	<0.000010	<0.000010		0.0244	11.3	472	<5.0	<5.0
NR-09-428	10-Jul-2012	0.0907	<0.0010	<0.0010	<0.000010	<0.000010		0.0057	1.81			
NH-10-12	25-Apr-2012	0.0036	<0.00010	0.00010	<0.000010	<0.000010		0.0224	22.5	475	<5.0	<5.0
RR-09-213A	24-Oct-2011	0.0672	0.000063	0.00040	<0.000020	<0.000010		0.220	21.4	487	<5.0	<5.0
RR-09-213A	25-Apr-2012	0.0793	<0.00010	0.00037	<0.000010	<0.000010		0.124	16.6	486	<5.0	<5.0
RR-09-213A	10-Jul-2012	0.174	<0.0010	<0.0010	<0.000010	<0.000010		0.185	21.4			
RR-09-214	24-Oct-2011	<0.0030	0.000099	0.00031	<0.000020	<0.000010	0.0236	18.8	482	<5.0	<5.0	
RR-09-214	25-Apr-2012	<0.0020	0.00010	0.00021	<0.000010	0.000067		0.0143	12.5	480	<5.0	<5.0
BH-10-04	24-Oct-2011	0.0036	0.000135	0.00024	<0.000020	<0.000010		0.0386	25.5	500	<5.0	<5.0
BH-10-04	16-Jan-2012	0.0060	<0.0010	0.00029	<0.000010	<0.000010	383	0.0388	28.0	493	<5.0	<5.0
BH-10-04	25-Apr-2012	0.0031	<0.00010	0.00024	<0.000010	<0.000010		0.0446	26.9	505	<5.0	<5.0
BH-10-04	10-Jul-2012	0.0046	<0.0010	<0.0010	<0.000010	<0.000010		0.0408	26.2			
BH-10-05	24-Oct-2011	0.0841	0.000195	0.00516	<0.000020	<0.000010		0.410	26.9	562	<5.0	<5.0
BH-10-05	16-Jan-2012	0.0348	<0.0010	0.00205	<0.000010	<0.000010	690	0.442	23.8	594	<5.0	<5.0
BH-10-05	25-Apr-2012	0.0112	0.00017	0.00107	<0.000010	<0.000010		0.165	18.2	589	<5.0	<5.0
BH-10-05	10-Jul-2012	0.0243	<0.0010	0.0016	<0.000010	<0.000010		0.237	19.9			
BH-10-05	06-Jun-2013	0.0608	<0.0010	<0.010	<0.000010	<0.000010		0.367	20.8	463	<5.0	<5.0
BH-10-05	22-Oct-2013	0.0300	<0.0050	<0.0050	<0.00010	<0.00010	557	0.258	22.4	608	<5.0	<5.0
BH-10-7A	24-Oct-2011	0.0041	<0.000020	0.00029	<0.000020	<0.000010		0.0898	21.3	353	<5.0	<5.0
BH-10-7A	25-Apr-2012	0.0135	<0.00010	0.00040	<0.000010	<0.000010		0.114	20.4	335	<5.0	<5.0
BH-10-7A	10-Jul-2012	0.0081	<0.0010	<0.0010	<0.000010	<0.000010		0.308	24.0			
BH-10-7A	06-Jun-2013	<0.0030	<0.0010	<0.0010	<0.000010	<0.000010		0.0291	21.0	278	<5.0	<5.0
BH-10-7A	23-Oct-2013	0.0089	<0.0050	<0.0050	<0.00010	<0.00010	279	0.183	20.1	360	<5.0	<5.0
BH-10-11A	24-Oct-2011	4.35	0.000052	0.0152	<0.000020	<0.000010		52.8	18.0	541	<5.0	<5.0
BH-10-11A	25-Apr-2012	0.160	<0.00010	0.00376	<0.000010	<0.000010		0.214	17.3	541	<5.0	<5.0
BH-10-11A	10-Jul-2012	0.371	<0.0010	0.0055	<0.000010	<0.000010		23.7	13.8			
BH-10-12A	24-Oct-2011	<0.0030	0.000054	<0.00020	<0.000020	<0.000010		0.0735	24.8	496	<5.0	<5.0
BH-10-12A	10-Jul-2012	<0.0030	<0.0010	<0.0010	<0.000010	<0.000010		0.0594	24.0			
BH-10-14	24-Oct-2011	<0.0030	0.000174	0.00032	<0.000020	<0.000010		0.0082	20.7	523	<5.0	<5.0
BH-10-14	25-Apr-2012	0.0024	<0.00010	0.00016	<0.000010	0.000048		0.0120	16.0	505	<5.0	<5.0
BH-10-14	10-Jul-2012	0.0030	<0.0010	<0.0010	<0.000010	<0.000010		0.0137	21.3			
BH-10-20	24-Oct-2011	0.142	0.000050	0.00138	<0.000020	<0.000010		0.397	21.4	488	<5.0	<5.0
BH-10-20	16-Jan-2012	0.0931	<0.0010	0.00021	<0.000010	<0.000010	396	0.0493	12.7	471	<5.0	<5.0
BH-10-20	10-Jul-2012	<0.0030	<0.0010	<0.0010	<0.000010	<0.000010		0.0099	19.9			
TRIP BLANK	24-Oct-2011	<0.0030	<0.000020	<0.00020	<0.000020	<0.000010		<0.0050	0.0168	<5.0	<5.0	<5.0
TRIP BLANK	16-Jan-2012	<0.0020	<0.00010	<0.00010	<0.000010	<0.000010		<0.0050	0.0067	<5.0	<5.0	<5.0
TRIP BLANK	25-Apr-2012	<0.0020	<0.00010	<0.00010	<0.000010	<0.000010		<0.0050	<0.0050	<5.0	<5.0	<5.0
TRIP BLANK	10-Jul-2012	<0.0030	<0.0010	<0.0010	<0.000010	<0.000010		<0.0050	<0.0050			
TRIP BLANK	01-Nov-2012	<0.0030	<0.0010	<0.0010	<0.000010	<0.000010		<0.0050	0.0079	<5.0	<5.0	<5.0
TRIP BLANK	06-Jun-2013	<0.0030	<0.0010	0.0016	<0.000010	<0.000010		<0.0050	<0.0050	<5.0	<5.0	<5.0
TRIP BLANK	02-Apr-2014	<0.0030	<0.0010	<0.0010	<0.000010	<0.000010		<0.0030	<0.0050	<10	<10	<10
BH11-44A	01-Nov-2012	0.0521	<0.0010	0.0035	<0.000010	<0.000010		1.06	21.4	342	<5.0	<5.0
BH11-44A	06-Jun-2013	<0.0030	<0.0010	<0.0010	<0.000010	<0.000010		0.0104	21.4	357	<5.0	<5.0
BH11-44A	23-Oct-2013	<0.0050	<0.0050	<0.0050	<0.00010	<0.00010	330	0.0168	21.9	451	<5.0	<5.0
BH11-41	01-Nov-2012	0.174	<0.0010	0.0037	<0.000010	<0.000010		1.23	21.0	390	<5.0	<5.0
BH11-13A	01-Nov-2012	<0.0030	<0.0010	<0.0010	<0.000010	<0.000010		0.0227	21.6	348	<5.0	<5.0
BH11-51A	01-Nov-2012	0.512	<0.010	0.0090	<0.000010	<0.000010		18.6	18.1	469	<5.0	<5.0
BH11-51A	06-Jun-2013	0.0190	<0.0010	<0.010	<0.000010	<0.000010		0.277	18.6	462	<5.0	<5.0
BH11-51A	21-Oct-2013	<0.0050	<0.0050	<0.0050	<0.00010	<0.00010	470	0.0220	18.5	596	<5.0	<5.0
BH12-20	01-Nov-2012	1.25	<0.0010	0.0039	<0.000010	<0.000010		8.89	13.2	261	<5.0	<5.0
BH11-01B	06-Jun-2013	1.70	<0.0010	0.032	<0.000010	0.000016		13.5	20.2	351	<5.0	<5.0
BH11-01B	22-Oct-2013	1.28	<0.0050	<0.050	<0.00010	<0.00010	376	7.47	43.7	421	<5.0	<5.0
BH11-44B	06-Jun-2013	3.17	<0.0010	0.038	<0.000010	0.000078		36.2	17.8	458	<5.0	<5.0
BH11-44B	23-Oct-2013	0.294	<0.0050	<0.025	<0.00010	<0.00010	930	3.35	30.8	526	<5.0	<5.0
BH11-49A	06-Jun-2013	4.44	<0.0010	0.016	<0.000010	0.000019		40.8	17.1	519	<5.0	<5.0
BH11-49A	22-Oct-2013	0.088	<0.0050	<0.025	<0.00010	<0.00010	292	0.523	18.2	416	<5.0	<5.0
BH11-49B	06-Jun-2013	0.0093	<0.0010	<0.0010	<0.000010	<0.000010		0.0190	11.3	262	<5.0	<5.0
BH11-49B	22-Oct-2013	2.67	<0.025	<0.025	<0.00010	<0.00010	690	27.5	47.6	426	<5.0	<5.0
BH11-51B	06-Jun-2013	2.14	<0.0010	0.029	<0.000010	0.000031		15.2	17.0	407	<5.0	<5.0
BH11-51B	22-Oct-2013	1.94	<0.0050	<0.025	<0.00010	<0.00010	480	18.4	193	479	<5.0	<5.0
BH12-08	06-Jun-2013	0.484	<0.0010	0.0145	<0.000010	<0.000010		5.95	18.6	404	<5.0	<5.0
BH12-08	23-Oct-2013	0.234	<0.0050	<0.025	<0.00010	<0.00010	895	4.11	32.0	501	<5.0	<5.0
BH11-01A	22-Oct-2013	0.0243	<0.0050	<0.0050	<0.00010	<0.00010	200	0.157	23.3	310	<5.0	<5.0
P16	22-Oct-2013	0.0099	<0.0050	<0.0050	<0.00010	<0.00010	104	<0.0050	14.9	393	5.7	<5.0
3880	21-Oct-2013	0.0273	<0.0050	<0.0050	<0.00010	<0.00010	509	<0.0050	23.5	653	<5.0	<5.0
3221	21-Oct-2013	<0.0050	<0.0050	<0.0050	<0.00010	<0.00010	572	<0.0050	19.8	659	<5.0	<5.0
3226	21-Oct-2013	<0.0050	<0.0050	<0.0050	<0.00010	<0.00010	526	<0.0050	19.9	660	<5.0	<5.0
3443-1	23-Oct-2014	0.0087	<0.0050	<0.0050	<0.00010	<0.00010	419	0.0305	19.5	495	<5.0	<5.0
DUP	06-Jun-2013	0.0377	<0.0010	0.0037	<0.000010	<0.000010		0.877	23.9	238	<5.0	<5.0
DUP	01-Nov-2012	<0.0030	<0.0010	<0.0010	<0.000010	<0.000010		0.0351	21.9	351	<5.0	<5.0
BH11-27	01-Nov-2012	0.196	<0.0010	0.0151	<0.000010	<0.000010		1.38	20.8	346	<5.0	<5.0
JOHNSON 1	02-Apr-2014	0.0049	<0.0010	<0.0010	<0.000010	<0.000010		<0.0030	15.3	315	<10	<10
JOHNSON 2	02-Apr-2014	0.0044	<0.0010	<0.0010	<0.000010	<0.000010		<0.0030	15.8	313	<10	<10

Notes

T.: total

D.: dissolved


Hydrograph of NR9628, 2009-2013
Completion in Bedrock
Depth of open hole well: 243 m at a dip angle of -60°
Groundwater Elevation (masl)
Total Monthly Precipitation (mm/month)
Precipitation (Barwick)
Climate Normal (1971-2000)
Ground surface
Water Level
355
354
353
352
351
350
349
348
347
346
345
200
180
160
140
120
100
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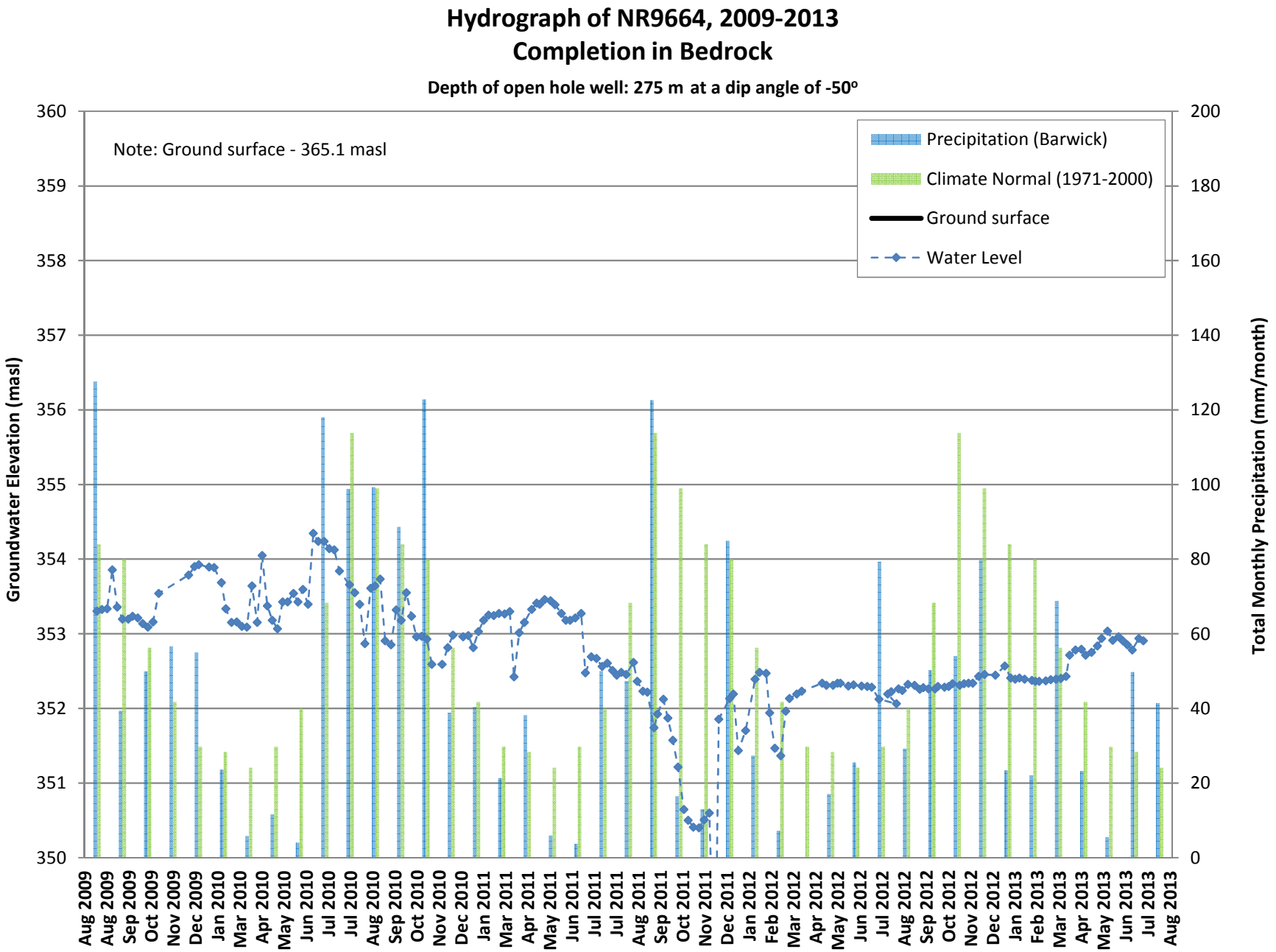
Hydrograph of NR9664, 2009-2013
Completion in Bedrock
Depth of open hole well: 275 m at a dip angle of -50°
Note: Ground surface - 365.1 masl
Precipitation (Barwick)
Climate Normal (1971-2000)
Ground surface
Water Level
Groundwater Elevation (masl)
Total Monthly Precipitation (mm/month)
360
359
358
357
356
355
354
353
352
351
350
200
180
160
140
120
100
80
60
40
20
0
Aug 2009
Aug 2009
Sep 2009
Oct 2009
Nov 2009
Dec 2009
Jan 2010
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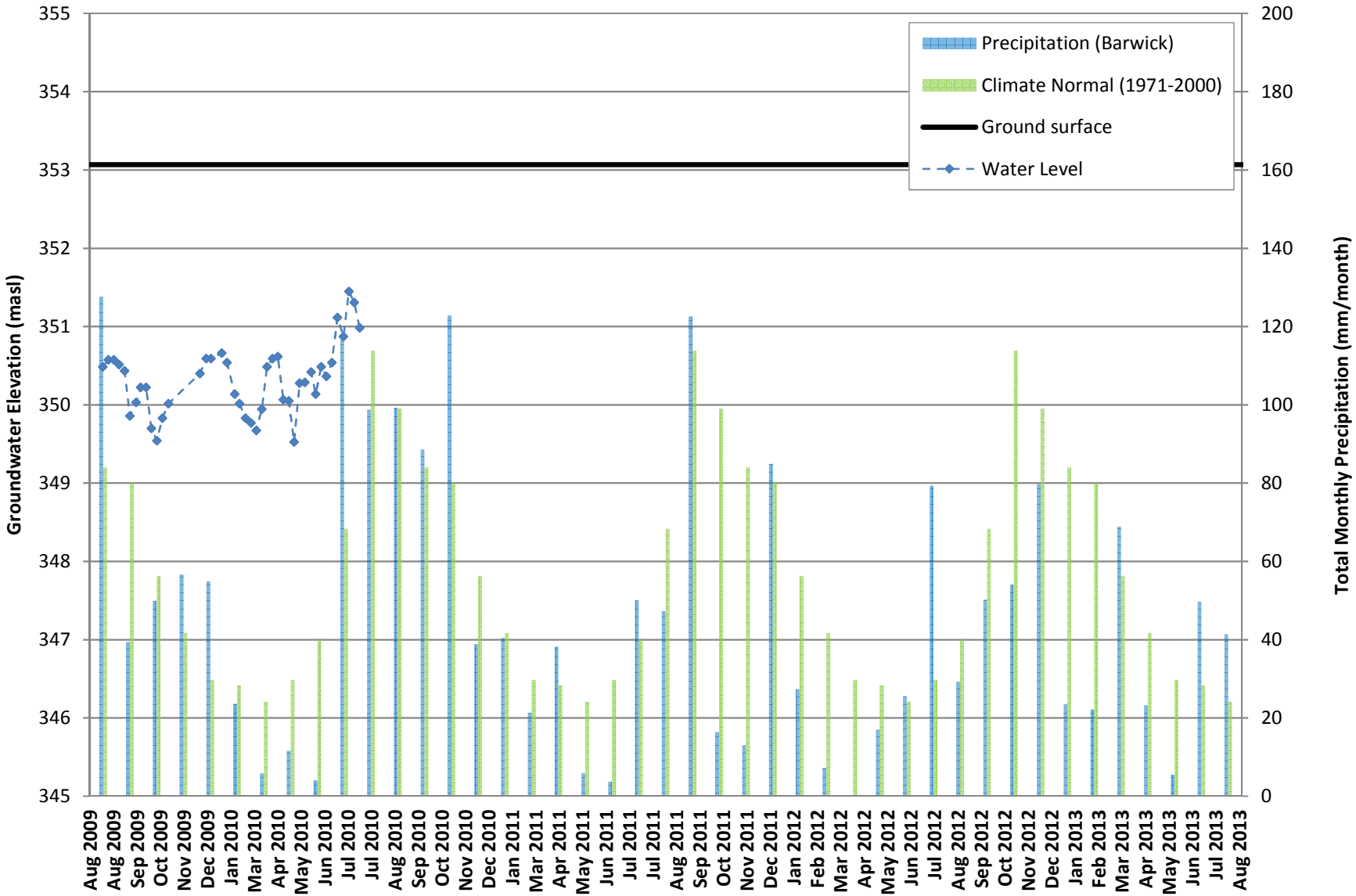
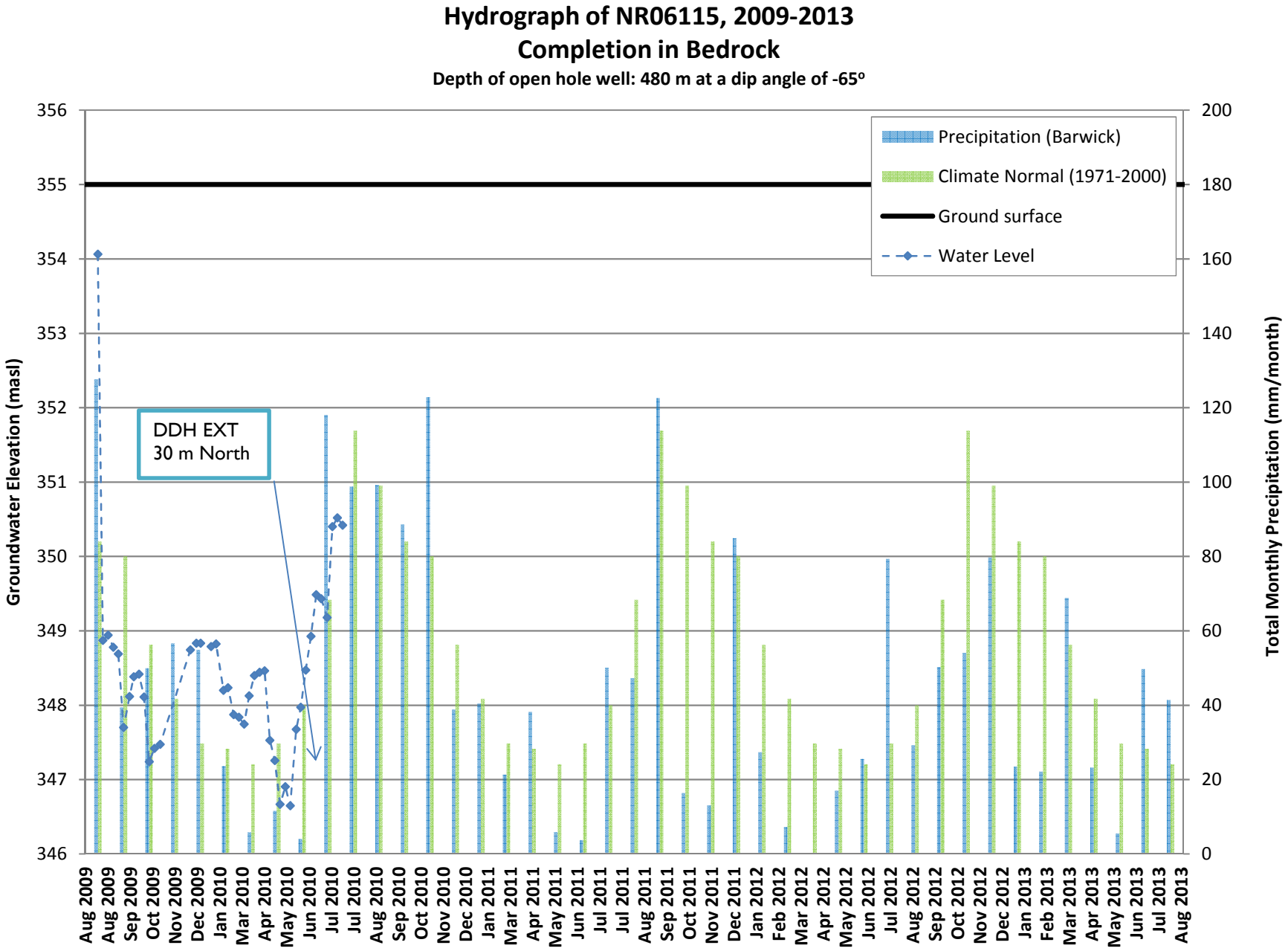
Jun 2013
Jul 2013
Aug 2013

TC111504

Hydrograph of NR06104, 2009-2013
Completion in Bedrock
Depth of open hole well: 500 m at a dip angle of -61°




Hydrograph of NR06115, 2009-2013
Completion in Bedrock
Depth of open hole well: 480 m at a dip angle of -65°
Groundwater Elevation (masl)
Total Monthly Precipitation (mm/month)
Precipitation (Barwick)
Climate Normal (1971-2000)
Ground surface
Water Level
DDH EXT
30 m North
356
355
354
353
352
351
350
349
348
347
346
200
180
160
140
120
100
80
60
40
20
0
Aug 2009
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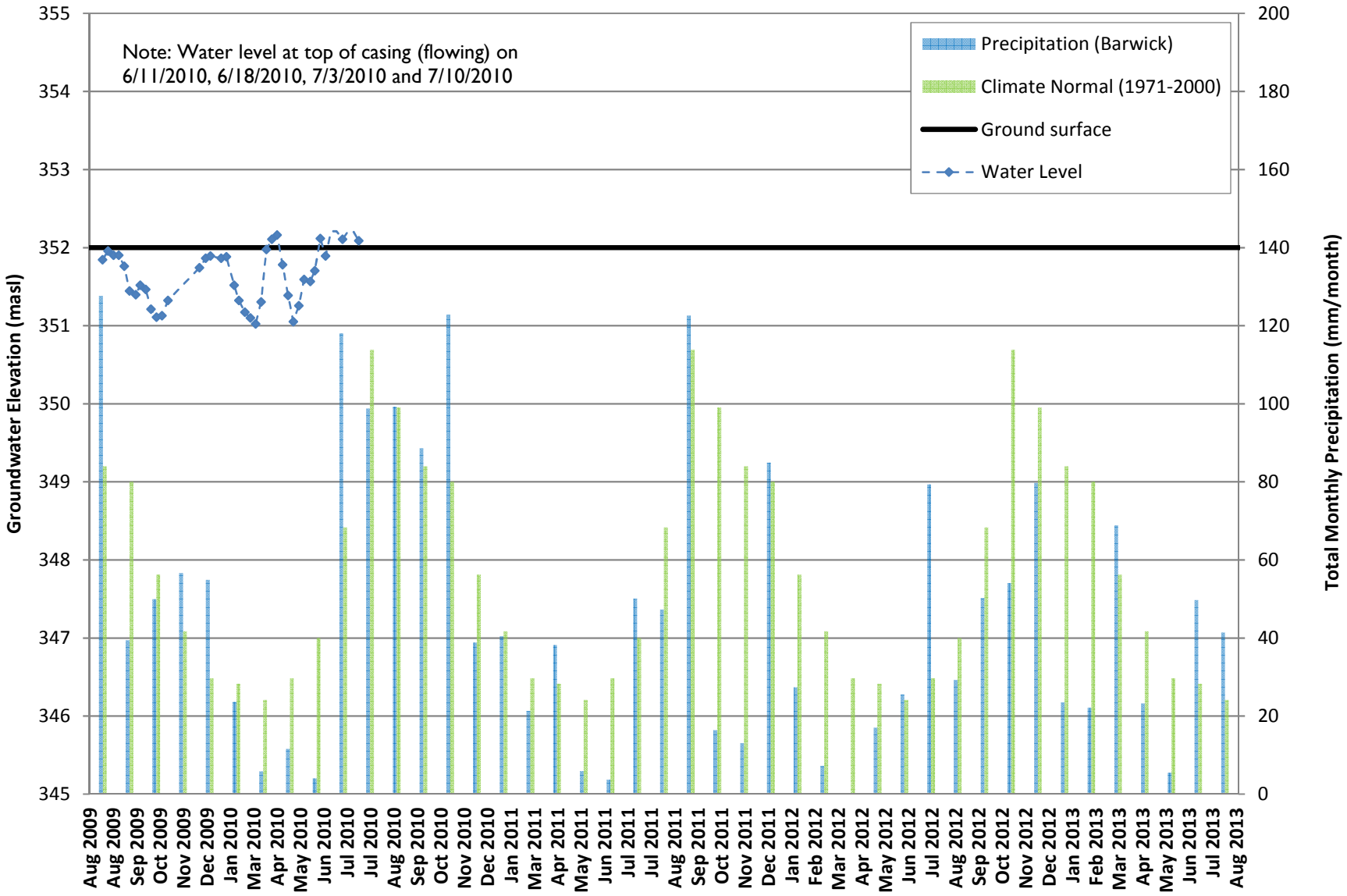
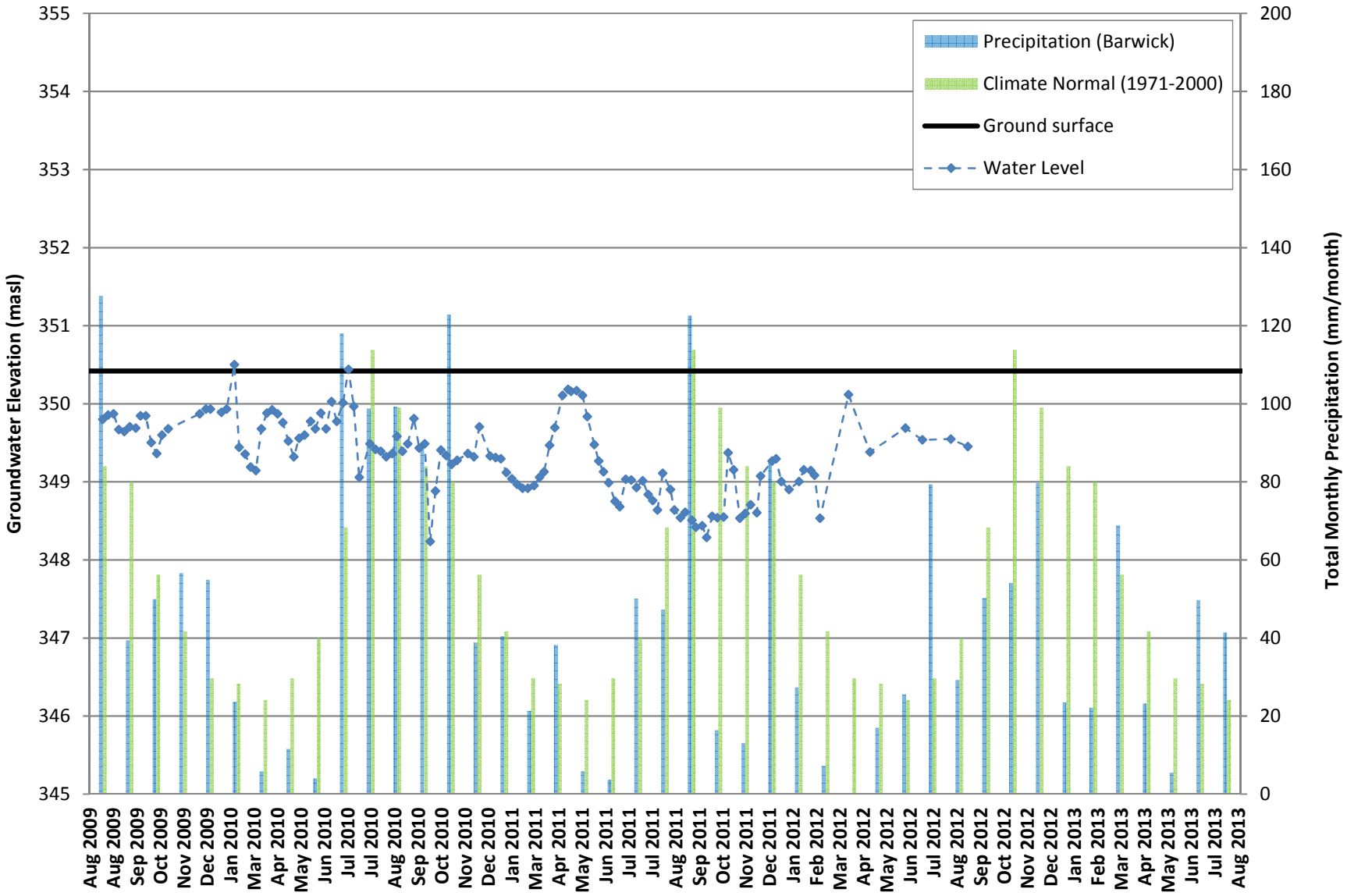
Jul 2013
Aug 2013

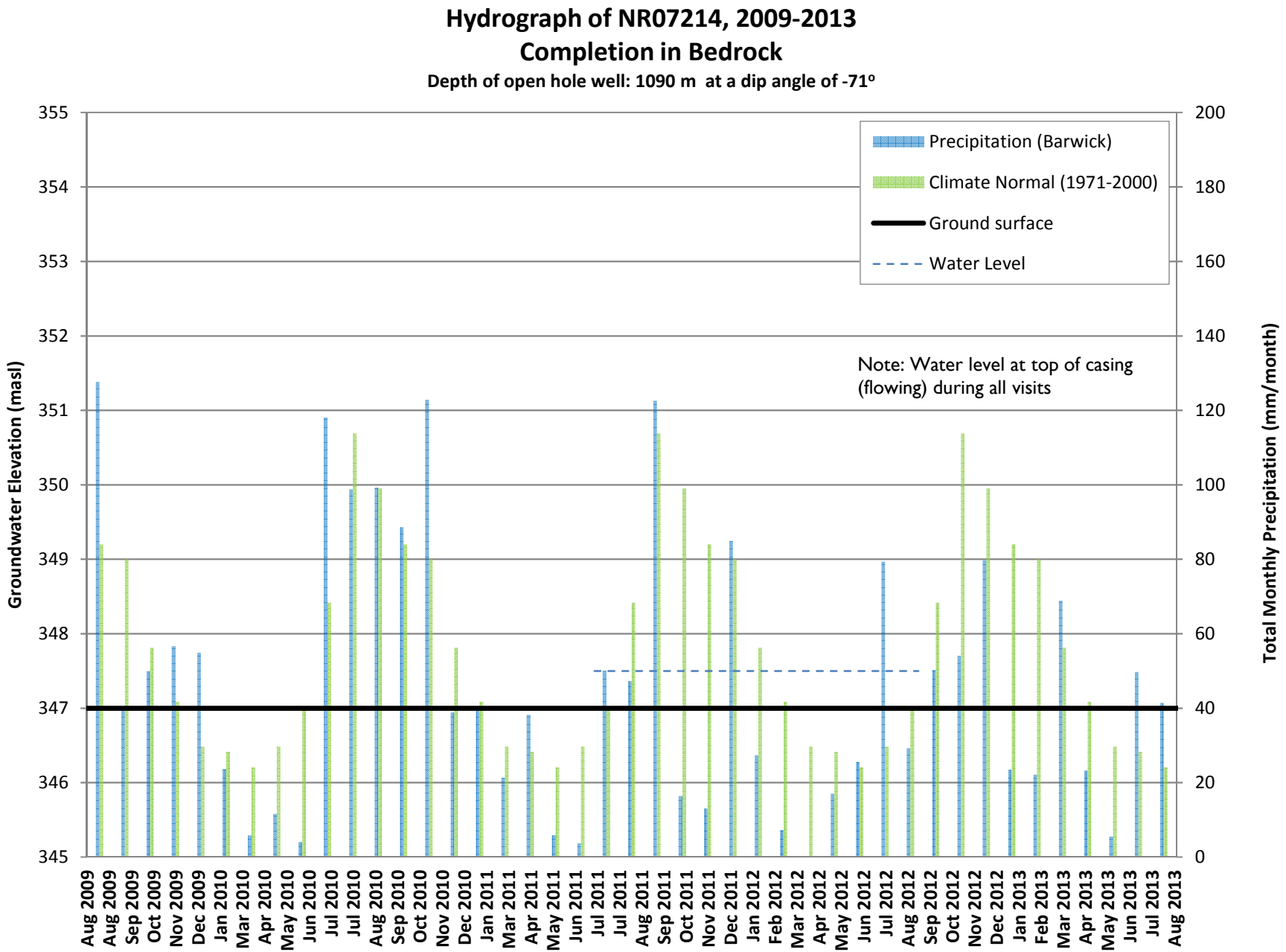
Hydrograph of NR07151, 2009-2013
Completion in Bedrock
Depth of open hole well: 489 m at a dip angle of -69°



TC111504

Hydrograph of NR07190, 2009-2013
Completion in Bedrock
Depth of open hole well: 593 m at a dip angle of -61°




Hydrograph of NR07214, 2009-2013
Completion in Bedrock
Depth of open hole well: 1090 m at a dip angle of -71°
Groundwater Elevation (masl)
Total Monthly Precipitation (mm/month)
355
354
353
352
351
350
349
348
347
346
345
200
180
160
140
120
100
80
60
40
20
0
Precipitation (Barwick)
Climate Normal (1971-2000)
Ground surface
Water Level
Note: Water level at top of casing (flowing) during all visits
Aug 2009
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Dec 2009
Jan 2010
Mar 2010
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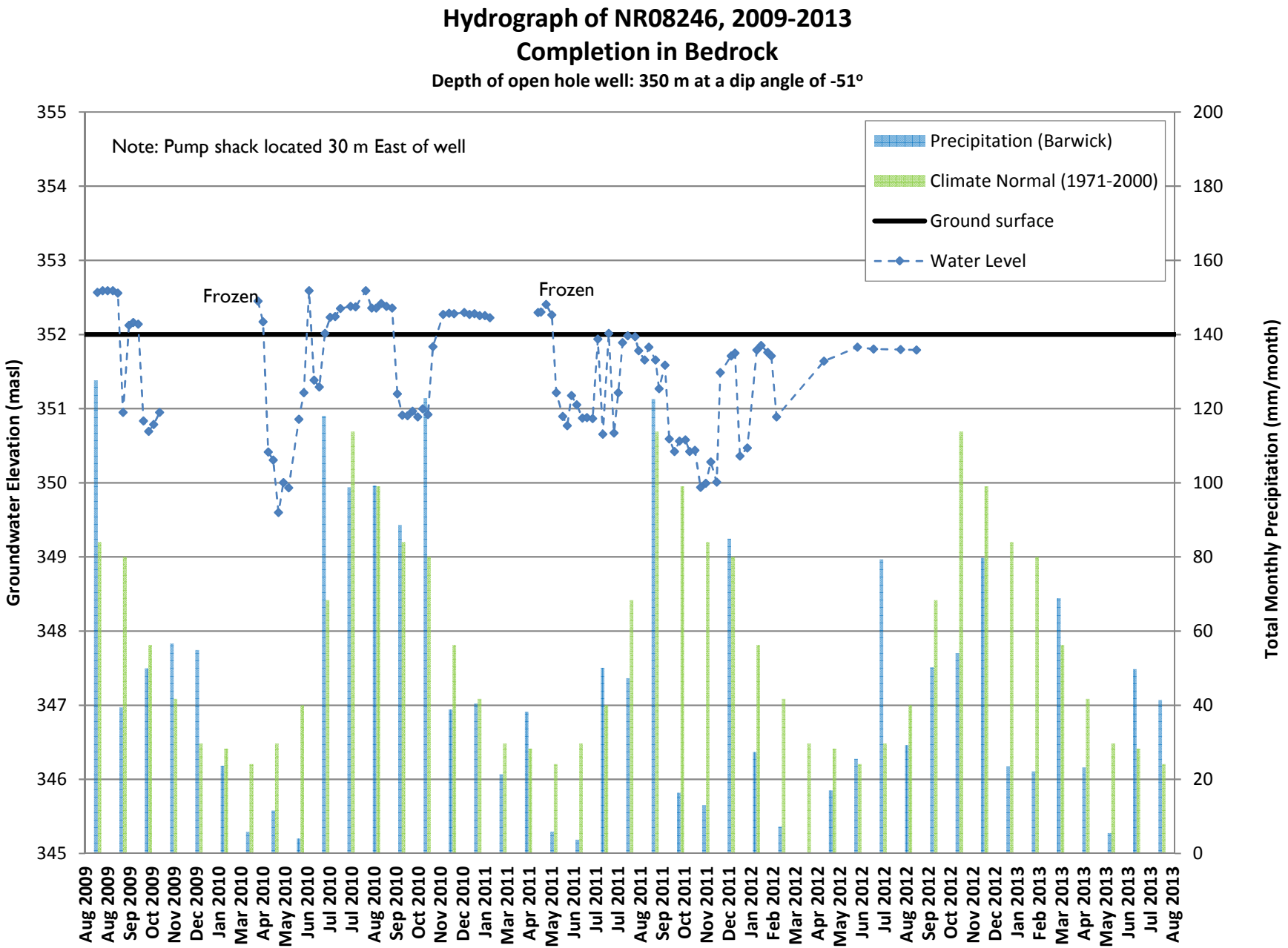
Hydrograph of NR08246, 2009-2013
Completion in Bedrock
Depth of open hole well: 350 m at a dip angle of -51°
Note: Pump shack located 30 m East of well
Frozen
Frozen
Precipitation (Barwick)
Climate Normal (1971-2000)
Ground surface
Water Level
Groundwater Elevation (masl)
Total Monthly Precipitation (mm/month)
355
354
353
352
351
350
349
348
347
346
345
200
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140
120
100
80
60
40
20
0
Aug 2009
Aug 2009
Sep 2009
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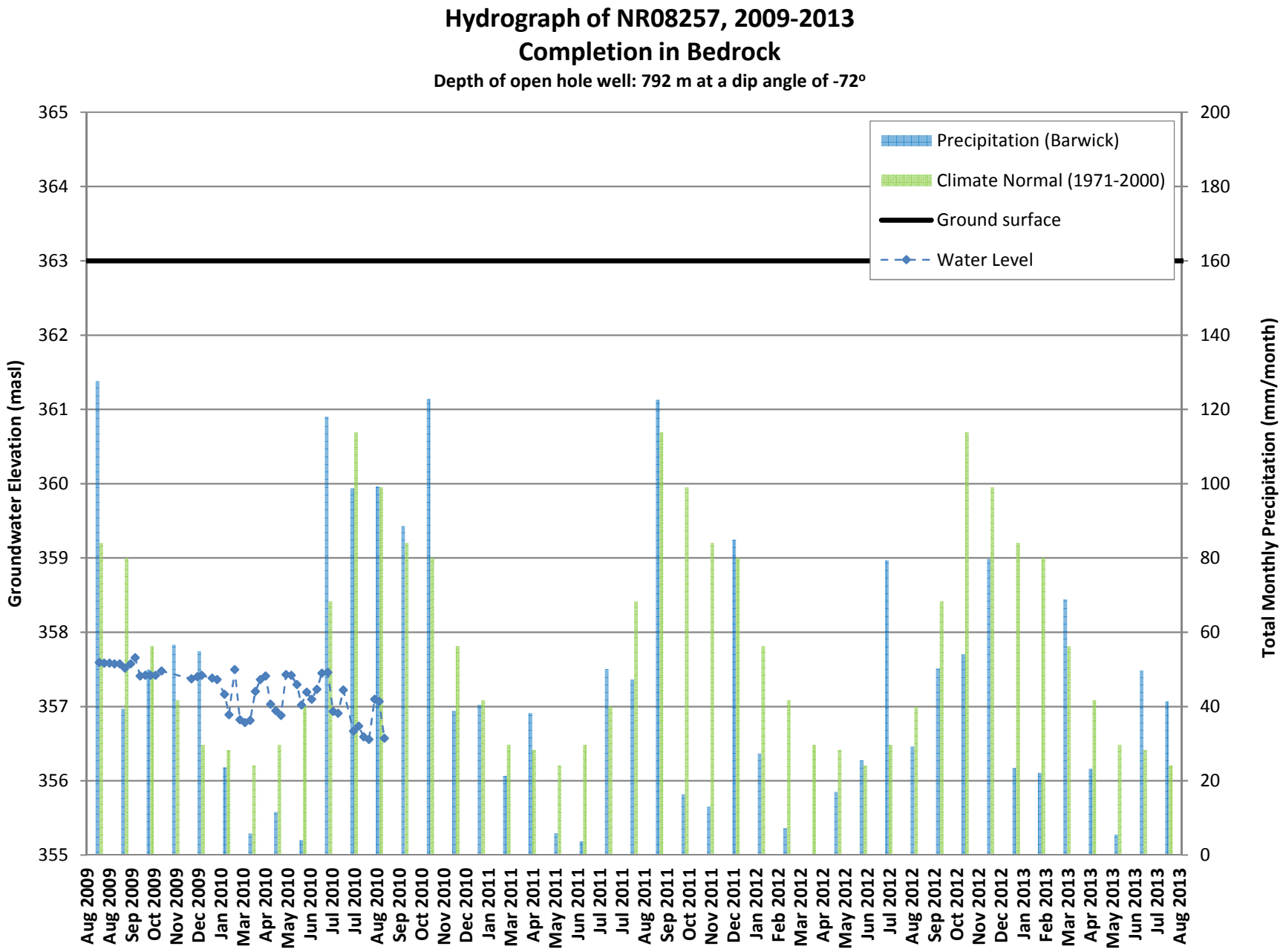
Hydrograph of NR08257, 2009-2013
Completion in Bedrock
Depth of open hole well: 792 m at a dip angle of -72°
Groundwater Elevation (masl)
Total Monthly Precipitation (mm/month)
Precipitation (Barwick)
Climate Normal (1971-2000)
Ground surface
Water Level
365
364
363
362
361
360
359
358
357
356
355
200
180
160
140
120
100
80
60
40
20
0
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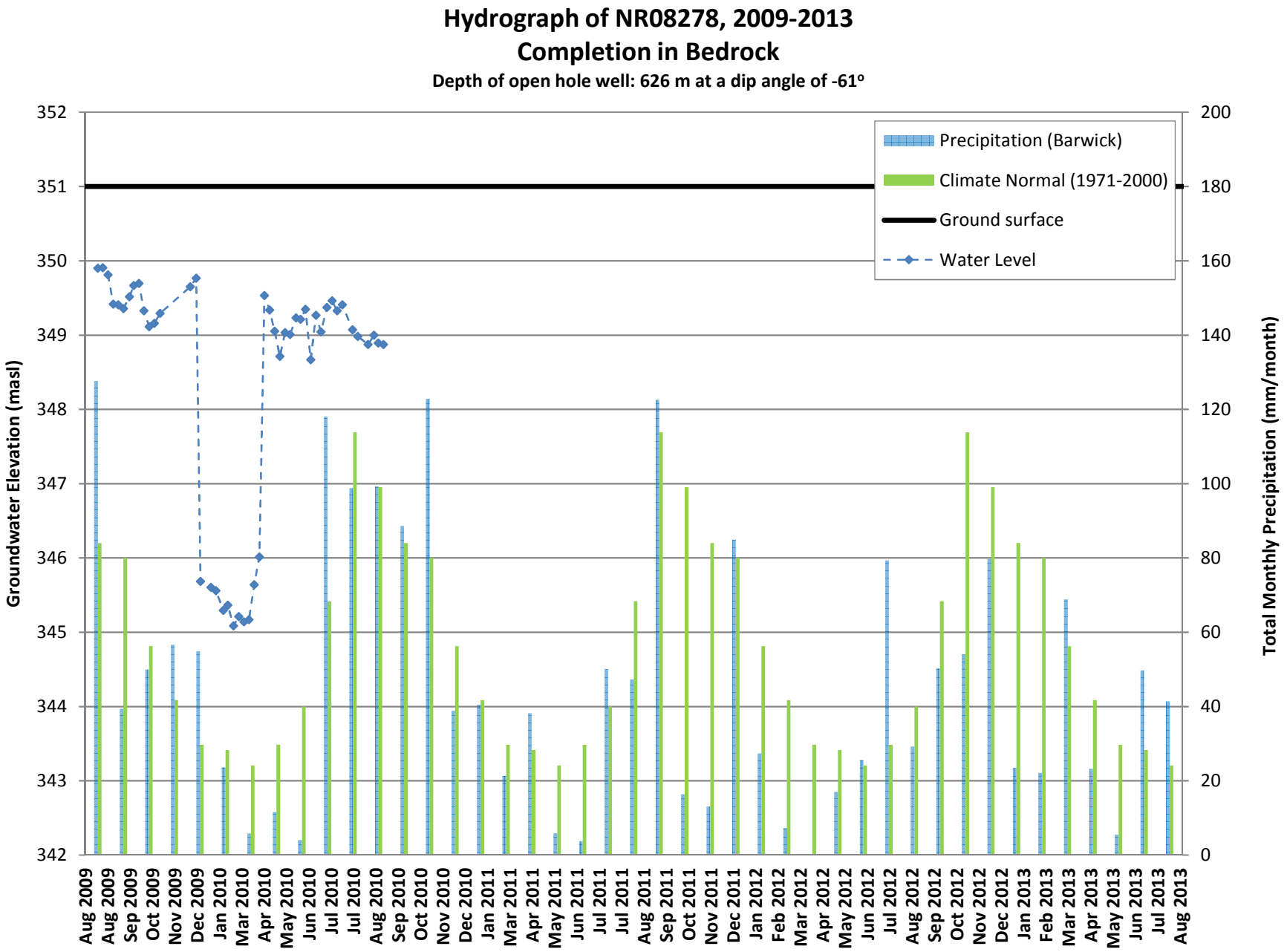
Hydrograph of NR08278, 2009-2013
Completion in Bedrock
Depth of open hole well: 626 m at a dip angle of -61°
Groundwater Elevation (masl)
Total Monthly Precipitation (mm/month)
Precipitation (Barwick)
Climate Normal (1971-2000)
Ground surface
Water Level
352
351
350
349
348
347
346
345
344
343
342
200
180
160
140
120
100
80
60
40
20
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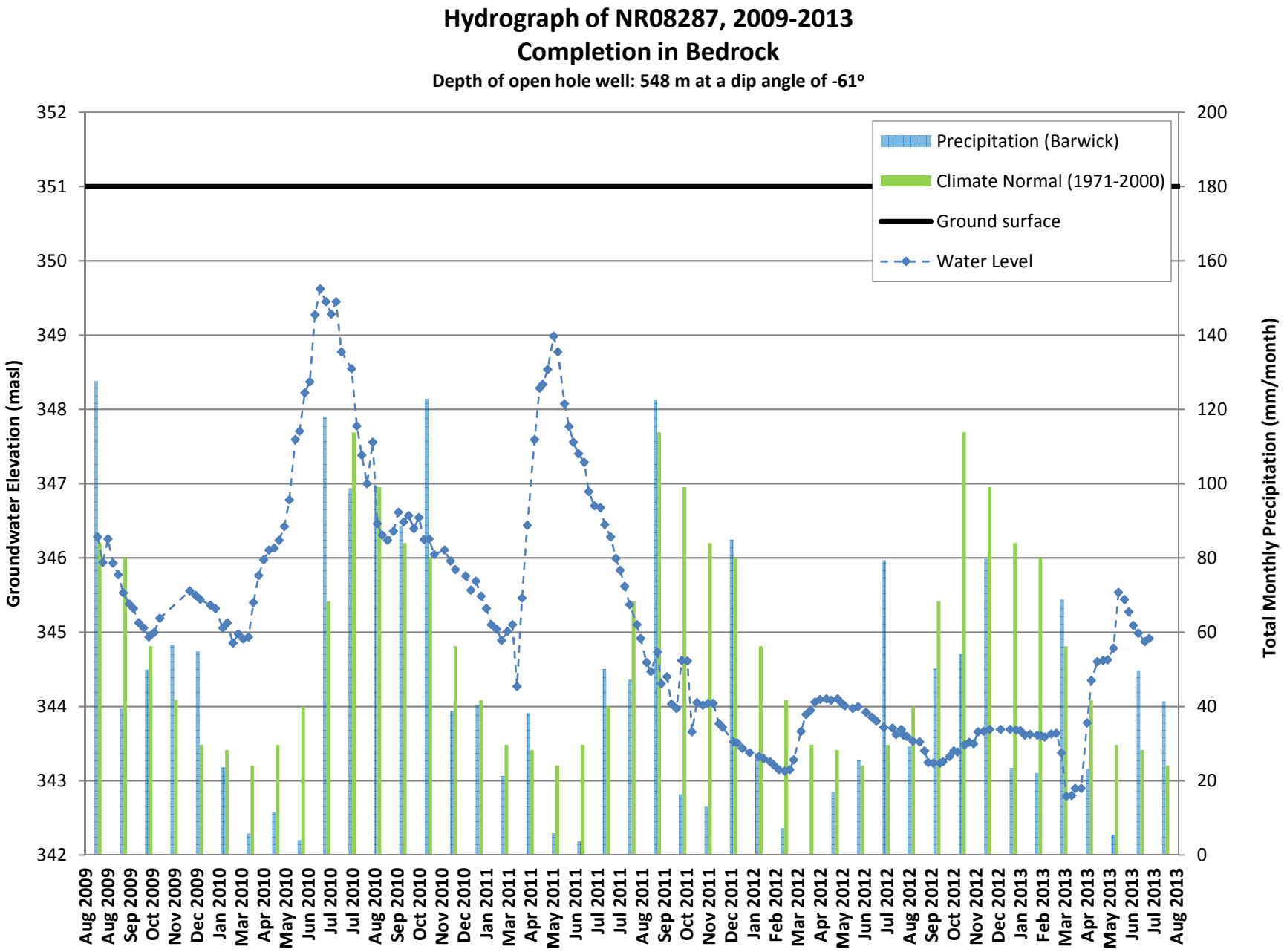
Hydrograph of NR08287, 2009-2013
Completion in Bedrock
Depth of open hole well: 548 m at a dip angle of -61°
Groundwater Elevation (masl)
Total Monthly Precipitation (mm/month)
Precipitation (Barwick)
Climate Normal (1971-2000)
Ground surface
Water Level
352
351
350
349
348
347
346
345
344
343
342
200
180
160
140
120
100
80
60
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20
0
Aug 2009
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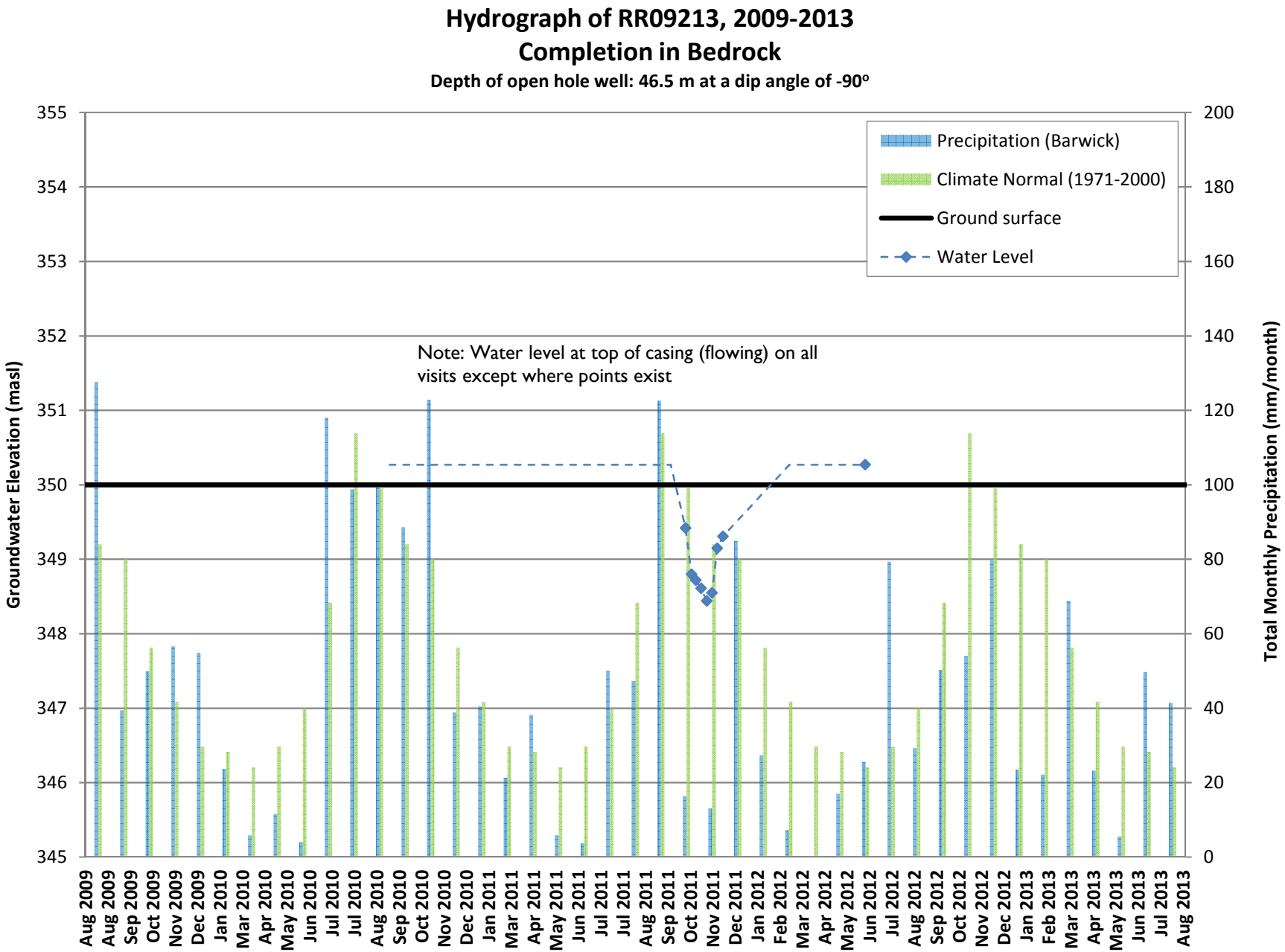
Hydrograph of RR09213, 2009-2013
Completion in Bedrock
Depth of open hole well: 46.5 m at a dip angle of -90°
Precipitation (Barwick)
Climate Normal (1971-2000)
Ground surface
Water Level
Note: Water level at top of casing (flowing) on all visits except where points exist
Groundwater Elevation (masl)
Total Monthly Precipitation (mm/month)
355
354
353
352
351
350
349
348
347
346
345
200
180
160
140
120
100
80
60
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Aug 2009
Aug 2009
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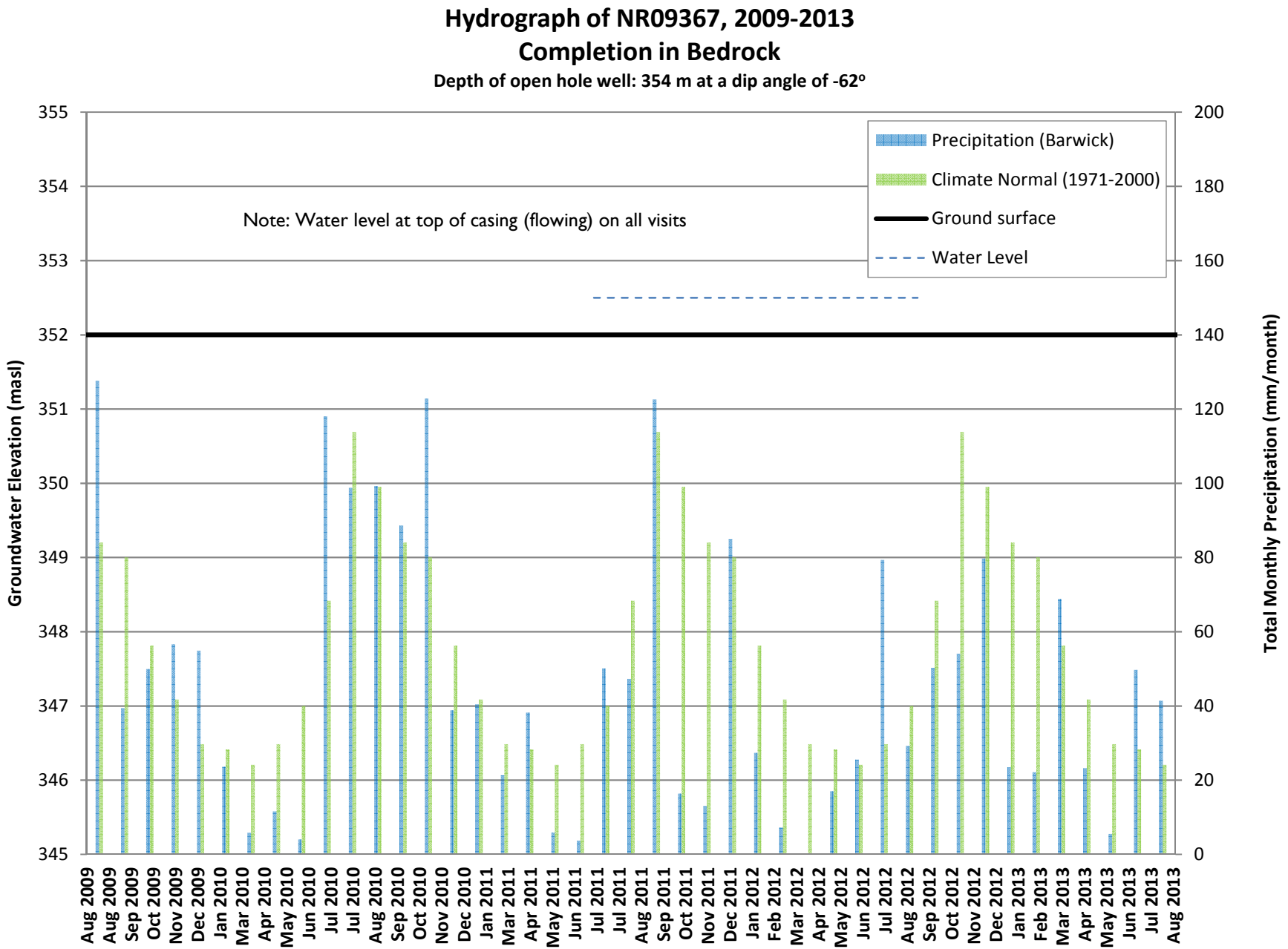
Hydrograph of NR09367, 2009-2013
Completion in Bedrock
Depth of open hole well: 354 m at a dip angle of -62°
Note: Water level at top of casing (flowing) on all visits
Precipitation (Barwick)
Climate Normal (1971-2000)
Ground surface
Water Level
Groundwater Elevation (masl)
Total Monthly Precipitation (mm/month)
355
354
353
352
351
350
349
348
347
346
345
200
180
160
140
120
100
80
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Aug 2009
Aug 2009
Sep 2009
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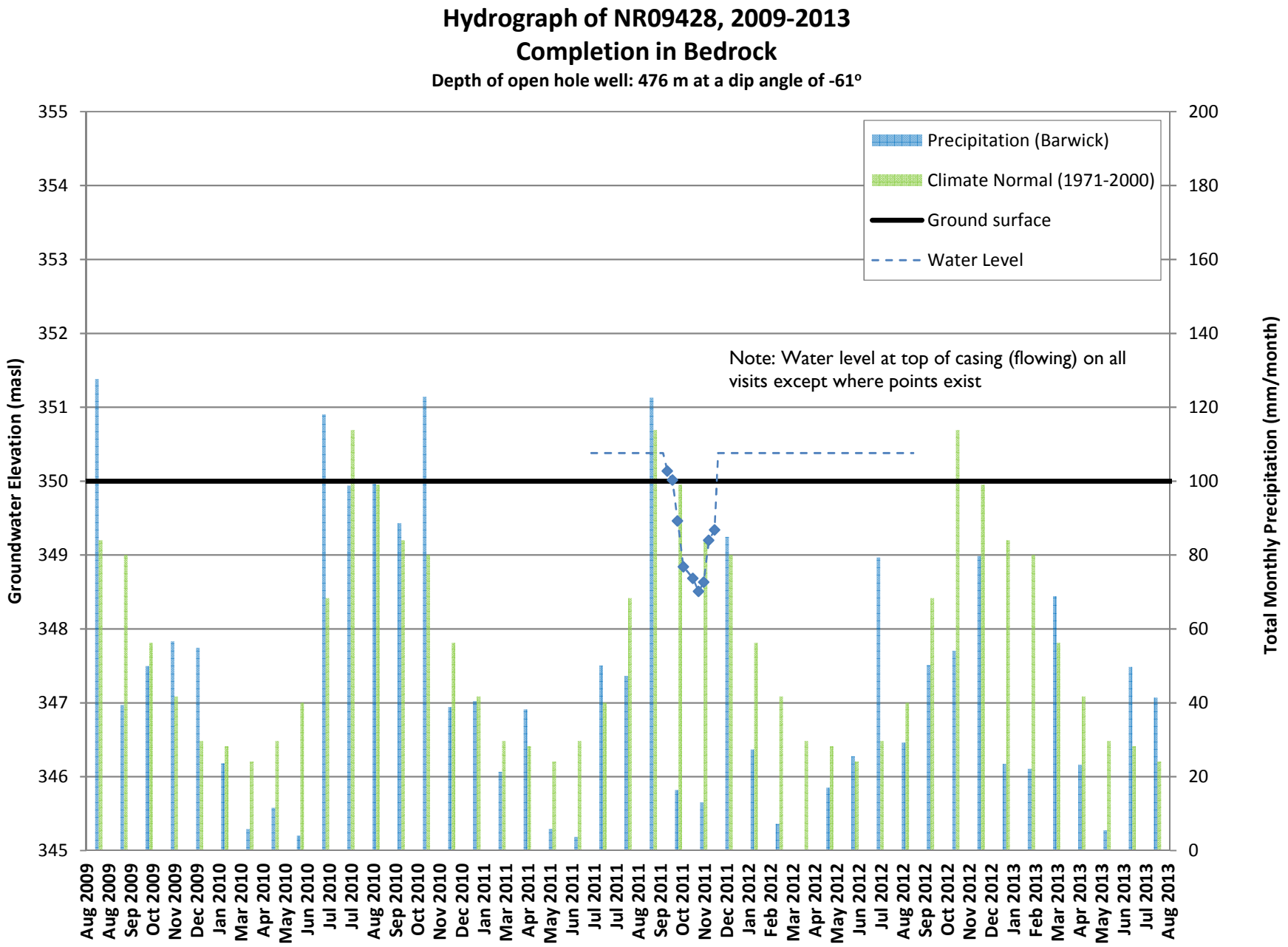
Hydrograph of NR09428, 2009-2013
Completion in Bedrock
Depth of open hole well: 476 m at a dip angle of -61°
Groundwater Elevation (masl)
Total Monthly Precipitation (mm/month)
Precipitation (Barwick)
Climate Normal (1971-2000)
Ground surface
Water Level
Note: Water level at top of casing (flowing) on all visits except where points exist
355
354
353
352
351
350
349
348
347
346
345
200
180
160
140
120
100
80
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Aug 2009
Aug 2009
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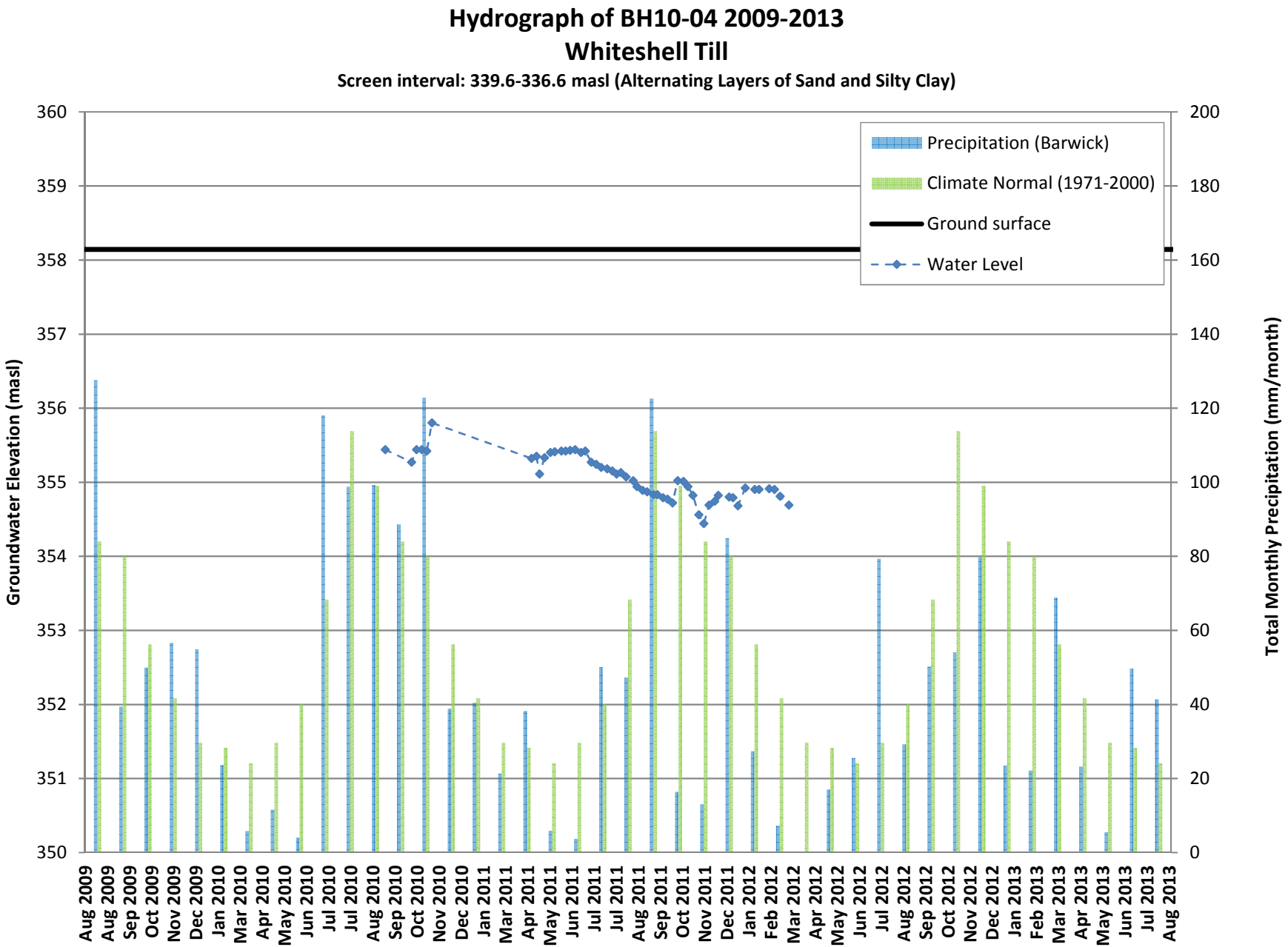
Hydrograph of BH10-04 2009-2013
Whiteshell Till
Screen interval: 339.6-336.6 masl (Alternating Layers of Sand and Silty Clay)
Groundwater Elevation (masl)
Total Monthly Precipitation (mm/month)
Precipitation (Barwick)
Climate Normal (1971-2000)
Ground surface
Water Level
360
359
358
357
356
355
354
353
352
351
350
200
180
160
140
120
100
80
60
40
20
0
Aug 2009
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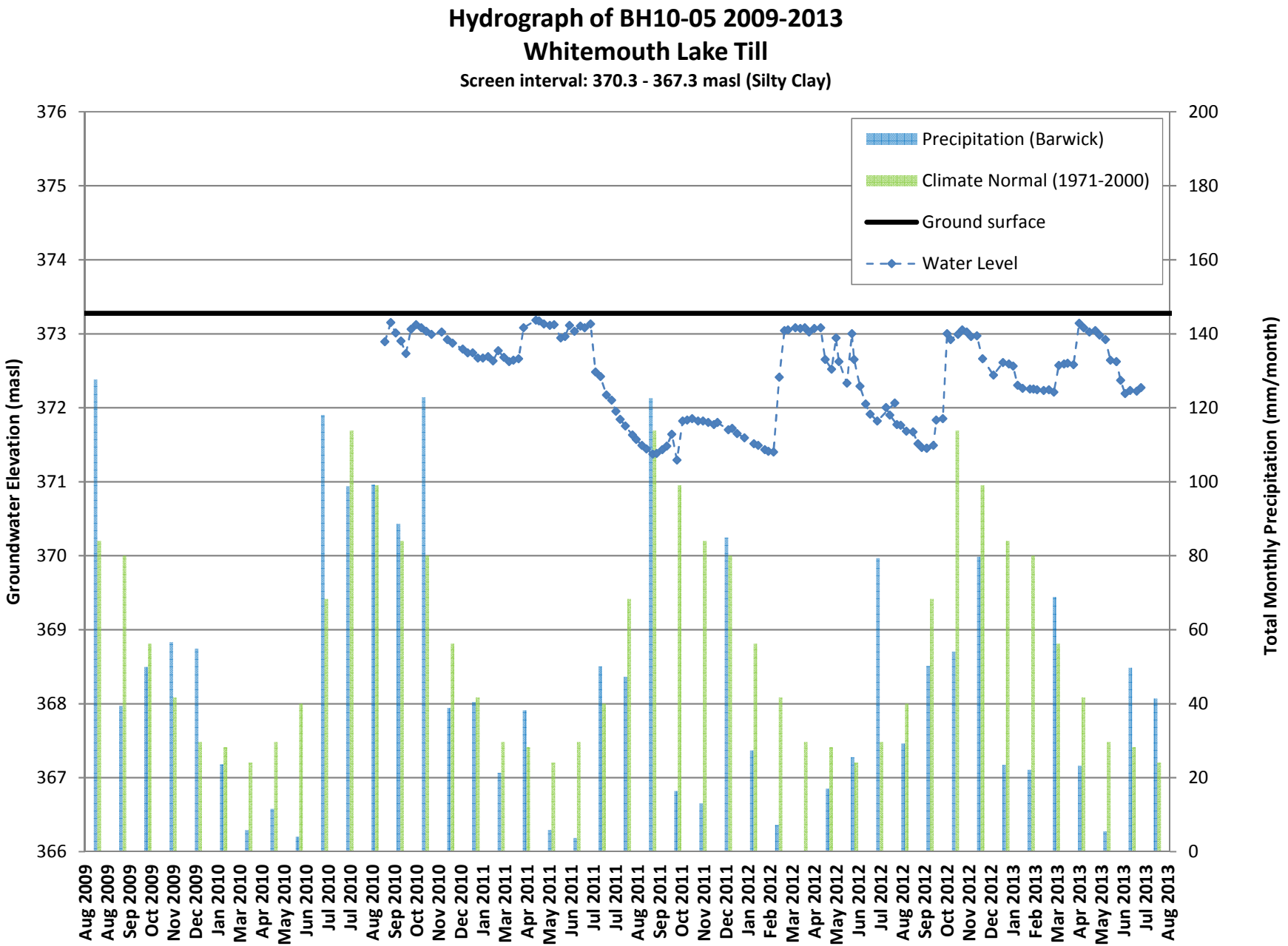
Hydrograph of BH10-05 2009-2013
Whitemouth Lake Till
Screen interval: 370.3 - 367.3 masl (Silty Clay)
Groundwater Elevation (masl)
Total Monthly Precipitation (mm/month)
Precipitation (Barwick)
Climate Normal (1971-2000)
Ground surface
Water Level
376
375
374
373
372
371
370
369
368
367
366
200
180
160
140
120
100
80
60
40
20
0
Aug 2009
Aug 2009
Sep 2009
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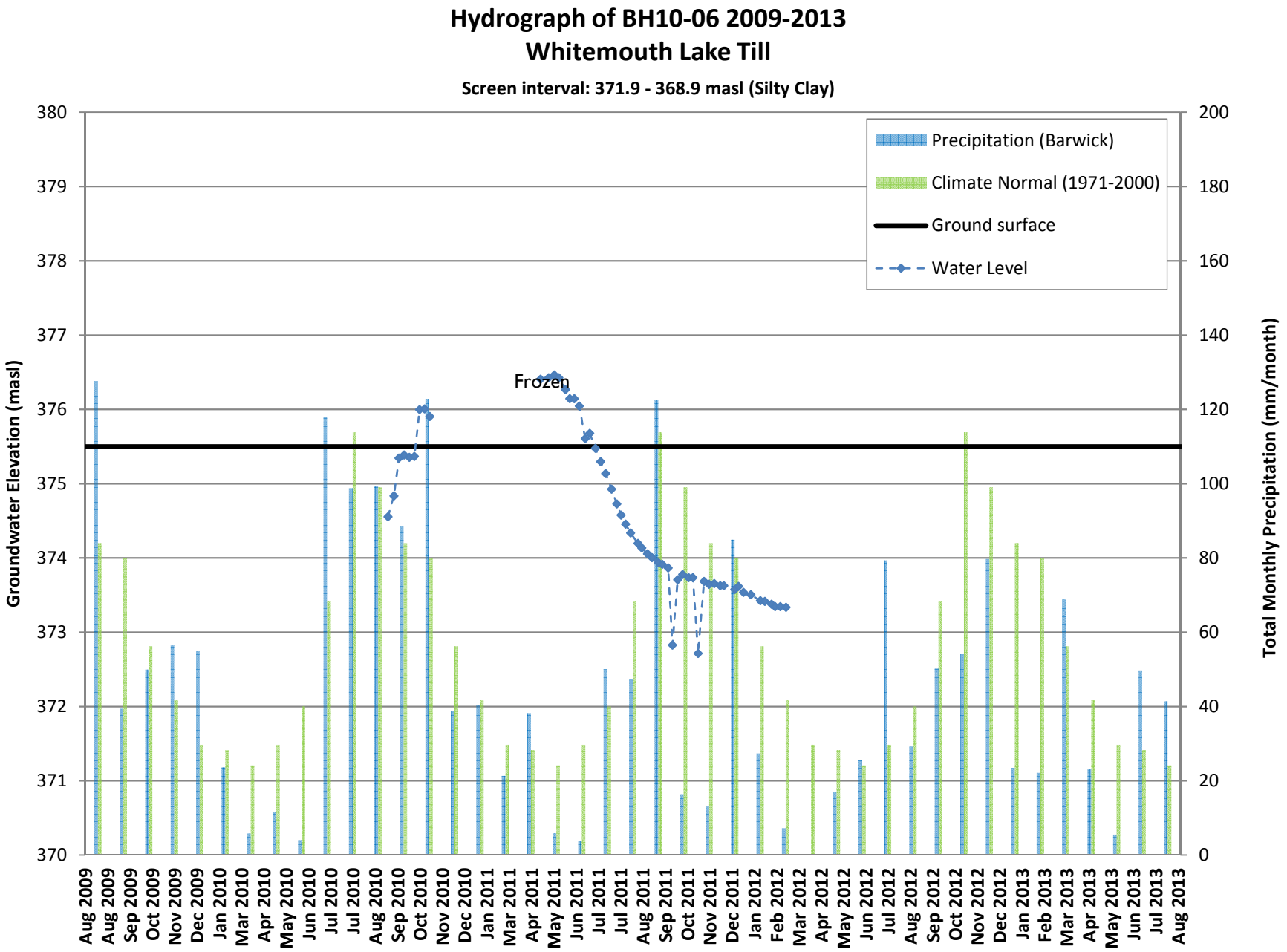
Hydrograph of BH10-06 2009-2013
Whitemouth Lake Till
Screen interval: 371.9 - 368.9 masl (Silty Clay)
Groundwater Elevation (masl)
Total Monthly Precipitation (mm/month)
Precipitation (Barwick)
Climate Normal (1971-2000)
Ground surface
Water Level
Frozen
380
379
378
377
376
375
374
373
372
371
370
200
180
160
140
120
100
80
60
40
20
0
Aug 2009
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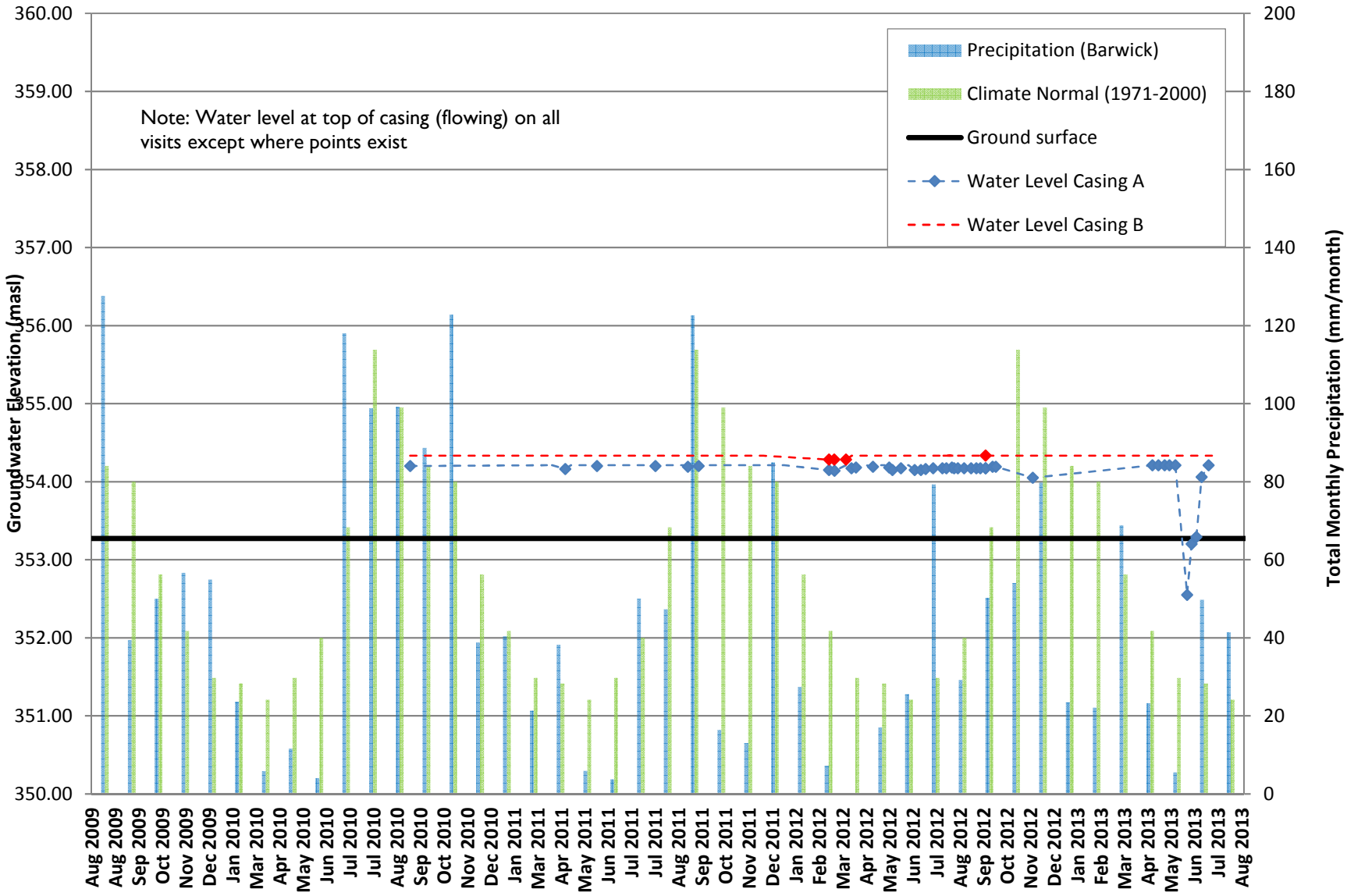
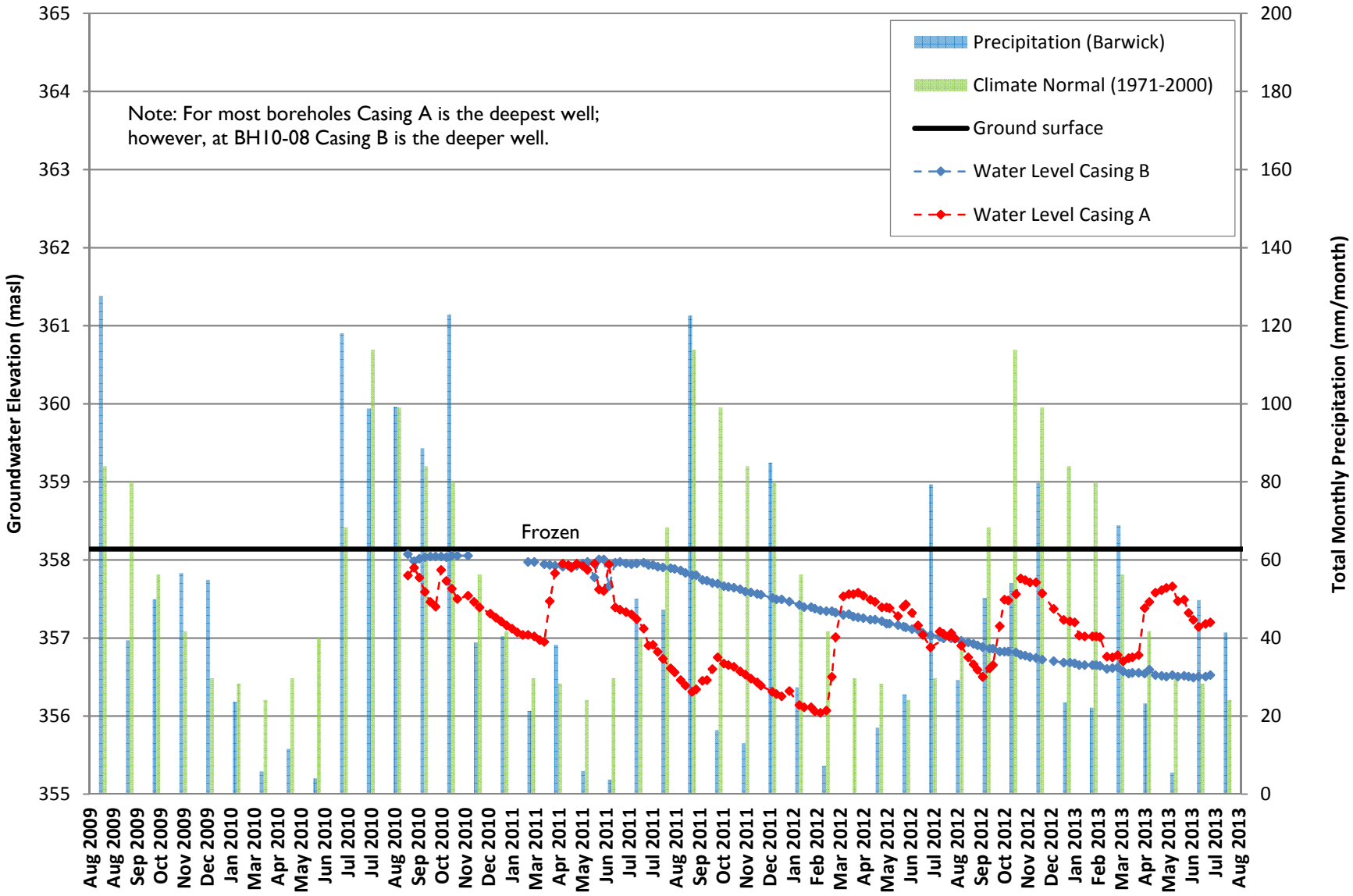
Hydrograph of BH10-07 2009-2013
Casing A - Whitemouth Lake Till; Casing B - Whitemouth Lake Till
Screen interval: Casing A - 331.3 - 328.3 masl (Silty Clay); Casing B - 351.9 - 348.9 masl (Silty Clay)



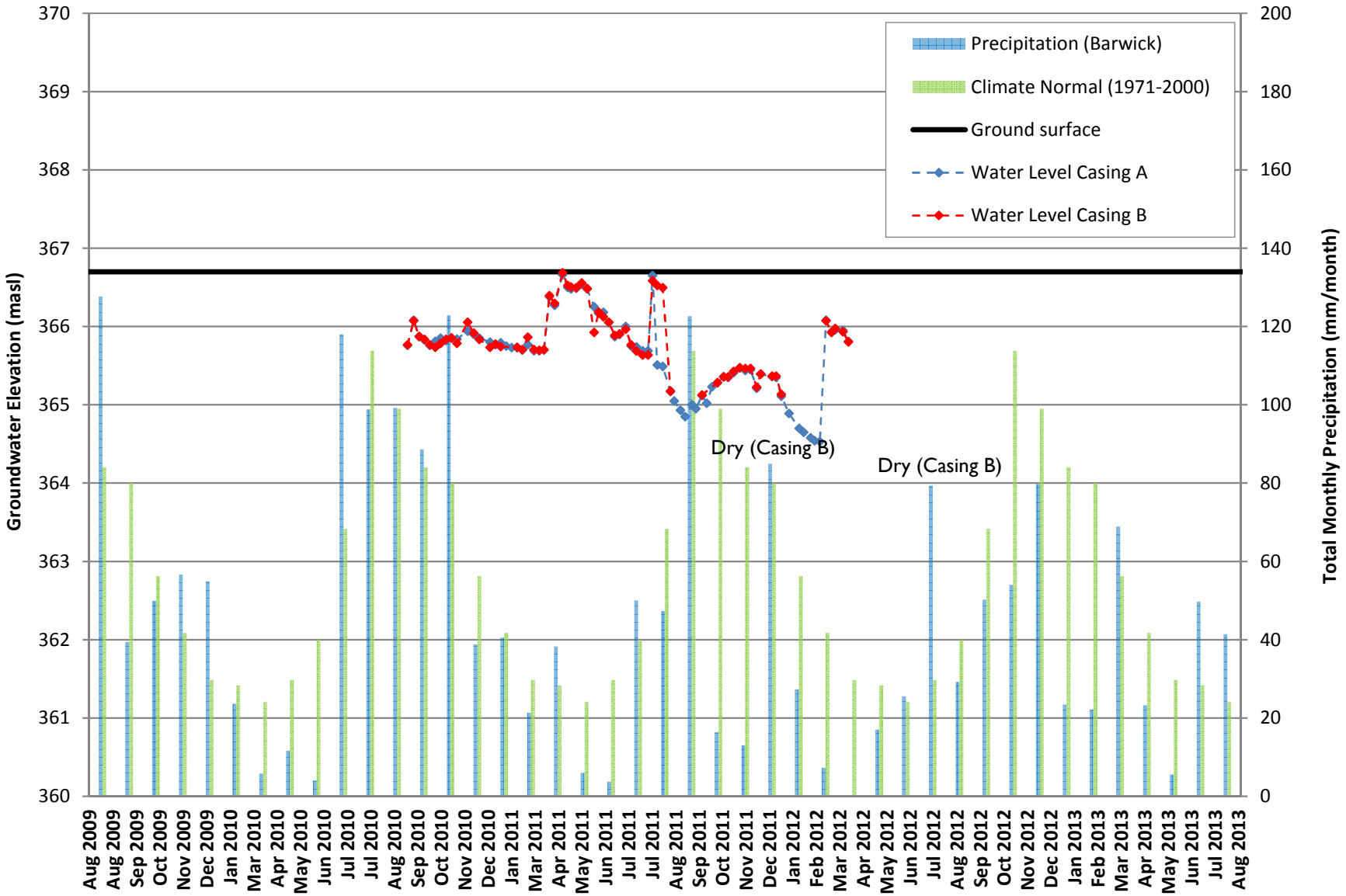
Hydrograph of BH10-08 2009-2013

Casing A - Whitemouth Lake Till; Casing B - Whitemouth Lake Till

Screen interval: Casing A - 354.4 - 351.4 masl (Silty Clay); Casing B - 346.4 - 343.4 masl (Silty Clay and Varved Clay)



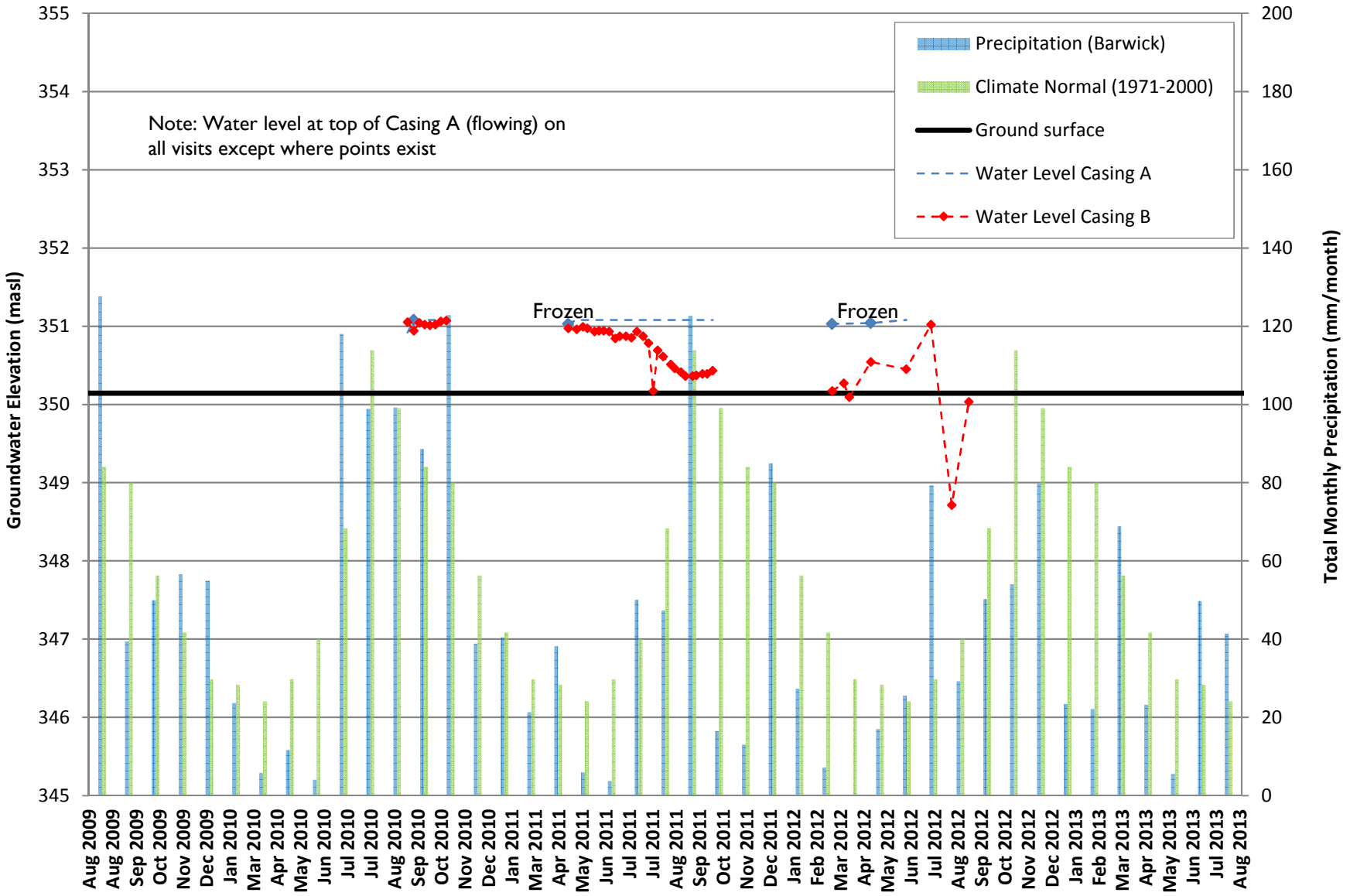
Hydrograph of BH10-09 2009-2013
Casing A - Bedrock; Casing B - Whiteshell Till
Screen interval: Casing A - 364.5 - 363.0 masl (Bedrock); Casing B - 366.2 - 364.7 masl (Sandy Gravel)



Hydrograph of BH10-10 2009-2013

Casing A - Whitemouth Lake Till; Casing B - Whitemouth Lake Till

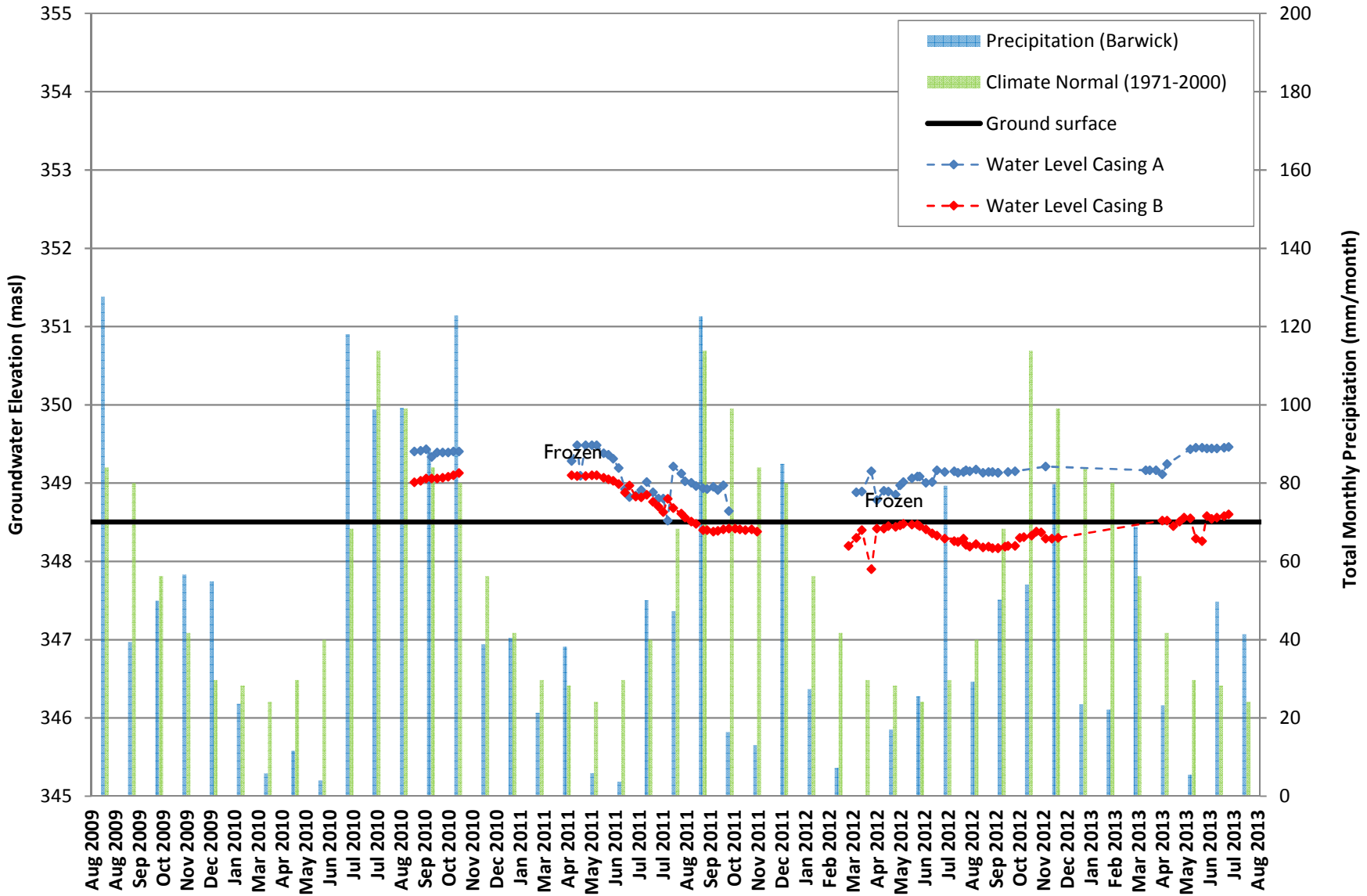
Screen interval: Casing A - 322.9 - 319.9 masl (Silty Clay and Silty Sand); Casing B - 340.3 - 337.3 masl (Silty Sand and Silty Clay)



Hydrograph of BH10-11 2009-2013

Casing A - Whiteshell Till; Casing B - Whitemouth Lake Till

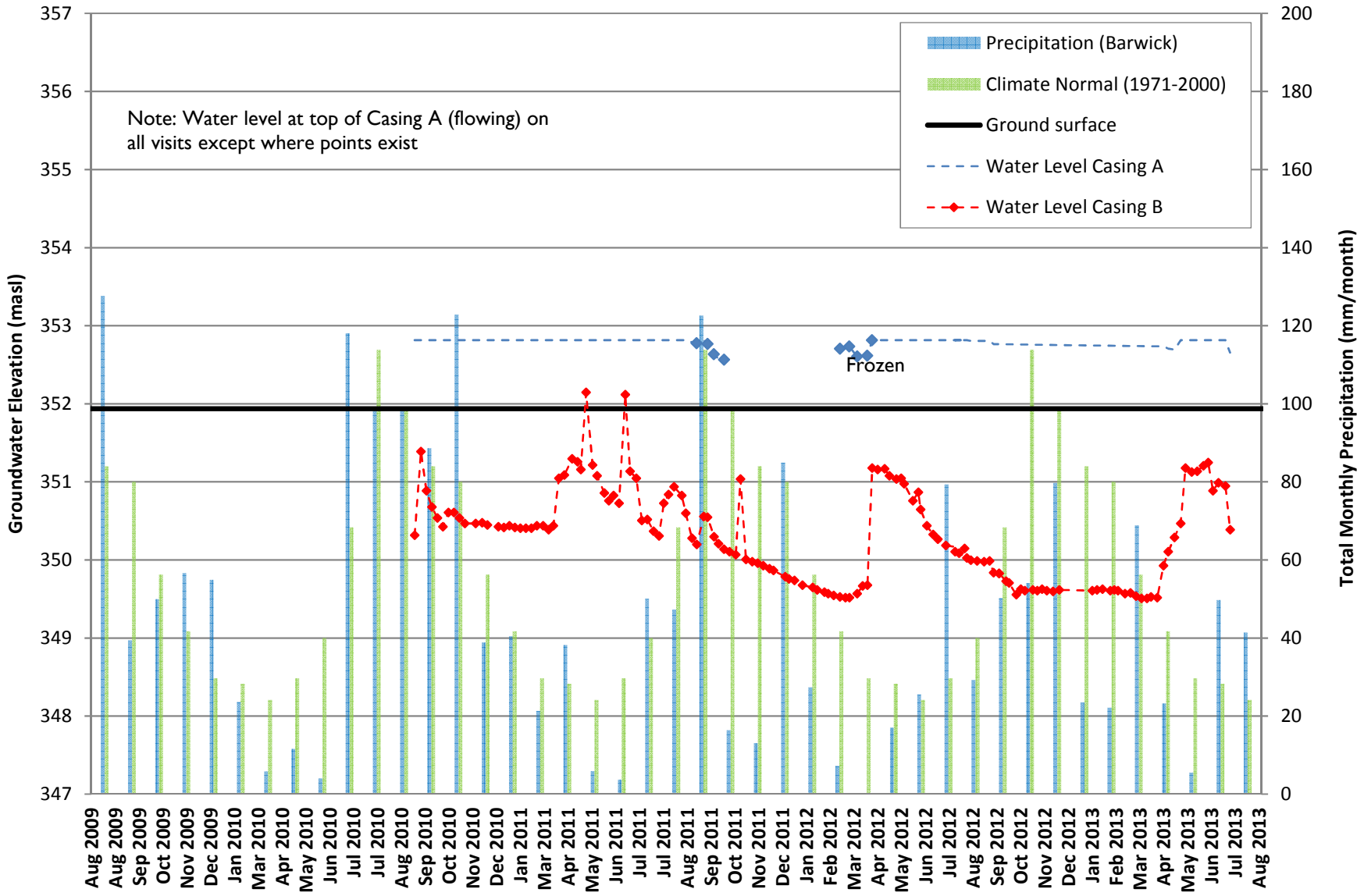
Screen interval: Casing A - 321.8 - 318.8 masl (Silty Sand and Sand Gravel); Casing B - 339.1 - 336.1 masl (Silty Clay)



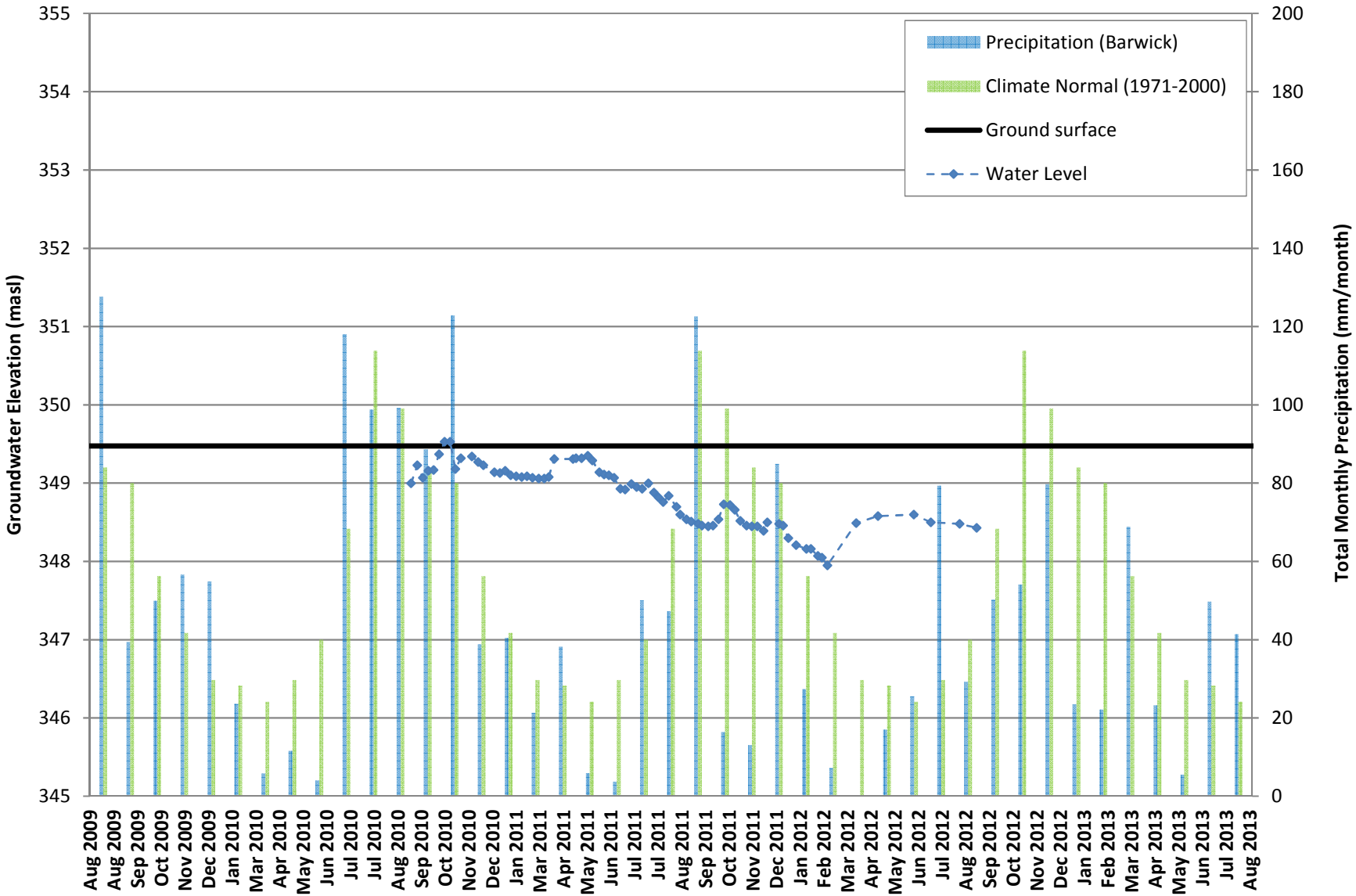
Hydrograph of BH10-12 2009-2013

Casing A - Whiteshell Till and Bedrock; Casing B - Whitemouth Lake Till

Screen interval: Casing A - 335.4 - 332.4 masl (Silty Sand and Bedrock); Casing - 345.9 - 342.9 masl (Silty Clay)

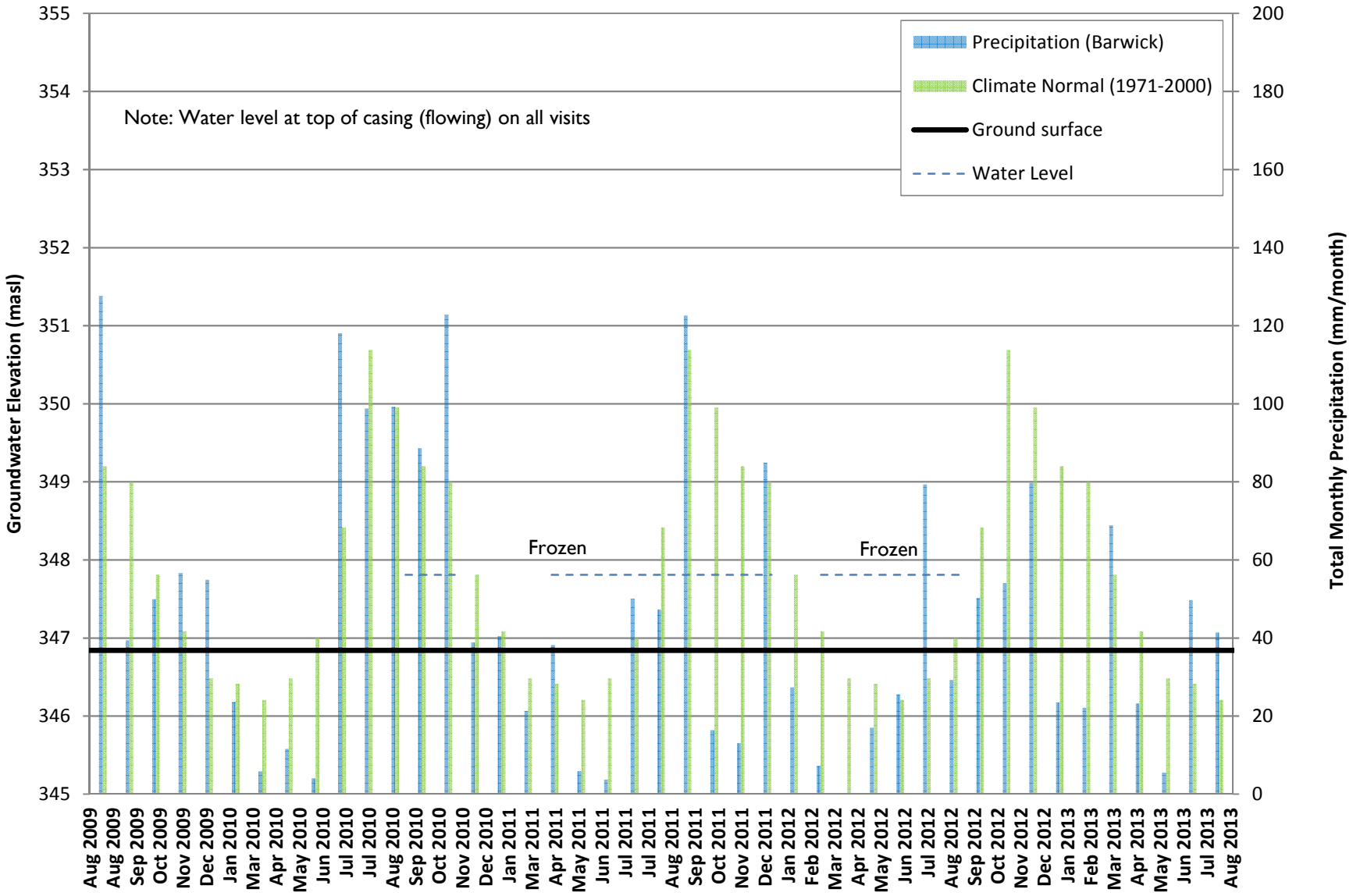


Hydrograph of BH10-13 2009-2013
Whiteshell Till
Screen interval: 333.2 - 330.2 masl (Sandy Gravel, Silty Clay, and Sand)

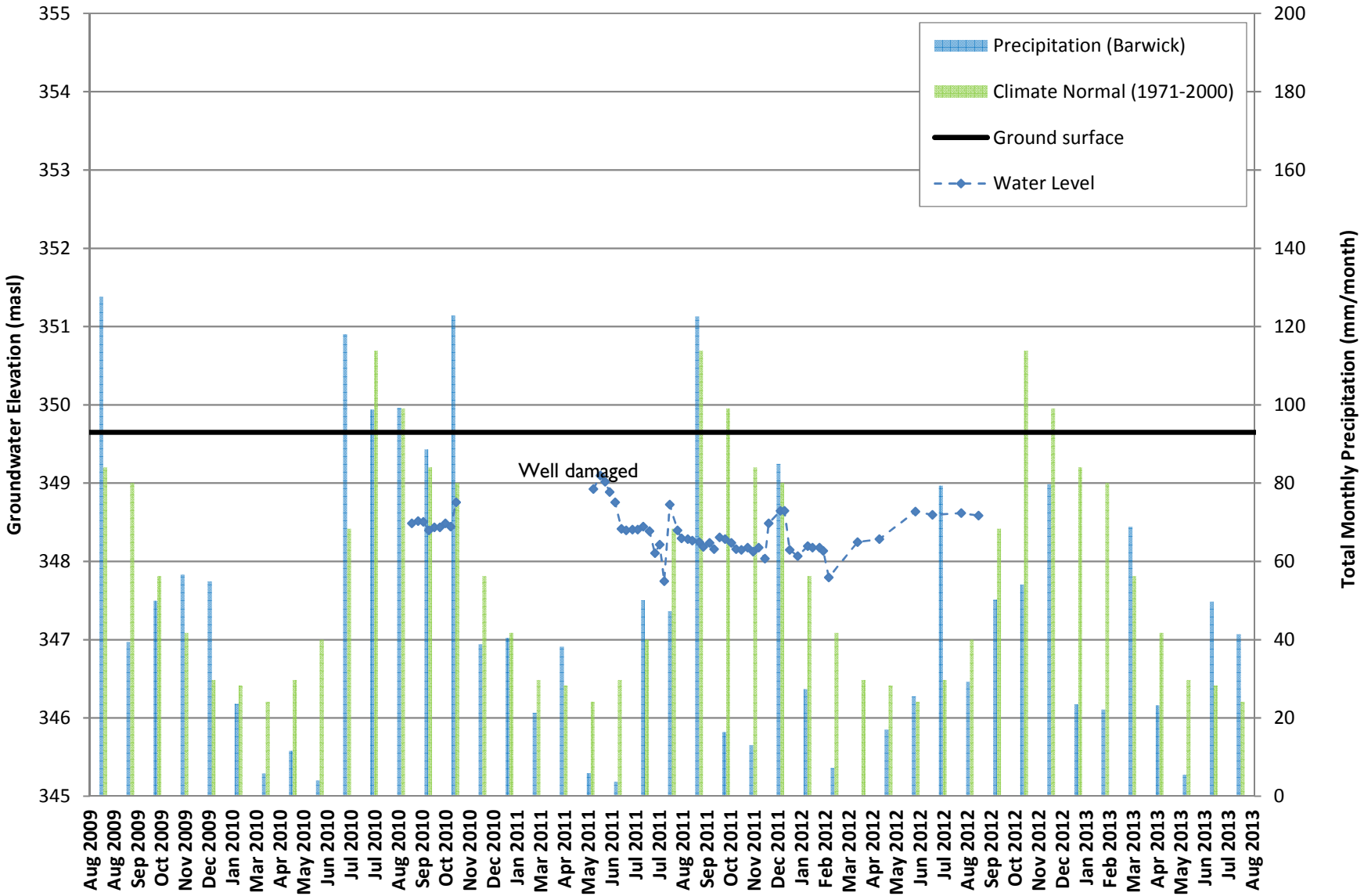


TC111504

Hydrograph of BH10-14 2009-2013
Whitemouth Lake Till and Whiteshell Till
Screen interval: 330.2 - 327.3 masl (Silty Clay and Sandy Gravel)

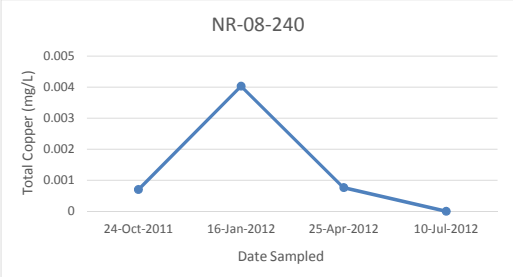


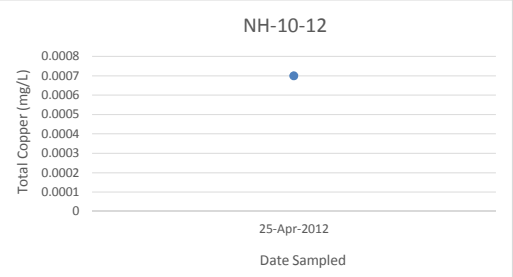
Hydrograph of BH10-15 2009-2013
Whitemouth Lake Till and Whiteshell Till
Screen interval: 334.1 - 331.1 masl (Silty Clay and Sandy Silt)

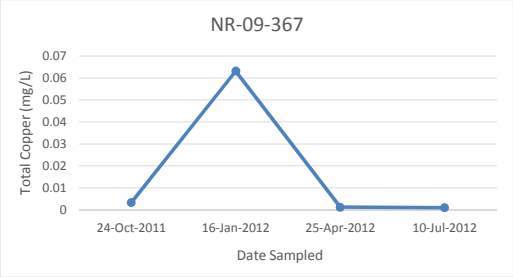


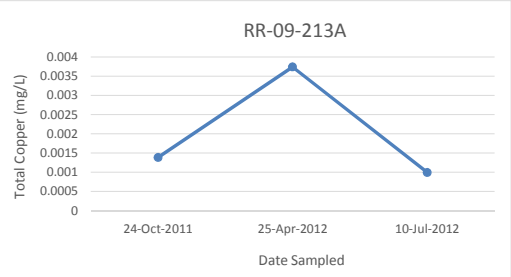
APPENDIX E

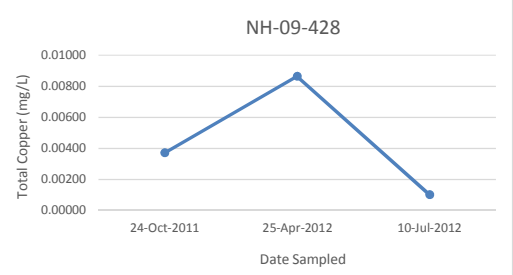
HISTORICAL GROUNDWATER CHEMISTRY TREND GRAPHS

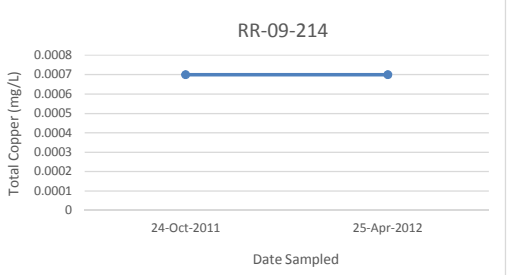

NR-08-240
Total Copper (mg/L)
0.005
0.004
0.003
0.002
0.001
0
24-Oct-2011
16-Jan-2012
25-Apr-2012
10-Jul-2012
Date Sampled

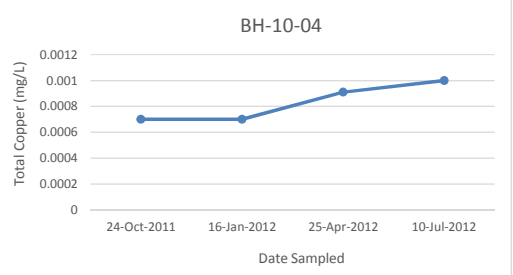

NH-10-12
Total Copper (mg/L)
0.0008
0.0007
0.0006
0.0005
0.0004
0.0003
0.0002
0.0001
0
25-Apr-2012
Date Sampled

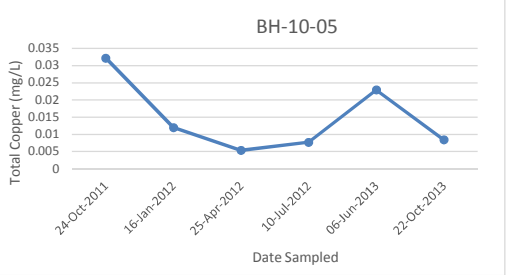

NR-09-367
Total Copper (mg/L)
0.07
0.06
0.05
0.04
0.03
0.02
0.01
0
24-Oct-2011
16-Jan-2012
25-Apr-2012
10-Jul-2012
Date Sampled

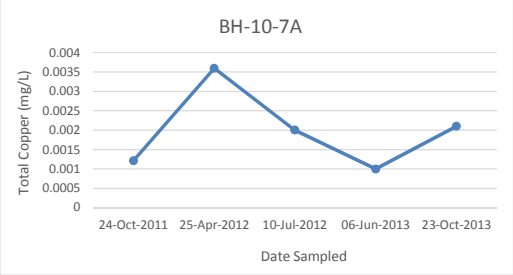

RR-09-213A
Total Copper (mg/L)
0.004
0.0035
0.003
0.0025
0.002
0.0015
0.001
0.0005
0
24-Oct-2011
25-Apr-2012
10-Jul-2012
Date Sampled

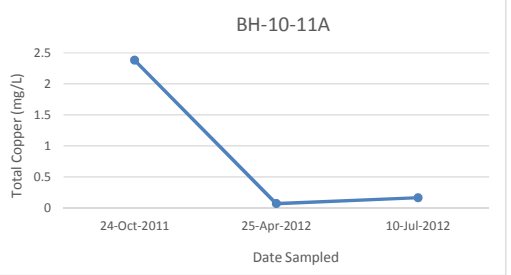

NH-09-428
Total Copper (mg/L)
0.01000
0.00800
0.00600
0.00400
0.00200
0.00000
24-Oct-2011
25-Apr-2012
10-Jul-2012
Date Sampled

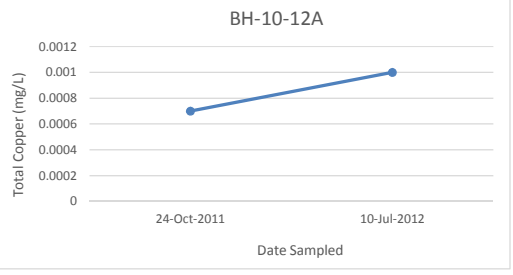

RR-09-214
Total Copper (mg/L)
0.0008
0.0007
0.0006
0.0005
0.0004
0.0003
0.0002
0.0001
0
24-Oct-2011
25-Apr-2012
Date Sampled

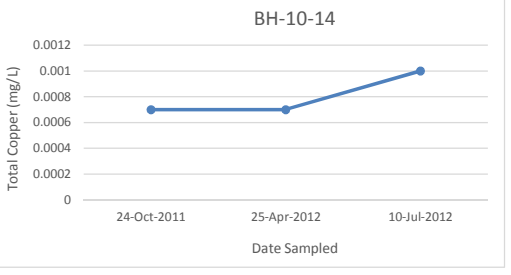

BH-10-04
Total Copper (mg/L)
0.0012
0.001
0.0008
0.0006
0.0004
0.0002
0
24-Oct-2011
16-Jan-2012
25-Apr-2012
10-Jul-2012
Date Sampled

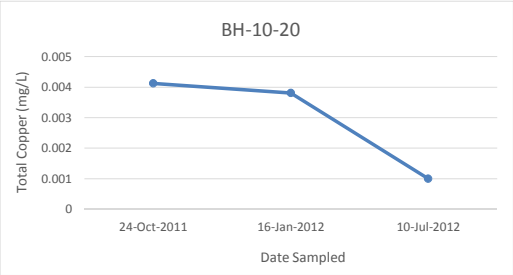

BH-10-05
Total Copper (mg/L)
0.035
0.03
0.025
0.02
0.015
0.01
0.005
0
24-Oct-2011
16-Jan-2012
25-Apr-2012
10-Jul-2012
06-Jun-2013
22-Oct-2013
Date Sampled

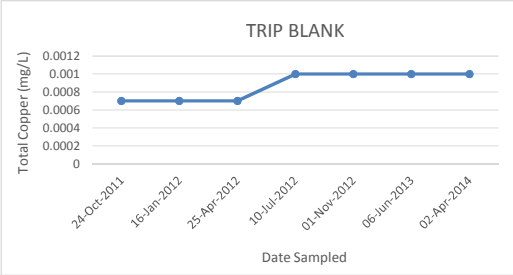

BH-10-7A
Total Copper (mg/L)
0.004
0.0035
0.003
0.0025
0.002
0.0015
0.001
0.0005
0
24-Oct-2011
25-Apr-2012
10-Jul-2012
06-Jun-2013
23-Oct-2013
Date Sampled

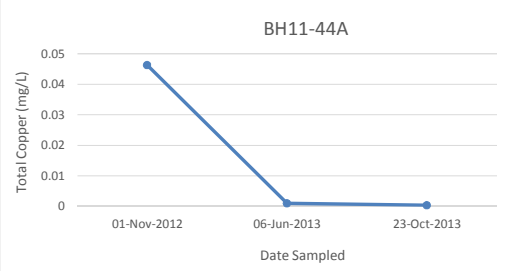

BH-10-11A
Total Copper (mg/L)
2.5
2
1.5
1
0.5
0
24-Oct-2011
25-Apr-2012
10-Jul-2012
Date Sampled

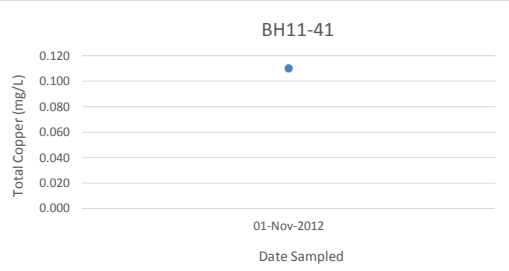

BH-10-12A
Total Copper (mg/L)
0.0012
0.001
0.0008
0.0006
0.0004
0.0002
0
24-Oct-2011
10-Jul-2012
Date Sampled

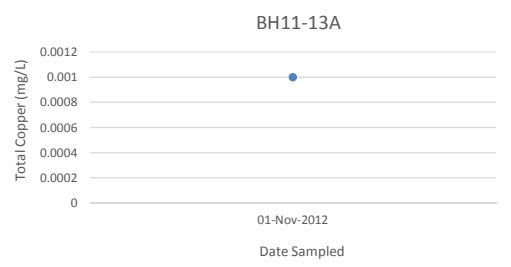

BH-10-14
Total Copper (mg/L)
0.0012
0.001
0.0008
0.0006
0.0004
0.0002
0
24-Oct-2011
25-Apr-2012
10-Jul-2012
Date Sampled

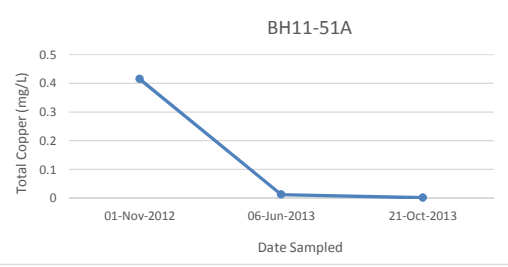

BH-10-20
Total Copper (mg/L)
0.005
0.004
0.003
0.002
0.001
0
24-Oct-2011
16-Jan-2012
10-Jul-2012
Date Sampled

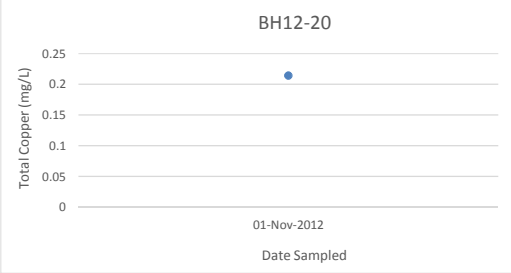

TRIP BLANK
Total Copper (mg/L)
0.0012
0.001
0.0008
0.0006
0.0004
0.0002
0
24-Oct-2011
16-Jan-2012
25-Apr-2012
10-Jul-2012
01-Nov-2012
06-Jun-2013
02-Apr-2014
Date Sampled

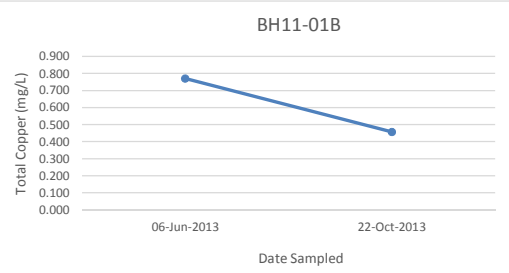

BH11-44A
Total Copper (mg/L)
0.05
0.04
0.03
0.02
0.01
0
01-Nov-2012
06-Jun-2013
23-Oct-2013
Date Sampled

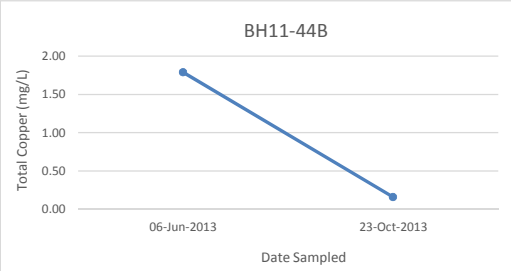

BH11-41
Total Copper (mg/L)
0.120
0.100
0.080
0.060
0.040
0.020
0.000
01-Nov-2012
Date Sampled

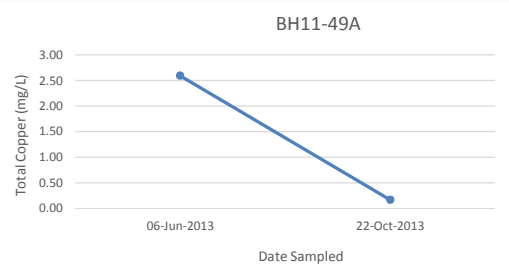

BH11-13A
Total Copper (mg/L)
0.0012
0.001
0.0008
0.0006
0.0004
0.0002
0
01-Nov-2012
Date Sampled

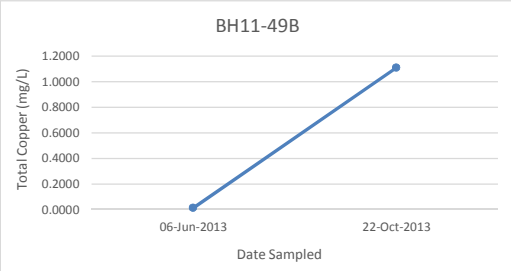

BH11-51A
Total Copper (mg/L)
0.5
0.4
0.3
0.2
0.1
0
01-Nov-2012
06-Jun-2013
21-Oct-2013
Date Sampled

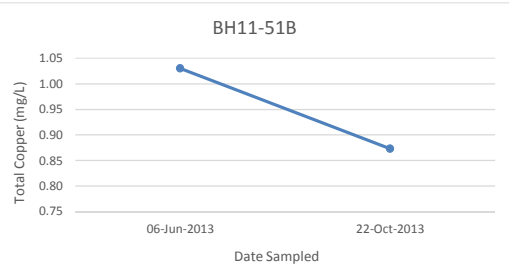

BH12-20
Total Copper (mg/L)
0.25
0.2
0.15
0.1
0.05
0
01-Nov-2012
Date Sampled

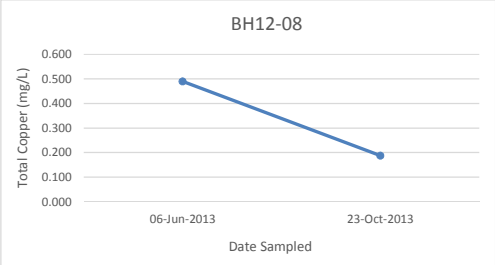

BH11-01B
Total Copper (mg/L)
0.900
0.800
0.700
0.600
0.500
0.400
0.300
0.200
0.100
0.000
06-Jun-2013
22-Oct-2013
Date Sampled

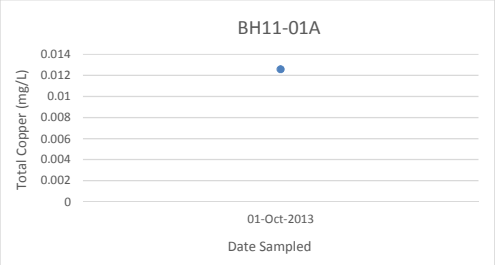

BH11-44B
Total Copper (mg/L)
2.00
1.50
1.00
0.50
0.00
06-Jun-2013
23-Oct-2013
Date Sampled

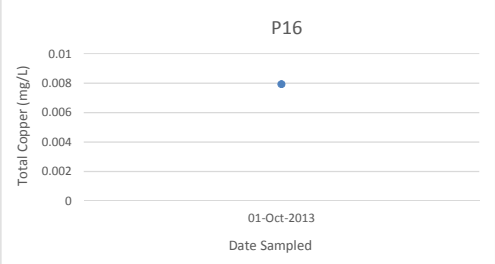

BH11-49A
Total Copper (mg/L)
3.00
2.50
2.00
1.50
1.00
0.50
0.00
06-Jun-2013
22-Oct-2013
Date Sampled

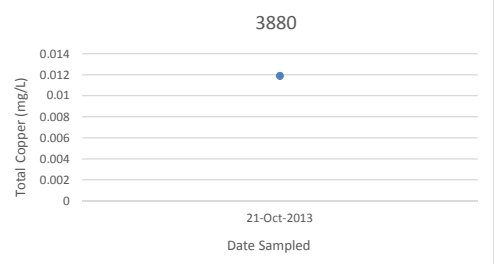

BH11-49B
Total Copper (mg/L)
1.2000
1.0000
0.8000
0.6000
0.4000
0.2000
0.0000
06-Jun-2013
22-Oct-2013
Date Sampled

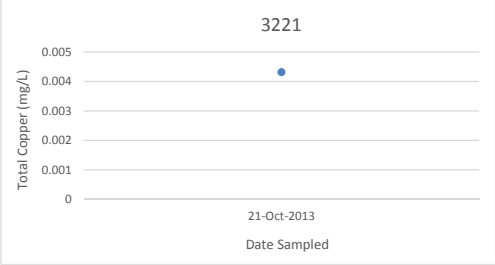

BH11-51B
Total Copper (mg/L)
1.05
1.00
0.95
0.90
0.85
0.80
0.75
06-Jun-2013
22-Oct-2013
Date Sampled

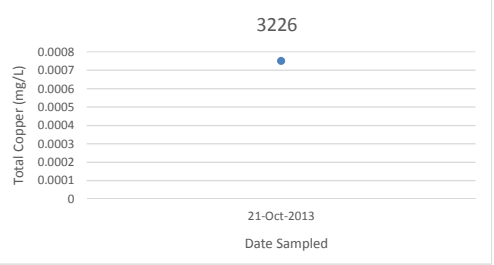

BH12-08
Total Copper (mg/L)
0.600
0.500
0.400
0.300
0.200
0.100
0.000
06-Jun-2013
23-Oct-2013
Date Sampled

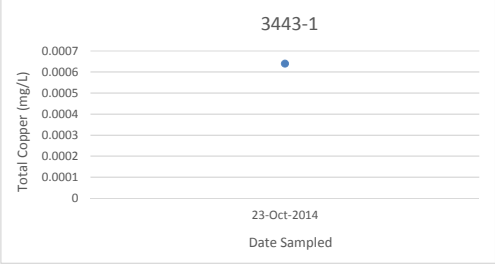

BH11-01A
Total Copper (mg/L)
0.014
0.012
0.01
0.008
0.006
0.004
0.002
0
01-Oct-2013
Date Sampled

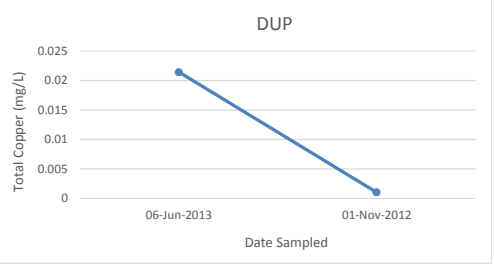

P16
Total Copper (mg/L)
0.01
0.008
0.006
0.004
0.002
0
01-Oct-2013
Date Sampled

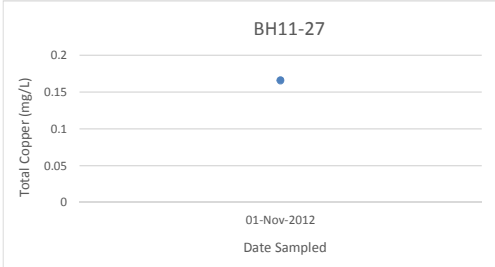

3880
Total Copper (mg/L)
0.014
0.012
0.01
0.008
0.006
0.004
0.002
0
21-Oct-2013
Date Sampled

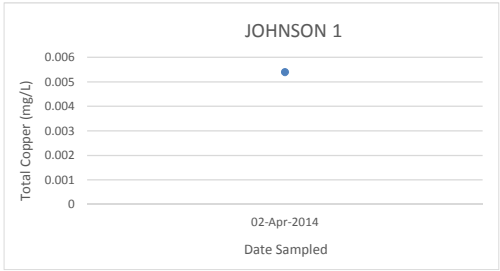

3221
Total Copper (mg/L)
0.005
0.004
0.003
0.002
0.001
0
21-Oct-2013
Date Sampled

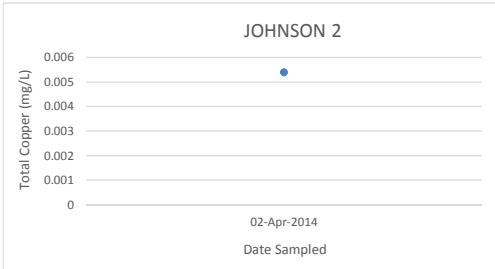

3226
Total Copper (mg/L)
0.0008
0.0007
0.0006
0.0005
0.0004
0.0003
0.0002
0.0001
0
21-Oct-2013
Date Sampled

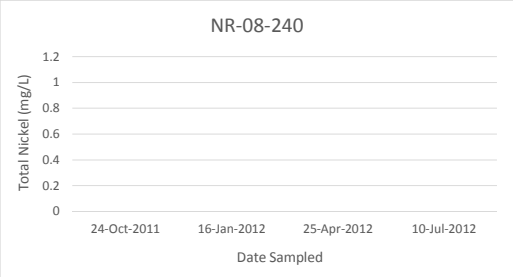

3443-1
Total Copper (mg/L)
0.0007
0.0006
0.0005
0.0004
0.0003
0.0002
0.0001
0
23-Oct-2014
Date Sampled

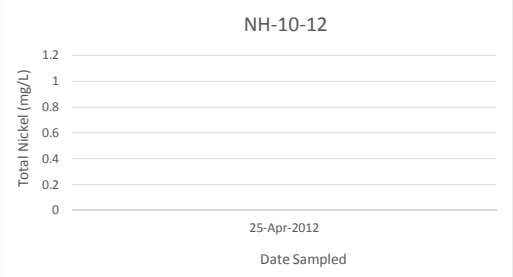

DUP
Total Copper (mg/L)
0.025
0.02
0.015
0.01
0.005
0
06-Jun-2013
01-Nov-2012
Date Sampled

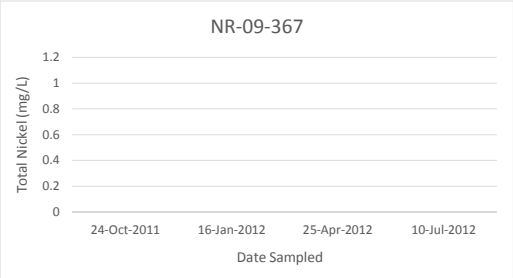

BH11-27
Total Copper (mg/L)
0.2
0.15
0.1
0.05
0
01-Nov-2012
Date Sampled

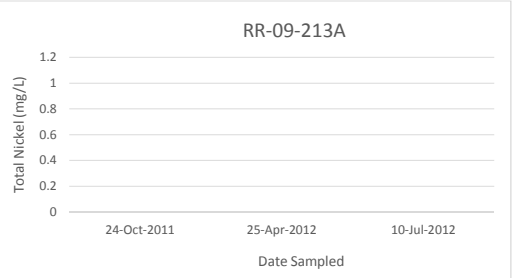

JOHNSON 1
Total Copper (mg/L)
0.006
0.005
0.004
0.003
0.002
0.001
0
02-Apr-2014
Date Sampled

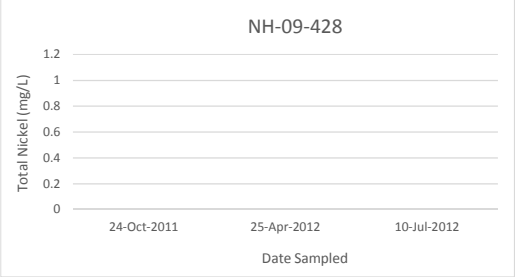

JOHNSON 2
Total Copper (mg/L)
0.006
0.005
0.004
0.003
0.002
0.001
0
02-Apr-2014
Date Sampled

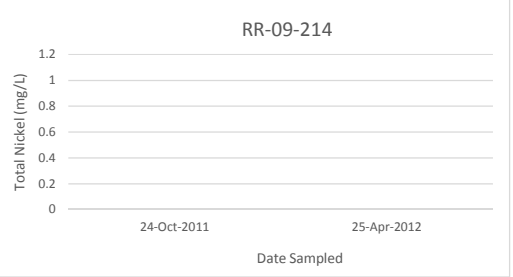

NR-08-240
Total Nickel (mg/L)
1.2
1
0.8
0.6
0.4
0.2
0
24-Oct-2011
16-Jan-2012
25-Apr-2012
10-Jul-2012
Date Sampled

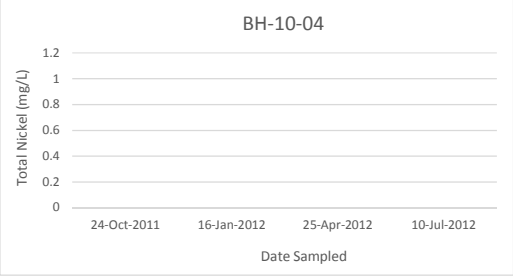

NH-10-12
Total Nickel (mg/L)
1.2
1
0.8
0.6
0.4
0.2
0
25-Apr-2012
Date Sampled

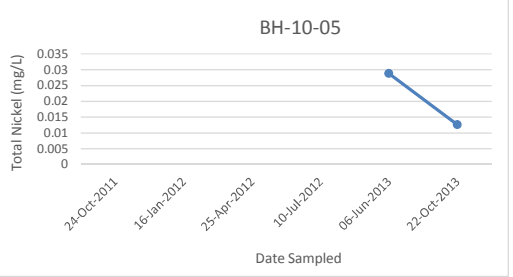

NR-09-367
Total Nickel (mg/L)
1.2
1
0.8
0.6
0.4
0.2
0
24-Oct-2011
16-Jan-2012
25-Apr-2012
10-Jul-2012
Date Sampled

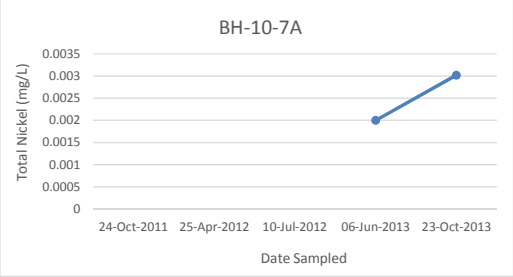

RR-09-213A
Total Nickel (mg/L)
1.2
1
0.8
0.6
0.4
0.2
0
24-Oct-2011
25-Apr-2012
10-Jul-2012
Date Sampled

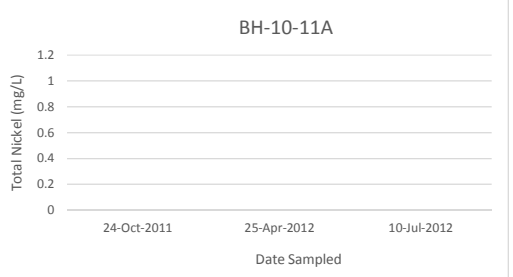

NH-09-428
Total Nickel (mg/L)
1.2
1
0.8
0.6
0.4
0.2
0
24-Oct-2011
25-Apr-2012
10-Jul-2012
Date Sampled

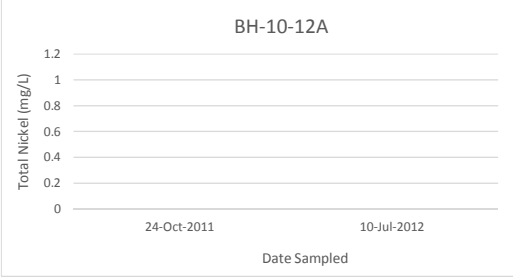

RR-09-214
Total Nickel (mg/L)
1.2
1
0.8
0.6
0.4
0.2
0
24-Oct-2011
25-Apr-2012
Date Sampled

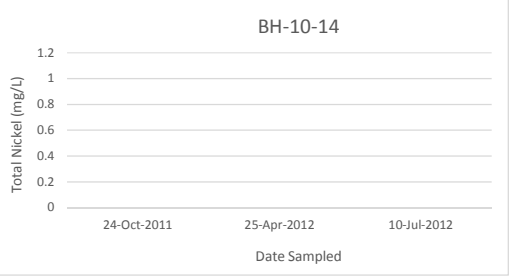

BH-10-04
Total Nickel (mg/L)
1.2
1
0.8
0.6
0.4
0.2
0
24-Oct-2011
16-Jan-2012
25-Apr-2012
10-Jul-2012
Date Sampled

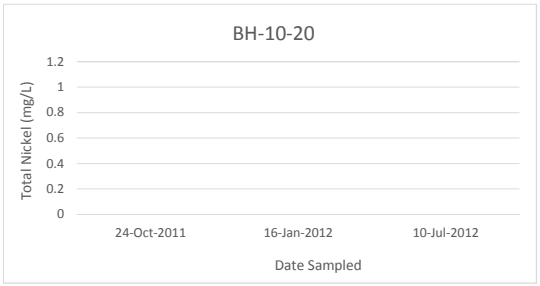

BH-10-05
Total Nickel (mg/L)
0.035
0.03
0.025
0.02
0.015
0.01
0.005
0
24-Oct-2011
16-Jan-2012
25-Apr-2012
10-Jul-2012
06-Jun-2013
22-Oct-2013
Date Sampled

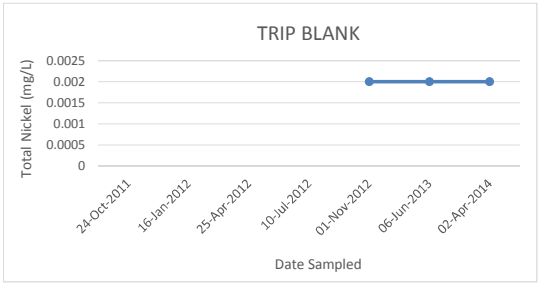

BH-10-7A
Total Nickel (mg/L)
0.0035
0.003
0.0025
0.002
0.0015
0.001
0.0005
0
24-Oct-2011
25-Apr-2012
10-Jul-2012
06-Jun-2013
23-Oct-2013
Date Sampled

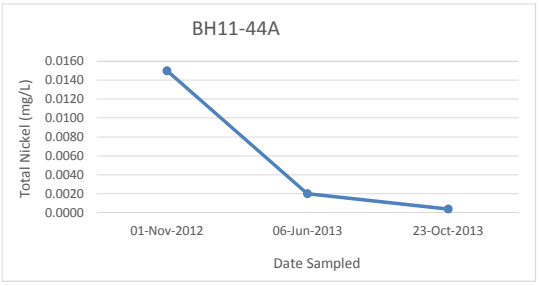

BH-10-11A
Total Nickel (mg/L)
1.2
1
0.8
0.6
0.4
0.2
0
24-Oct-2011
25-Apr-2012
10-Jul-2012
Date Sampled

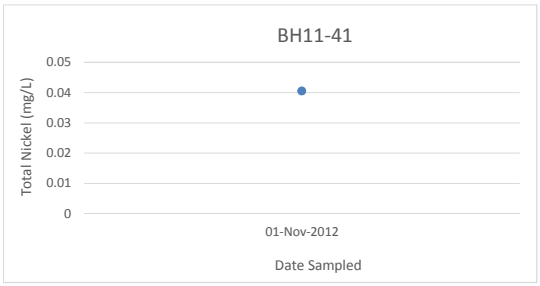

BH-10-12A
Total Nickel (mg/L)
1.2
1
0.8
0.6
0.4
0.2
0
24-Oct-2011
10-Jul-2012
Date Sampled

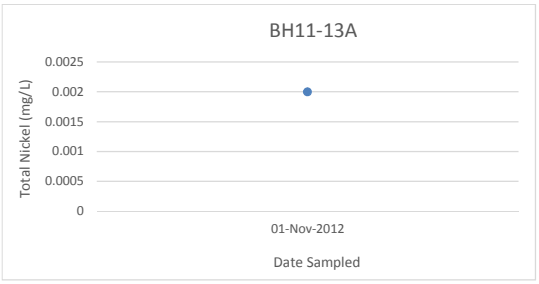

BH-10-14
Total Nickel (mg/L)
1.2
1
0.8
0.6
0.4
0.2
0
24-Oct-2011
25-Apr-2012
10-Jul-2012
Date Sampled

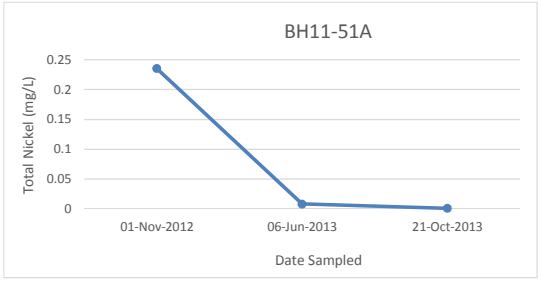

BH-10-20
Total Nickel (mg/L)
1.2
1
0.8
0.6
0.4
0.2
0
24-Oct-2011
16-Jan-2012
10-Jul-2012
Date Sampled

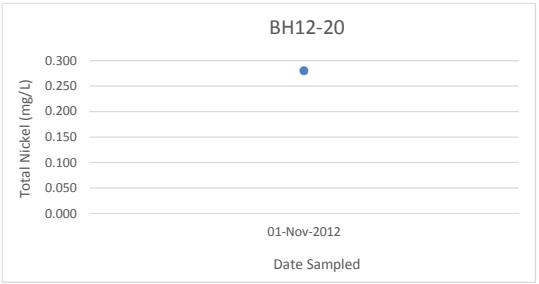

TRIP BLANK
Total Nickel (mg/L)
0.0025
0.002
0.0015
0.001
0.0005
0
24-Oct-2011
16-Jan-2012
25-Apr-2012
10-Jul-2012
01-Nov-2012
06-Jun-2013
02-Apr-2014
Date Sampled

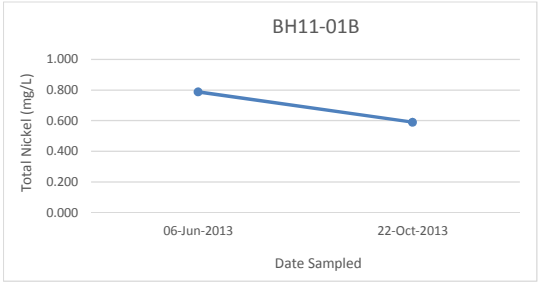

BH11-44A
Total Nickel (mg/L)
0.0160
0.0140
0.0120
0.0100
0.0080
0.0060
0.0040
0.0020
0.0000
01-Nov-2012
06-Jun-2013
23-Oct-2013
Date Sampled

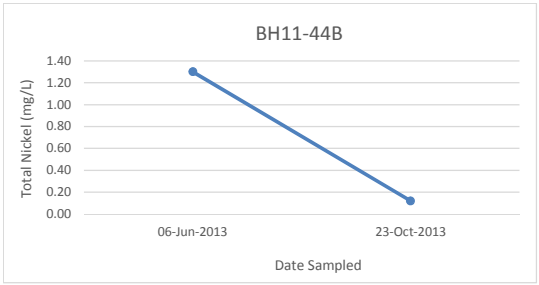

BH11-41
Total Nickel (mg/L)
0.05
0.04
0.03
0.02
0.01
0
01-Nov-2012
Date Sampled

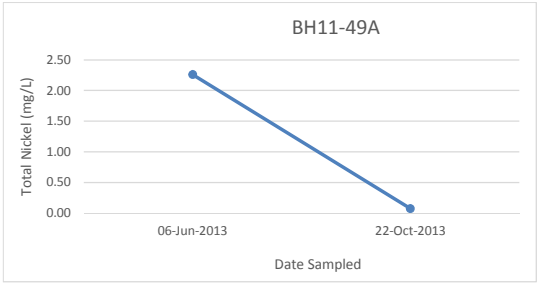

BH11-13A
Total Nickel (mg/L)
0.0025
0.002
0.0015
0.001
0.0005
0
01-Nov-2012
Date Sampled

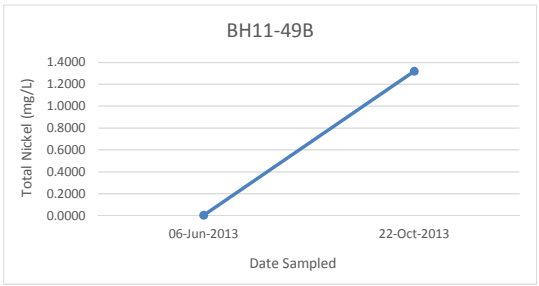

BH11-51A
Total Nickel (mg/L)
0.25
0.2
0.15
0.1
0.05
0
01-Nov-2012
06-Jun-2013
21-Oct-2013
Date Sampled

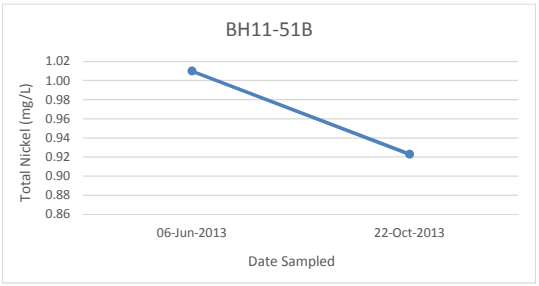

BH12-20
Total Nickel (mg/L)
0.300
0.250
0.200
0.150
0.100
0.050
0.000
01-Nov-2012
Date Sampled

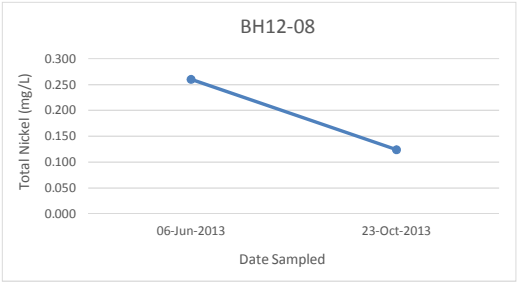

BH11-01B
Total Nickel (mg/L)
1.000
0.800
0.600
0.400
0.200
0.000
06-Jun-2013
22-Oct-2013
Date Sampled

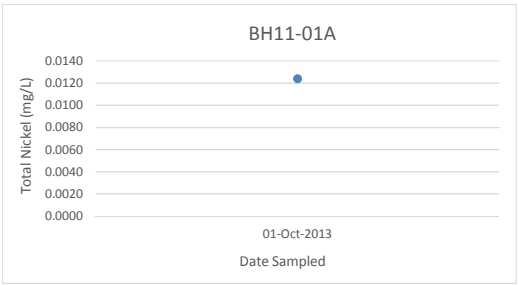

BH11-44B
Total Nickel (mg/L)
1.40
1.20
1.00
0.80
0.60
0.40
0.20
0.00
06-Jun-2013
23-Oct-2013
Date Sampled

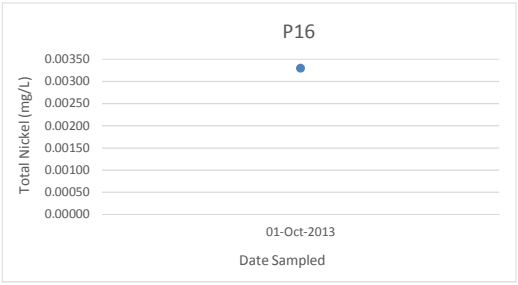

BH11-49A
Total Nickel (mg/L)
2.50
2.00
1.50
1.00
0.50
0.00
06-Jun-2013
22-Oct-2013
Date Sampled

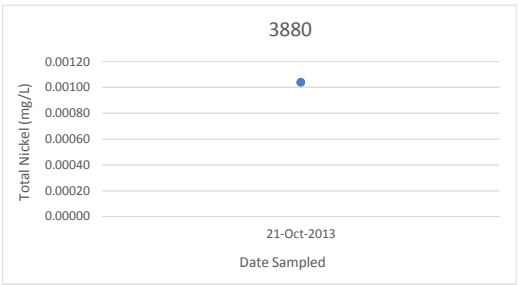

BH11-49B
Total Nickel (mg/L)
1.4000
1.2000
1.0000
0.8000
0.6000
0.4000
0.2000
0.0000
06-Jun-2013
22-Oct-2013
Date Sampled

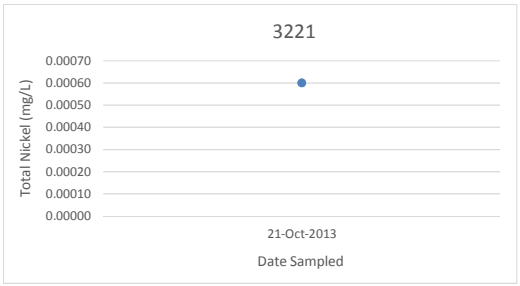

BH11-51B
Total Nickel (mg/L)
1.02
1.00
0.98
0.96
0.94
0.92
0.90
0.88
0.86
06-Jun-2013
22-Oct-2013
Date Sampled

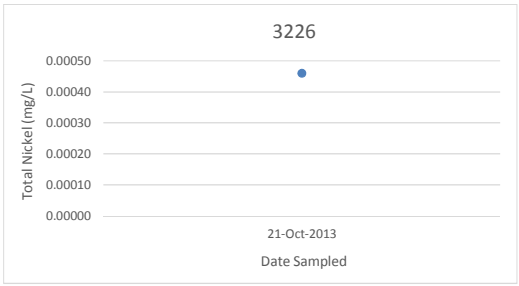

BH12-08
Total Nickel (mg/L)
0.300
0.250
0.200
0.150
0.100
0.050
0.000
06-Jun-2013
23-Oct-2013
Date Sampled

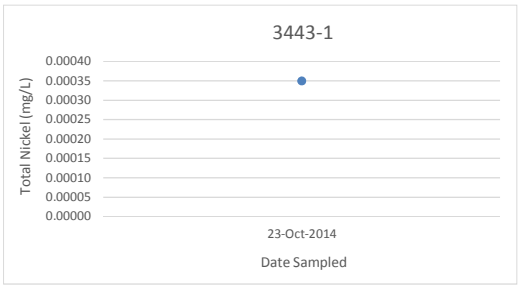

BH11-01A
Total Nickel (mg/L)
0.0140
0.0120
0.0100
0.0080
0.0060
0.0040
0.0020
0.0000
01-Oct-2013
Date Sampled

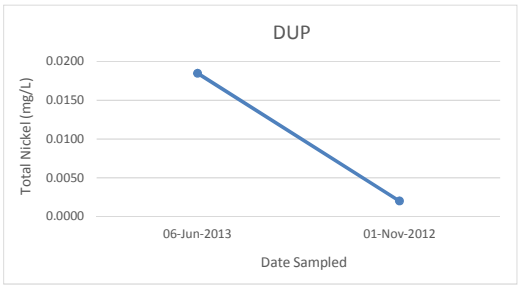

P16
Total Nickel (mg/L)
0.00350
0.00300
0.00250
0.00200
0.00150
0.00100
0.00050
0.00000
01-Oct-2013
Date Sampled

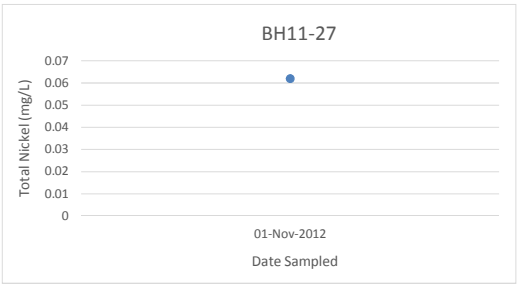

3880
Total Nickel (mg/L)
0.00120
0.00100
0.00080
0.00060
0.00040
0.00020
0.00000
21-Oct-2013
Date Sampled

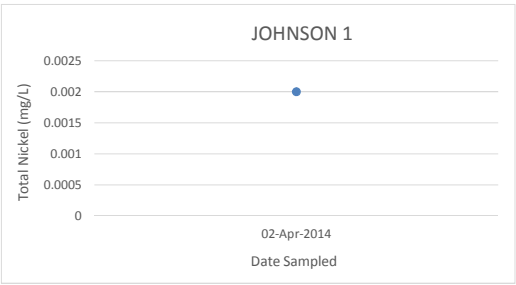

3221
Total Nickel (mg/L)
0.00070
0.00060
0.00050
0.00040
0.00030
0.00020
0.00010
0.00000
21-Oct-2013
Date Sampled

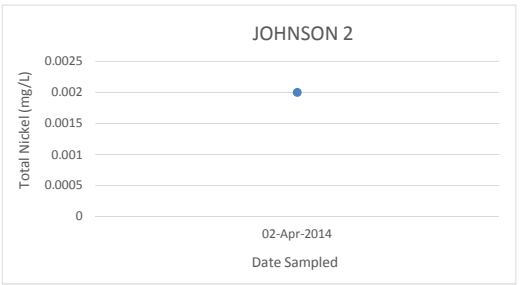

3226
Total Nickel (mg/L)
0.00050
0.00040
0.00030
0.00020
0.00010
0.00000
21-Oct-2013
Date Sampled

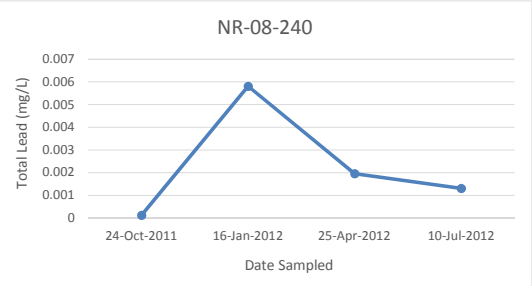

3443-1
Total Nickel (mg/L)
0.00040
0.00035
0.00030
0.00025
0.00020
0.00015
0.00010
0.00005
0.00000
23-Oct-2014
Date Sampled

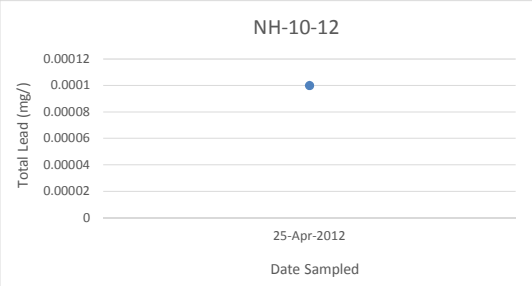

DUP
Total Nickel (mg/L)
0.0200
0.0150
0.0100
0.0050
0.0000
06-Jun-2013
01-Nov-2012
Date Sampled

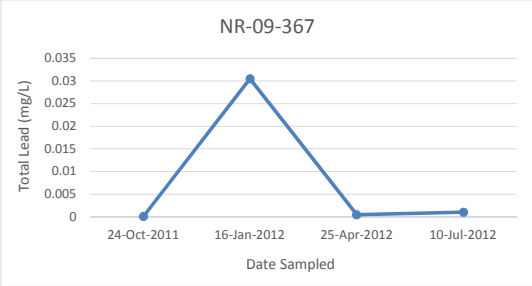

BH11-27
Total Nickel (mg/L)
0.07
0.06
0.05
0.04
0.03
0.02
0.01
0
01-Nov-2012
Date Sampled

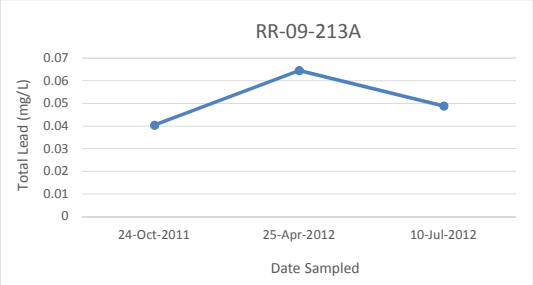

JOHNSON 1
Total Nickel (mg/L)
0.0025
0.002
0.0015
0.001
0.0005
0
02-Apr-2014
Date Sampled

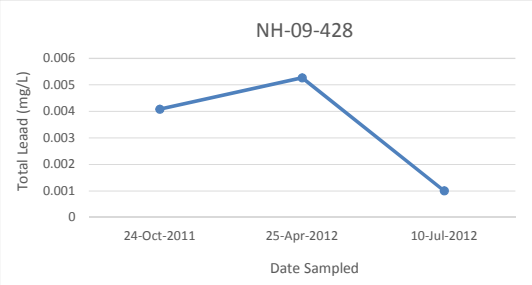

JOHNSON 2
Total Nickel (mg/L)
0.0025
0.002
0.0015
0.001
0.0005
0
02-Apr-2014
Date Sampled

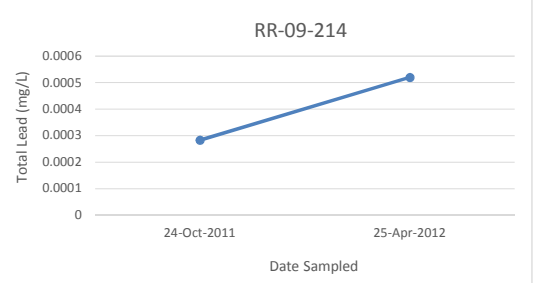

NR-08-240
Total Lead (mg/L)
0.007
0.006
0.005
0.004
0.003
0.002
0.001
0
24-Oct-2011
16-Jan-2012
25-Apr-2012
10-Jul-2012
Date Sampled

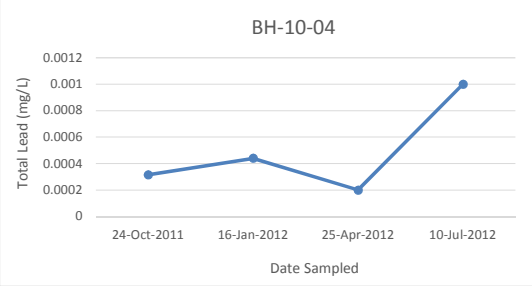

NH-10-12
Total Lead (mg/)
0.00012
0.0001
0.00008
0.00006
0.00004
0.00002
0
25-Apr-2012
Date Sampled

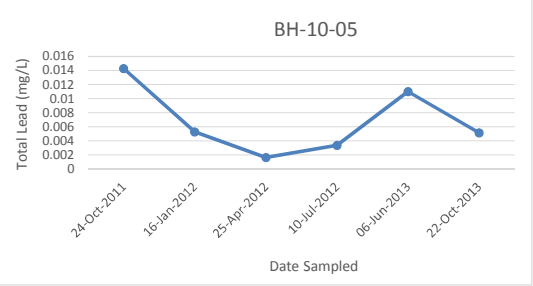

NR-09-367
Total Lead (mg/L)
0.035
0.03
0.025
0.02
0.015
0.01
0.005
0
24-Oct-2011
16-Jan-2012
25-Apr-2012
10-Jul-2012
Date Sampled

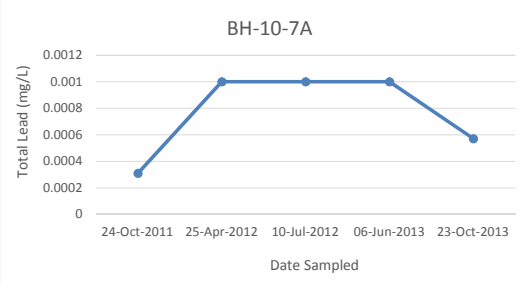

RR-09-213A
Total Lead (mg/L)
0.07
0.06
0.05
0.04
0.03
0.02
0.01
0
24-Oct-2011
25-Apr-2012
10-Jul-2012
Date Sampled

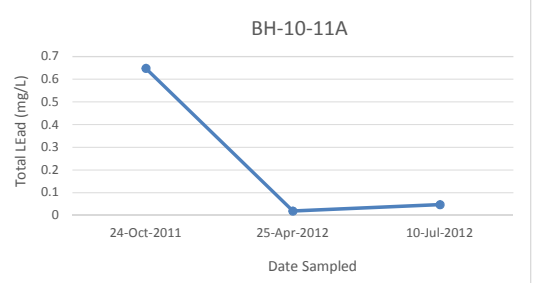

NH-09-428
Total Leaad (mg/L)
0.006
0.005
0.004
0.003
0.002
0.001
0
24-Oct-2011
25-Apr-2012
10-Jul-2012
Date Sampled

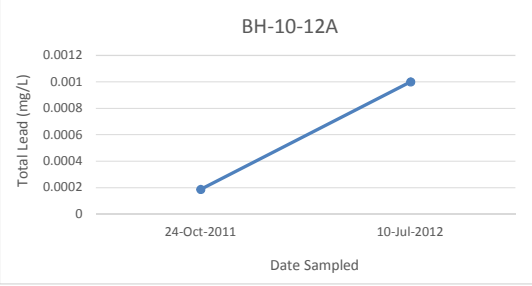

RR-09-214
Total Lead (mg/L)
0.0006
0.0005
0.0004
0.0003
0.0002
0.0001
0
24-Oct-2011
25-Apr-2012
Date Sampled

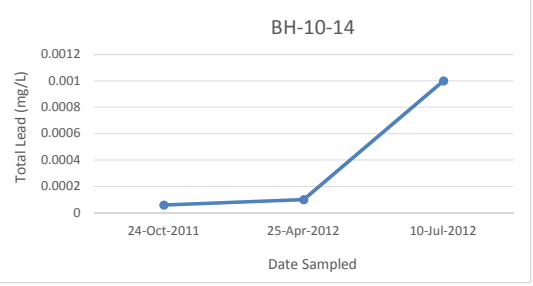

BH-10-04
Total Lead (mg/L)
0.0012
0.001
0.0008
0.0006
0.0004
0.0002
0
24-Oct-2011
16-Jan-2012
25-Apr-2012
10-Jul-2012
Date Sampled

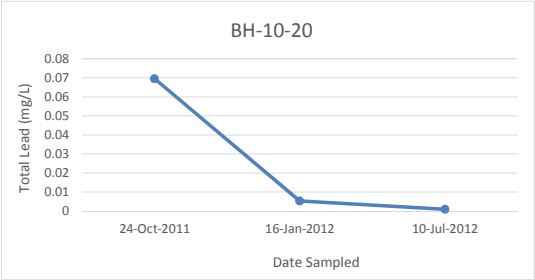

BH-10-05
Total Lead (mg/L)
0.016
0.014
0.012
0.01
0.008
0.006
0.004
0.002
0
24-Oct-2011
16-Jan-2012
25-Apr-2012
10-Jul-2012
06-Jun-2013
22-Oct-2013
Date Sampled


BH-10-7A
Total Lead (mg/L)
0.0012
0.001
0.0008
0.0006
0.0004
0.0002
0
24-Oct-2011
25-Apr-2012
10-Jul-2012
06-Jun-2013
23-Oct-2013
Date Sampled


BH-10-11A
Total LEad (mg/L)
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
24-Oct-2011
25-Apr-2012
10-Jul-2012
Date Sampled


BH-10-12A
Total Lead (mg/L)
0.0012
0.001
0.0008
0.0006
0.0004
0.0002
0
24-Oct-2011
10-Jul-2012
Date Sampled


BH-10-14
Total Lead (mg/L)
0.0012
0.001
0.0008
0.0006
0.0004
0.0002
0
24-Oct-2011
25-Apr-2012
10-Jul-2012
Date Sampled


BH-10-20
Total Lead (mg/L)
0.08
0.07
0.06
0.05
0.04
0.03
0.02
0.01
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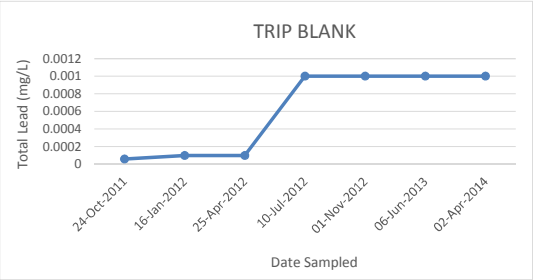
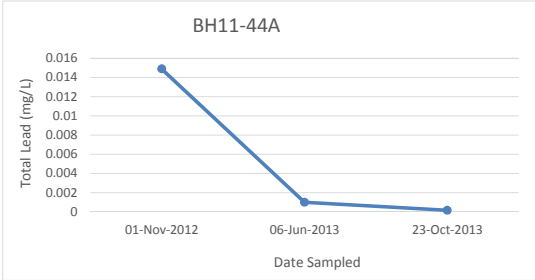
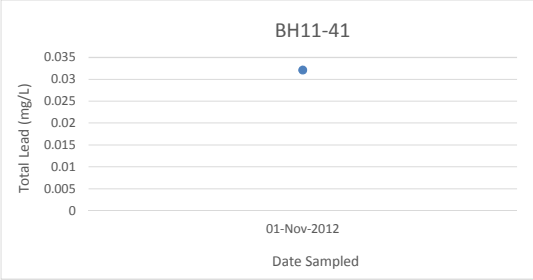
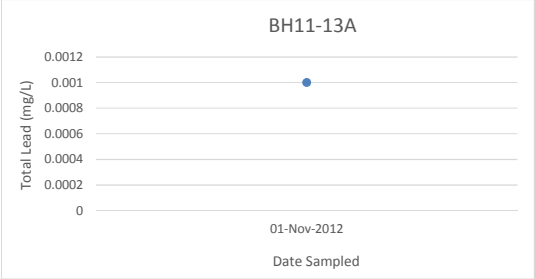
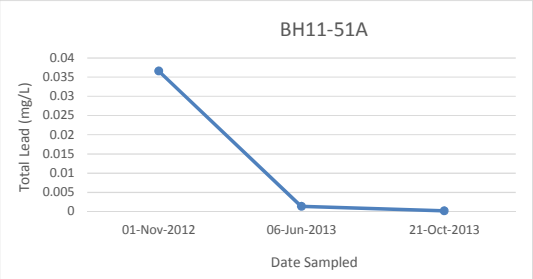
24-Oct-2011
16-Jan-2012
10-Jul-2012
Date Sampled

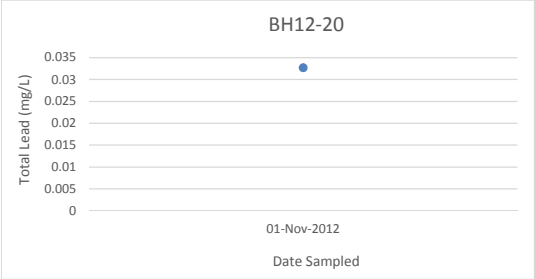

TRIP BLANK
Total Lead (mg/L)
0.0012
0.001
0.0008
0.0006
0.0004
0.0002
0
24-Oct-2011
16-Jan-2012
25-Apr-2012
10-Jul-2012
01-Nov-2012
06-Jun-2013
02-Apr-2014
Date Sampled

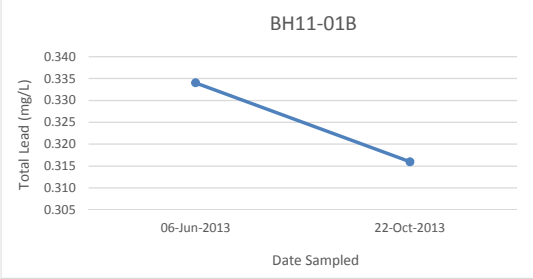

BH11-44A
Total Lead (mg/L)
0.016
0.014
0.012
0.01
0.008
0.006
0.004
0.002
0
01-Nov-2012
06-Jun-2013
23-Oct-2013
Date Sampled

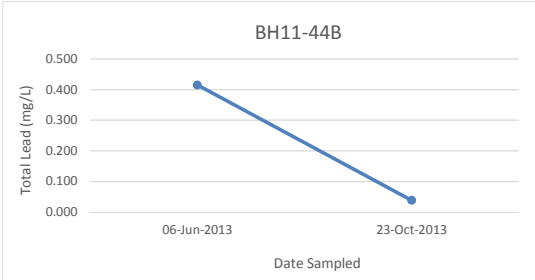

BH11-41
Total Lead (mg/L)
0.035
0.03
0.025
0.02
0.015
0.01
0.005
0
01-Nov-2012
Date Sampled

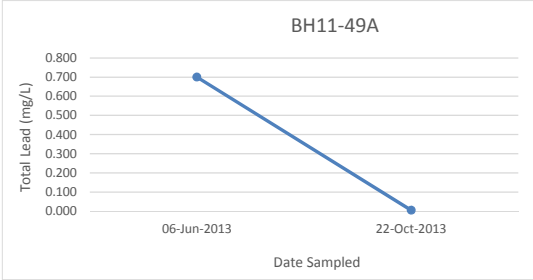

BH11-13A
Total Lead (mg/L)
0.0012
0.001
0.0008
0.0006
0.0004
0.0002
0
01-Nov-2012
Date Sampled

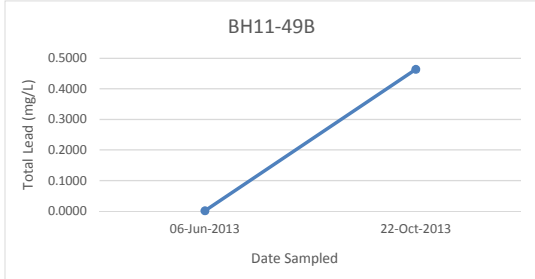

BH11-51A
Total Lead (mg/L)
0.04
0.035
0.03
0.025
0.02
0.015
0.01
0.005
0
01-Nov-2012
06-Jun-2013
21-Oct-2013
Date Sampled

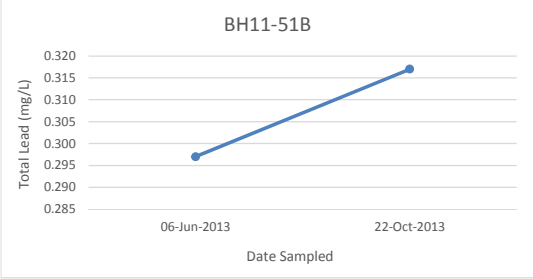

BH12-20
Total Lead (mg/L)
0.035
0.03
0.025
0.02
0.015
0.01
0.005
0
01-Nov-2012
Date Sampled

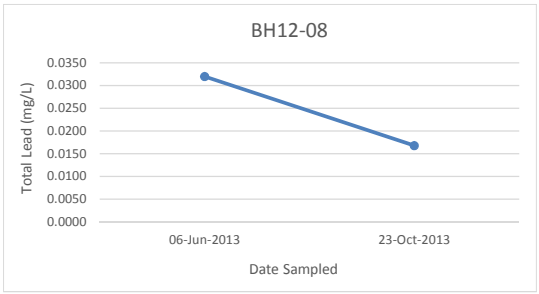

BH11-01B
Total Lead (mg/L)
0.340
0.335
0.330
0.325
0.320
0.315
0.310
0.305
06-Jun-2013
22-Oct-2013
Date Sampled

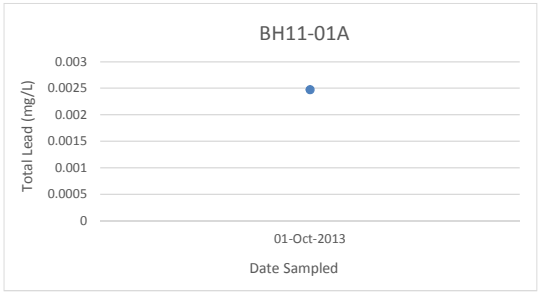

BH11-44B
Total Lead (mg/L)
0.500
0.400
0.300
0.200
0.100
0.000
06-Jun-2013
23-Oct-2013
Date Sampled

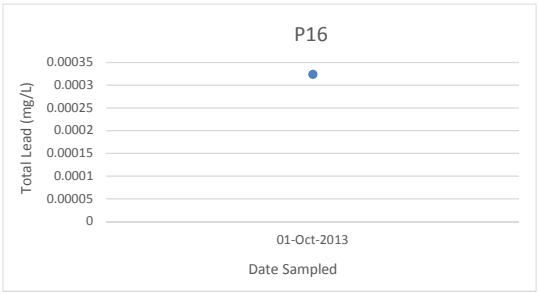

BH11-49A
Total Lead (mg/L)
0.800
0.700
0.600
0.500
0.400
0.300
0.200
0.100
0.000
06-Jun-2013
22-Oct-2013
Date Sampled

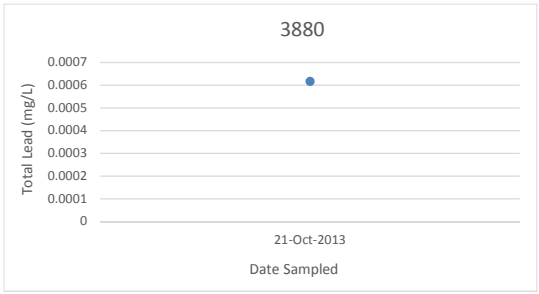

BH11-49B
Total Lead (mg/L)
0.5000
0.4000
0.3000
0.2000
0.1000
0.0000
06-Jun-2013
22-Oct-2013
Date Sampled

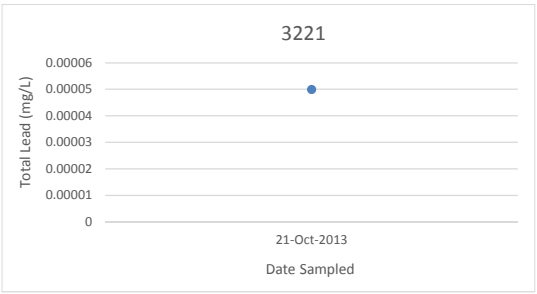

BH11-51B
Total Lead (mg/L)
0.320
0.315
0.310
0.305
0.300
0.295
0.290
0.285
06-Jun-2013
22-Oct-2013
Date Sampled

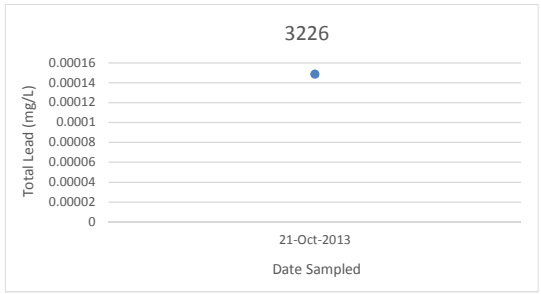

BH12-08
Total Lead (mg/L)
0.0350
0.0300
0.0250
0.0200
0.0150
0.0100
0.0050
0.0000
06-Jun-2013
23-Oct-2013
Date Sampled

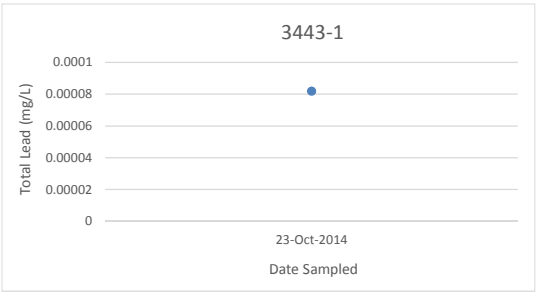

BH11-01A
Total Lead (mg/L)
0.003
0.0025
0.002
0.0015
0.001
0.0005
0
01-Oct-2013
Date Sampled

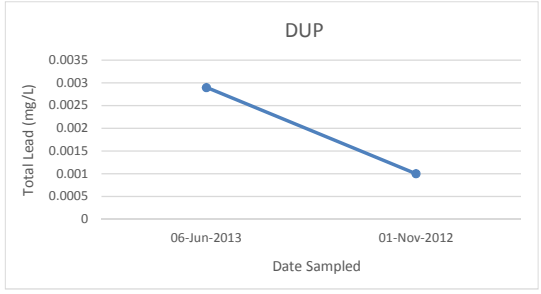

P16
Total Lead (mg/L)
0.00035
0.0003
0.00025
0.0002
0.00015
0.0001
0.00005
0
01-Oct-2013
Date Sampled

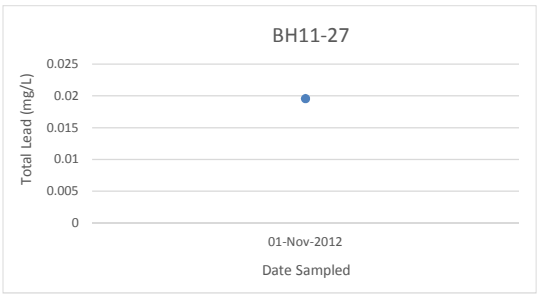

3880
Total Lead (mg/L)
0.0007
0.0006
0.0005
0.0004
0.0003
0.0002
0.0001
0
21-Oct-2013
Date Sampled

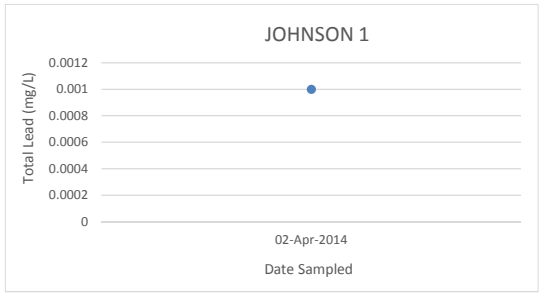

3221
Total Lead (mg/L)
0.00006
0.00005
0.00004
0.00003
0.00002
0.00001
0
21-Oct-2013
Date Sampled

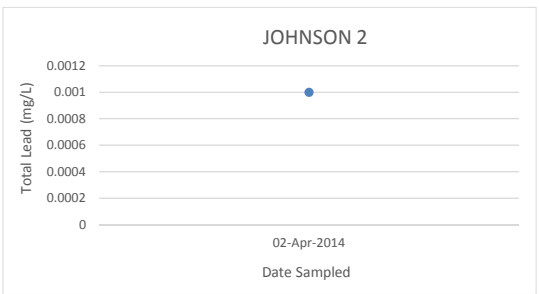

3226
Total Lead (mg/L)
0.00016
0.00014
0.00012
0.0001
0.00008
0.00006
0.00004
0.00002
0
21-Oct-2013
Date Sampled

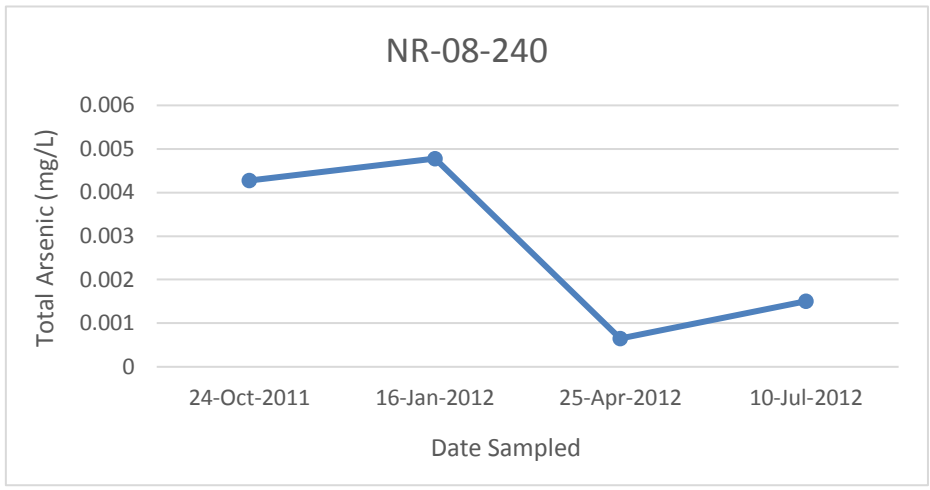

3443-1
Total Lead (mg/L)
0.0001
0.00008
0.00006
0.00004
0.00002
0
23-Oct-2014
Date Sampled

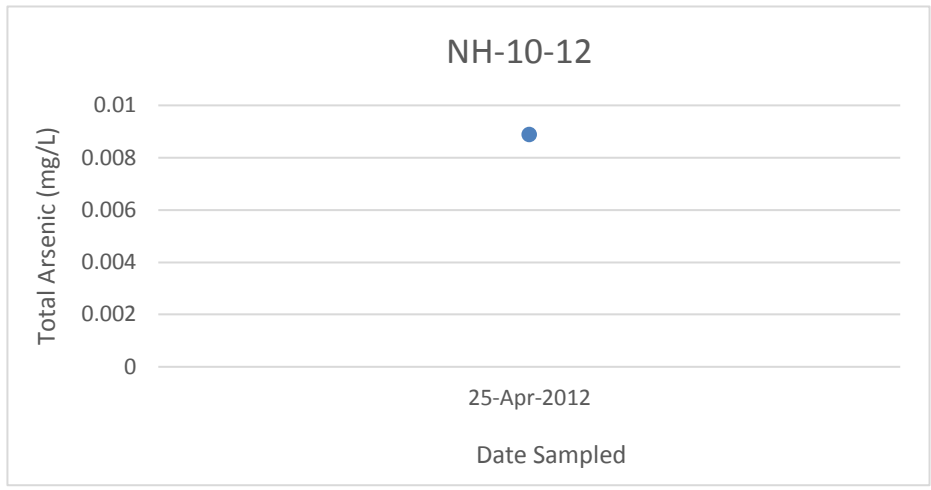

DUP
Total Lead (mg/L)
0.0035
0.003
0.0025
0.002
0.0015
0.001
0.0005
0
06-Jun-2013
01-Nov-2012
Date Sampled

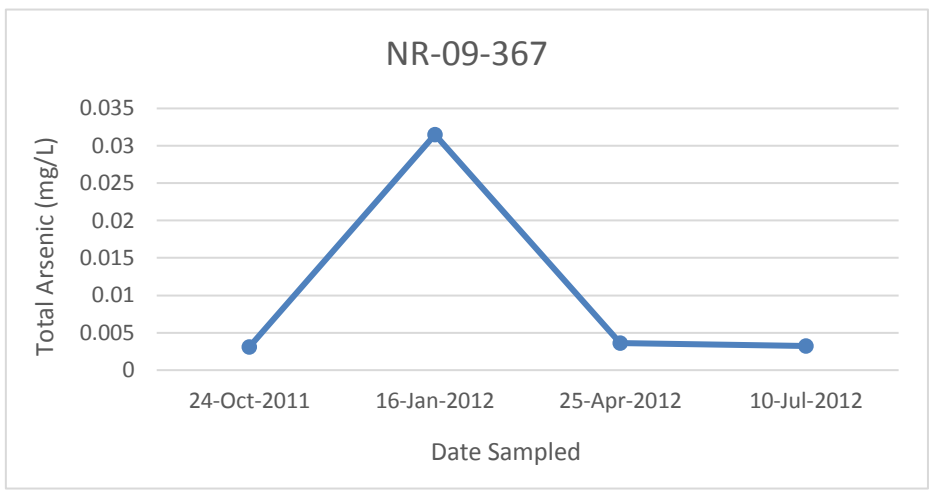

BH11-27
Total Lead (mg/L)
0.025
0.02
0.015
0.01
0.005
0
01-Nov-2012
Date Sampled

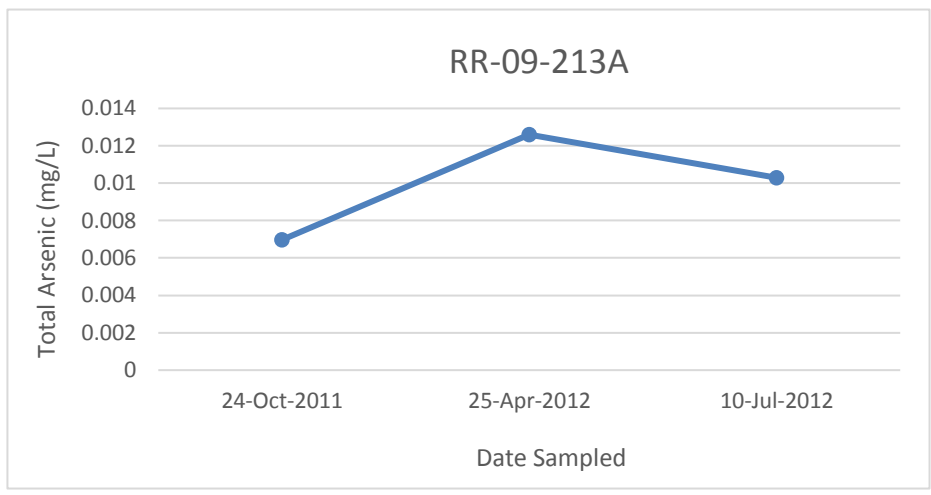

JOHNSON 1
Total Lead (mg/L)
0.0012
0.001
0.0008
0.0006
0.0004
0.0002
0
02-Apr-2014
Date Sampled

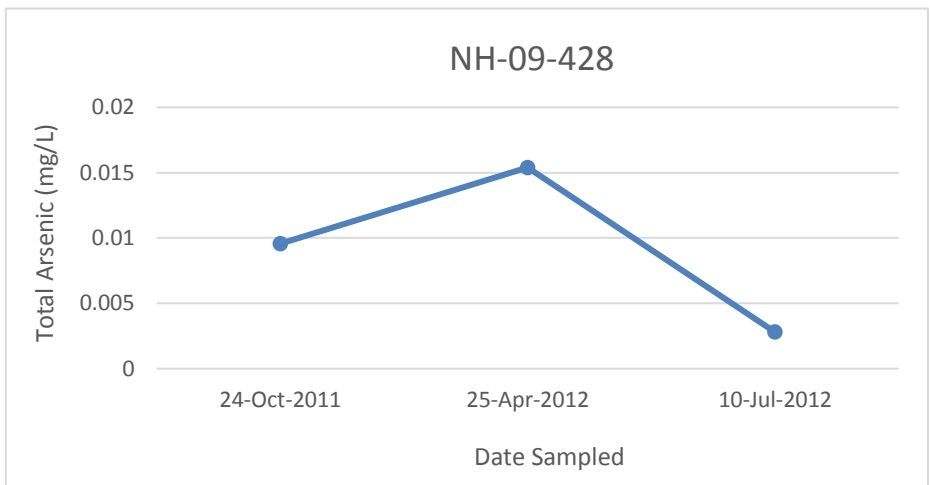

JOHNSON 2
Total Lead (mg/L)
0.0012
0.001
0.0008
0.0006
0.0004
0.0002
0
02-Apr-2014
Date Sampled

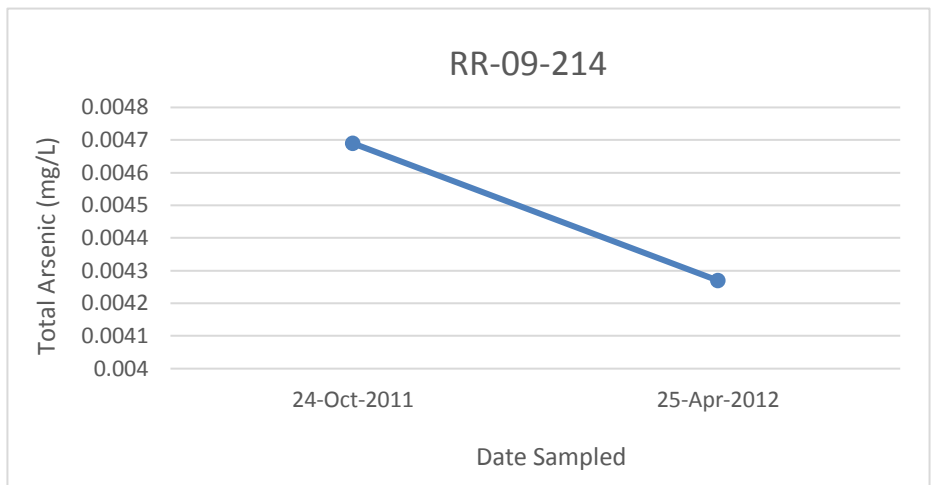

NR-08-240
Total Arsenic (mg/L)
0.006
0.005
0.004
0.003
0.002
0.001
0
24-Oct-2011
16-Jan-2012
25-Apr-2012
10-Jul-2012
Date Sampled

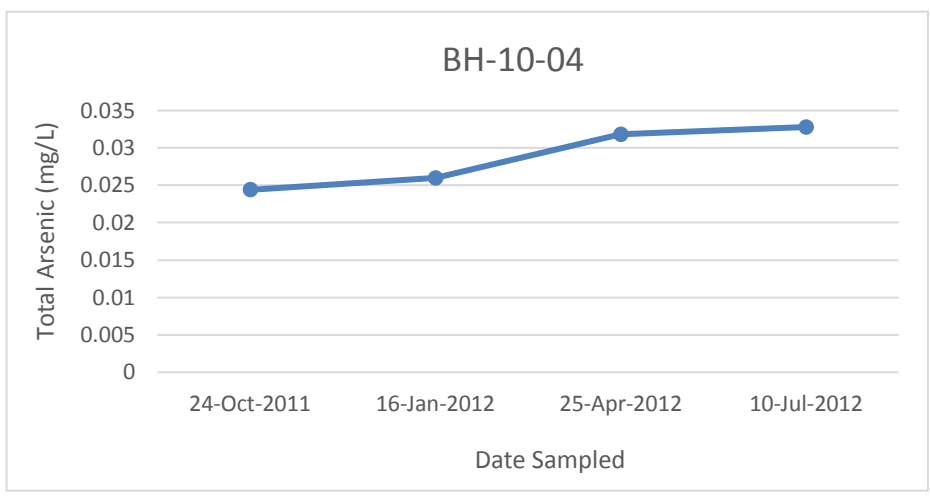

NH-10-12
Total Arsenic (mg/L)
0.01
0.008
0.006
0.004
0.002
0
25-Apr-2012
Date Sampled

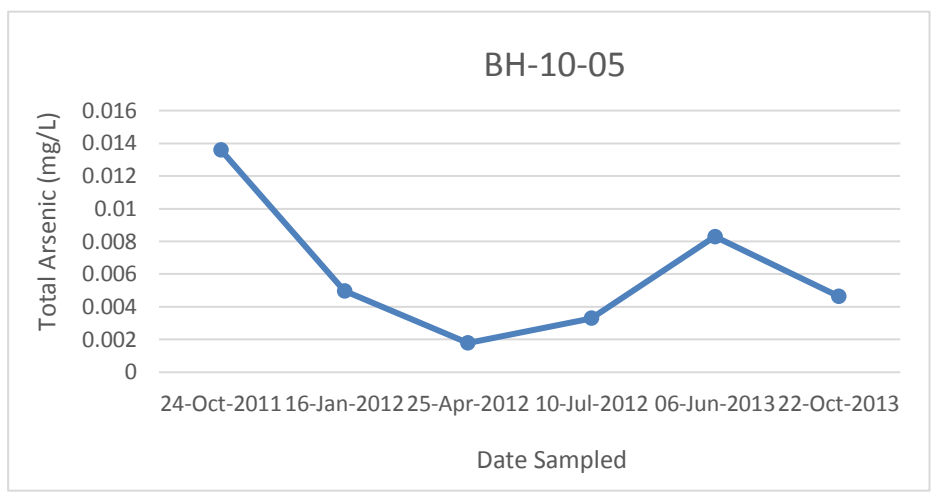

NR-09-367
Total Arsenic (mg/L)
0.035
0.03
0.025
0.02
0.015
0.01
0.005
0
24-Oct-2011
16-Jan-2012
25-Apr-2012
10-Jul-2012
Date Sampled

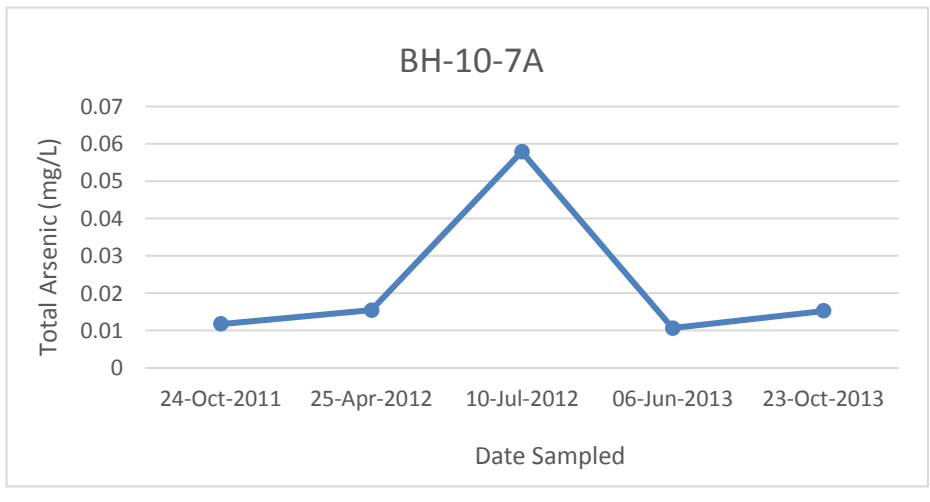

RR-09-213A
Total Arsenic (mg/L)
0.014
0.012
0.01
0.008
0.006
0.004
0.002
0
24-Oct-2011
25-Apr-2012
10-Jul-2012
Date Sampled

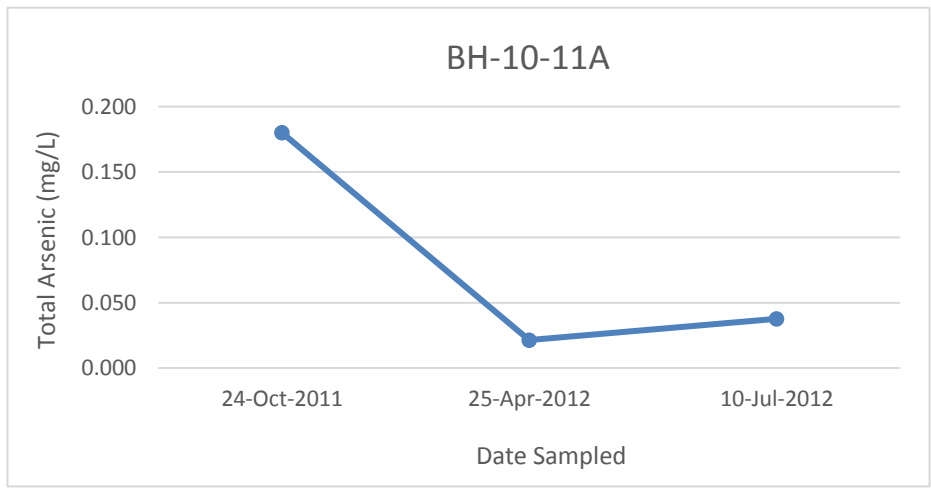

NH-09-428
Total Arsenic (mg/L)
0.02
0.015
0.01
0.005
0
24-Oct-2011
25-Apr-2012
10-Jul-2012
Date Sampled

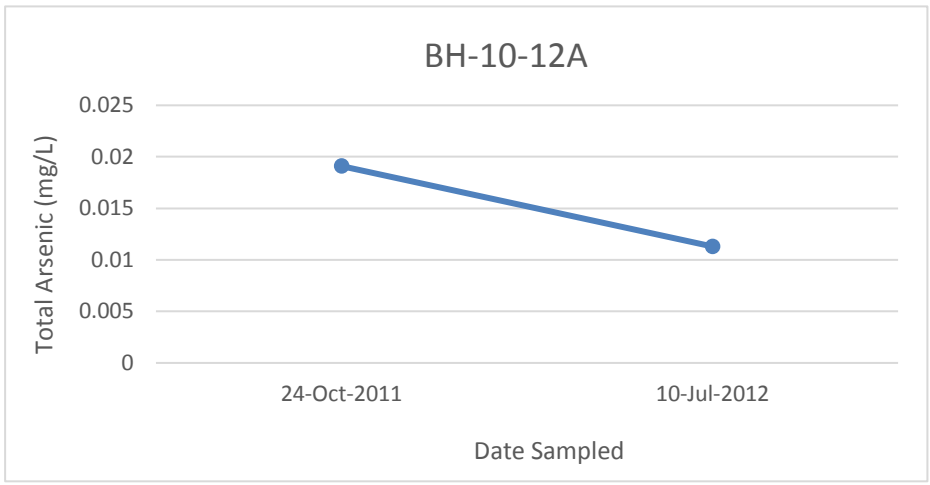

RR-09-214
Total Arsenic (mg/L)
0.0048
0.0047
0.0046
0.0045
0.0044
0.0043
0.0042
0.0041
0.004
24-Oct-2011
25-Apr-2012
Date Sampled

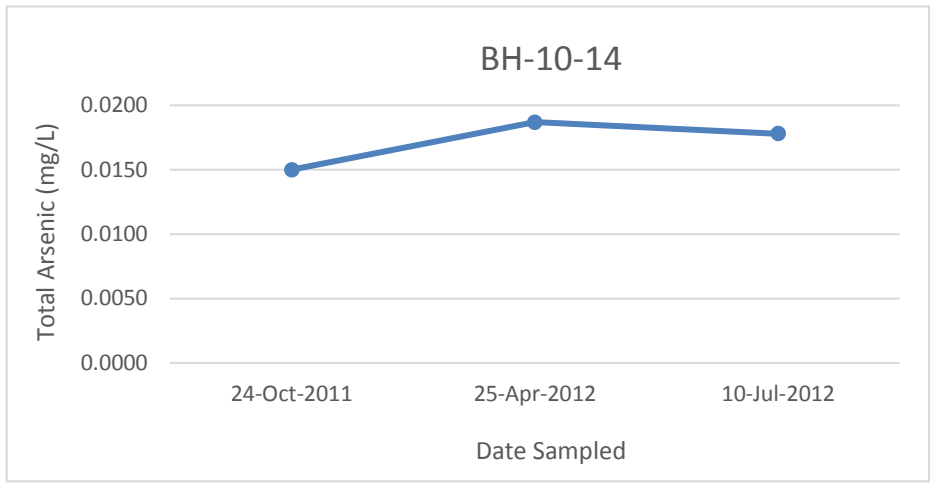

BH-10-04
Total Arsenic (mg/L)
0.035
0.03
0.025
0.02
0.015
0.01
0.005
0
24-Oct-2011
16-Jan-2012
25-Apr-2012
10-Jul-2012
Date Sampled

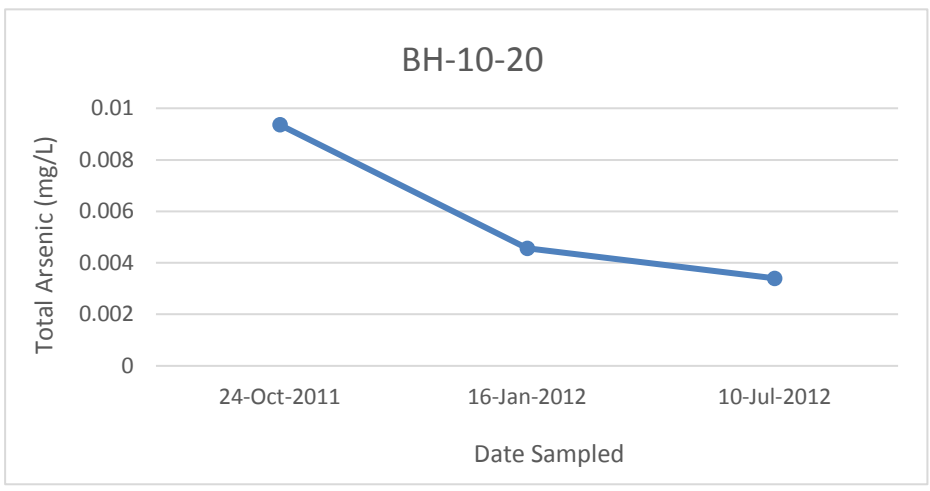

BH-10-05
Total Arsenic (mg/L)
0.016
0.014
0.012
0.01
0.008
0.006
0.004
0.002
0
24-Oct-2011
16-Jan-2012
25-Apr-2012
10-Jul-2012
06-Jun-2013
22-Oct-2013
Date Sampled

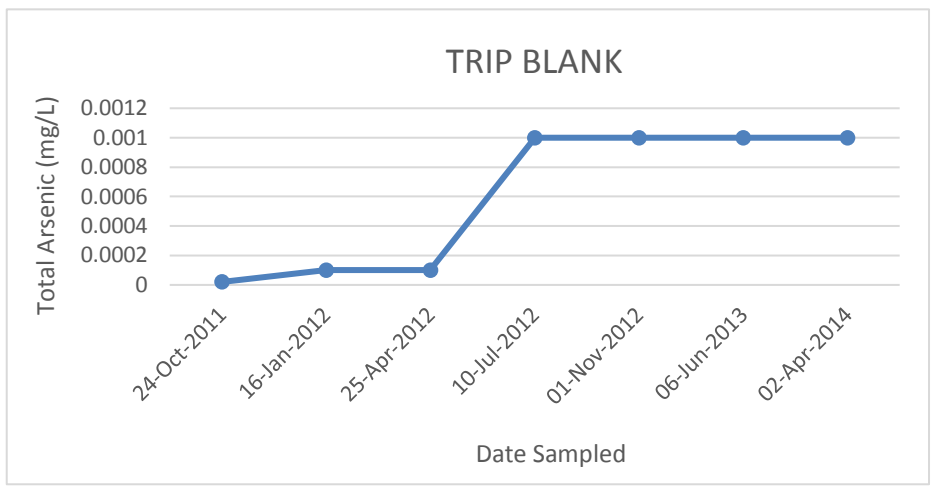

BH-10-7A
Total Arsenic (mg/L)
0.07
0.06
0.05
0.04
0.03
0.02
0.01
0
24-Oct-2011
25-Apr-2012
10-Jul-2012
06-Jun-2013
23-Oct-2013
Date Sampled

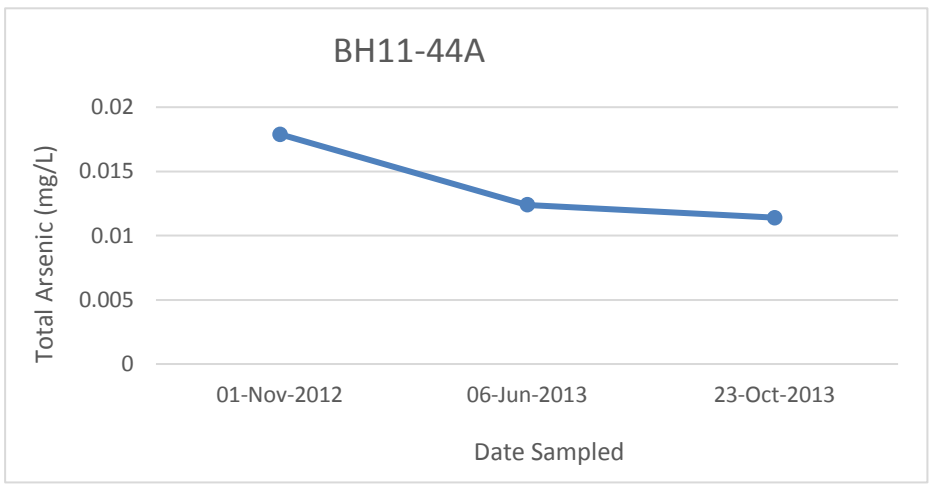

BH-10-11A
Total Arsenic (mg/L)
0.200
0.150
0.100
0.050
0.000
24-Oct-2011
25-Apr-2012
10-Jul-2012
Date Sampled

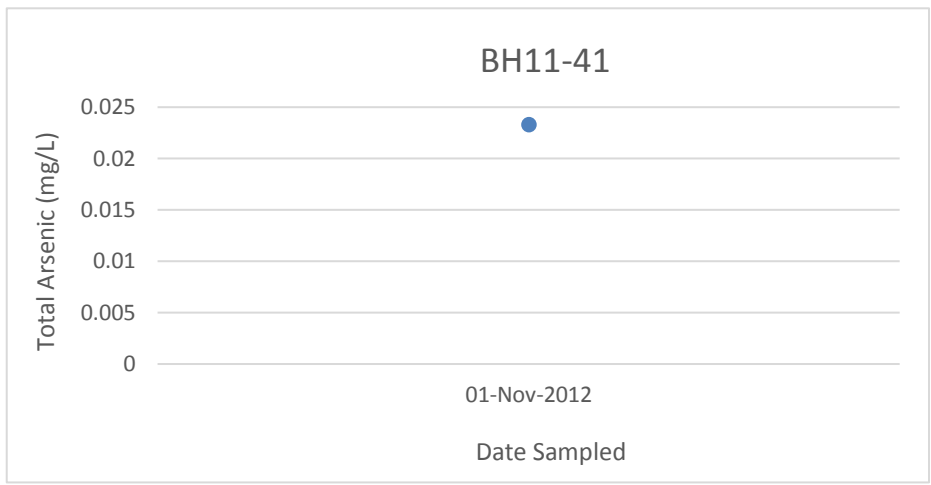

BH-10-12A
Total Arsenic (mg/L)
0.025
0.02
0.015
0.01
0.005
0
24-Oct-2011
10-Jul-2012
Date Sampled

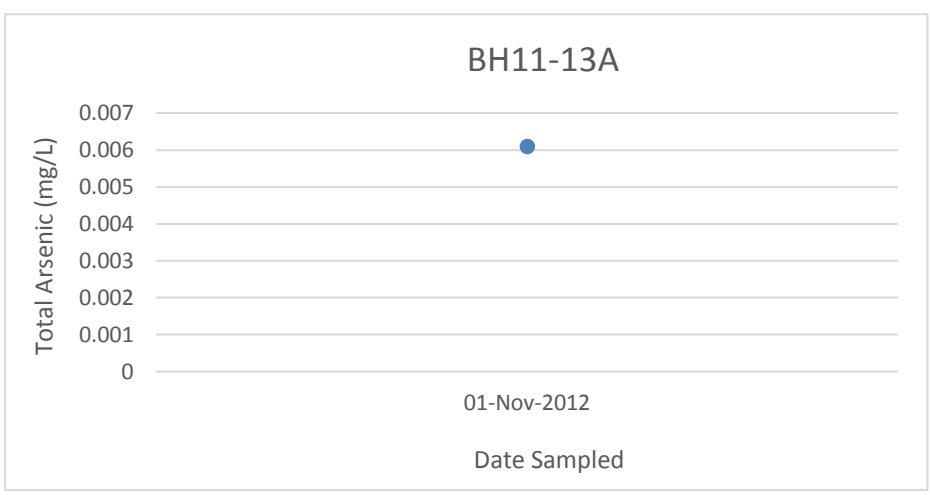

BH-10-14
Total Arsenic (mg/L)
0.0200
0.0150
0.0100
0.0050
0.0000
24-Oct-2011
25-Apr-2012
10-Jul-2012
Date Sampled

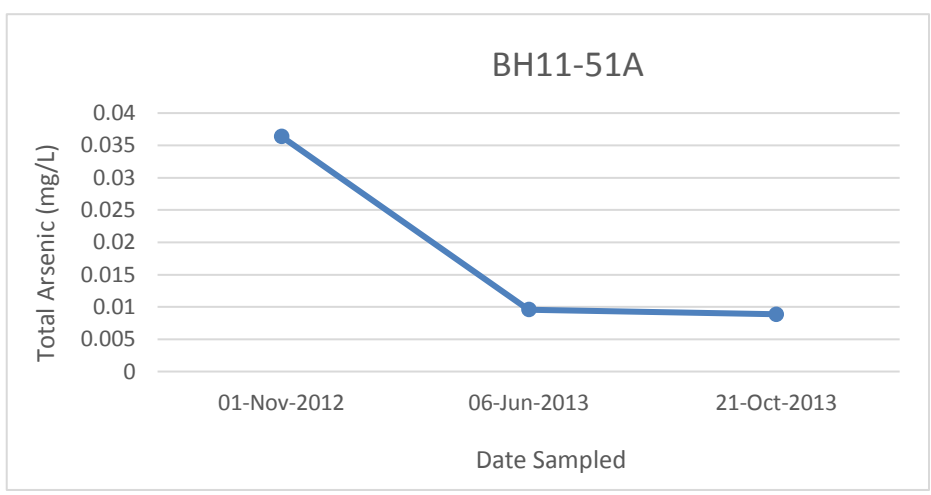

BH-10-20
Total Arsenic (mg/L)
0.01
0.008
0.006
0.004
0.002
0
24-Oct-2011
16-Jan-2012
10-Jul-2012
Date Sampled

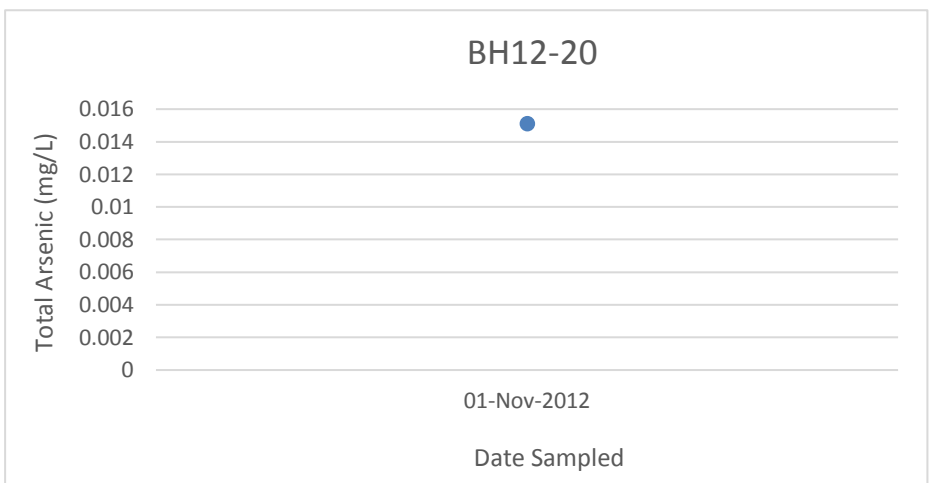

TRIP BLANK
Total Arsenic (mg/L)
0.0012
0.001
0.0008
0.0006
0.0004
0.0002
0
24-Oct-2011
16-Jan-2012
25-Apr-2012
10-Jul-2012
01-Nov-2012
06-Jun-2013
02-Apr-2014
Date Sampled

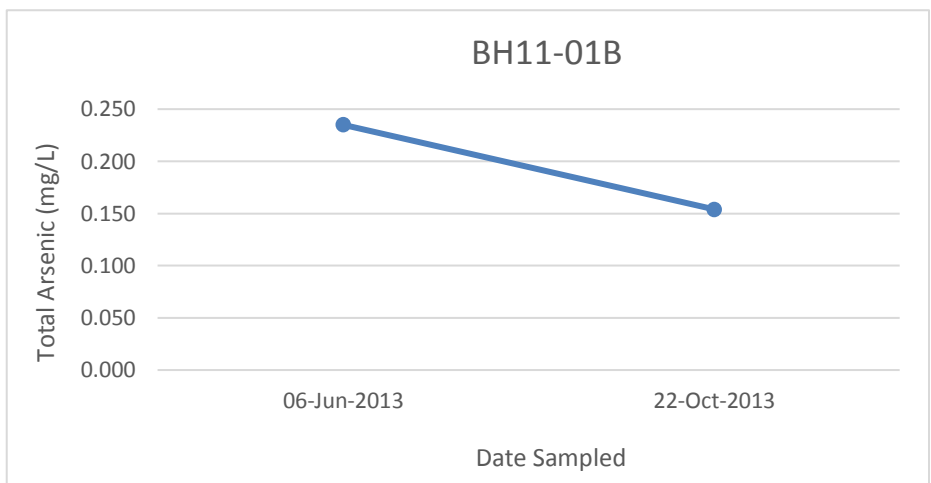

BH11-44A
Total Arsenic (mg/L)
0.02
0.015
0.01
0.005
0
01-Nov-2012
06-Jun-2013
23-Oct-2013
Date Sampled

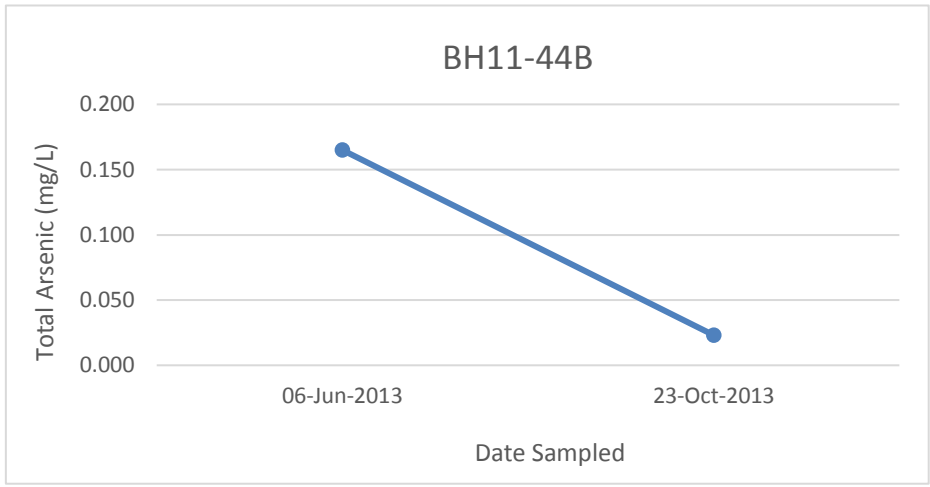

BH11-41
Total Arsenic (mg/L)
0.025
0.02
0.015
0.01
0.005
0
01-Nov-2012
Date Sampled

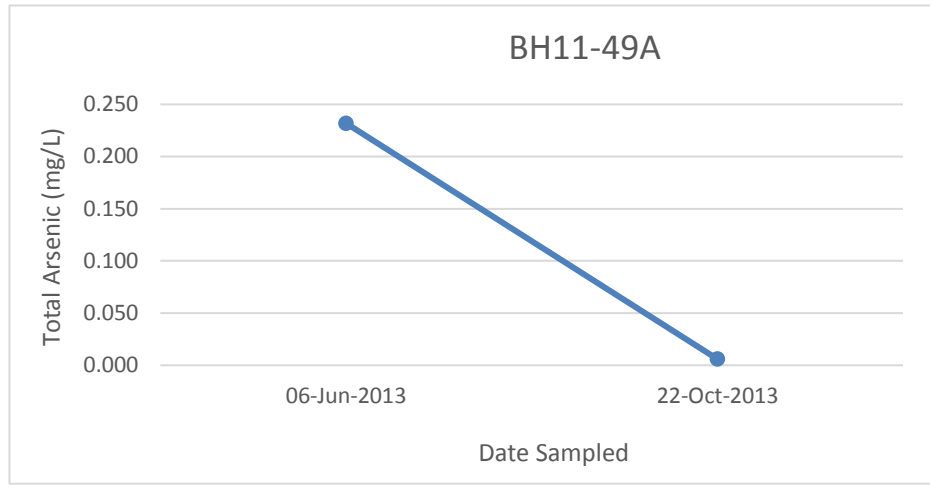

BH11-13A
Total Arsenic (mg/L)
0.007
0.006
0.005
0.004
0.003
0.002
0.001
0
01-Nov-2012
Date Sampled

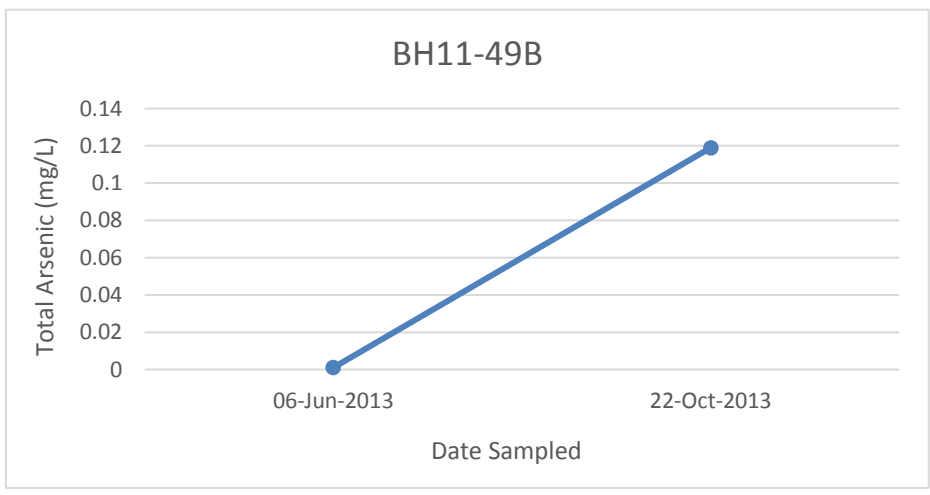

BH11-51A
Total Arsenic (mg/L)
0.04
0.035
0.03
0.025
0.02
0.015
0.01
0.005
0
01-Nov-2012
06-Jun-2013
21-Oct-2013
Date Sampled

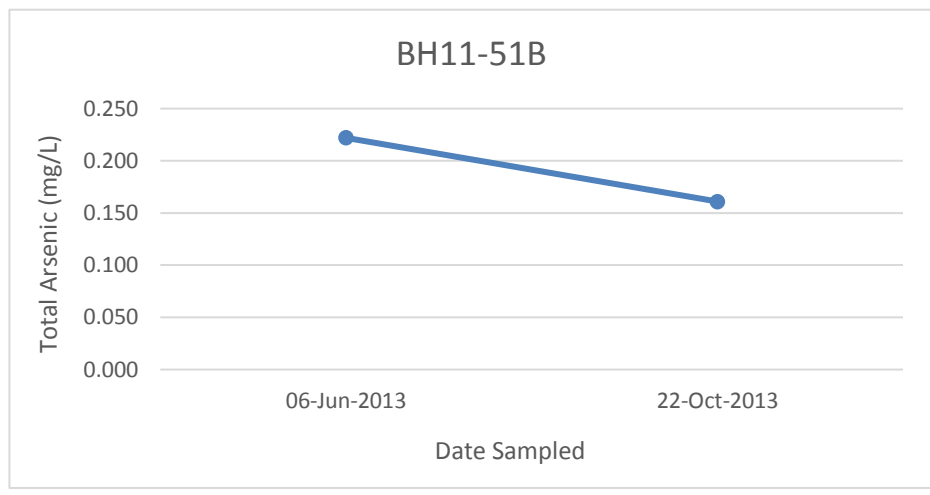

BH12-20
Total Arsenic (mg/L)
0.016
0.014
0.012
0.01
0.008
0.006
0.004
0.002
0
01-Nov-2012
Date Sampled

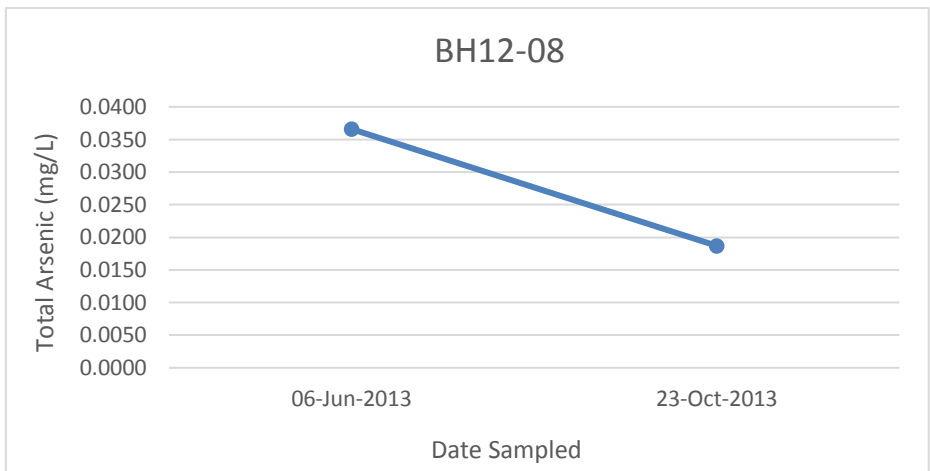

BH11-01B
Total Arsenic (mg/L)
0.250
0.200
0.150
0.100
0.050
0.000
06-Jun-2013
22-Oct-2013
Date Sampled

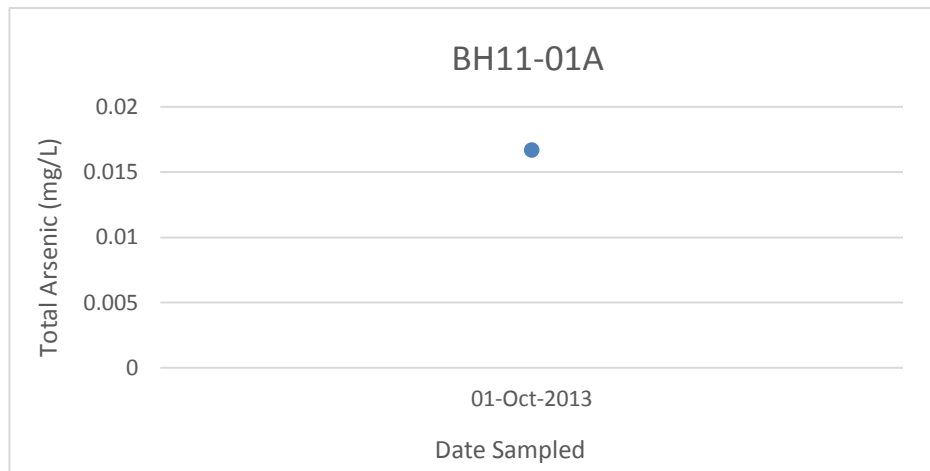

BH11-44B
0.200
0.150
0.100
0.050
0.000
Total Arsenic (mg/L)
06-Jun-2013
23-Oct-2013
Date Sampled

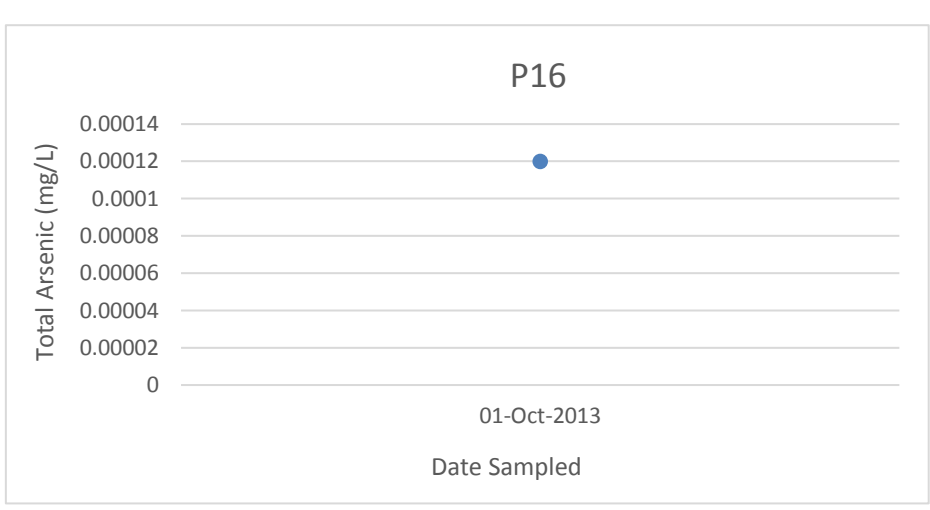

BH11-49A
0.250
0.200
0.150
0.100
0.050
0.000
Total Arsenic (mg/L)
06-Jun-2013
22-Oct-2013
Date Sampled

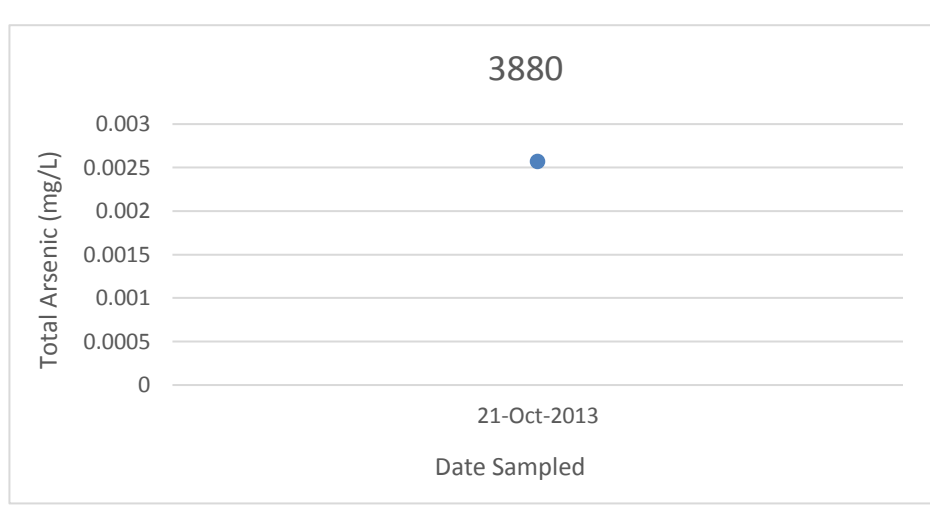

BH11-49B
0.14
0.12
0.1
0.08
0.06
0.04
0.02
0
Total Arsenic (mg/L)
06-Jun-2013
22-Oct-2013
Date Sampled

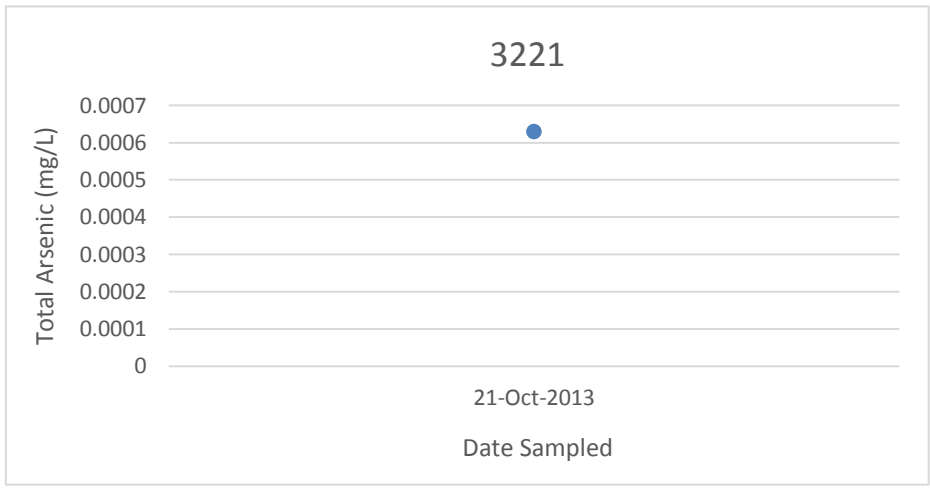

BH11-51B
0.250
0.200
0.150
0.100
0.050
0.000
Total Arsenic (mg/L)
06-Jun-2013
22-Oct-2013
Date Sampled

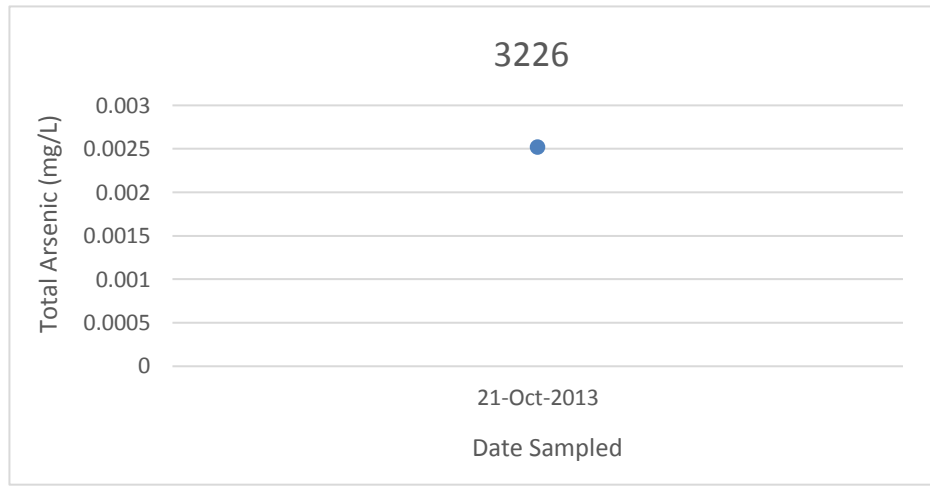

BH12-08
0.0400
0.0350
0.0300
0.0250
0.0200
0.0150
0.0100
0.0050
0.0000
Total Arsenic (mg/L)
06-Jun-2013
23-Oct-2013
Date Sampled

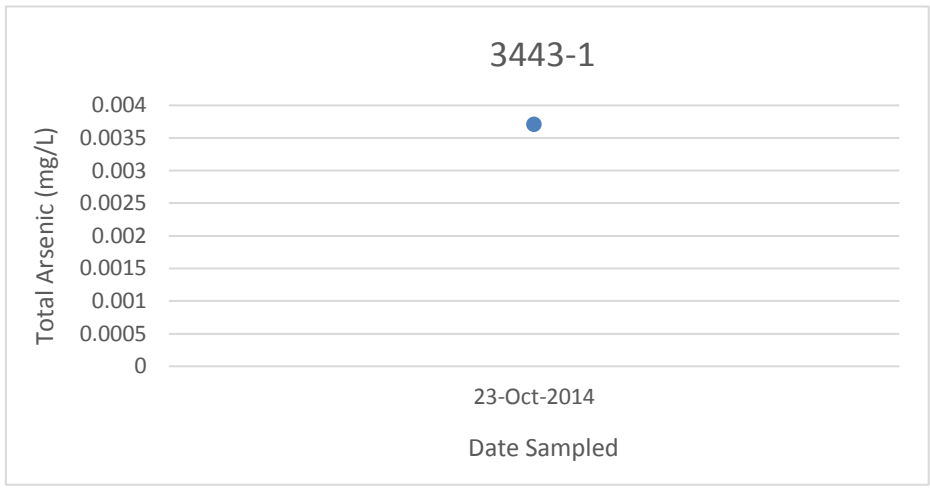

BH11-01A
0.02
0.015
0.01
0.005
0
Total Arsenic (mg/L)
01-Oct-2013
Date Sampled

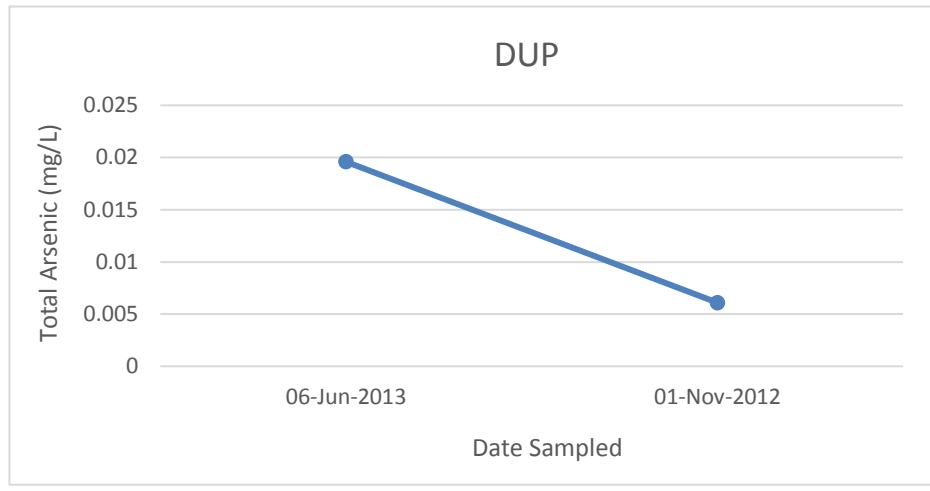

P16
0.00014
0.00012
0.0001
0.00008
0.00006
0.00004
0.00002
0
Total Arsenic (mg/L)
01-Oct-2013
Date Sampled

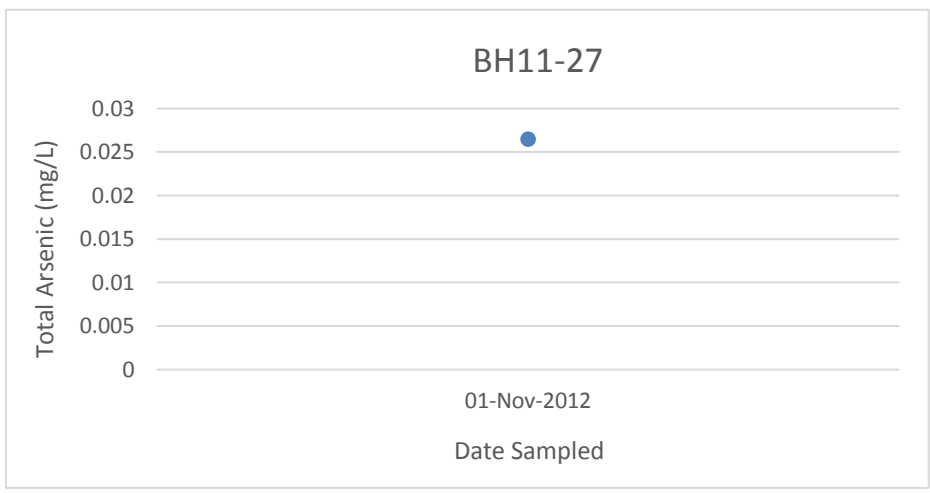

3880
0.003
0.0025
0.002
0.0015
0.001
0.0005
0
Total Arsenic (mg/L)
21-Oct-2013
Date Sampled

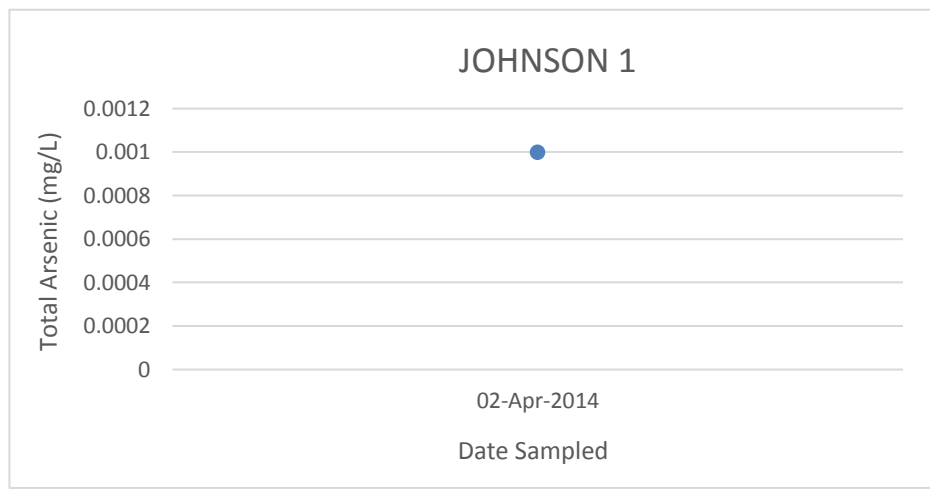

3221
0.0007
0.0006
0.0005
0.0004
0.0003
0.0002
0.0001
0
Total Arsenic (mg/L)
21-Oct-2013
Date Sampled

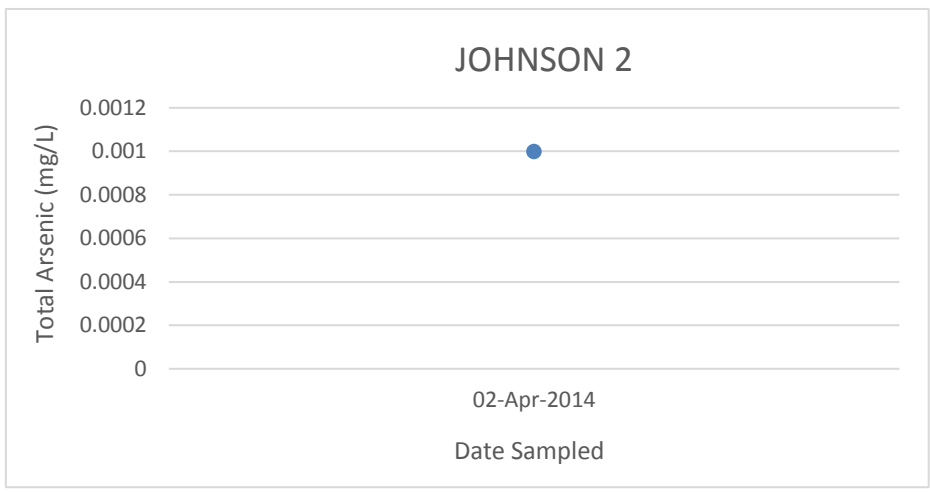

3226
0.003
0.0025
0.002
0.0015
0.001
0.0005
0
Total Arsenic (mg/L)
21-Oct-2013
Date Sampled

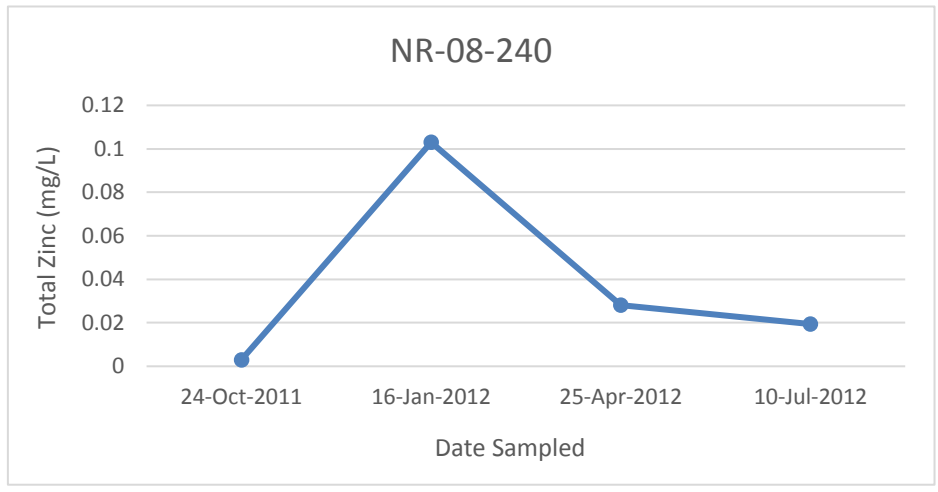

3443-1
Total Arsenic (mg/L)
0.004
0.0035
0.003
0.0025
0.002
0.0015
0.001
0.0005
0
23-Oct-2014
Date Sampled

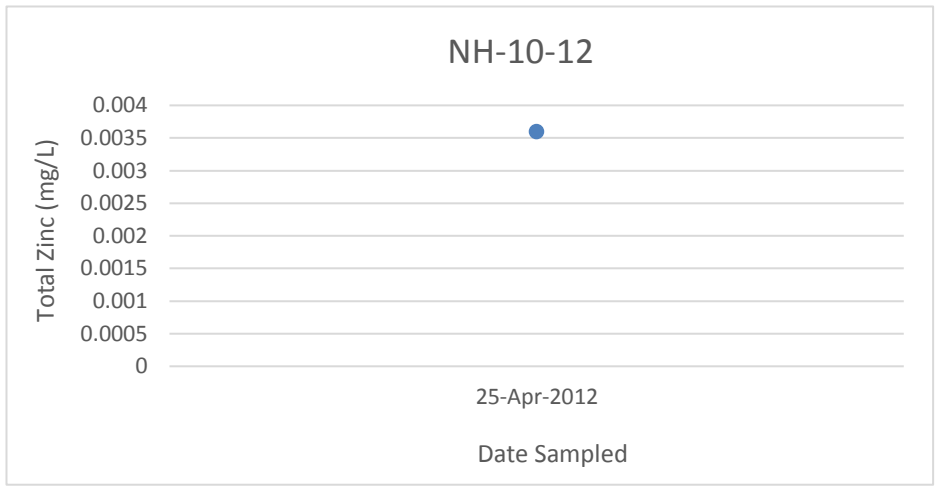

DUP
Total Arsenic (mg/L)
0.025
0.02
0.015
0.01
0.005
0
06-Jun-2013
01-Nov-2012
Date Sampled

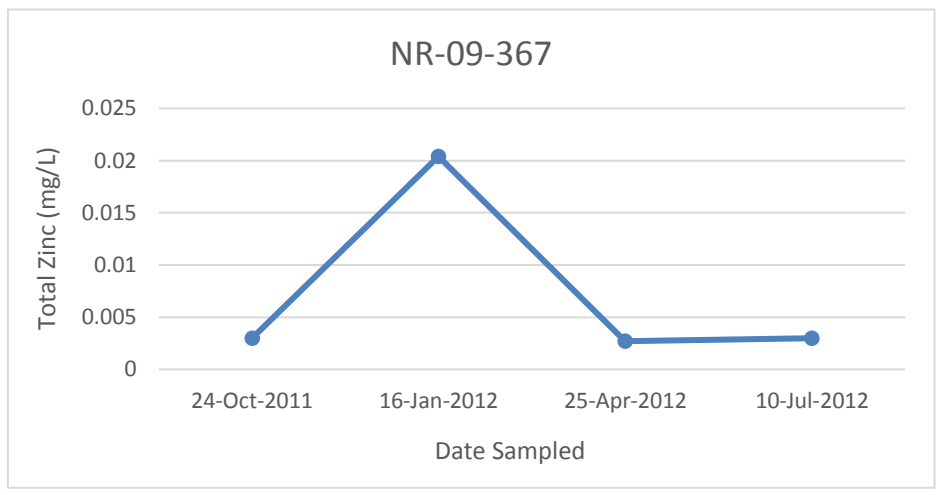

BH11-27
Total Arsenic (mg/L)
0.03
0.025
0.02
0.015
0.01
0.005
0
01-Nov-2012
Date Sampled

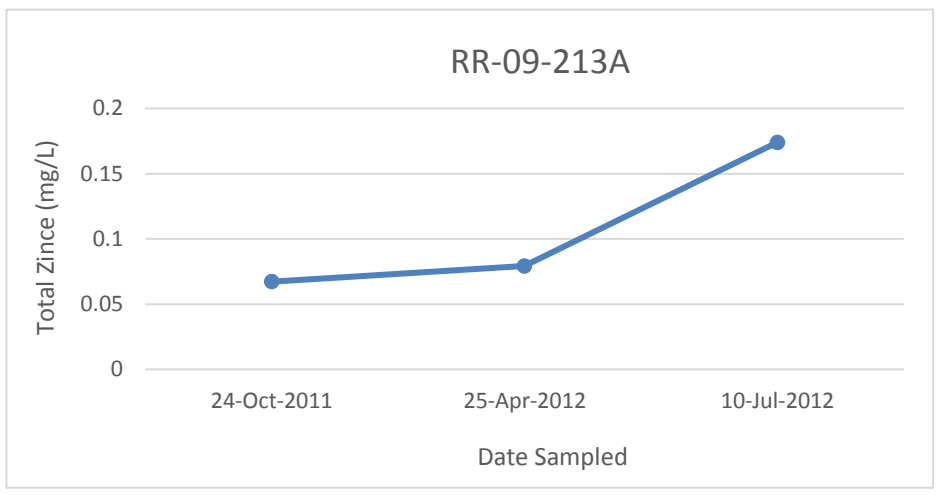

JOHNSON 1
Total Arsenic (mg/L)
0.0012
0.001
0.0008
0.0006
0.0004
0.0002
0
02-Apr-2014
Date Sampled

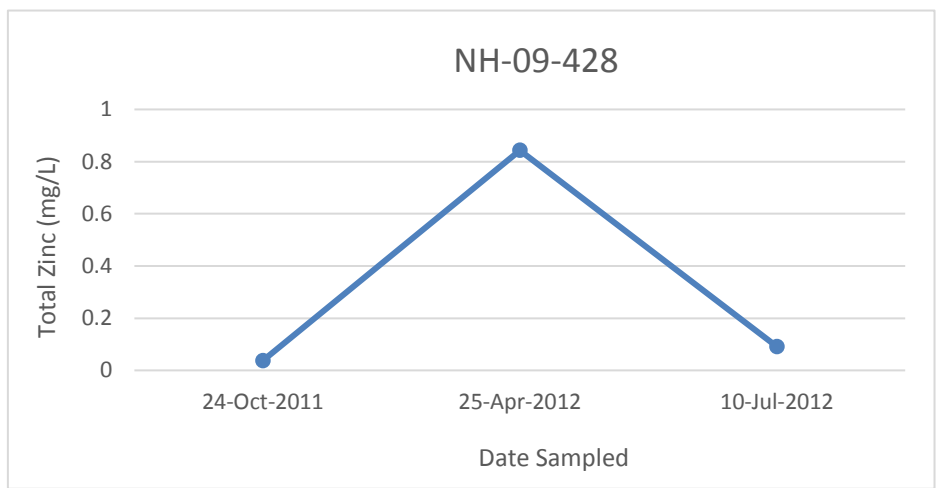

JOHNSON 2
Total Arsenic (mg/L)
0.0012
0.001
0.0008
0.0006
0.0004
0.0002
0
02-Apr-2014
Date Sampled

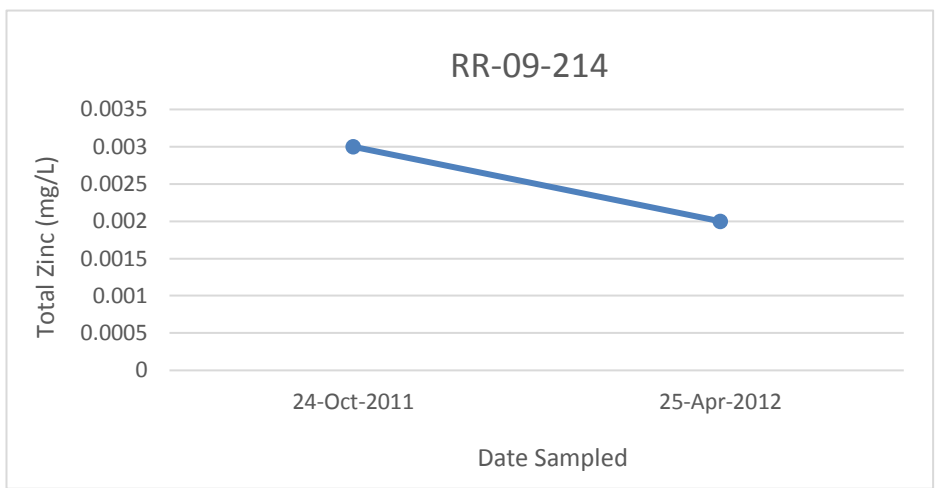

NR-08-240
Total Zinc (mg/L)
0.12
0.1
0.08
0.06
0.04
0.02
0
24-Oct-2011
16-Jan-2012
25-Apr-2012
10-Jul-2012
Date Sampled


NH-10-12
Total Zinc (mg/L)
0.004
0.0035
0.003
0.0025
0.002
0.0015
0.001
0.0005
0
25-Apr-2012
Date Sampled


NR-09-367
Total Zinc (mg/L)
0.025
0.02
0.015
0.01
0.005
0
24-Oct-2011
16-Jan-2012
25-Apr-2012
10-Jul-2012
Date Sampled


RR-09-213A
Total Zince (mg/L)
0.2
0.15
0.1
0.05
0
24-Oct-2011
25-Apr-2012
10-Jul-2012
Date Sampled


NH-09-428
Total Zinc (mg/L)
1
0.8
0.6
0.4
0.2
0
24-Oct-2011
25-Apr-2012
10-Jul-2012
Date Sampled


RR-09-214
Total Zinc (mg/L)
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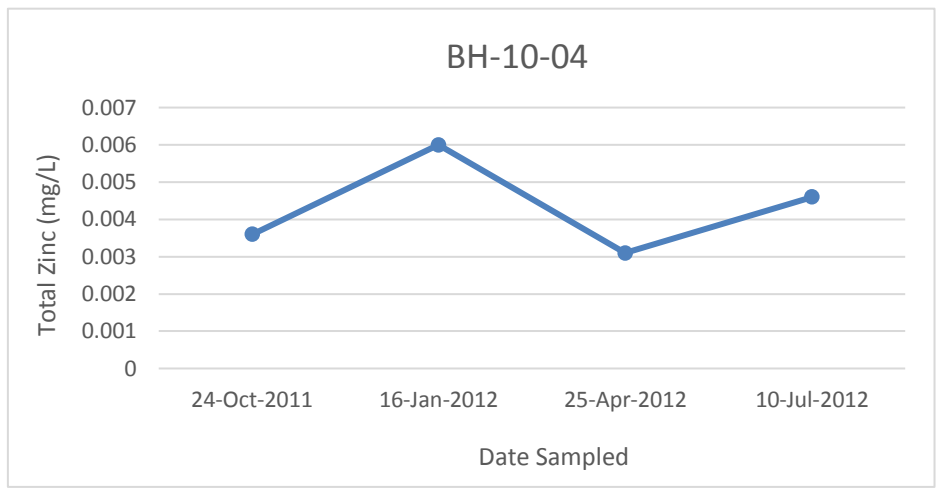
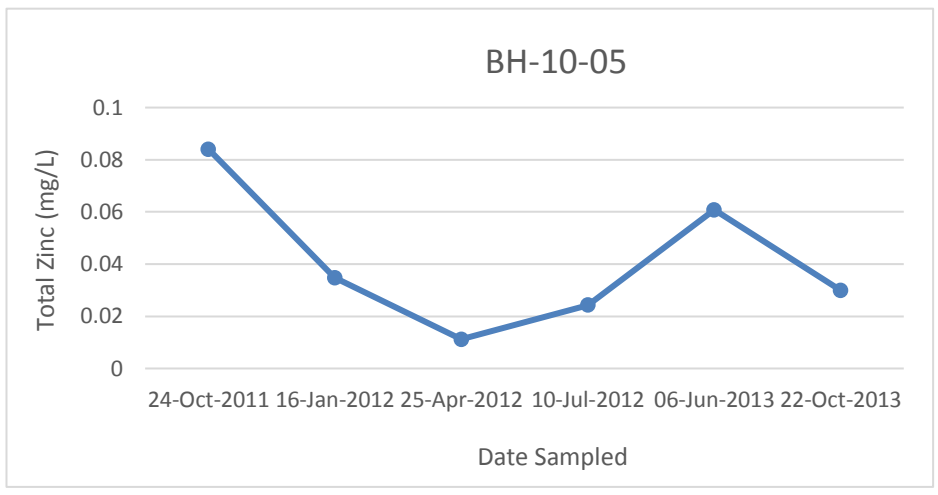
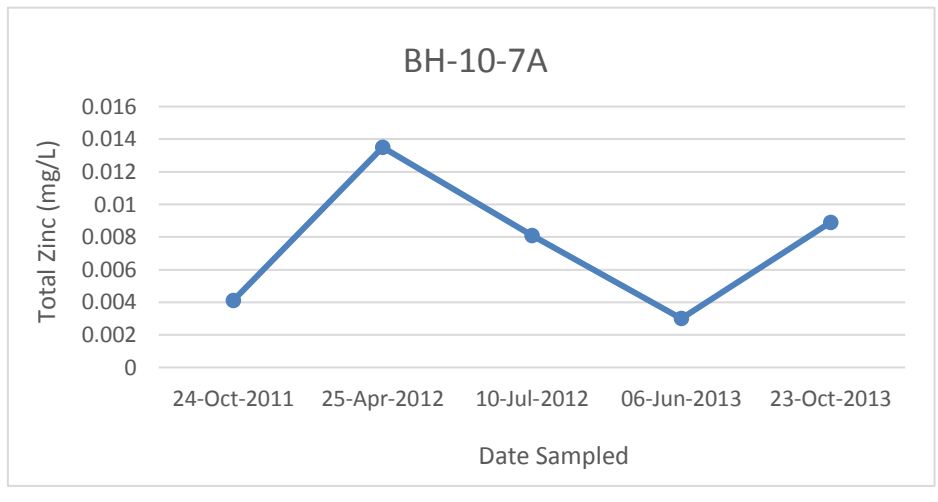
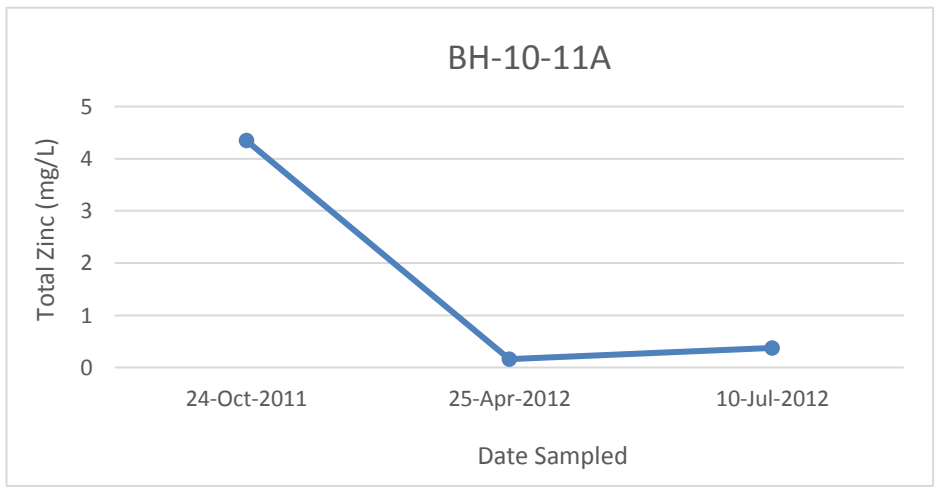
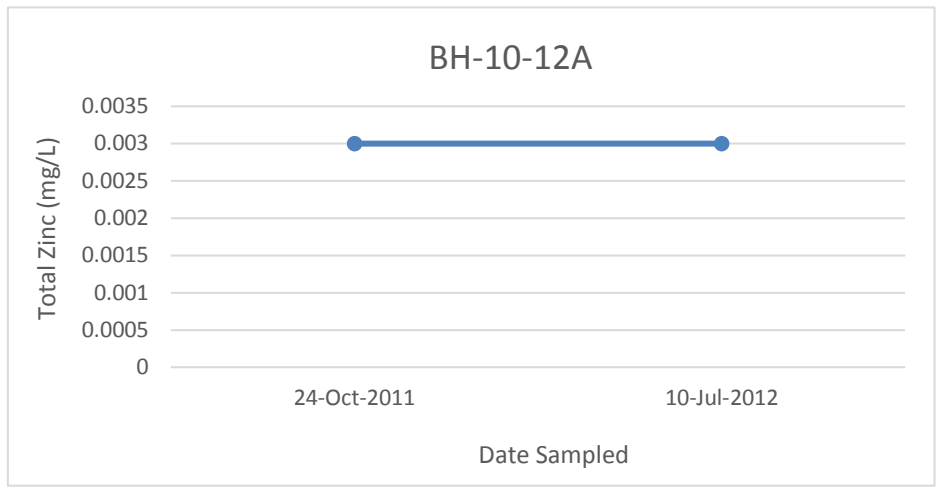
0.003
0.0025
0.002
0.0015
0.001
0.0005
0
24-Oct-2011
25-Apr-2012
Date Sampled


BH-10-04
Total Zinc (mg/L)
0.007
0.006
0.005
0.004
0.003
0.002
0.001
0
24-Oct-2011
16-Jan-2012
25-Apr-2012
10-Jul-2012
Date Sampled


BH-10-05
Total Zinc (mg/L)
0.1
0.08
0.06
0.04
0.02
0
24-Oct-2011
16-Jan-2012
25-Apr-2012
10-Jul-2012
06-Jun-2013
22-Oct-2013
Date Sampled


BH-10-7A
Total Zinc (mg/L)
0.016
0.014
0.012
0.01
0.008
0.006
0.004
0.002
0
24-Oct-2011
25-Apr-2012
10-Jul-2012
06-Jun-2013
23-Oct-2013
Date Sampled


BH-10-11A
Total Zinc (mg/L)
5
4
3
2
1
0
24-Oct-2011
25-Apr-2012
10-Jul-2012
Date Sampled


BH-10-12A
Total Zinc (mg/L)
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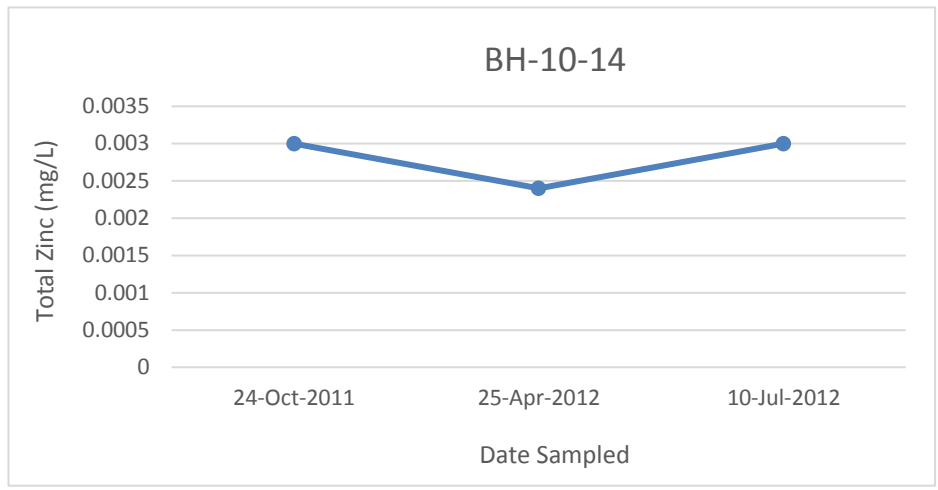
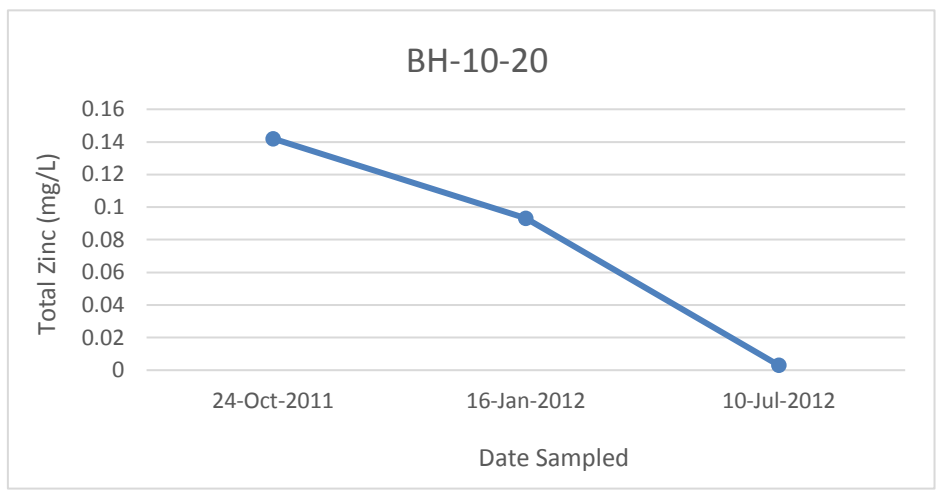
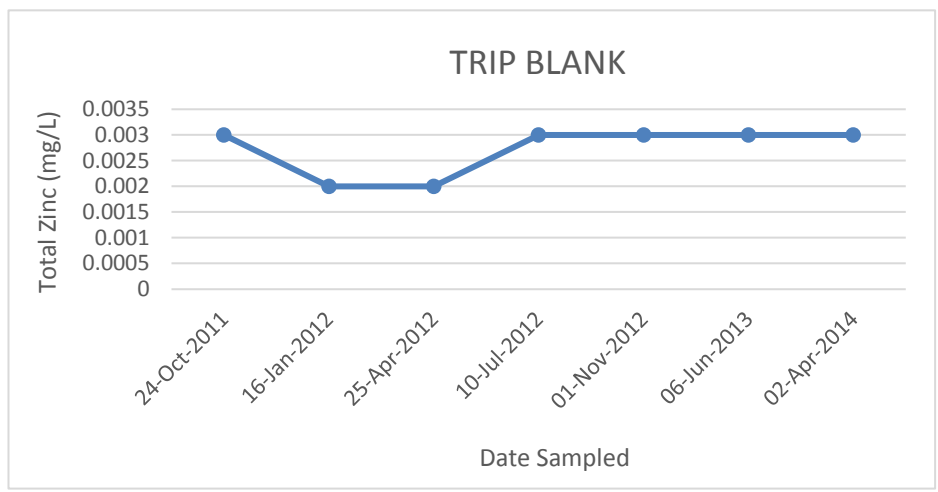
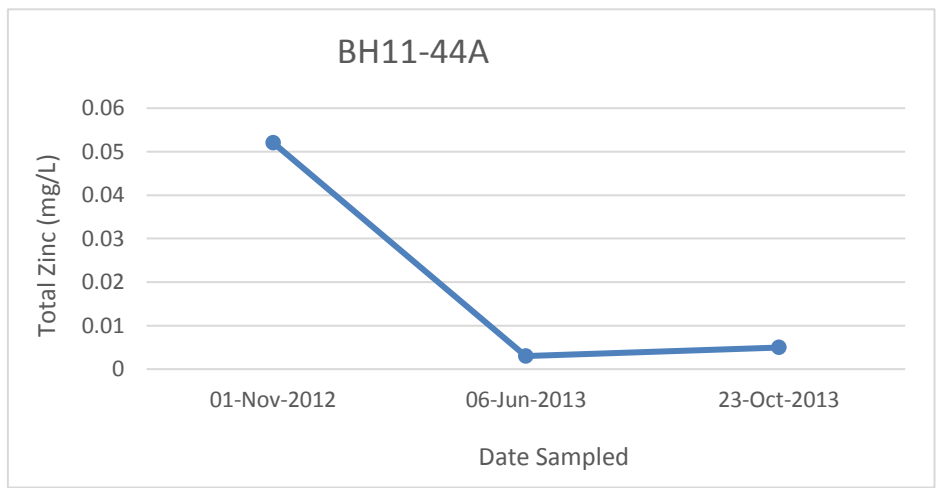
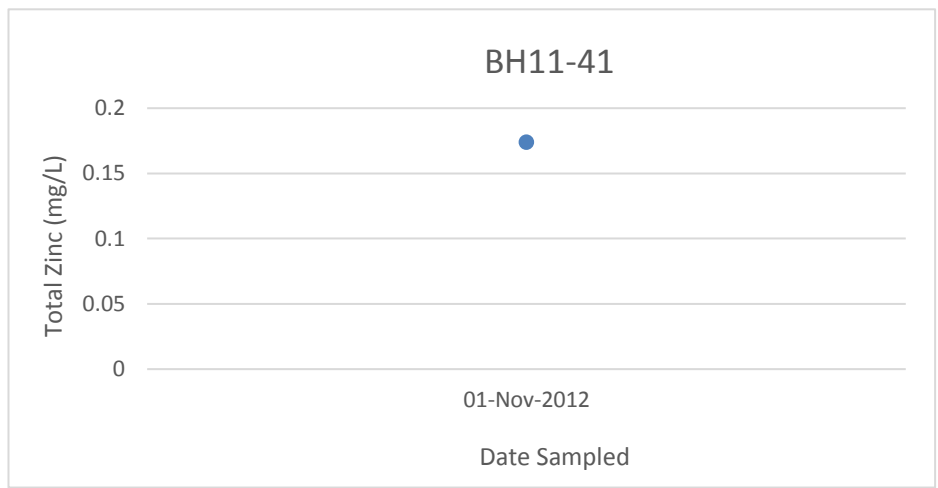
0.003
0.0025
0.002
0.0015
0.001
0.0005
0
24-Oct-2011
10-Jul-2012
Date Sampled

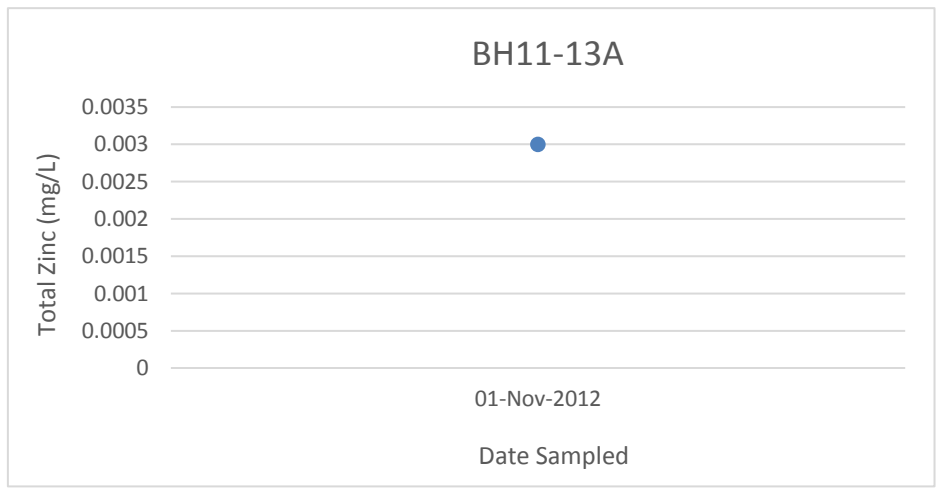

BH-10-14
Total Zinc (mg/L)
0.0035
0.003
0.0025
0.002
0.0015
0.001
0.0005
0
24-Oct-2011
25-Apr-2012
10-Jul-2012
Date Sampled

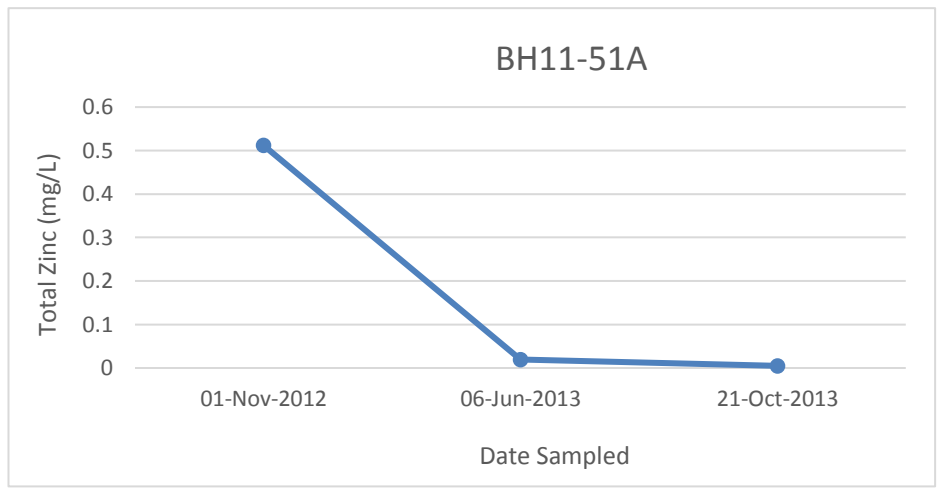

BH-10-20
Total Zinc (mg/L)
0.16
0.14
0.12
0.1
0.08
0.06
0.04
0.02
0
24-Oct-2011
16-Jan-2012
10-Jul-2012
Date Sampled

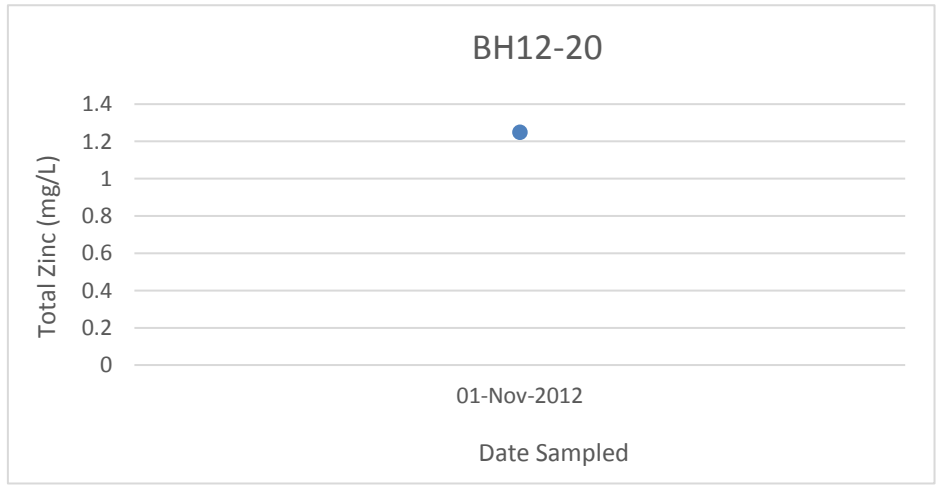

TRIP BLANK
Total Zinc (mg/L)
0.0035
0.003
0.0025
0.002
0.0015
0.001
0.0005
0
24-Oct-2011
16-Jan-2012
25-Apr-2012
10-Jul-2012
01-Nov-2012
06-Jun-2013
02-Apr-2014
Date Sampled

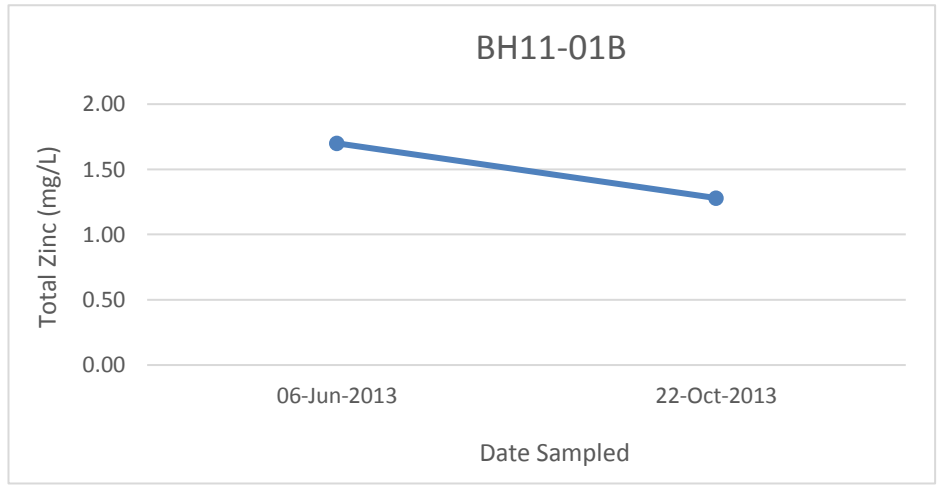

BH11-44A
Total Zinc (mg/L)
0.06
0.05
0.04
0.03
0.02
0.01
0
01-Nov-2012
06-Jun-2013
23-Oct-2013
Date Sampled

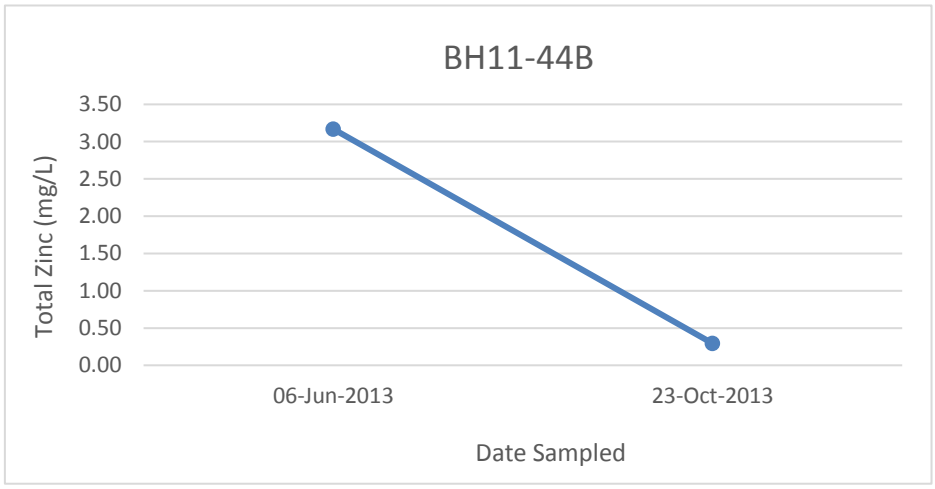

BH11-41
Total Zinc (mg/L)
0.2
0.15
0.1
0.05
0
01-Nov-2012
Date Sampled

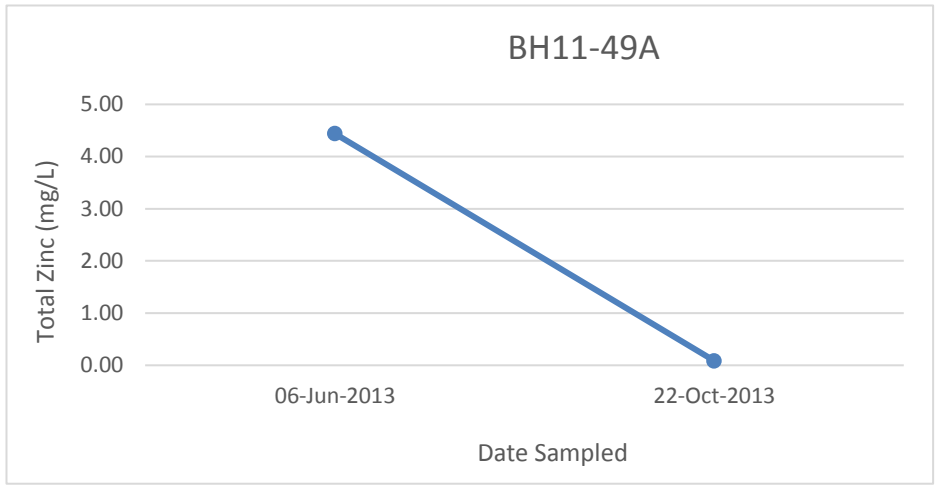

BH11-13A
Total Zinc (mg/L)
0.0035
0.003
0.0025
0.002
0.0015
0.001
0.0005
0
01-Nov-2012
Date Sampled

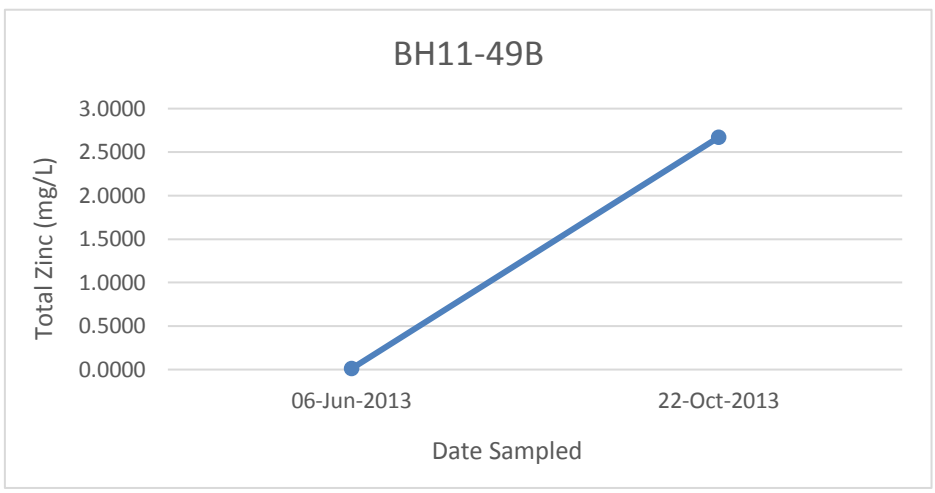

BH11-51A
Total Zinc (mg/L)
0.6
0.5
0.4
0.3
0.2
0.1
0
01-Nov-2012
06-Jun-2013
21-Oct-2013
Date Sampled

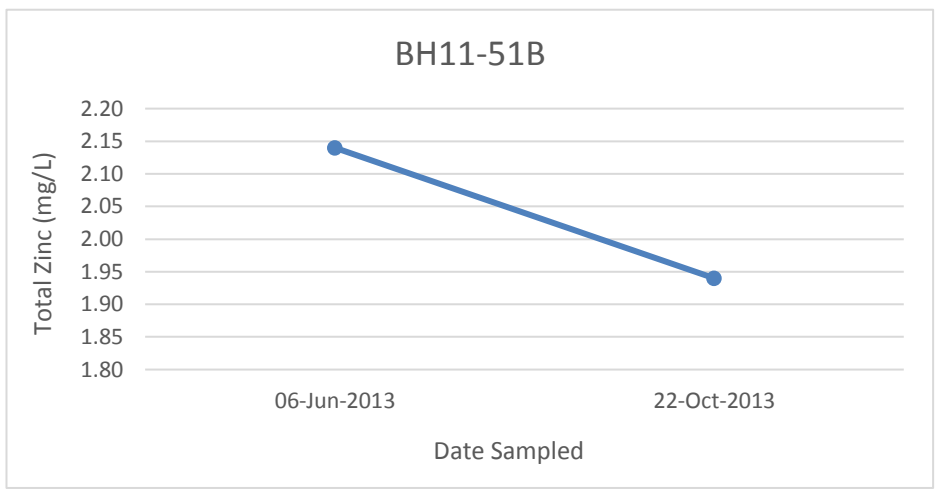

BH12-20
Total Zinc (mg/L)
1.4
1.2
1
0.8
0.6
0.4
0.2
0
01-Nov-2012
Date Sampled

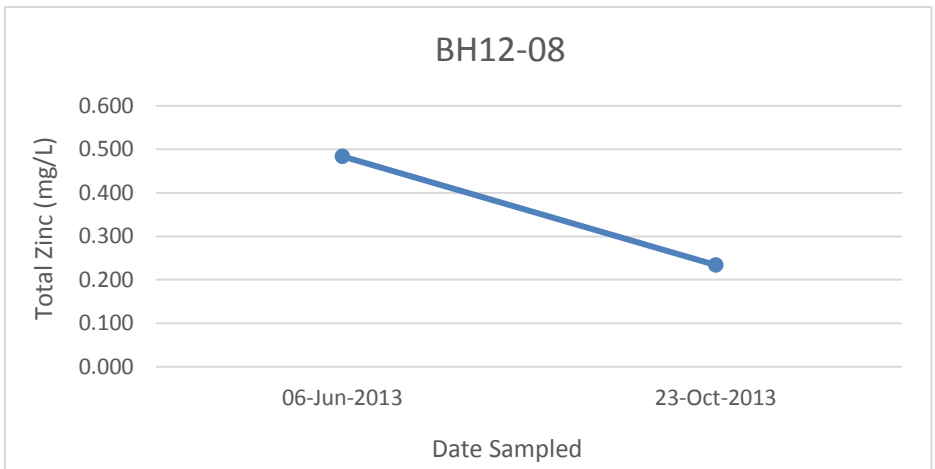

BH11-01B
Total Zinc (mg/L)
2.00
1.50
1.00
0.50
0.00
06-Jun-2013
22-Oct-2013
Date Sampled

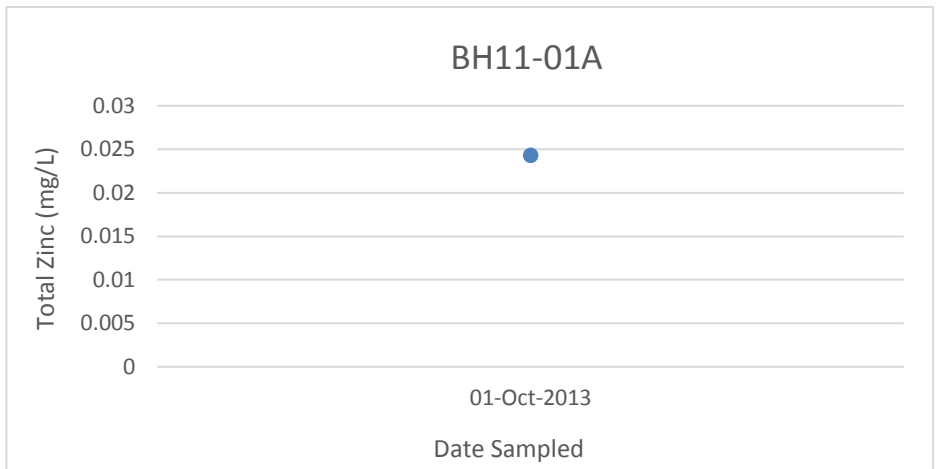

BH11-44B
Total Zinc (mg/L)
3.50
3.00
2.50
2.00
1.50
1.00
0.50
0.00
06-Jun-2013
23-Oct-2013
Date Sampled

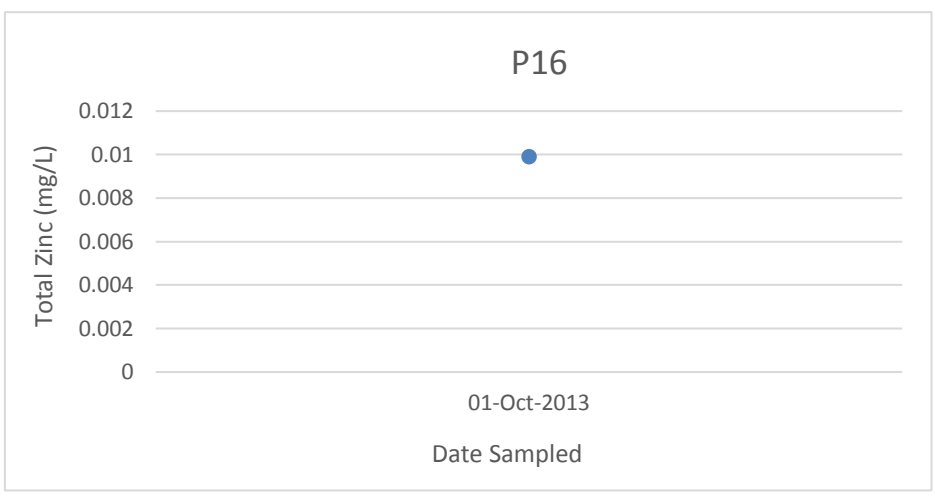

BH11-49A
Total Zinc (mg/L)
5.00
4.00
3.00
2.00
1.00
0.00
06-Jun-2013
22-Oct-2013
Date Sampled

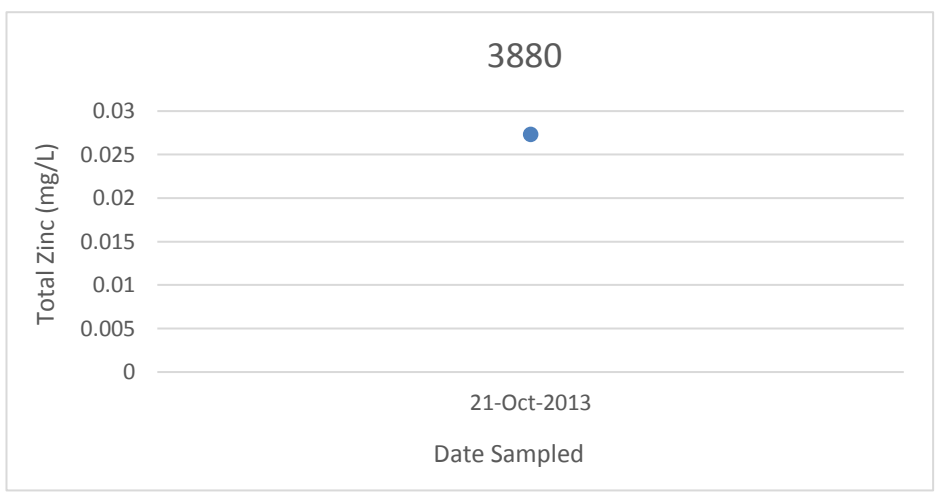

BH11-49B
Total Zinc (mg/L)
3.0000
2.5000
2.0000
1.5000
1.0000
0.5000
0.0000
06-Jun-2013
22-Oct-2013
Date Sampled

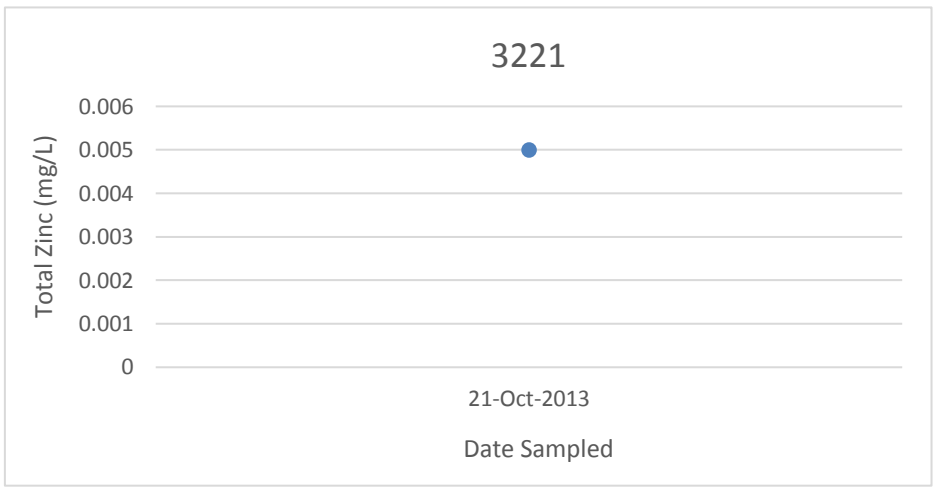

BH11-51B
Total Zinc (mg/L)
2.20
2.15
2.10
2.05
2.00
1.95
1.90
1.85
1.80
06-Jun-2013
22-Oct-2013
Date Sampled

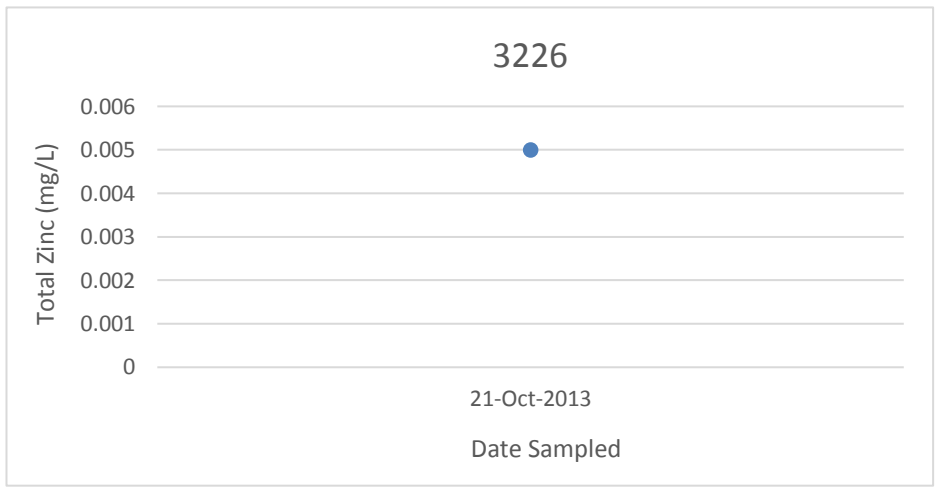

BH12-08
Total Zinc (mg/L)
0.600
0.500
0.400
0.300
0.200
0.100
0.000
06-Jun-2013
23-Oct-2013
Date Sampled

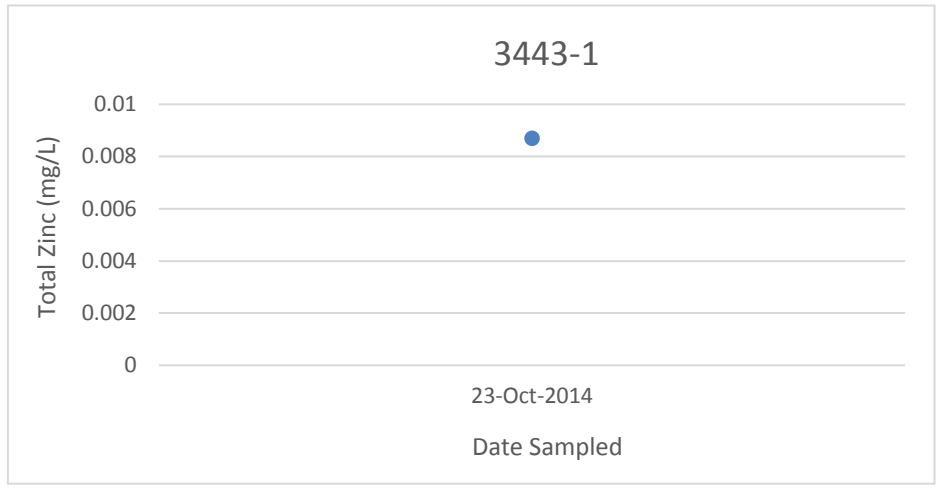

BH11-01A
Total Zinc (mg/L)
0.03
0.025
0.02
0.015
0.01
0.005
0
01-Oct-2013
Date Sampled

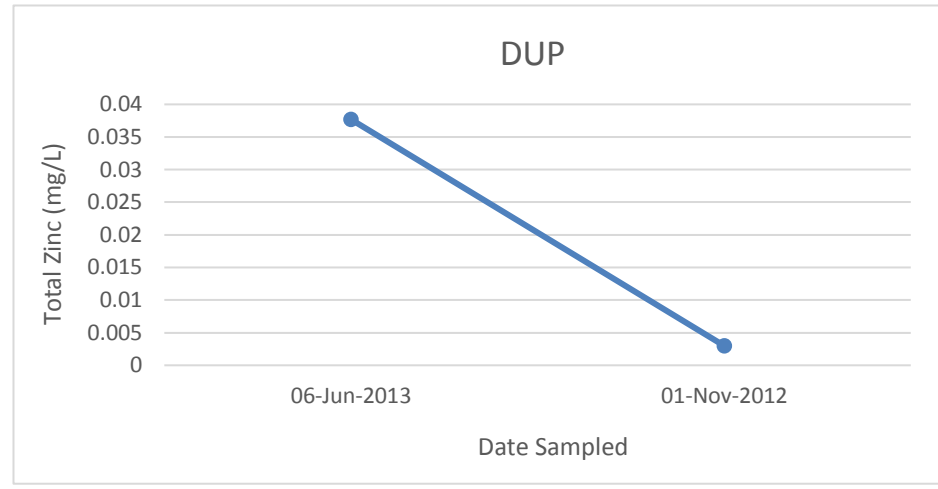

P16
Total Zinc (mg/L)
0.012
0.01
0.008
0.006
0.004
0.002
0
01-Oct-2013
Date Sampled

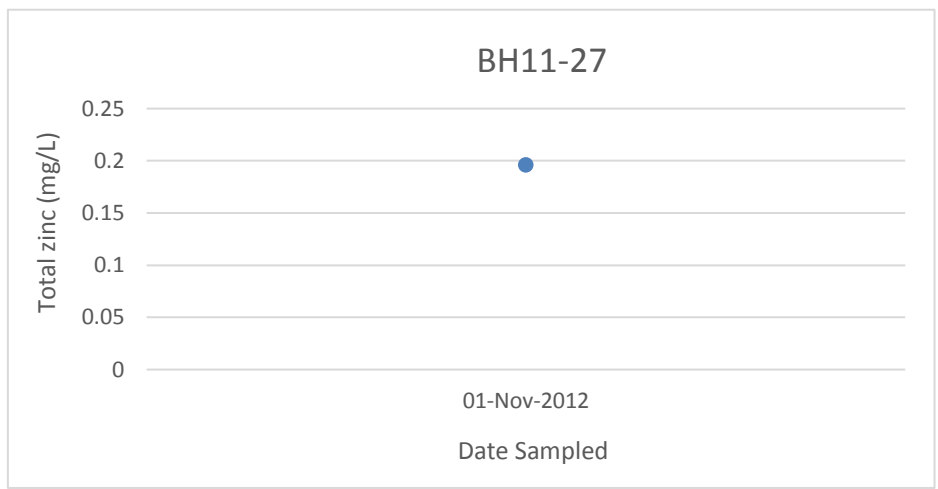

3880
Total Zinc (mg/L)
0.03
0.025
0.02
0.015
0.01
0.005
0
21-Oct-2013
Date Sampled

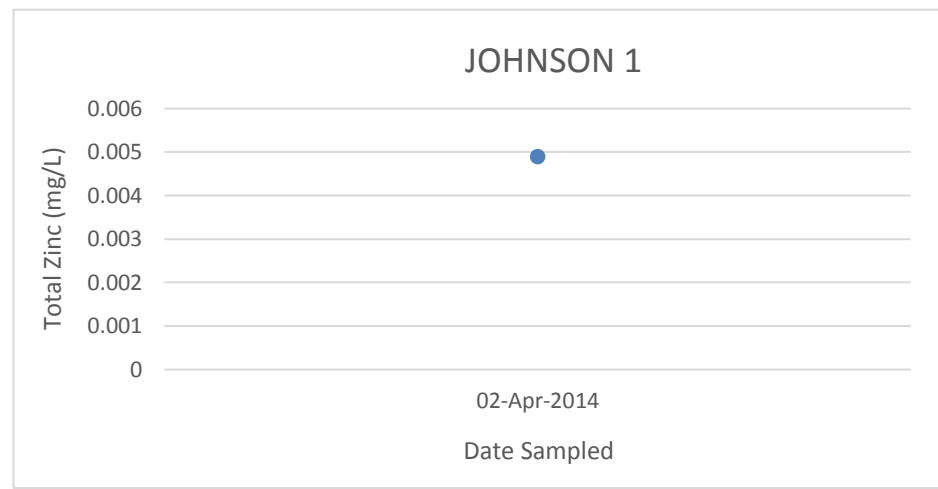

3221
Total Zinc (mg/L)
0.006
0.005
0.004
0.003
0.002
0.001
0
21-Oct-2013
Date Sampled

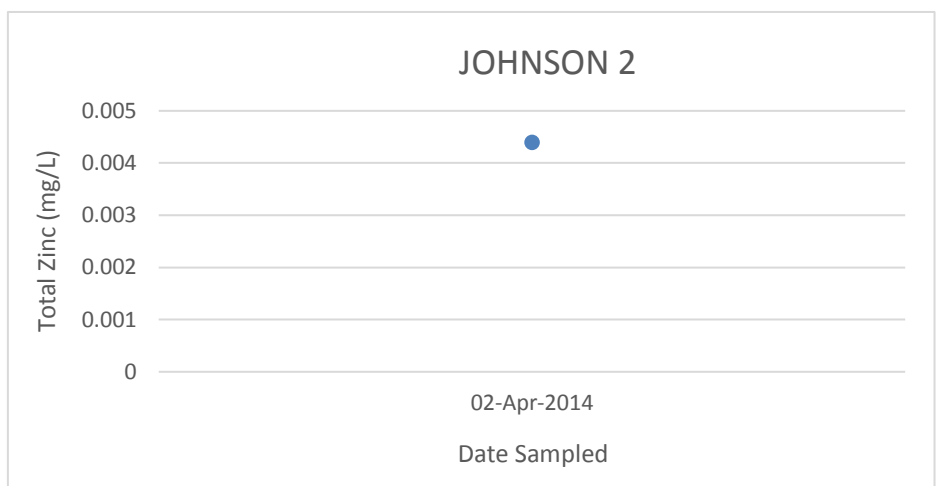

3226
Total Zinc (mg/L)
0.006
0.005
0.004
0.003
0.002
0.001
0
21-Oct-2013
Date Sampled

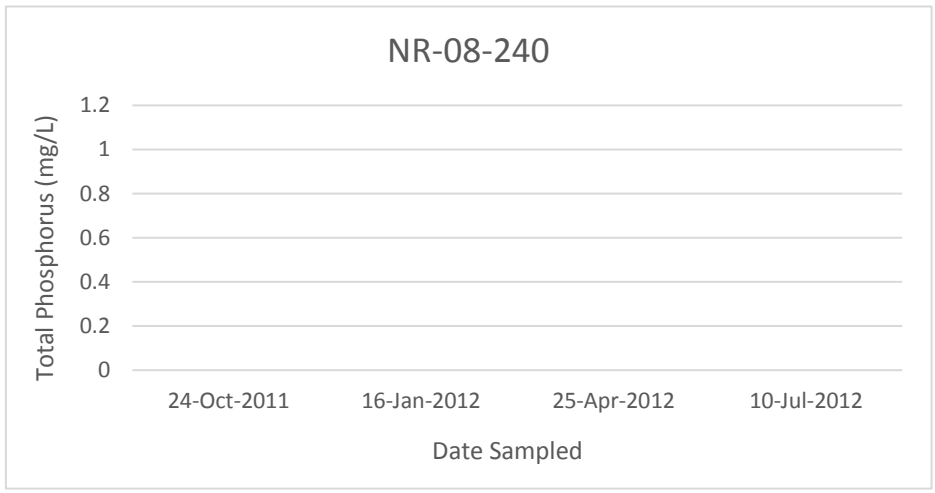

3443-1
Total Zinc (mg/L)
0.01
0.008
0.006
0.004
0.002
0
23-Oct-2014
Date Sampled

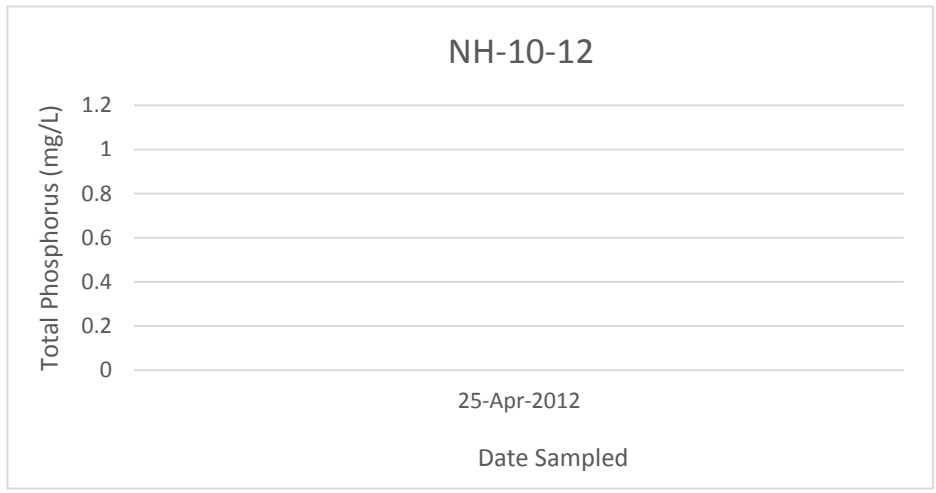

DUP
Total Zinc (mg/L)
0.04
0.035
0.03
0.025
0.02
0.015
0.01
0.005
0
06-Jun-2013
01-Nov-2012
Date Sampled

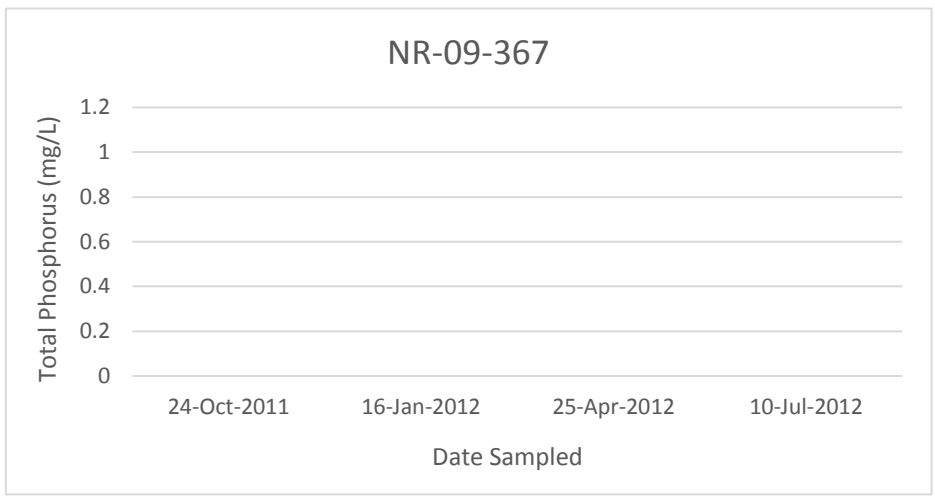

BH11-27
Total Zinc (mg/L)
0.25
0.2
0.15
0.1
0.05
0
01-Nov-2012
Date Sampled

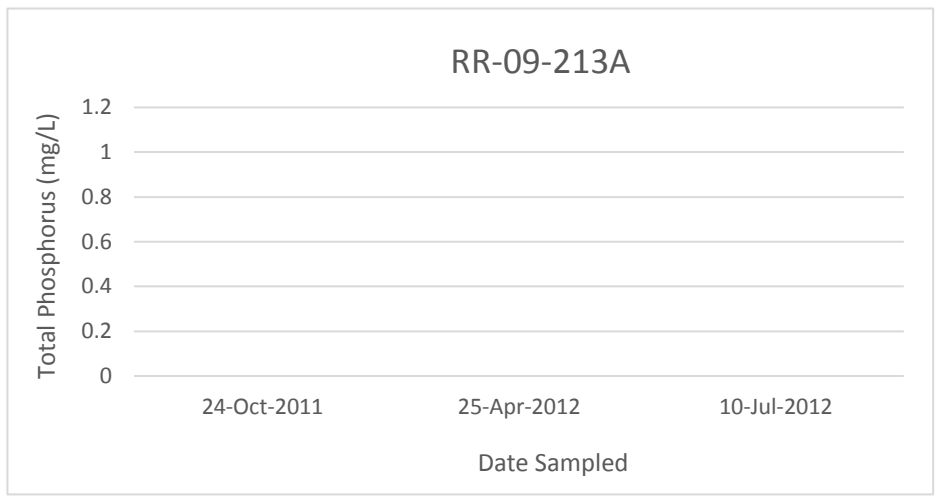

JOHNSON 1
Total Zinc (mg/L)
0.006
0.005
0.004
0.003
0.002
0.001
0
02-Apr-2014
Date Sampled

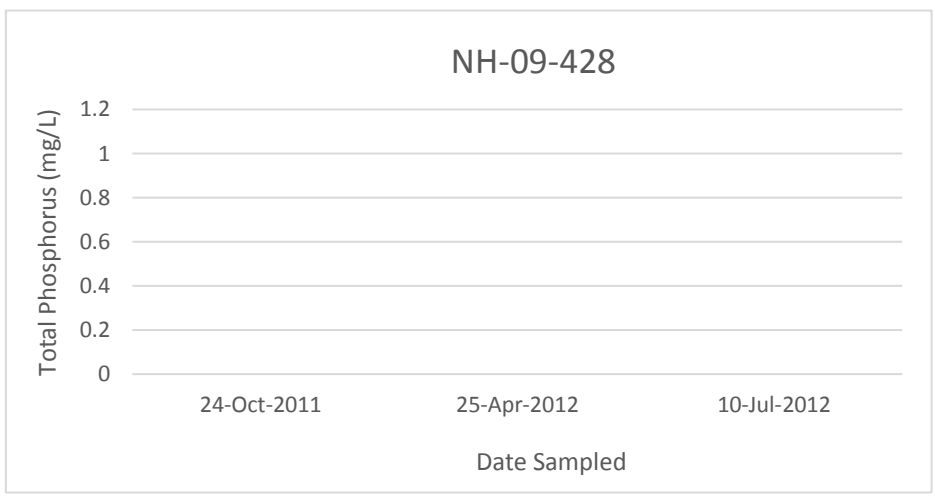

JOHNSON 2
Total Zinc (mg/L)
0.005
0.004
0.003
0.002
0.001
0
02-Apr-2014
Date Sampled

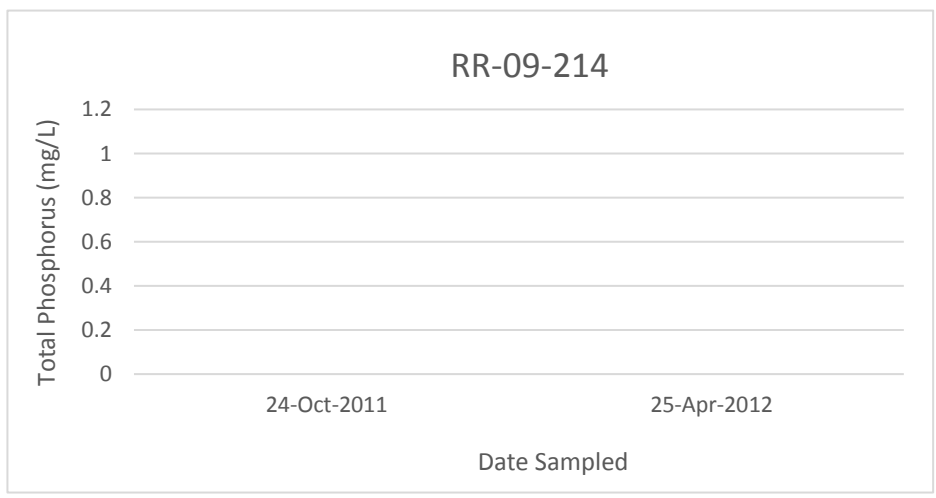

NR-08-240
Total Phosphorus (mg/L)
1.2
1
0.8
0.6
0.4
0.2
0
24-Oct-2011
16-Jan-2012
25-Apr-2012
10-Jul-2012
Date Sampled

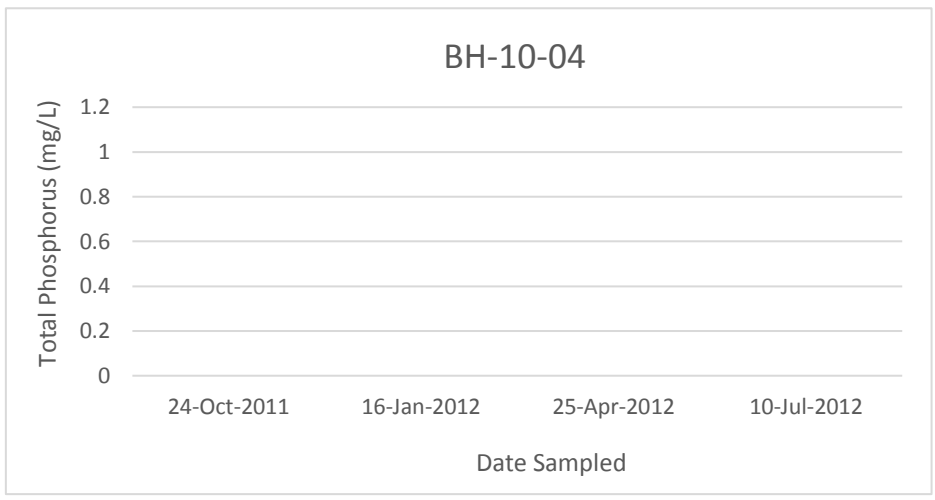

NH-10-12
Total Phosphorus (mg/L)
1.2
1
0.8
0.6
0.4
0.2
0
25-Apr-2012
Date Sampled

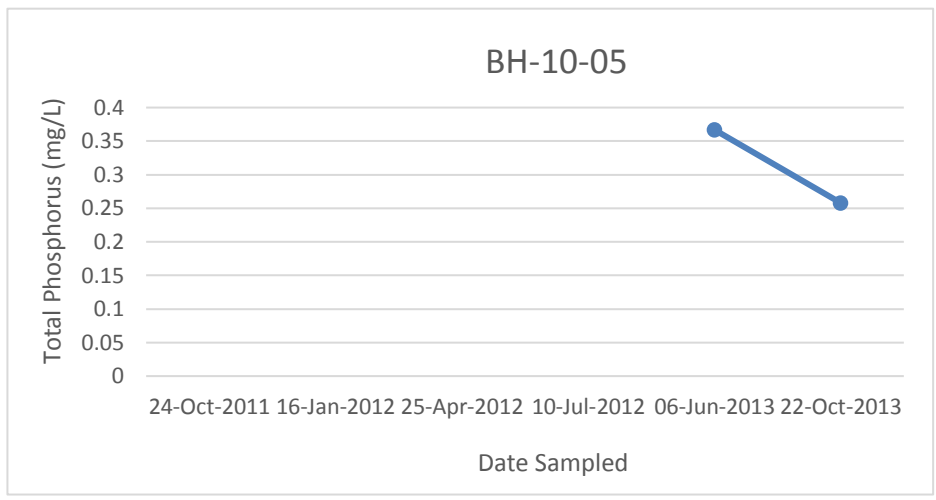

NR-09-367
Total Phosphorus (mg/L)
1.2
1
0.8
0.6
0.4
0.2
0
24-Oct-2011
16-Jan-2012
25-Apr-2012
10-Jul-2012
Date Sampled

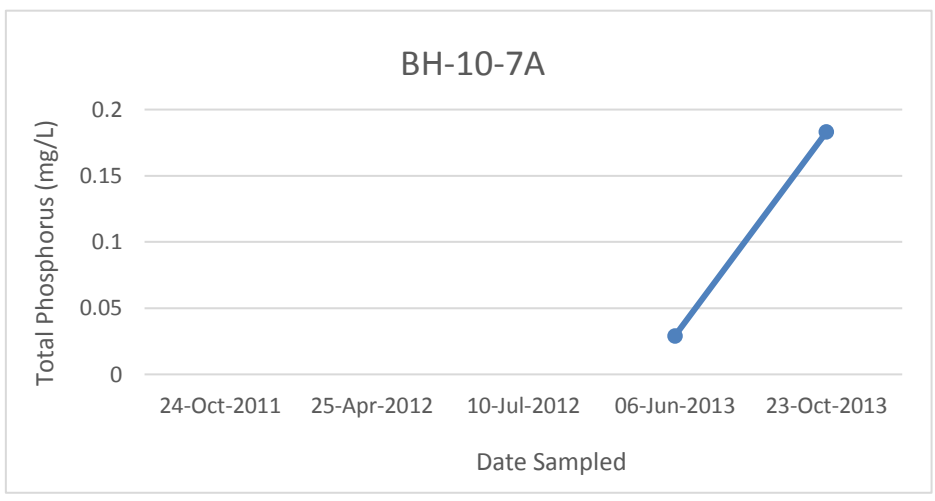

RR-09-213A
Total Phosphorus (mg/L)
1.2
1
0.8
0.6
0.4
0.2
0
24-Oct-2011
25-Apr-2012
10-Jul-2012
Date Sampled

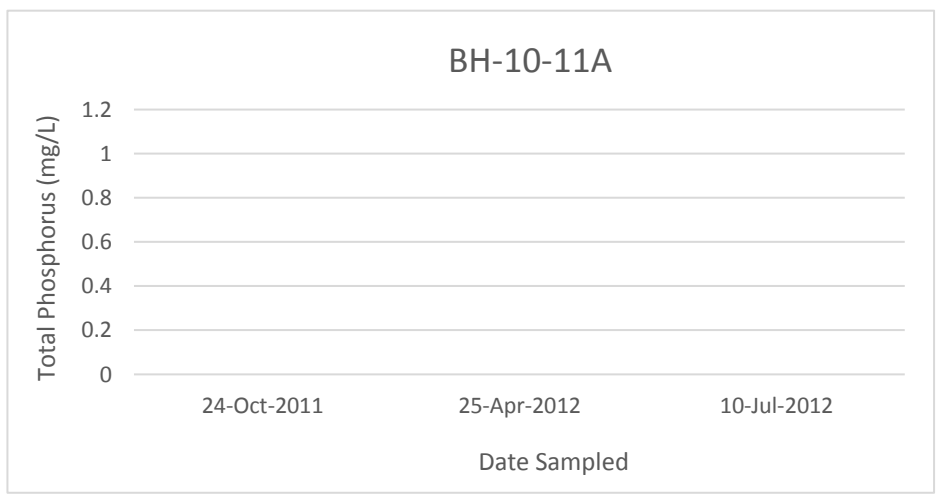

NH-09-428
Total Phosphorus (mg/L)
1.2
1
0.8
0.6
0.4
0.2
0
24-Oct-2011
25-Apr-2012
10-Jul-2012
Date Sampled

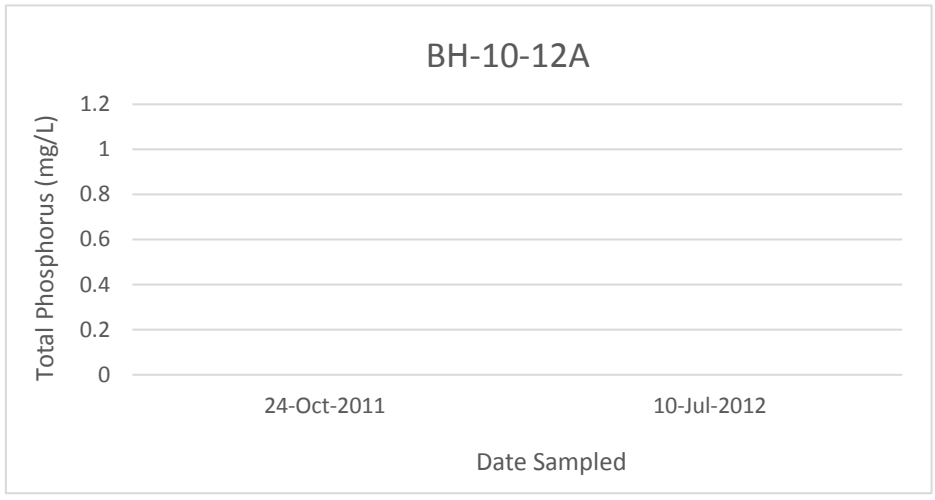

RR-09-214
Total Phosphorus (mg/L)
1.2
1
0.8
0.6
0.4
0.2
0
24-Oct-2011
25-Apr-2012
Date Sampled

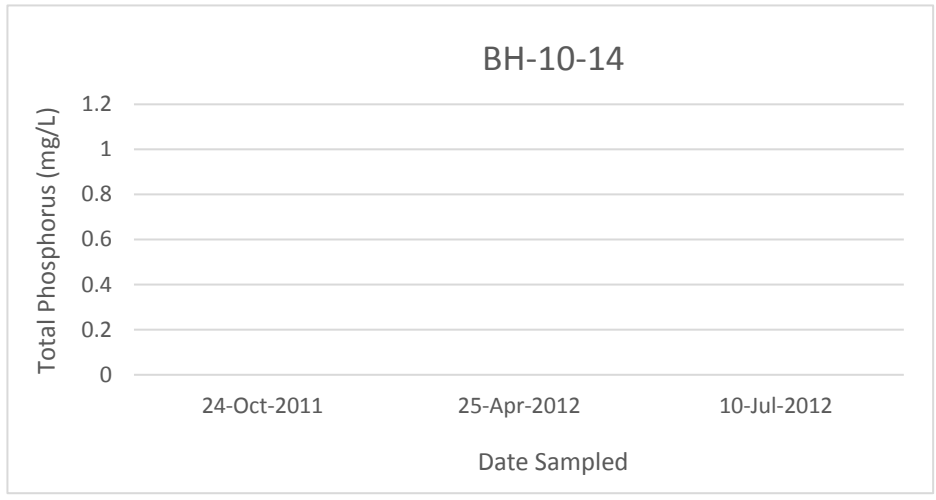

BH-10-04
Total Phosphorus (mg/L)
1.2
1
0.8
0.6
0.4
0.2
0
24-Oct-2011
16-Jan-2012
25-Apr-2012
10-Jul-2012
Date Sampled

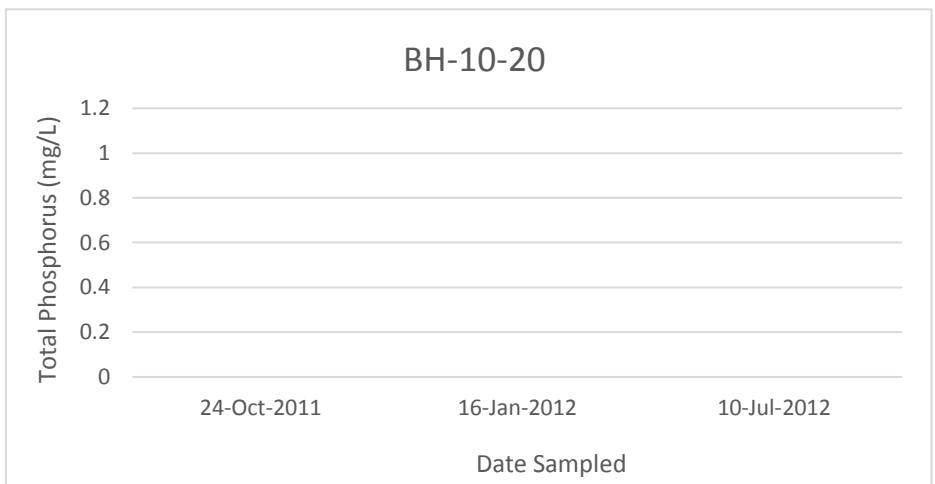

BH-10-05
Total Phosphorus (mg/L)
0.4
0.35
0.3
0.25
0.2
0.15
0.1
0.05
0
24-Oct-2011
16-Jan-2012
25-Apr-2012
10-Jul-2012
06-Jun-2013
22-Oct-2013
Date Sampled

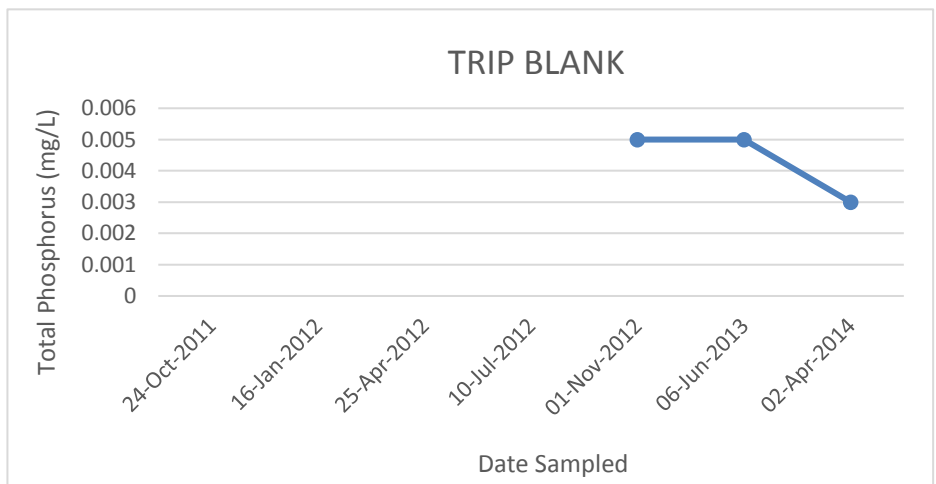

BH-10-7A
Total Phosphorus (mg/L)
0.2
0.15
0.1
0.05
0
24-Oct-2011
25-Apr-2012
10-Jul-2012
06-Jun-2013
23-Oct-2013
Date Sampled

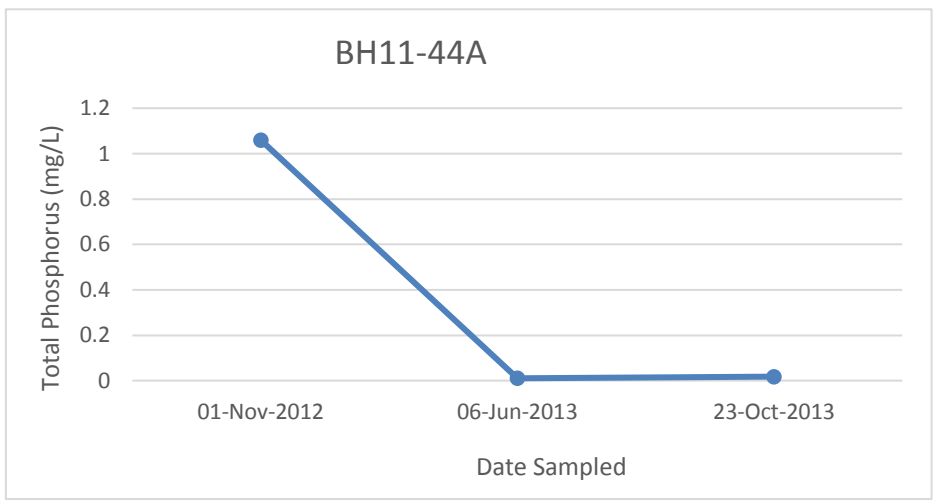

BH-10-11A
Total Phosphorus (mg/L)
1.2
1
0.8
0.6
0.4
0.2
0
24-Oct-2011
25-Apr-2012
10-Jul-2012
Date Sampled

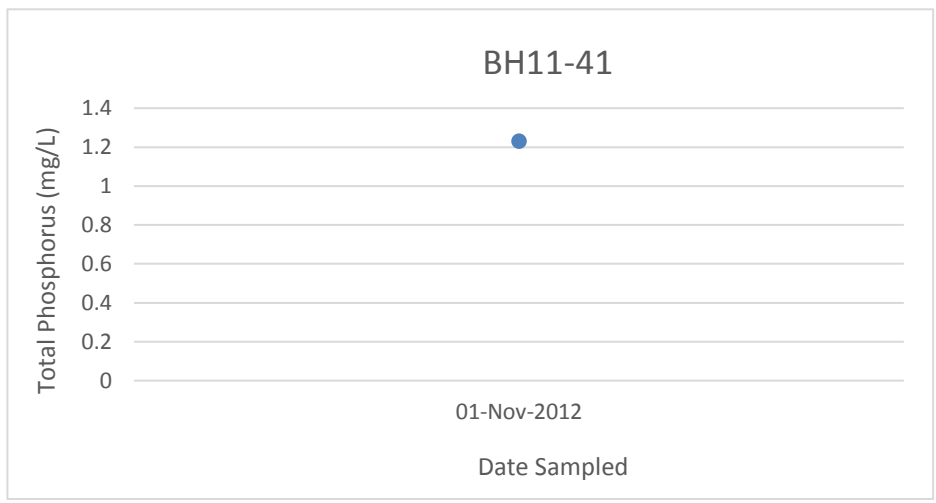

BH-10-12A
Total Phosphorus (mg/L)
1.2
1
0.8
0.6
0.4
0.2
0
24-Oct-2011
10-Jul-2012
Date Sampled

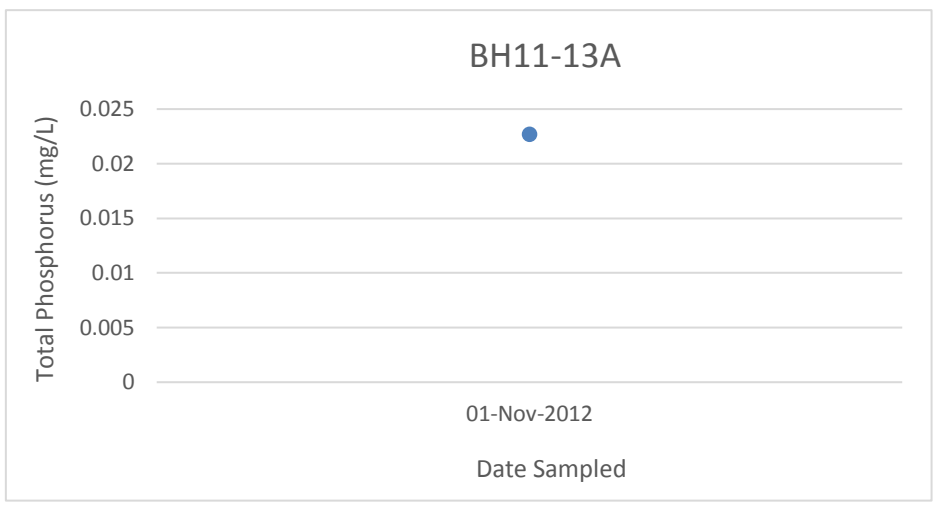

BH-10-14
Total Phosphorus (mg/L)
1.2
1
0.8
0.6
0.4
0.2
0
24-Oct-2011
25-Apr-2012
10-Jul-2012
Date Sampled

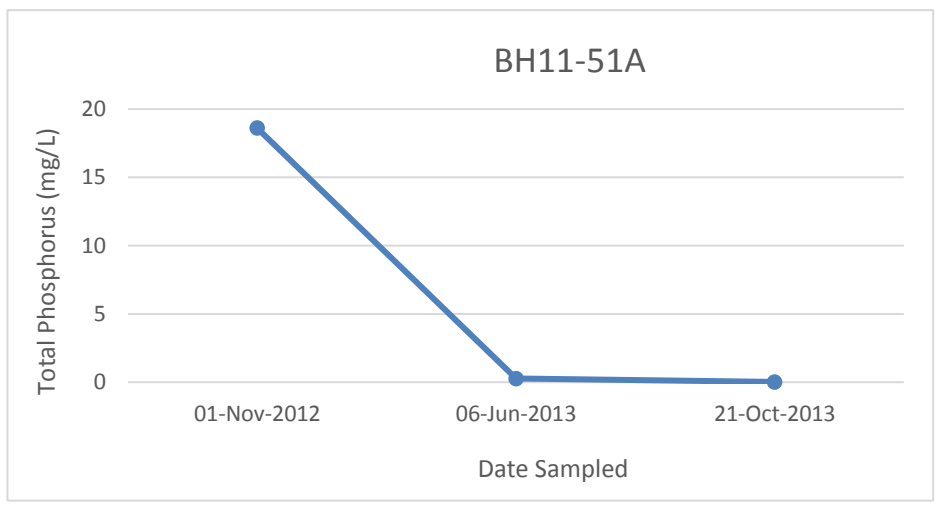

BH-10-20
Total Phosphorus (mg/L)
1.2
1
0.8
0.6
0.4
0.2
0
24-Oct-2011
16-Jan-2012
10-Jul-2012
Date Sampled

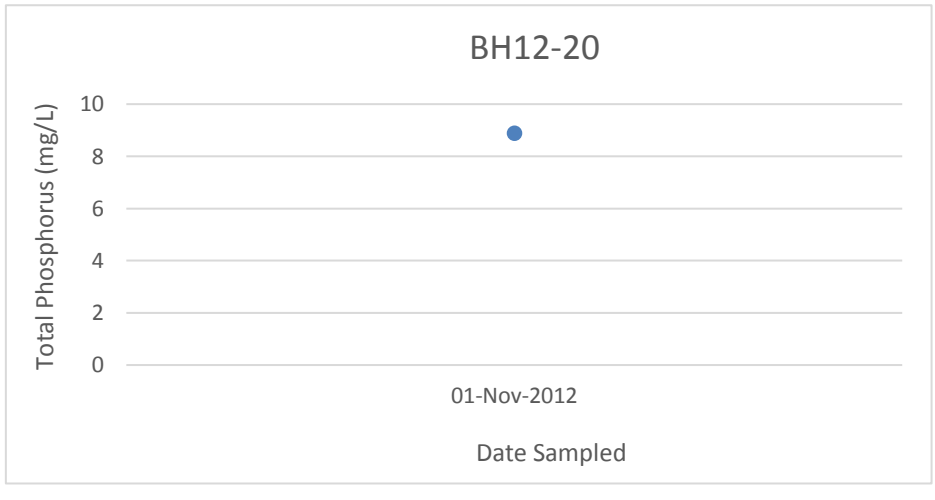

TRIP BLANK
Total Phosphorus (mg/L)
0.006
0.005
0.004
0.003
0.002
0.001
0
24-Oct-2011
16-Jan-2012
25-Apr-2012
10-Jul-2012
01-Nov-2012
06-Jun-2013
02-Apr-2014
Date Sampled

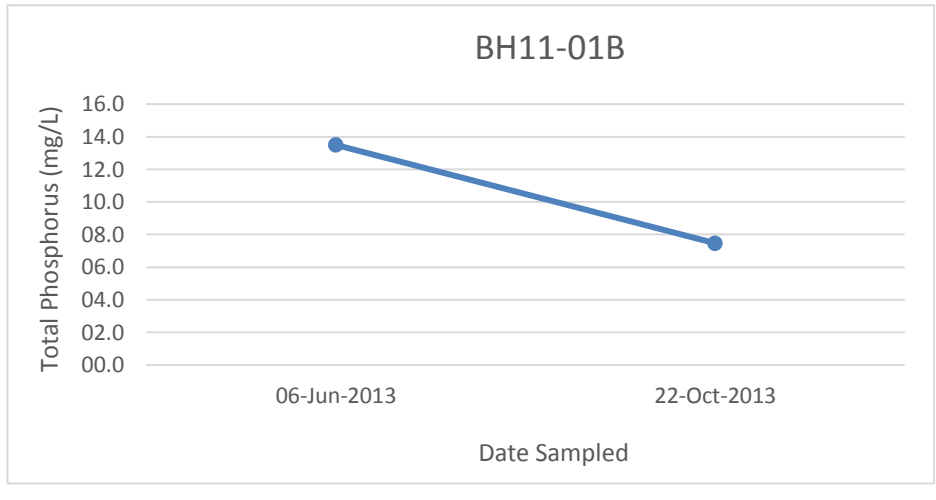

BH11-44A
Total Phosphorus (mg/L)
1.2
1
0.8
0.6
0.4
0.2
0
01-Nov-2012
06-Jun-2013
23-Oct-2013
Date Sampled

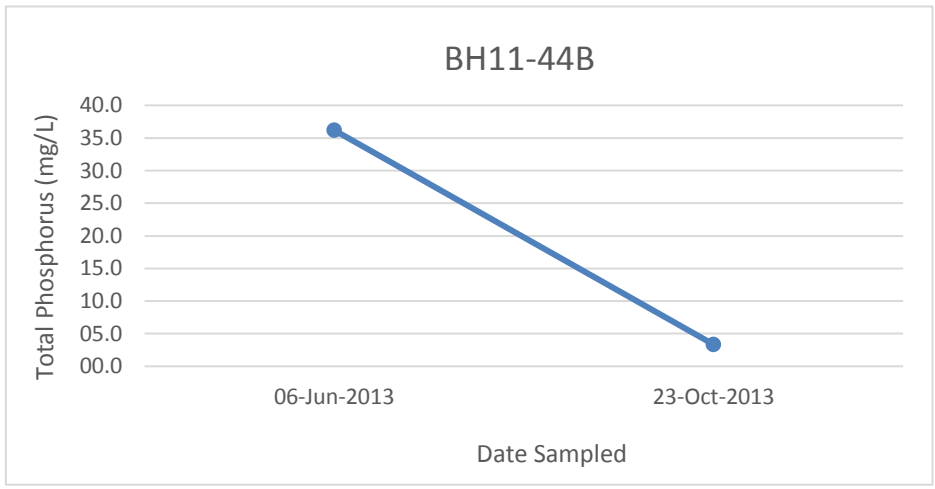

BH11-41
Total Phosphorus (mg/L)
1.4
1.2
1
0.8
0.6
0.4
0.2
0
01-Nov-2012
Date Sampled

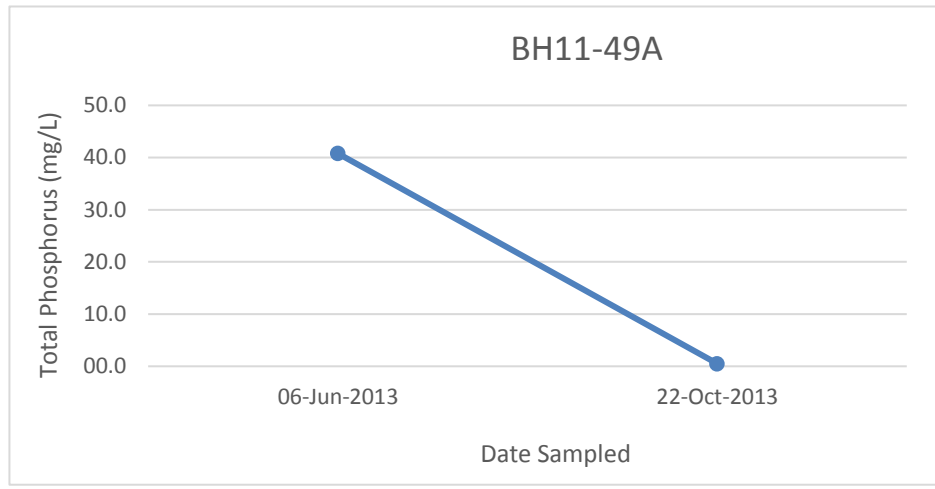

BH11-13A
Total Phosphorus (mg/L)
0.025
0.02
0.015
0.01
0.005
0
01-Nov-2012
Date Sampled

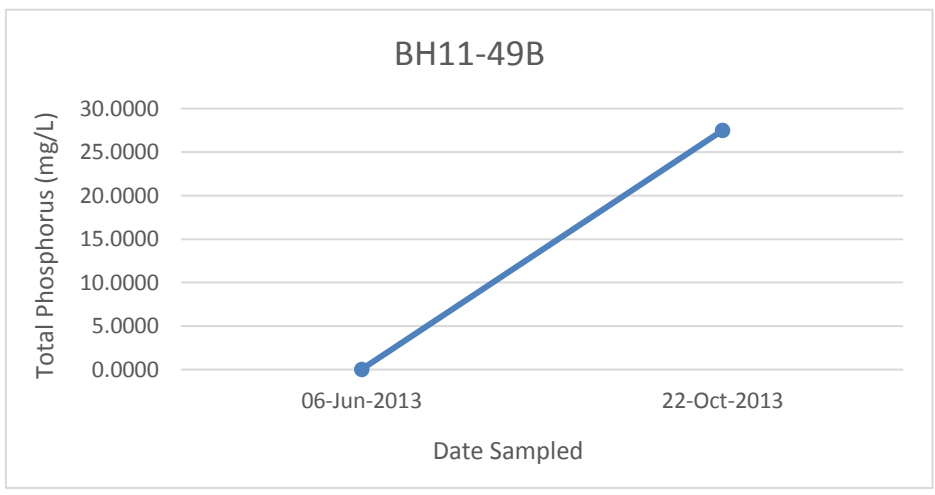

BH11-51A
Total Phosphorus (mg/L)
20
15
10
5
0
01-Nov-2012
06-Jun-2013
21-Oct-2013
Date Sampled

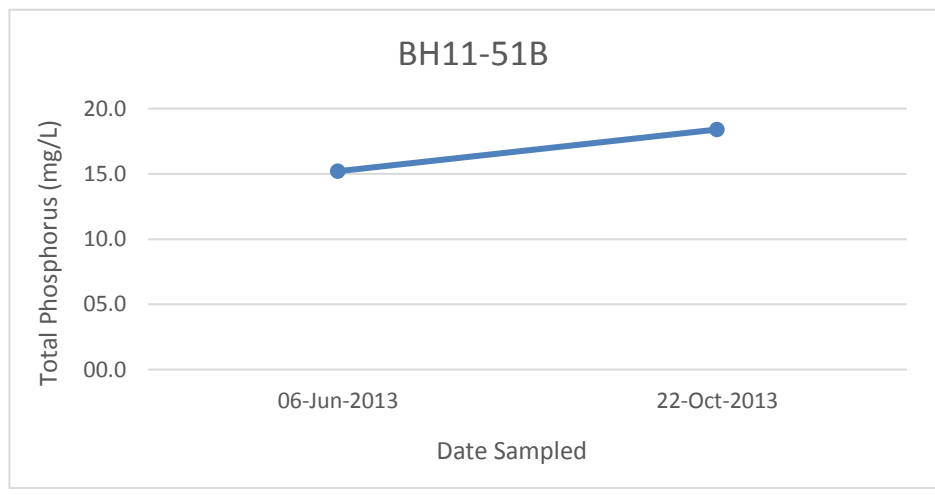

BH12-20
Total Phosphorus (mg/L)
10
8
6
4
2
0
01-Nov-2012
Date Sampled

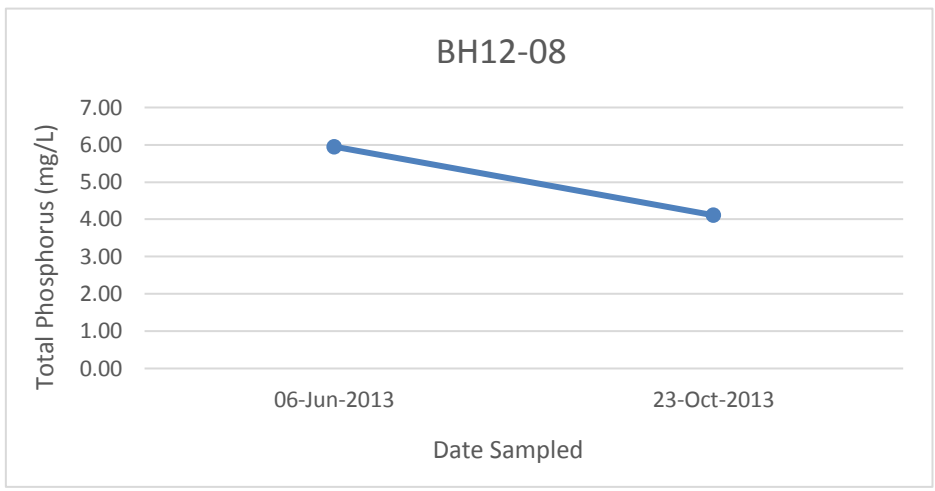

BH11-01B
Total Phosphorus (mg/L)
16.0
14.0
12.0
10.0
08.0
06.0
04.0
02.0
00.0
06-Jun-2013
22-Oct-2013
Date Sampled

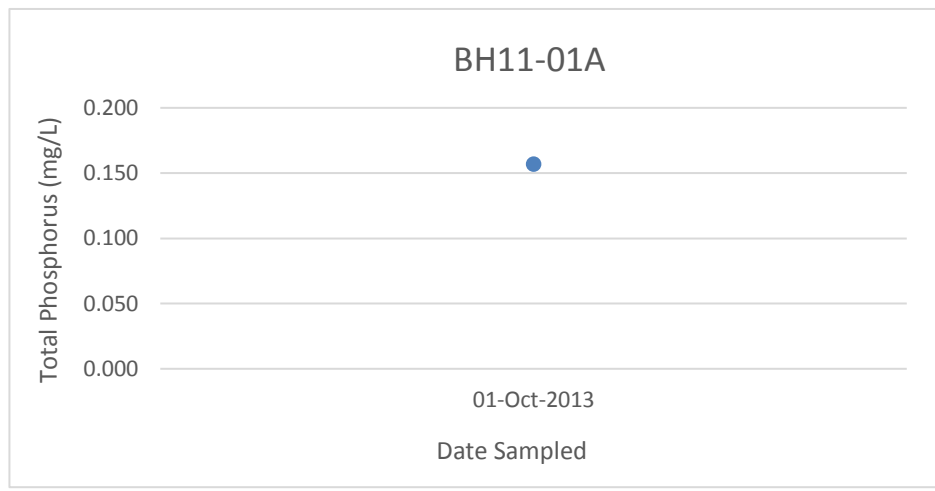

BH11-44B
Total Phosphorus (mg/L)
40.0
35.0
30.0
25.0
20.0
15.0
10.0
05.0
00.0
06-Jun-2013
23-Oct-2013
Date Sampled

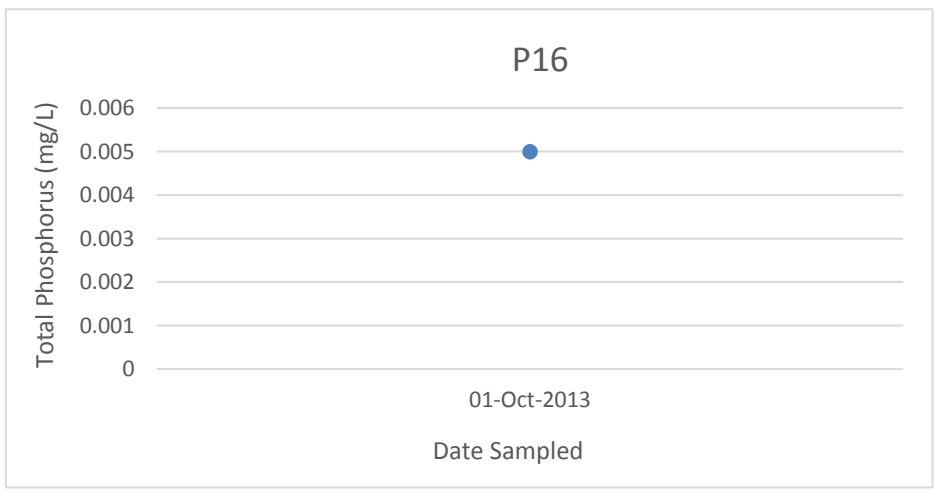

BH11-49A
Total Phosphorus (mg/L)
50.0
40.0
30.0
20.0
10.0
00.0
06-Jun-2013
22-Oct-2013
Date Sampled

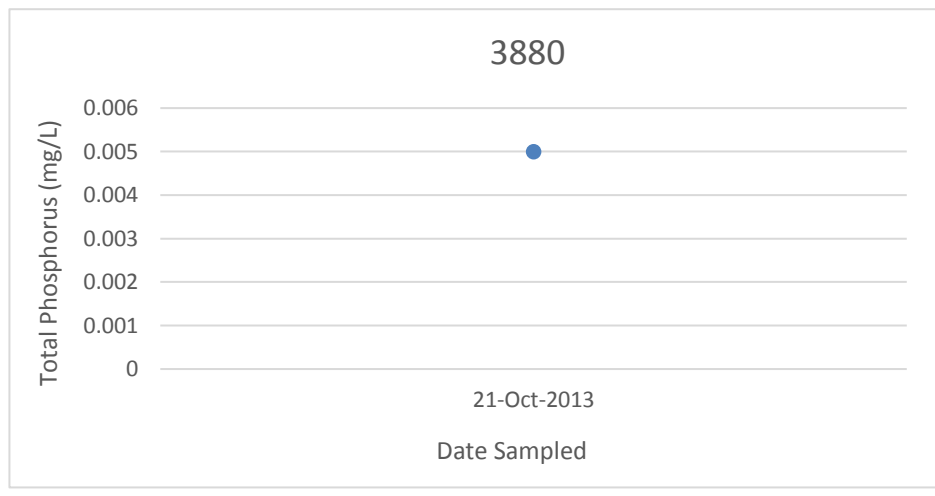

BH11-49B
Total Phosphorus (mg/L)
30.0000
25.0000
20.0000
15.0000
10.0000
5.0000
0.0000
06-Jun-2013
22-Oct-2013
Date Sampled

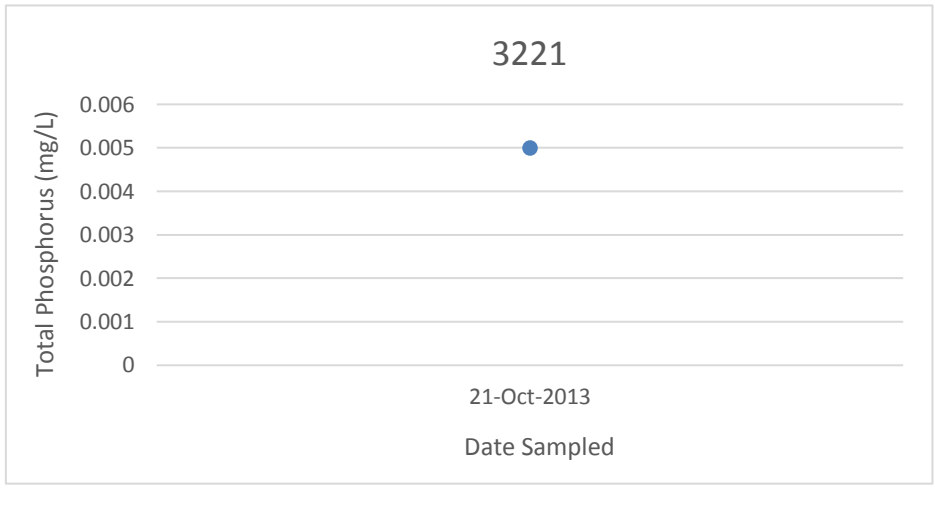

BH11-51B
Total Phosphorus (mg/L)
20.0
15.0
10.0
05.0
00.0
06-Jun-2013
22-Oct-2013
Date Sampled

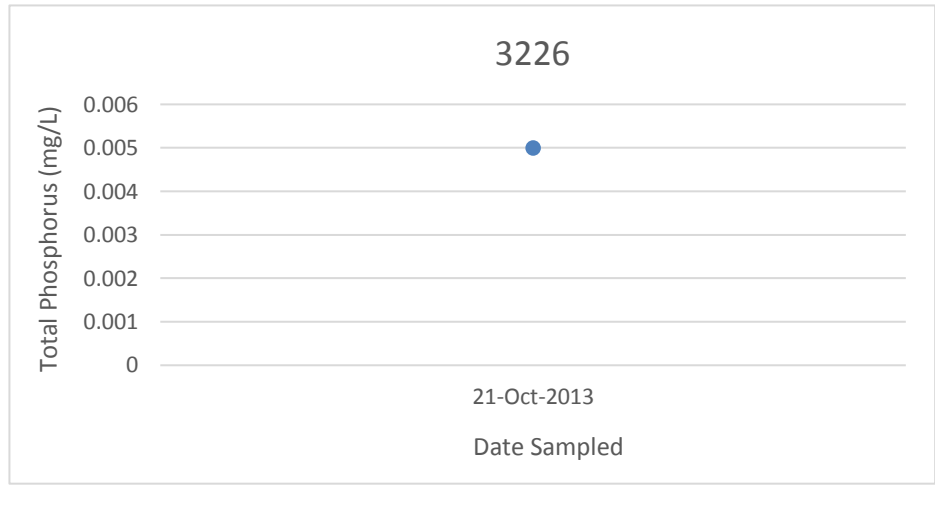

BH12-08
Total Phosphorus (mg/L)
7.00
6.00
5.00
4.00
3.00
2.00
1.00
0.00
06-Jun-2013
23-Oct-2013
Date Sampled

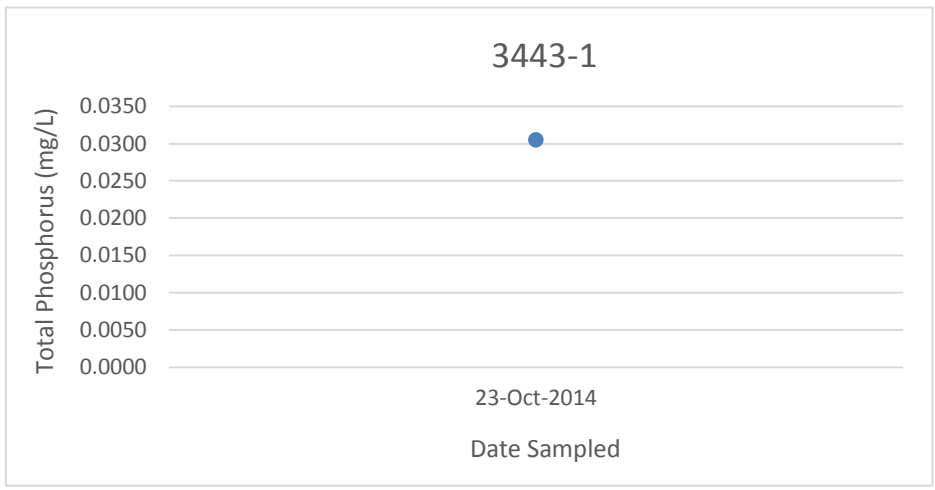

BH11-01A
Total Phosphorus (mg/L)
0.200
0.150
0.100
0.050
0.000
01-Oct-2013
Date Sampled

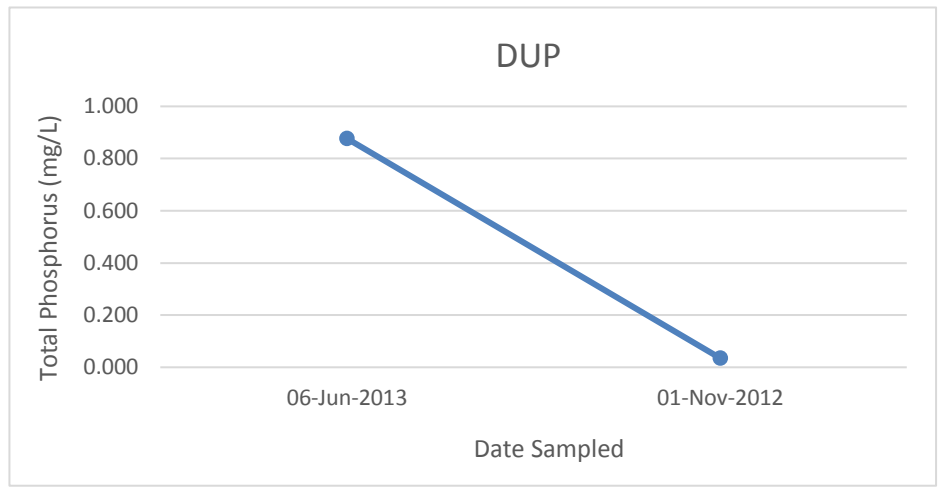

P16
Total Phosphorus (mg/L)
0.006
0.005
0.004
0.003
0.002
0.001
0
01-Oct-2013
Date Sampled

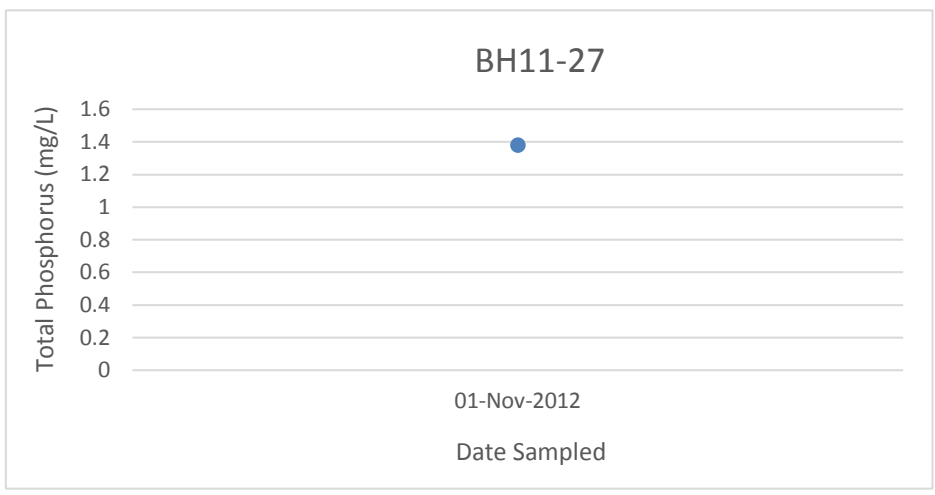

3880
Total Phosphorus (mg/L)
0.006
0.005
0.004
0.003
0.002
0.001
0
21-Oct-2013
Date Sampled

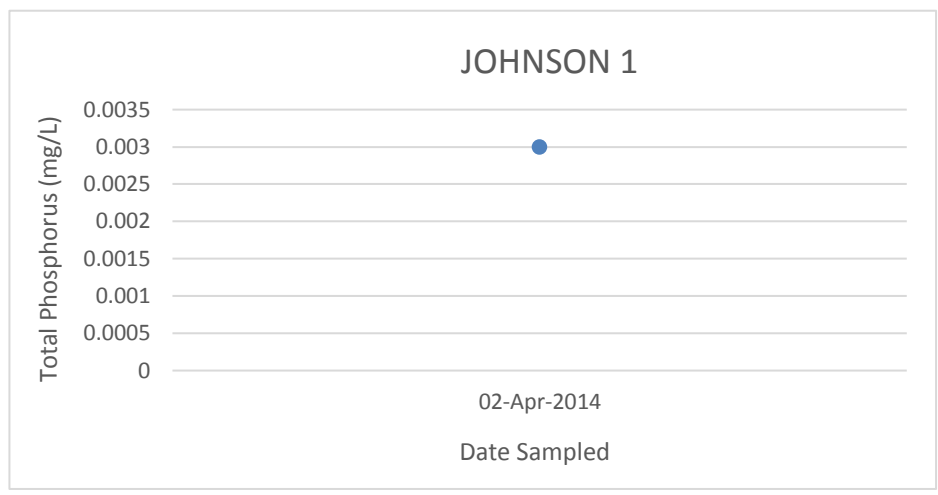

3221
Total Phosphorus (mg/L)
0.006
0.005
0.004
0.003
0.002
0.001
0
21-Oct-2013
Date Sampled

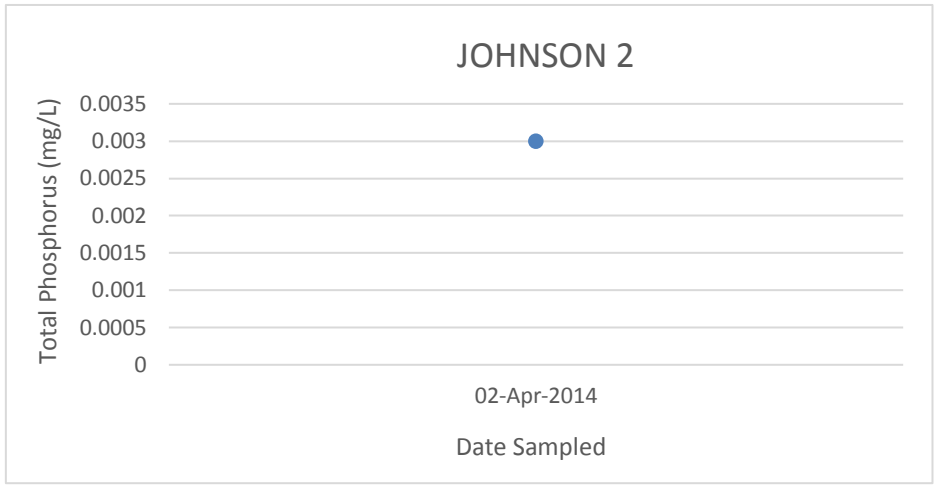

3226
Total Phosphorus (mg/L)
0.006
0.005
0.004
0.003
0.002
0.001
0
21-Oct-2013
Date Sampled

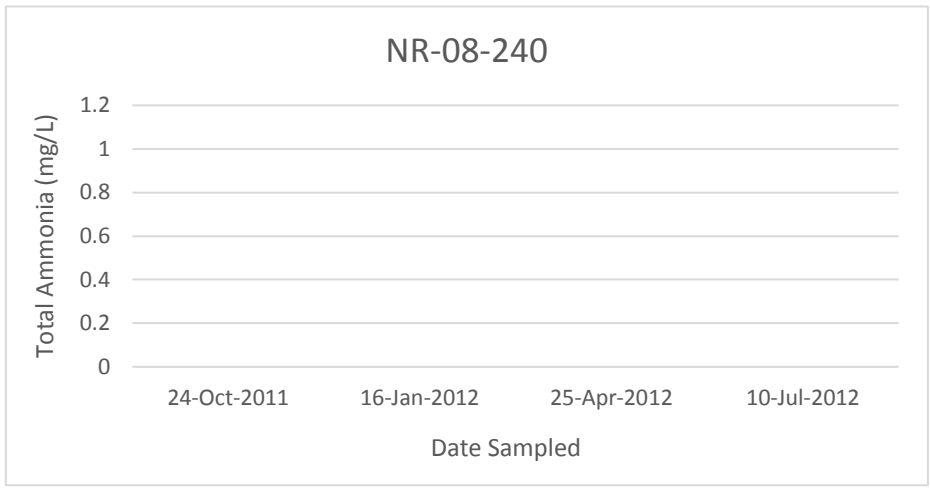

3443-1
Total Phosphorus (mg/L)
0.0350
0.0300
0.0250
0.0200
0.0150
0.0100
0.0050
0.0000
23-Oct-2014
Date Sampled

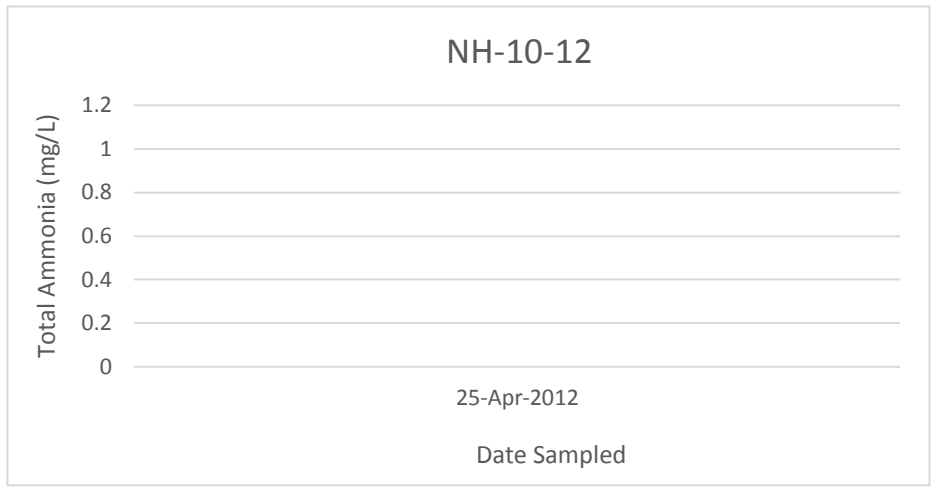

DUP
Total Phosphorus (mg/L)
1.000
0.800
0.600
0.400
0.200
0.000
06-Jun-2013
01-Nov-2012
Date Sampled

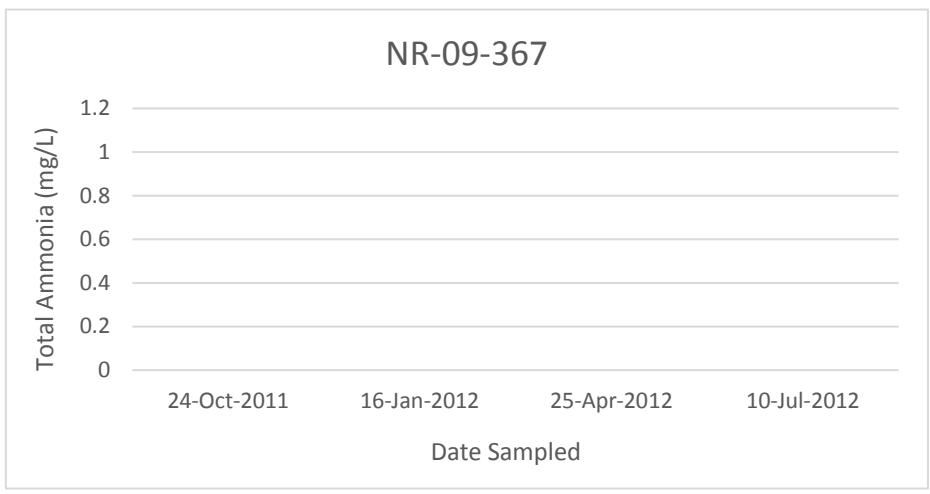

BH11-27
Total Phosphorus (mg/L)
1.6
1.4
1.2
1
0.8
0.6
0.4
0.2
0
01-Nov-2012
Date Sampled

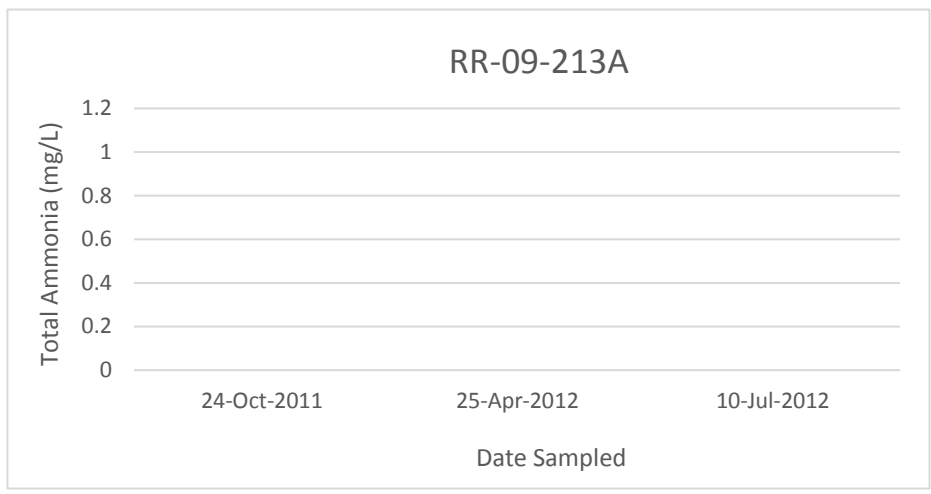

JOHNSON 1
Total Phosphorus (mg/L)
0.0035
0.003
0.0025
0.002
0.0015
0.001
0.0005
0
02-Apr-2014
Date Sampled

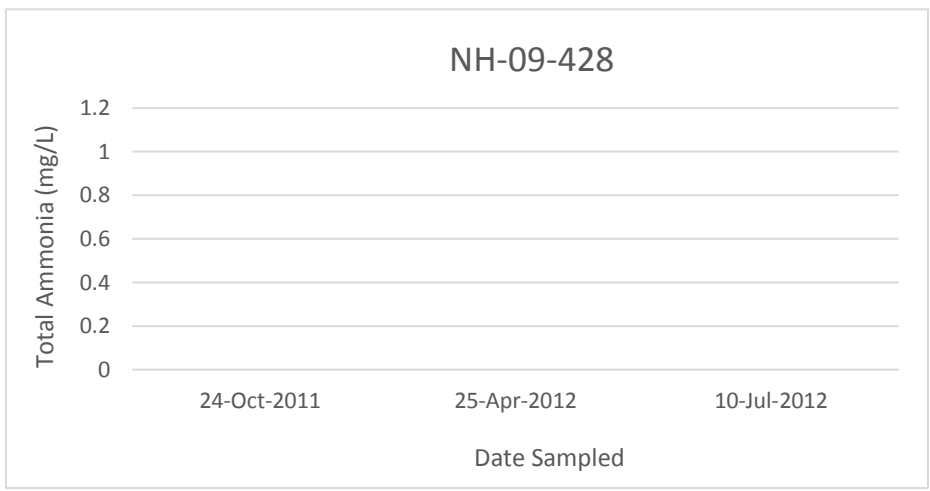

JOHNSON 2
Total Phosphorus (mg/L)
0.0035
0.003
0.0025
0.002
0.0015
0.001
0.0005
0
02-Apr-2014
Date Sampled

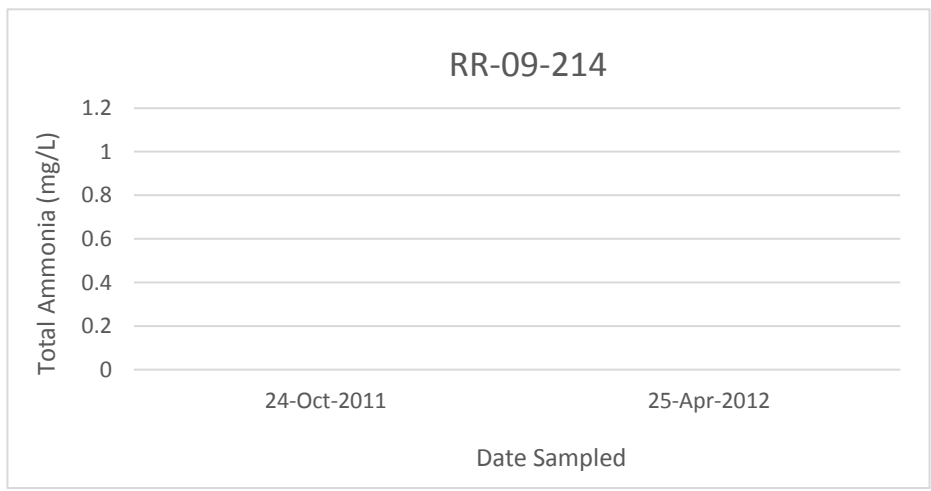

NR-08-240
Total Ammonia (mg/L)
1.2
1
0.8
0.6
0.4
0.2
0
24-Oct-2011
16-Jan-2012
25-Apr-2012
10-Jul-2012
Date Sampled

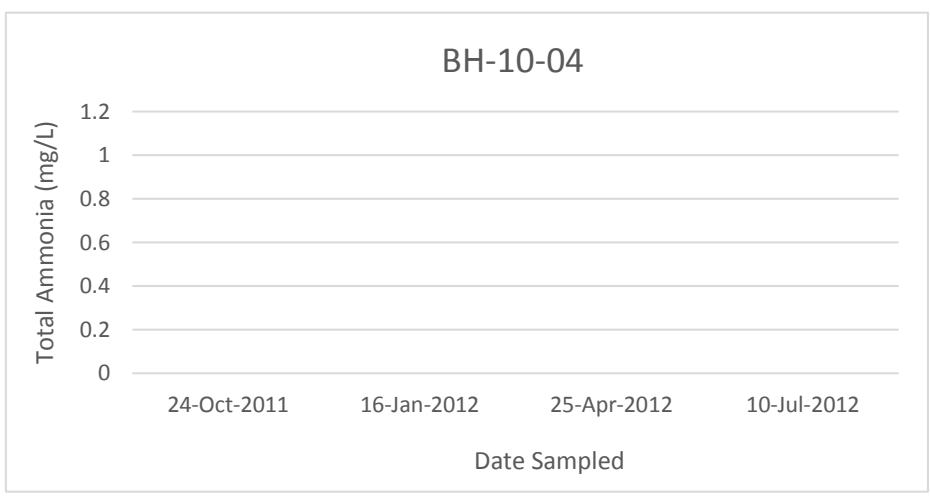

NH-10-12
Total Ammonia (mg/L)
1.2
1
0.8
0.6
0.4
0.2
0
25-Apr-2012
Date Sampled

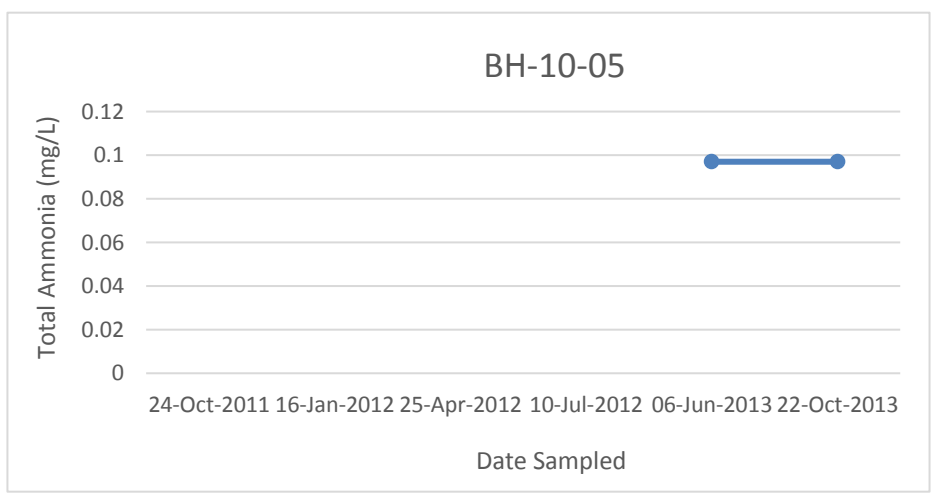

NR-09-367
Total Ammonia (mg/L)
1.2
1
0.8
0.6
0.4
0.2
0
24-Oct-2011
16-Jan-2012
25-Apr-2012
10-Jul-2012
Date Sampled

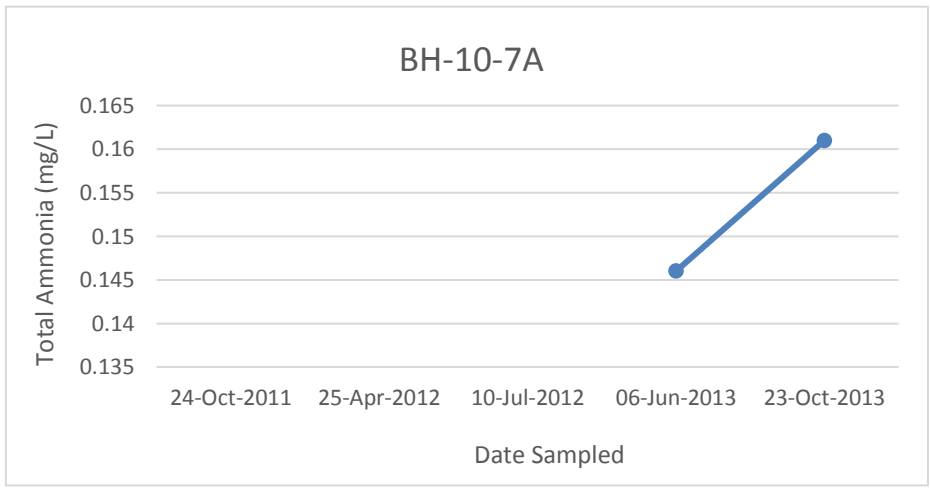

RR-09-213A
Total Ammonia (mg/L)
1.2
1
0.8
0.6
0.4
0.2
0
24-Oct-2011
25-Apr-2012
10-Jul-2012
Date Sampled

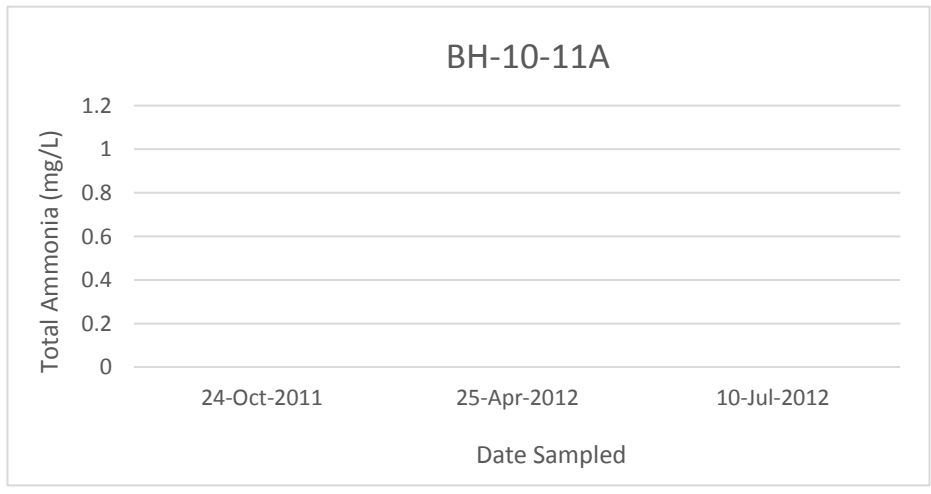

NH-09-428
Total Ammonia (mg/L)
1.2
1
0.8
0.6
0.4
0.2
0
24-Oct-2011
25-Apr-2012
10-Jul-2012
Date Sampled

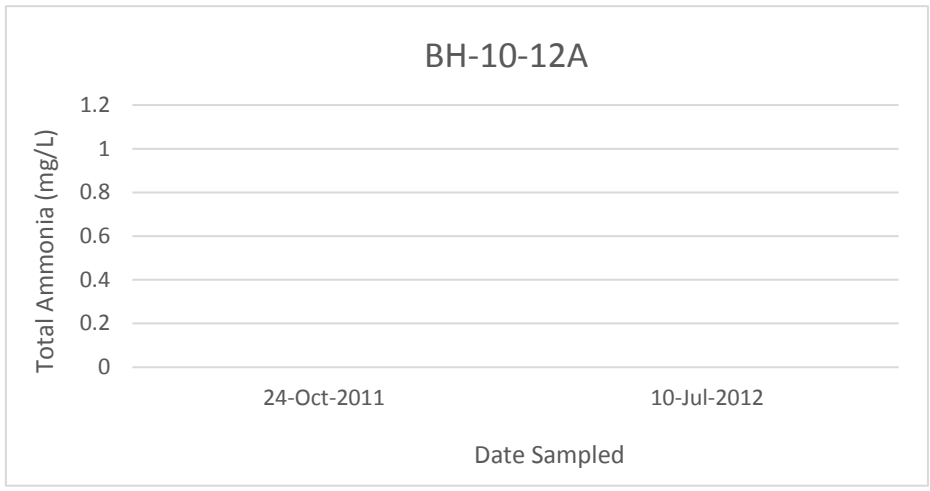

RR-09-214
Total Ammonia (mg/L)
1.2
1
0.8
0.6
0.4
0.2
0
24-Oct-2011
25-Apr-2012
Date Sampled

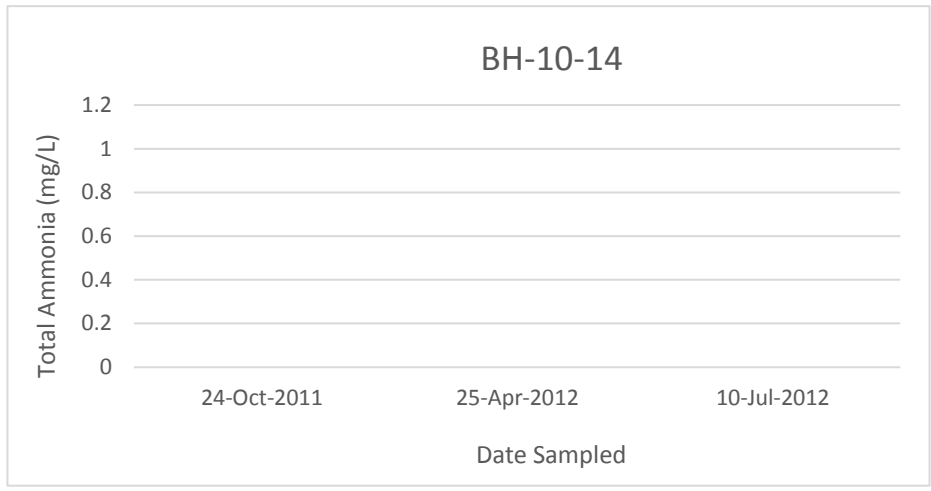

BH-10-04
Total Ammonia (mg/L)
1.2
1
0.8
0.6
0.4
0.2
0
24-Oct-2011
16-Jan-2012
25-Apr-2012
10-Jul-2012
Date Sampled

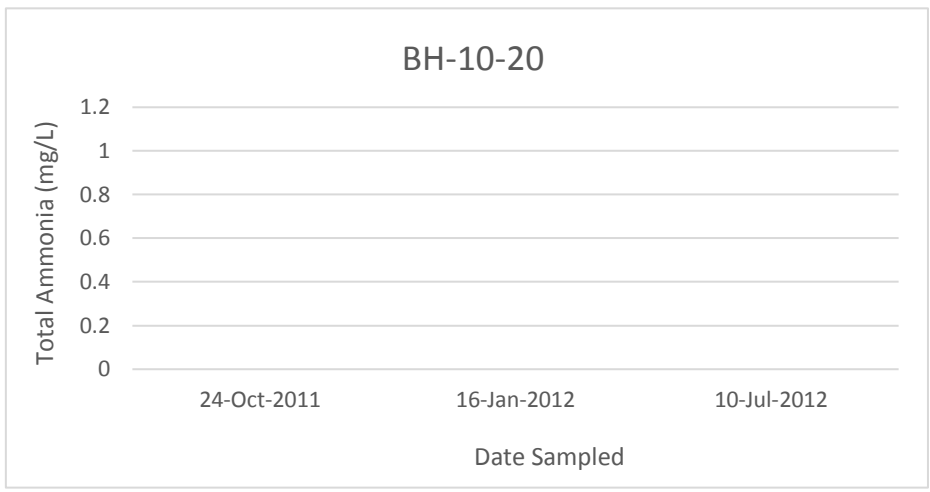

BH-10-05
Total Ammonia (mg/L)
0.12
0.1
0.08
0.06
0.04
0.02
0
24-Oct-2011
16-Jan-2012
25-Apr-2012
10-Jul-2012
06-Jun-2013
22-Oct-2013
Date Sampled

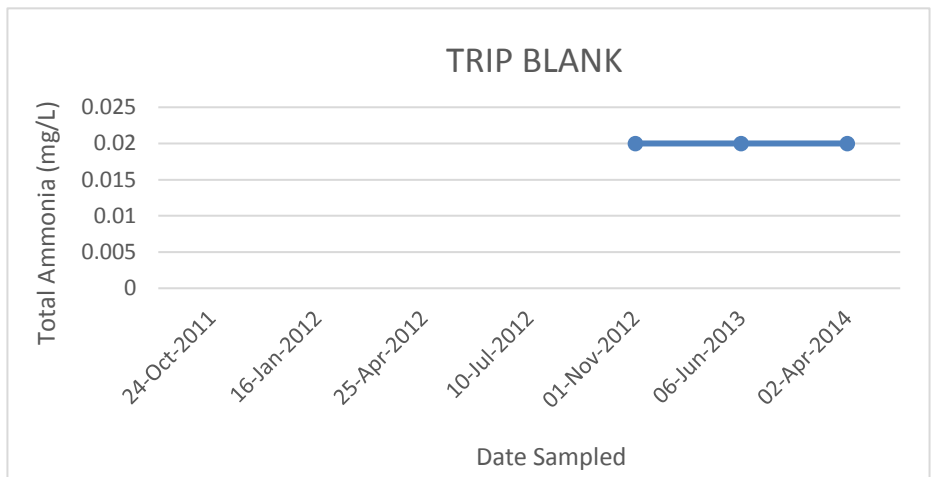

BH-10-7A
Total Ammonia (mg/L)
0.165
0.16
0.155
0.15
0.145
0.14
0.135
24-Oct-2011
25-Apr-2012
10-Jul-2012
06-Jun-2013
23-Oct-2013
Date Sampled

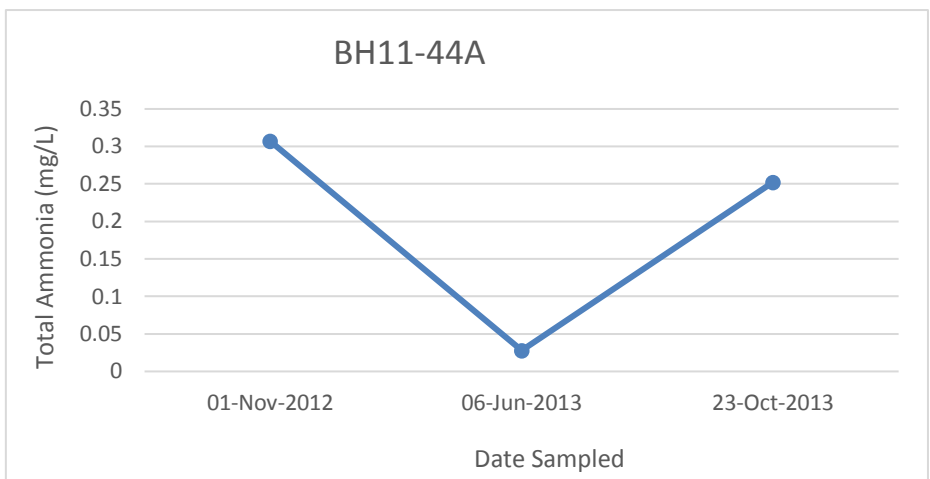

BH-10-11A
Total Ammonia (mg/L)
1.2
1
0.8
0.6
0.4
0.2
0
24-Oct-2011
25-Apr-2012
10-Jul-2012
Date Sampled

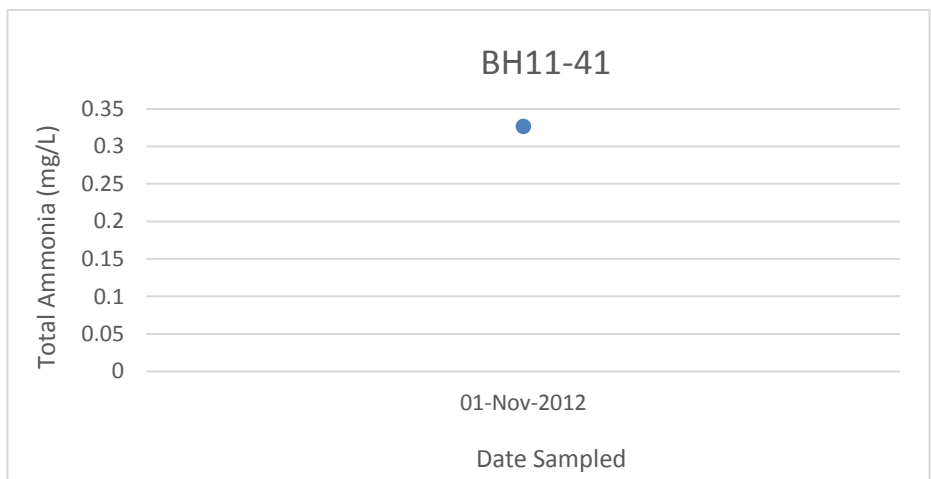

BH-10-12A
Total Ammonia (mg/L)
1.2
1
0.8
0.6
0.4
0.2
0
24-Oct-2011
10-Jul-2012
Date Sampled

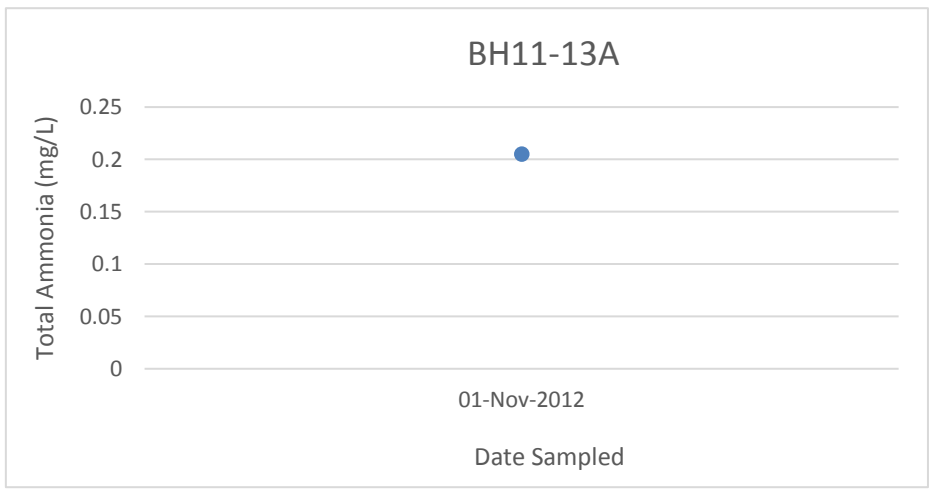

BH-10-14
Total Ammonia (mg/L)
1.2
1
0.8
0.6
0.4
0.2
0
24-Oct-2011
25-Apr-2012
10-Jul-2012
Date Sampled

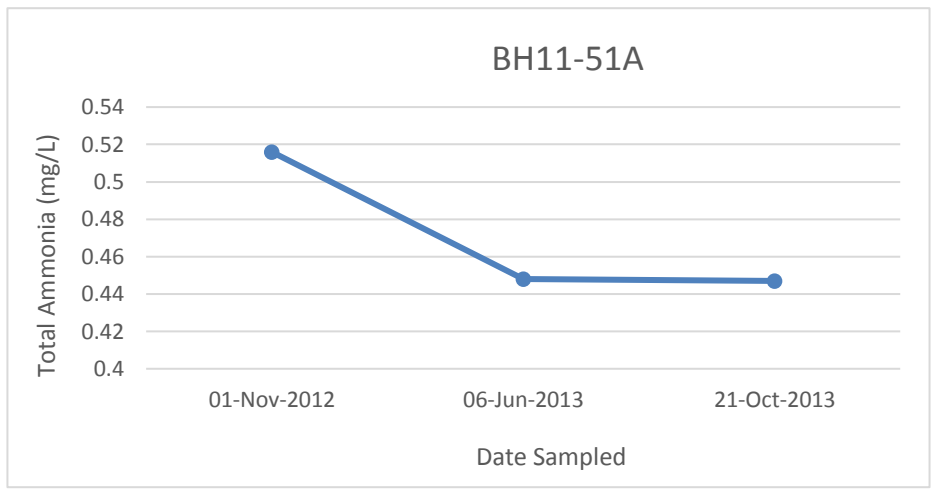

BH-10-20
Total Ammonia (mg/L)
1.2
1
0.8
0.6
0.4
0.2
0
24-Oct-2011
16-Jan-2012
10-Jul-2012
Date Sampled

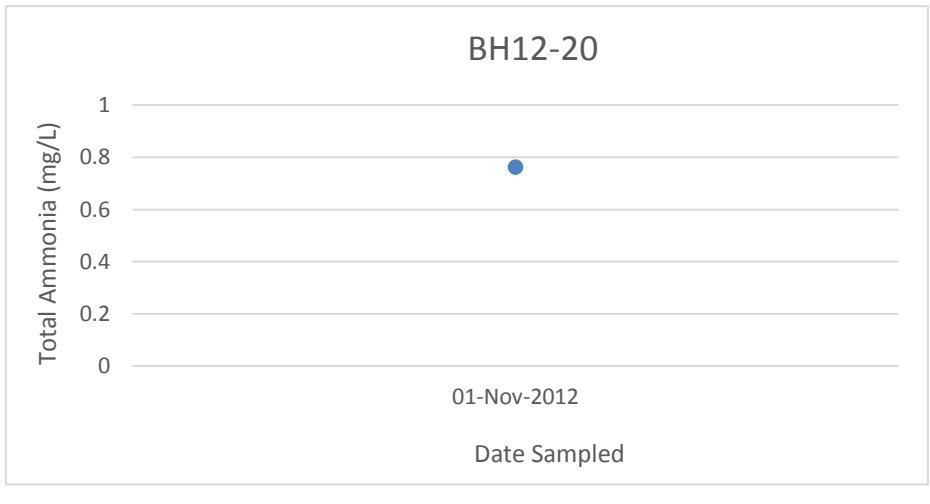

TRIP BLANK
Total Ammonia (mg/L)
0.025
0.02
0.015
0.01
0.005
0
24-Oct-2011
16-Jan-2012
25-Apr-2012
10-Jul-2012
01-Nov-2012
06-Jun-2013
02-Apr-2014
Date Sampled

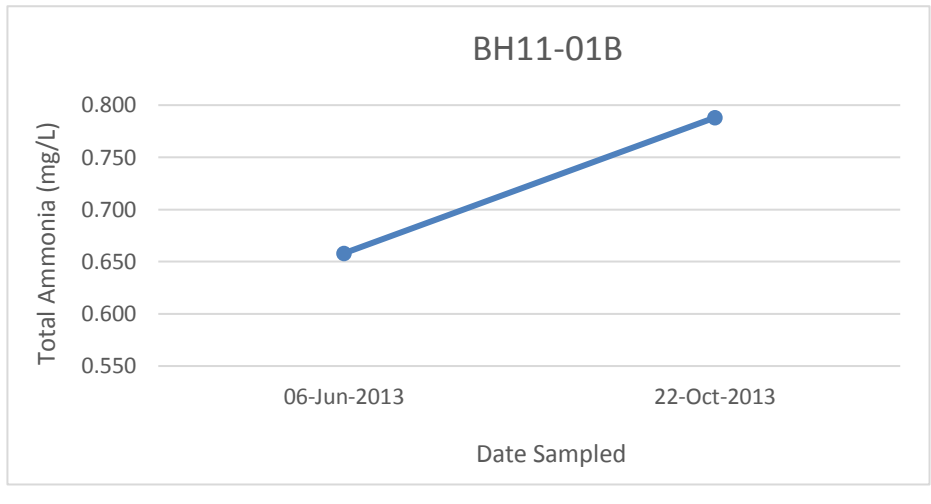

BH11-44A
Total Ammonia (mg/L)
0.35
0.3
0.25
0.2
0.15
0.1
0.05
0
01-Nov-2012
06-Jun-2013
23-Oct-2013
Date Sampled

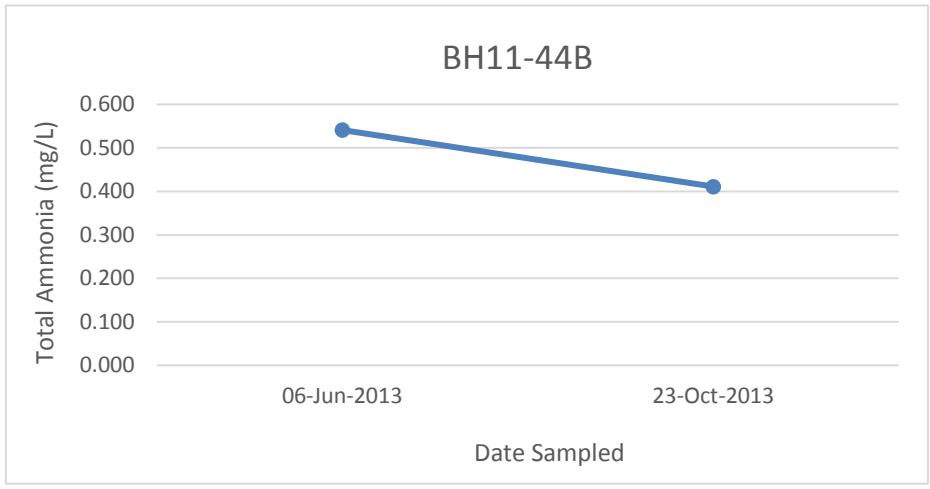

BH11-41
Total Ammonia (mg/L)
0.35
0.3
0.25
0.2
0.15
0.1
0.05
0
01-Nov-2012
Date Sampled

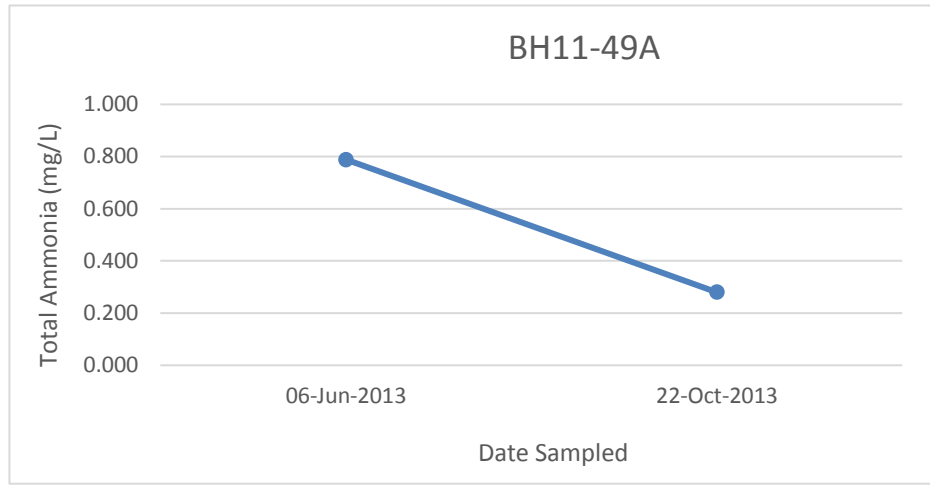

BH11-13A
Total Ammonia (mg/L)
0.25
0.2
0.15
0.1
0.05
0
01-Nov-2012
Date Sampled

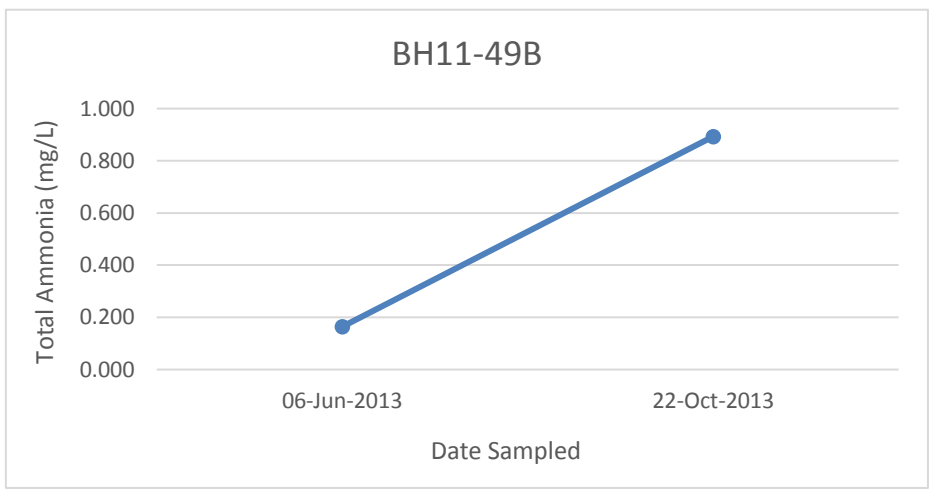

BH11-51A
Total Ammonia (mg/L)
0.54
0.52
0.5
0.48
0.46
0.44
0.42
0.4
01-Nov-2012
06-Jun-2013
21-Oct-2013
Date Sampled

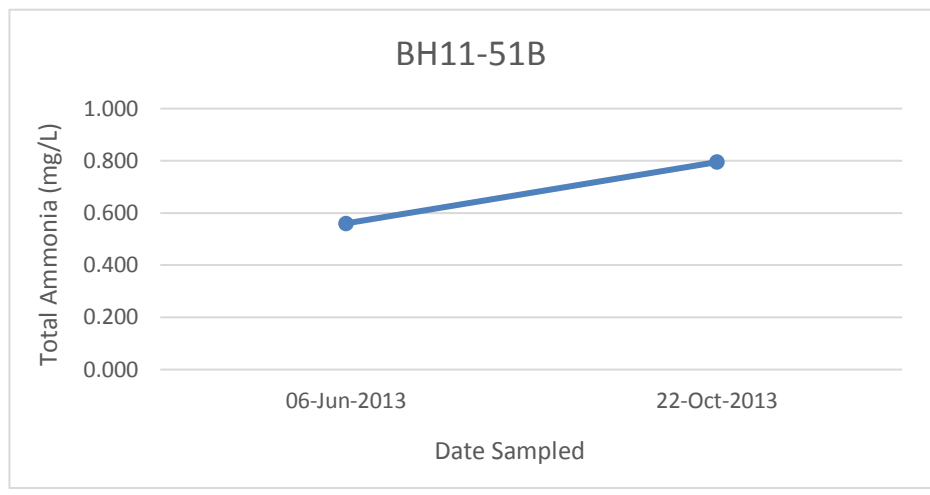

BH12-20
Total Ammonia (mg/L)
1
0.8
0.6
0.4
0.2
0
01-Nov-2012
Date Sampled

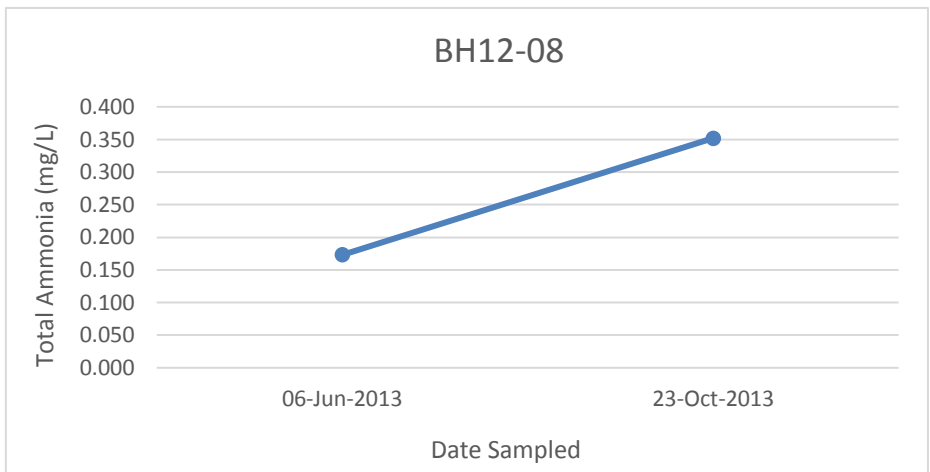

BH11-01B
Total Ammonia (mg/L)
0.800
0.750
0.700
0.650
0.600
0.550
06-Jun-2013
22-Oct-2013
Date Sampled

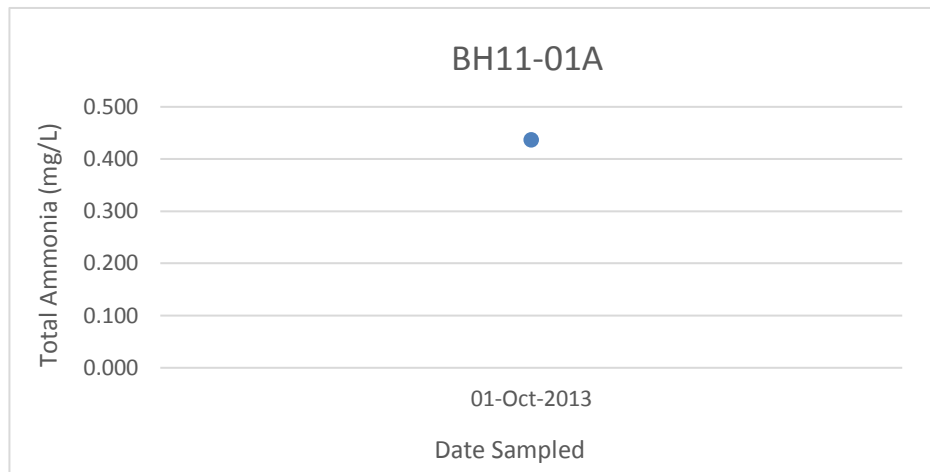

BH11-44B
Total Ammonia (mg/L)
0.600
0.500
0.400
0.300
0.200
0.100
0.000
06-Jun-2013
23-Oct-2013
Date Sampled

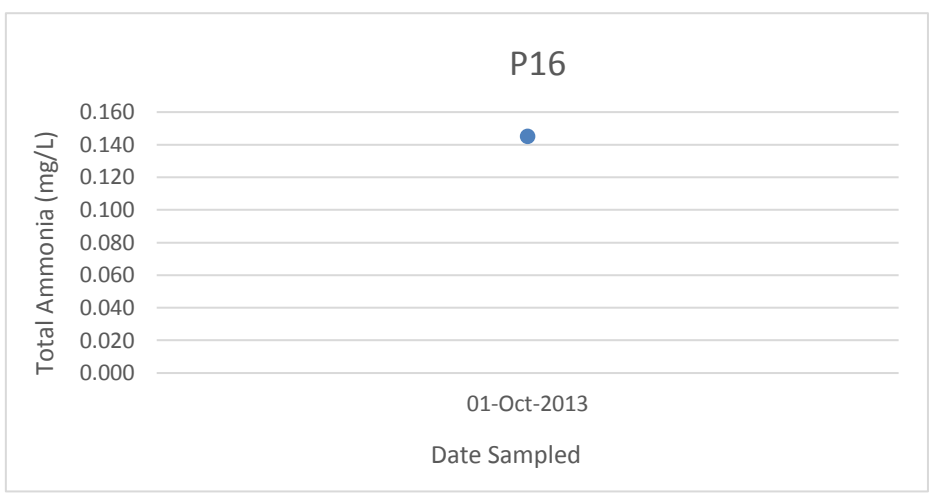

BH11-49A
Total Ammonia (mg/L)
1.000
0.800
0.600
0.400
0.200
0.000
06-Jun-2013
22-Oct-2013
Date Sampled

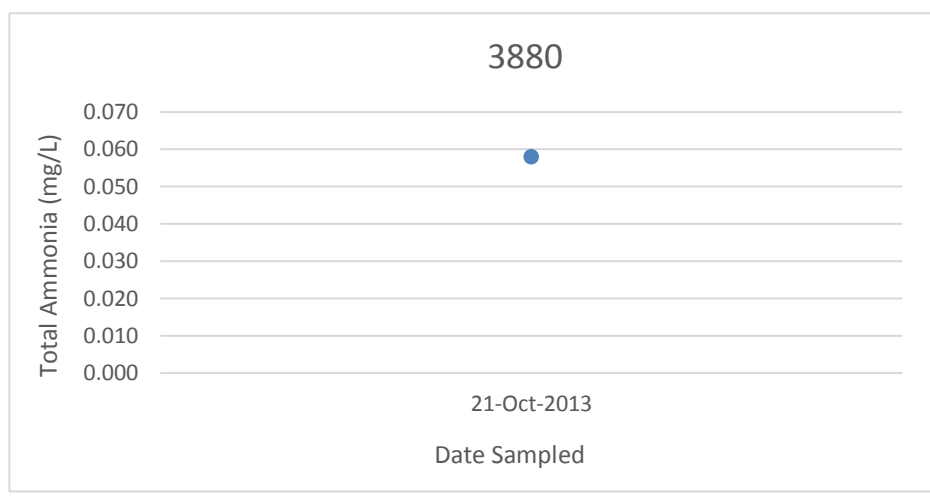

BH11-49B
Total Ammonia (mg/L)
1.000
0.800
0.600
0.400
0.200
0.000
06-Jun-2013
22-Oct-2013
Date Sampled

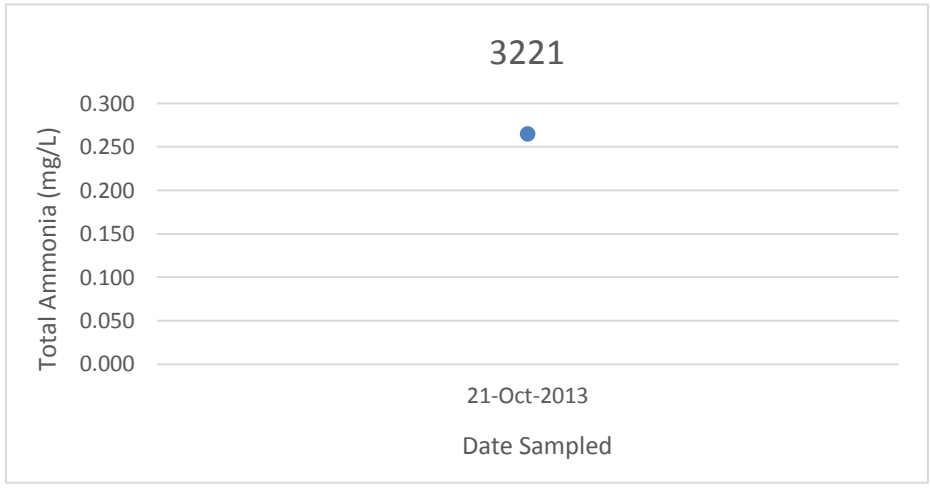

BH11-51B
Total Ammonia (mg/L)
1.000
0.800
0.600
0.400
0.200
0.000
06-Jun-2013
22-Oct-2013
Date Sampled

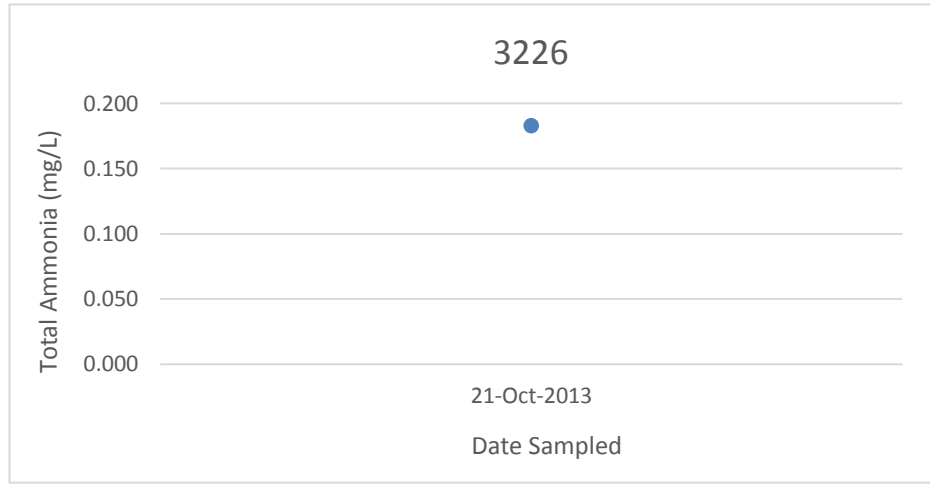

BH12-08
Total Ammonia (mg/L)
0.400
0.350
0.300
0.250
0.200
0.150
0.100
0.050
0.000
06-Jun-2013
23-Oct-2013
Date Sampled

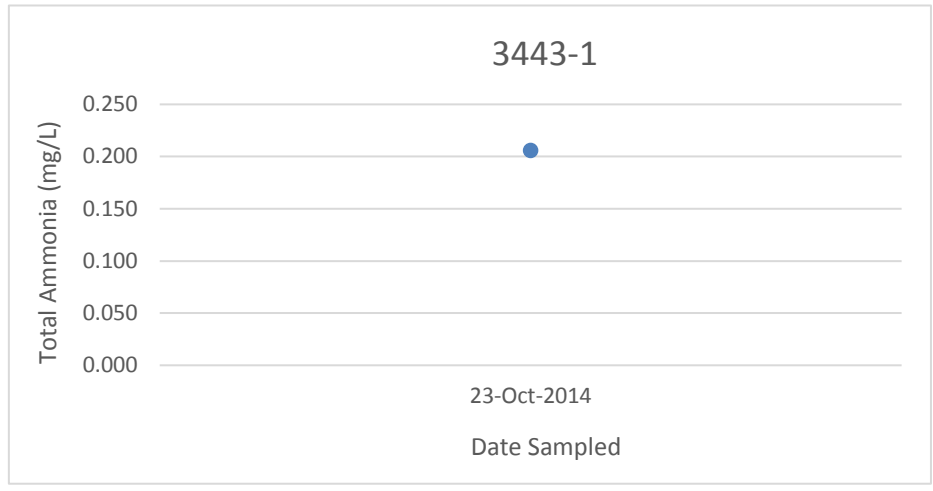

BH11-01A
Total Ammonia (mg/L)
0.500
0.400
0.300
0.200
0.100
0.000
01-Oct-2013
Date Sampled

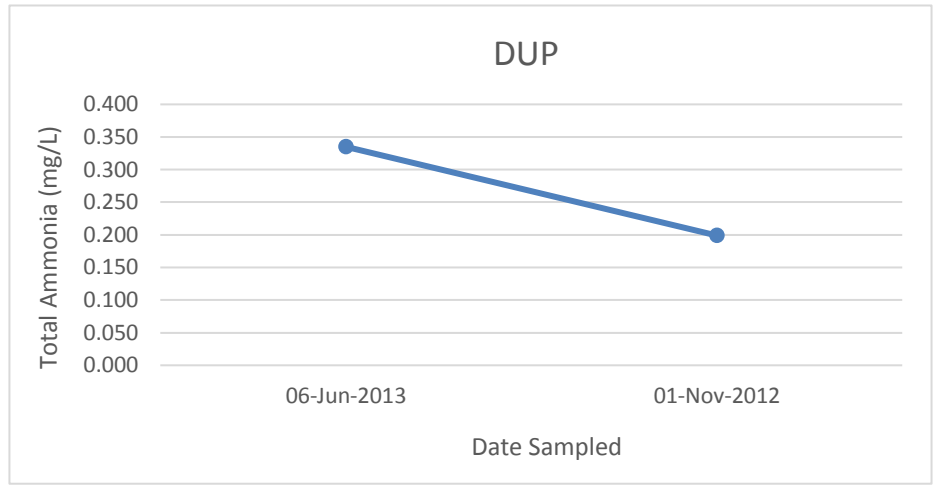

P16
Ammonia (mg/L)
0.160
0.140
0.120
0.100
0.080
0.060
0.040
0.020
0.000
01-Oct-2013
Date Sampled

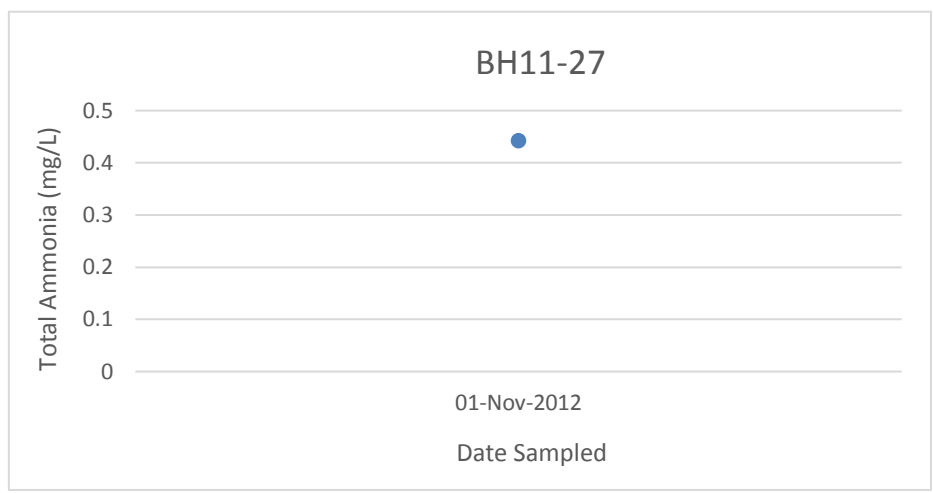

3880
Ammonia (mg/L)
0.070
0.060
0.050
0.040
0.030
0.020
0.010
0.000
21-Oct-2013
Date Sampled

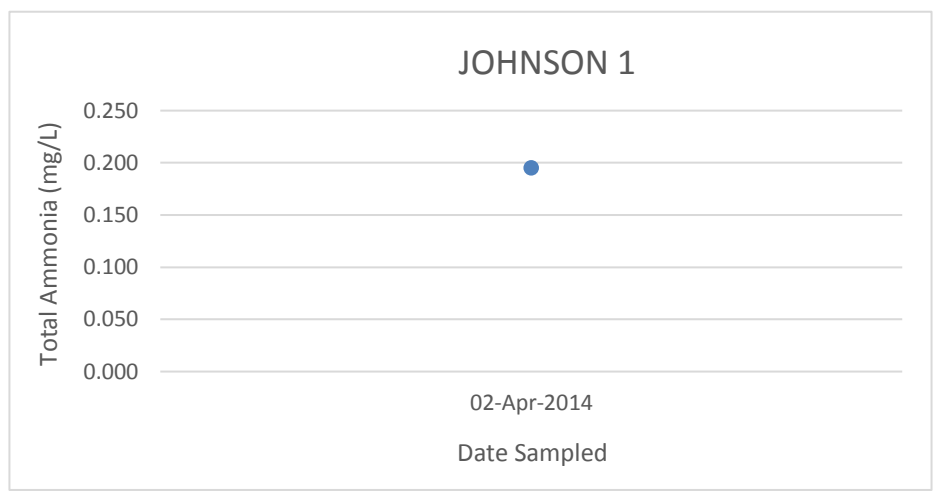

3221
Total Ammonia (mg/L)
0.300
0.250
0.200
0.150
0.100
0.050
0.000
21-Oct-2013
Date Sampled

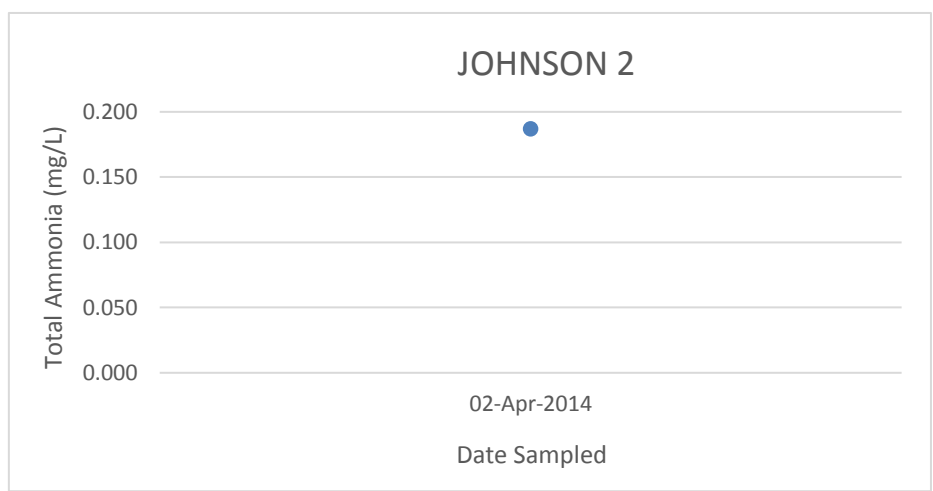

3226
Total Ammonia (mg/L)
0.200
0.150
0.100
0.050
0.000
21-Oct-2013
Date Sampled

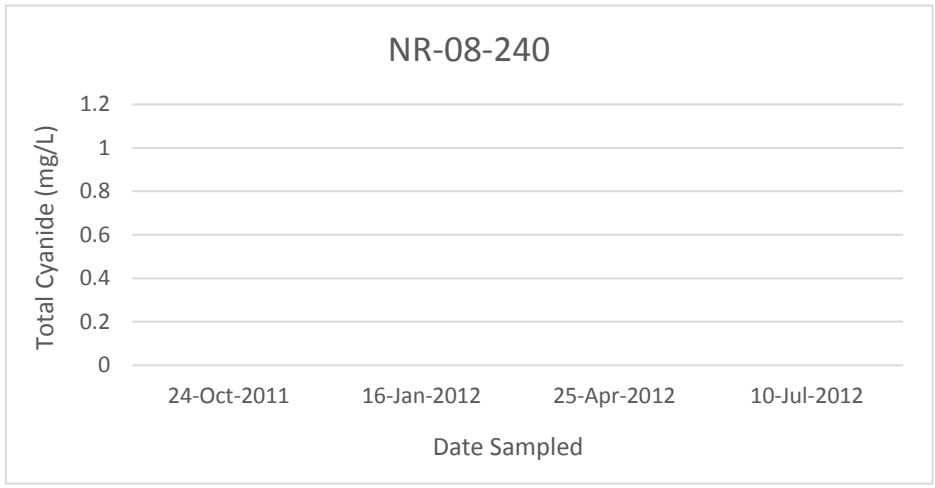

3443-1
Total Ammonia (mg/L)
0.250
0.200
0.150
0.100
0.050
0.000
23-Oct-2014
Date Sampled

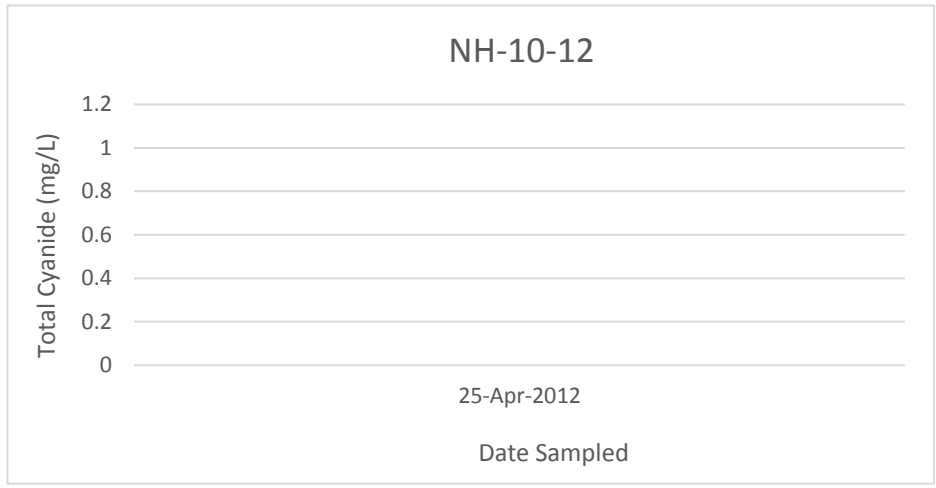

DUP
Total Ammonia (mg/L)
0.400
0.350
0.300
0.250
0.200
0.150
0.100
0.050
0.000
06-Jun-2013
01-Nov-2012
Date Sampled

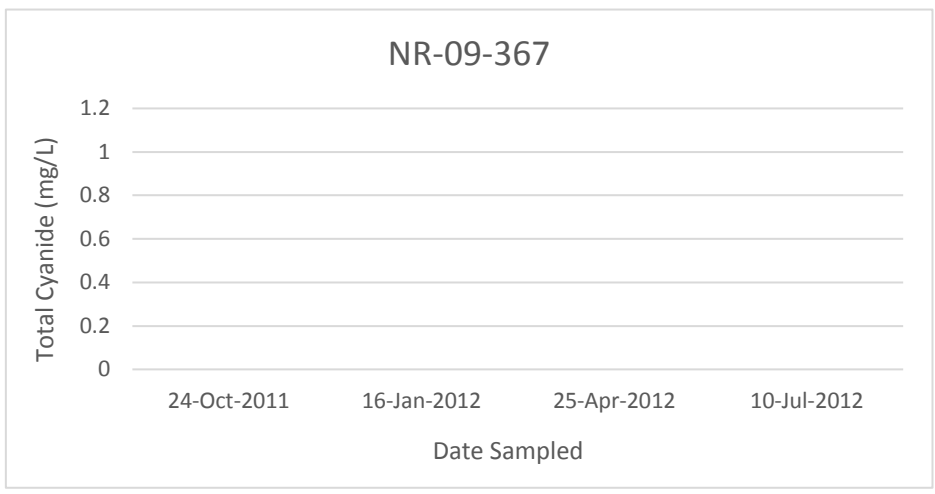

BH11-27
Total Ammonia (mg/L)
0.5
0.4
0.3
0.2
0.1
0
01-Nov-2012
Date Sampled

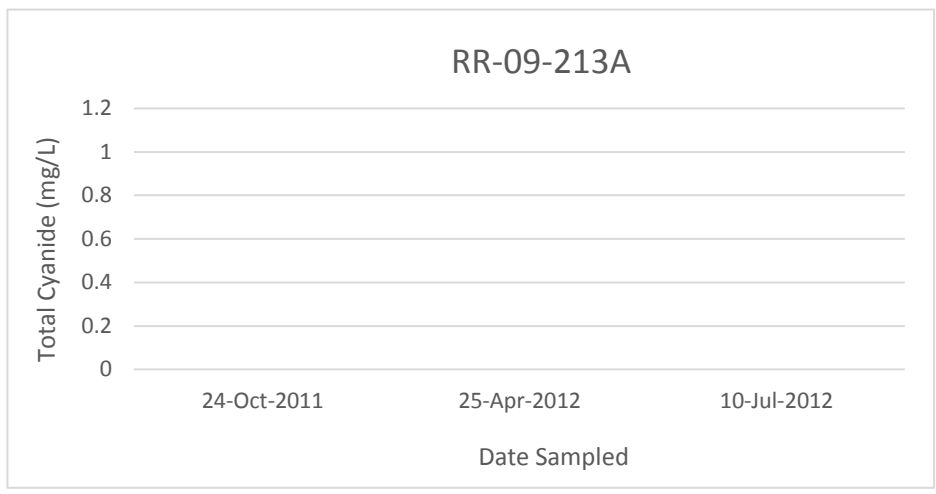

JOHNSON 1
Total Ammonia (mg/L)
0.250
0.200
0.150
0.100
0.050
0.000
02-Apr-2014
Date Sampled


JOHNSON 2
Total Ammonia (mg/L)
0.200
0.150
0.100
0.050
0.000
02-Apr-2014
Date Sampled


NR-08-240
Total Cyanide (mg/L)
1.2
1
0.8
0.6
0.4
0.2
0
24-Oct-2011
16-Jan-2012
25-Apr-2012
10-Jul-2012
Date Sampled


NH-10-12
Total Cyanide (mg/L)
1.2
1
0.8
0.6
0.4
0.2
0
25-Apr-2012
Date Sampled


NR-09-367
Total Cyanide (mg/L)
1.2
1
0.8
0.6
0.4
0.2
0
24-Oct-2011
16-Jan-2012
25-Apr-2012
10-Jul-2012
Date Sampled


RR-09-213A
Total Cyanide (mg/L)
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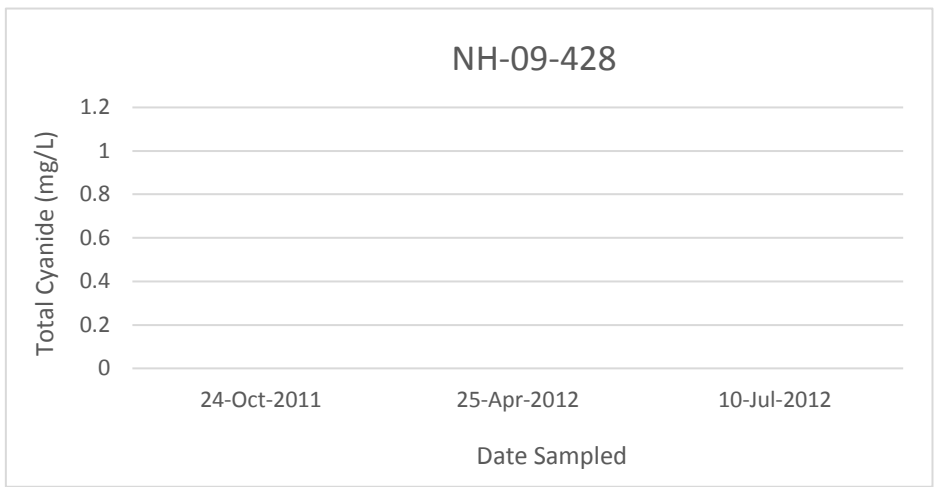
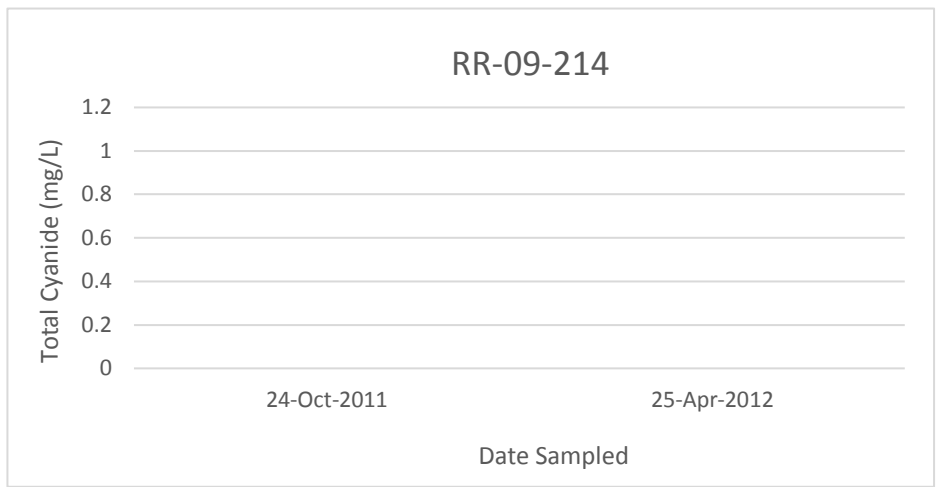
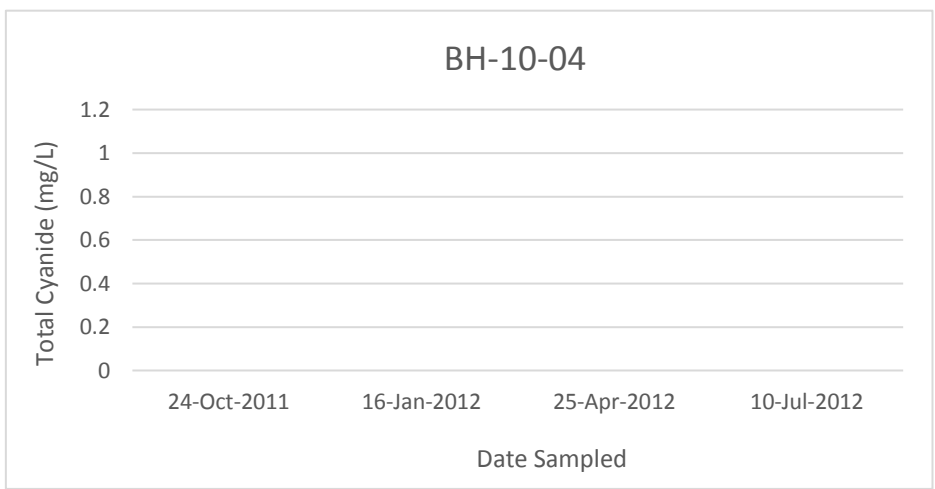
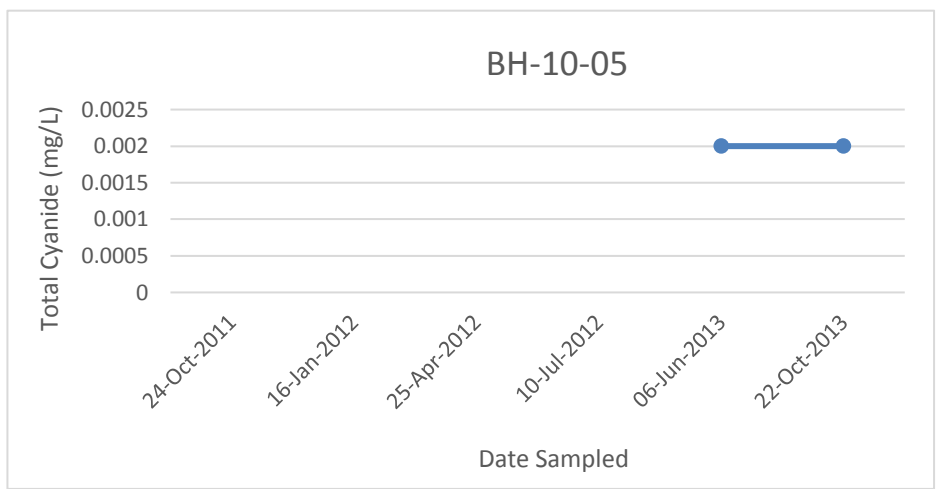
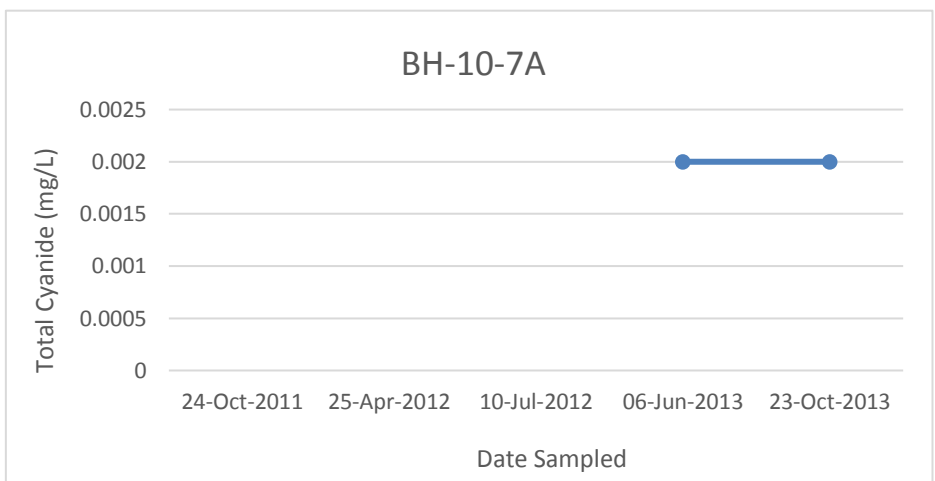
1
0.8
0.6
0.4
0.2
0
24-Oct-2011
25-Apr-2012
10-Jul-2012
Date Sampled

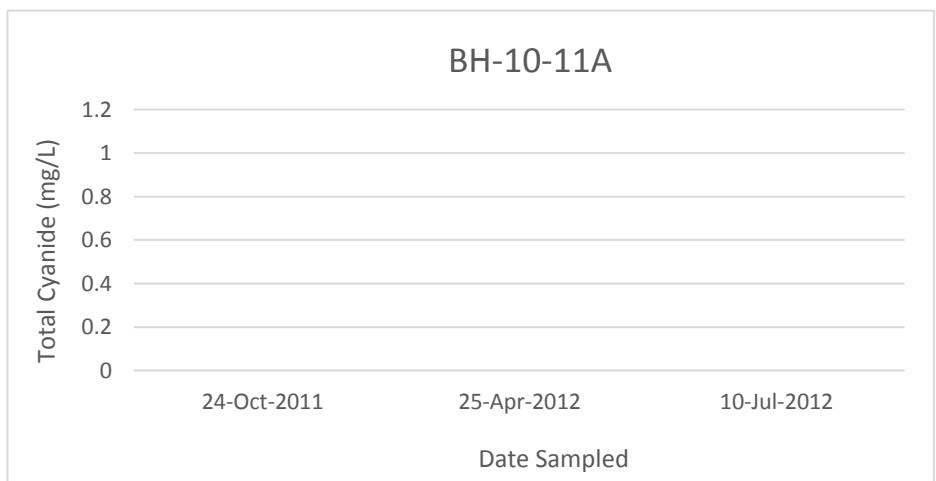

NH-09-428
Total Cyanide (mg/L)
1.2
1
0.8
0.6
0.4
0.2
0
24-Oct-2011
25-Apr-2012
10-Jul-2012
Date Sampled


RR-09-214
Total Cyanide (mg/L)
1.2
1
0.8
0.6
0.4
0.2
0
24-Oct-2011
25-Apr-2012
Date Sampled


BH-10-04
Total Cyanide (mg/L)
1.2
1
0.8
0.6
0.4
0.2
0
24-Oct-2011
16-Jan-2012
25-Apr-2012
10-Jul-2012
Date Sampled


BH-10-05
Total Cyanide (mg/L)
0.0025
0.002
0.0015
0.001
0.0005
0
24-Oct-2011
16-Jan-2012
25-Apr-2012
10-Jul-2012
06-Jun-2013
22-Oct-2013
Date Sampled


BH-10-7A
Total Cyanide (mg/L)
0.0025
0.002
0.0015
0.001
0.0005
0
24-Oct-2011
25-Apr-2012
10-Jul-2012
06-Jun-2013
23-Oct-2013
Date Sampled


BH-10-11A
Total Cyanide (mg/L)
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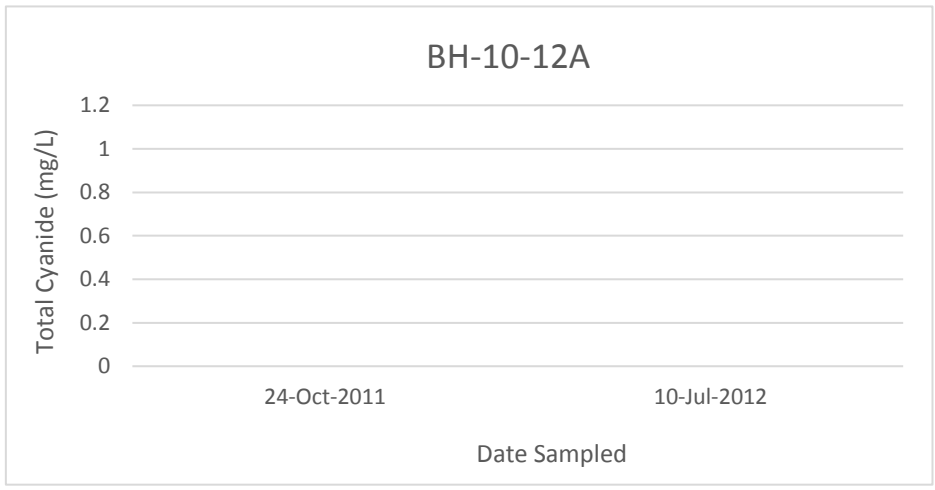
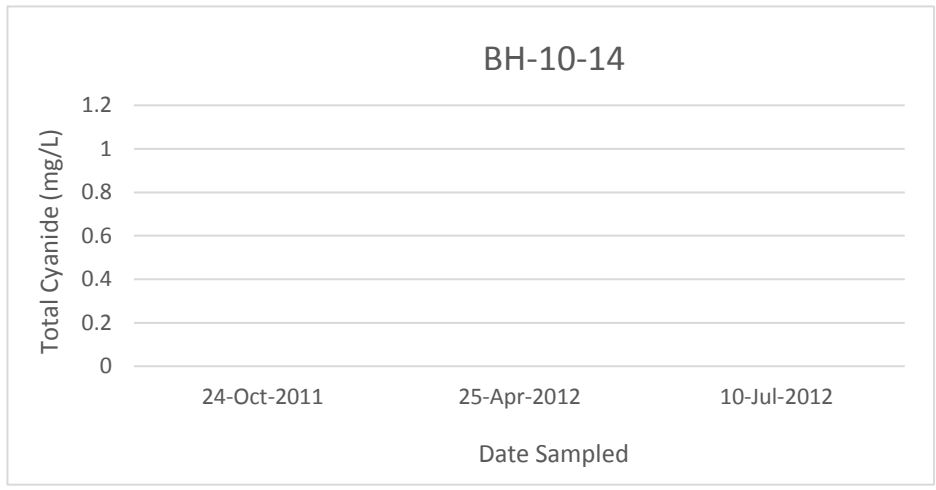
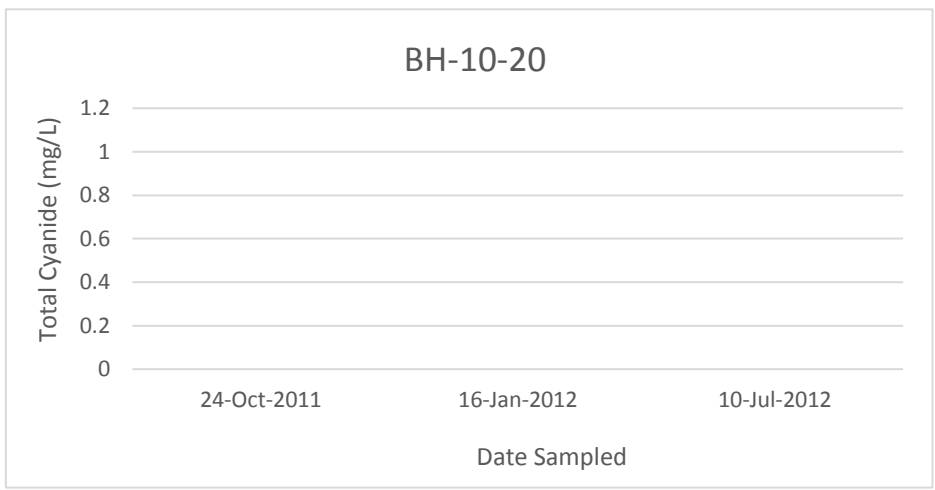
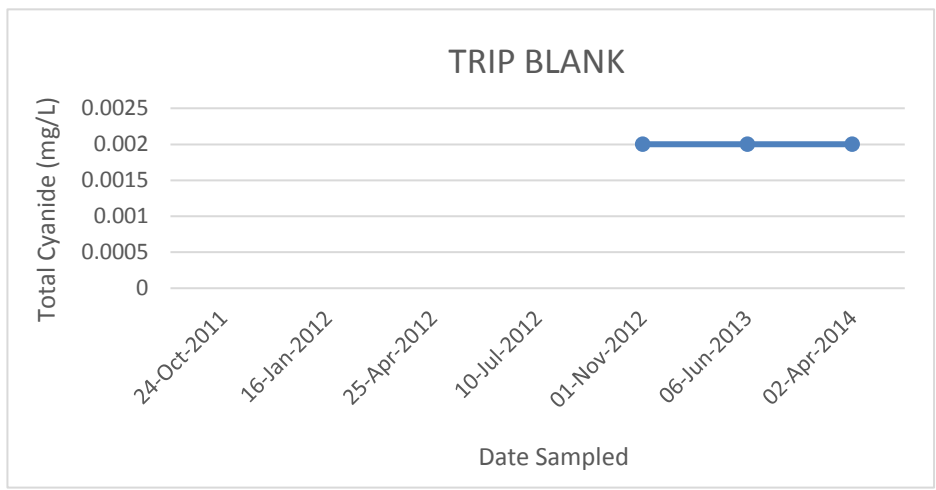
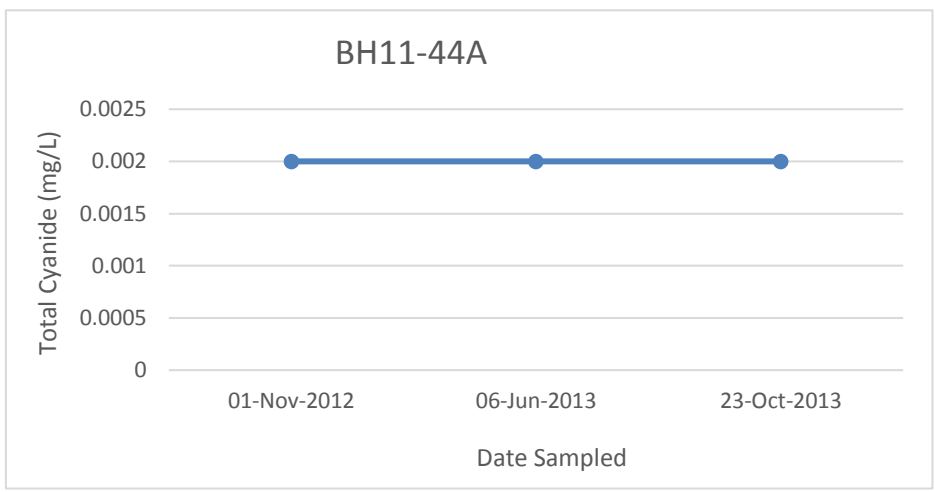
0.8
0.6
0.4
0.2
0
24-Oct-2011
25-Apr-2012
10-Jul-2012
Date Sampled

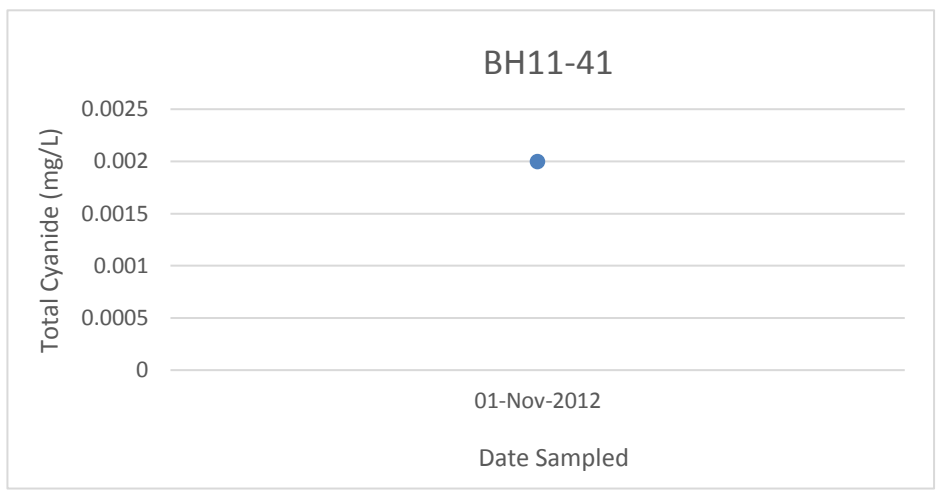

BH-10-12A
Total Cyanide (mg/L)
1.2
1
0.8
0.6
0.4
0.2
0
24-Oct-2011
10-Jul-2012
Date Sampled

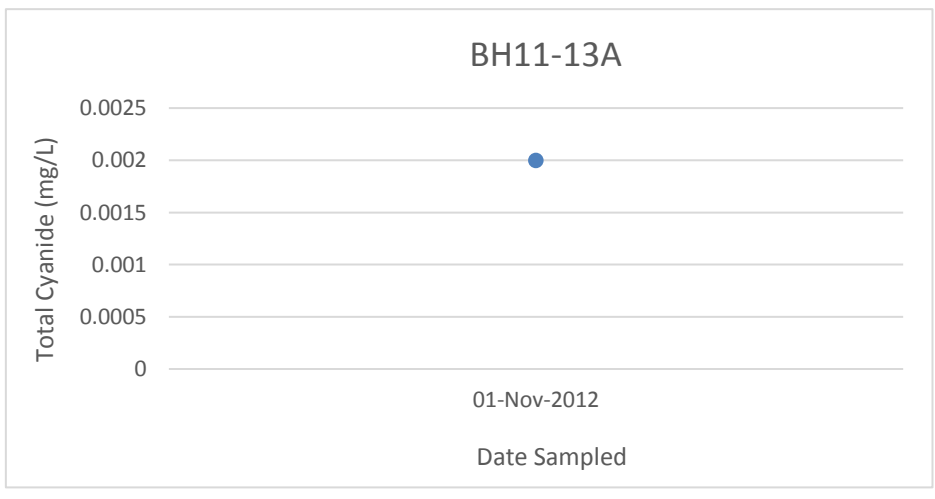

BH-10-14
Total Cyanide (mg/L)
1.2
1
0.8
0.6
0.4
0.2
0
24-Oct-2011
25-Apr-2012
10-Jul-2012
Date Sampled

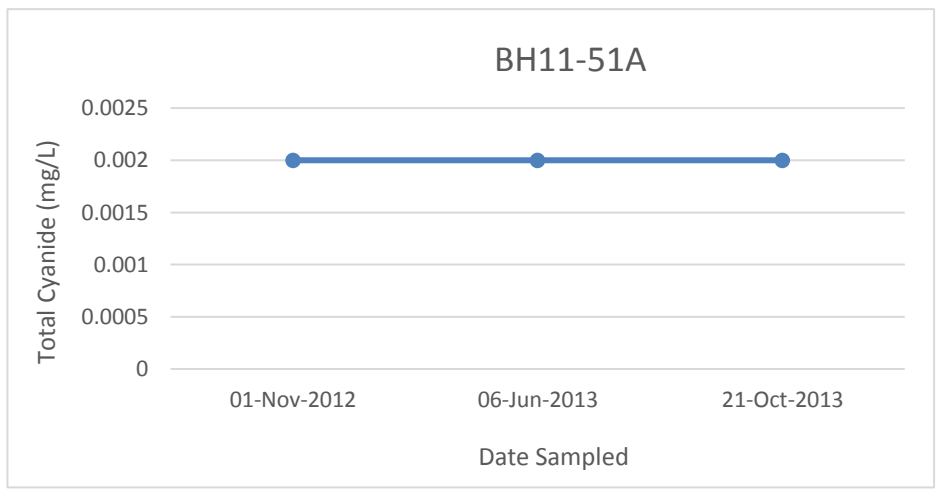

BH-10-20
Total Cyanide (mg/L)
1.2
1
0.8
0.6
0.4
0.2
0
24-Oct-2011
16-Jan-2012
10-Jul-2012
Date Sampled

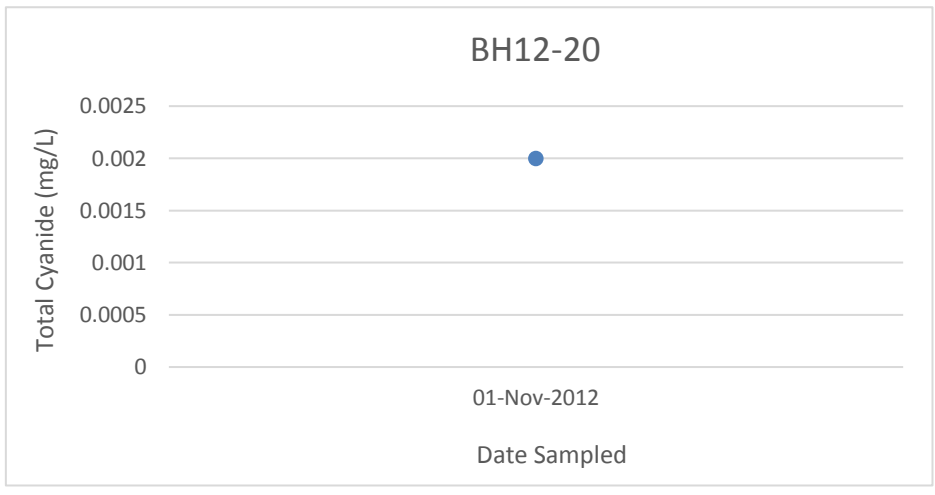

TRIP BLANK
Total Cyanide (mg/L)
0.0025
0.002
0.0015
0.001
0.0005
0
24-Oct-2011
16-Jan-2012
25-Apr-2012
10-Jul-2012
01-Nov-2012
06-Jun-2013
02-Apr-2014
Date Sampled

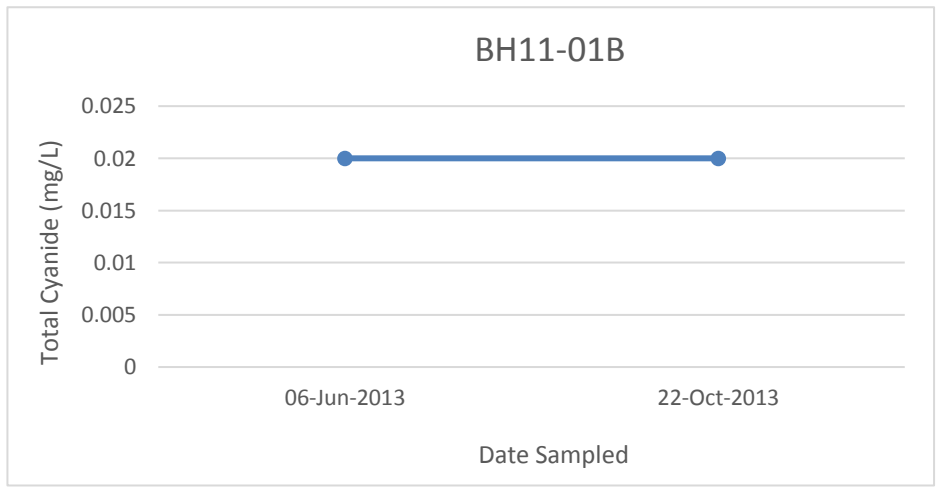

BH11-44A
Total Cyanide (mg/L)
0.0025
0.002
0.0015
0.001
0.0005
0
01-Nov-2012
06-Jun-2013
23-Oct-2013
Date Sampled

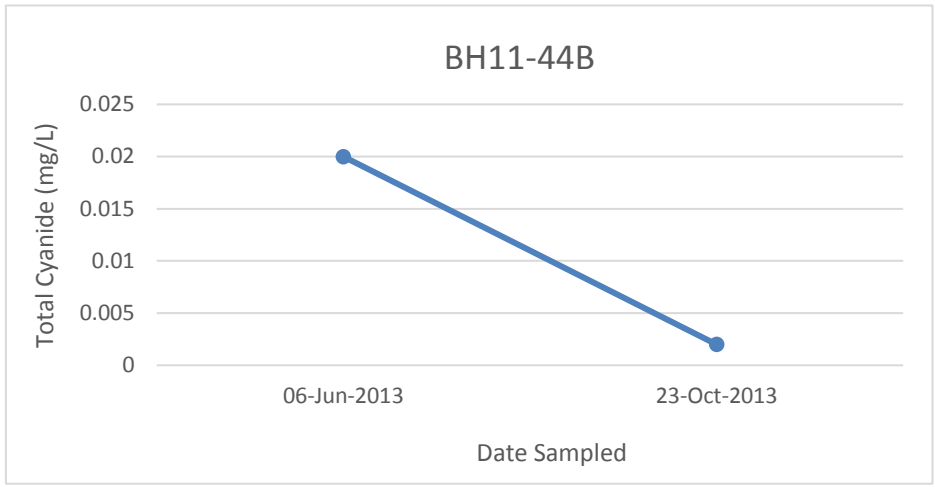

BH11-41
Total Cyanide (mg/L)
0.0025
0.002
0.0015
0.001
0.0005
0
01-Nov-2012
Date Sampled

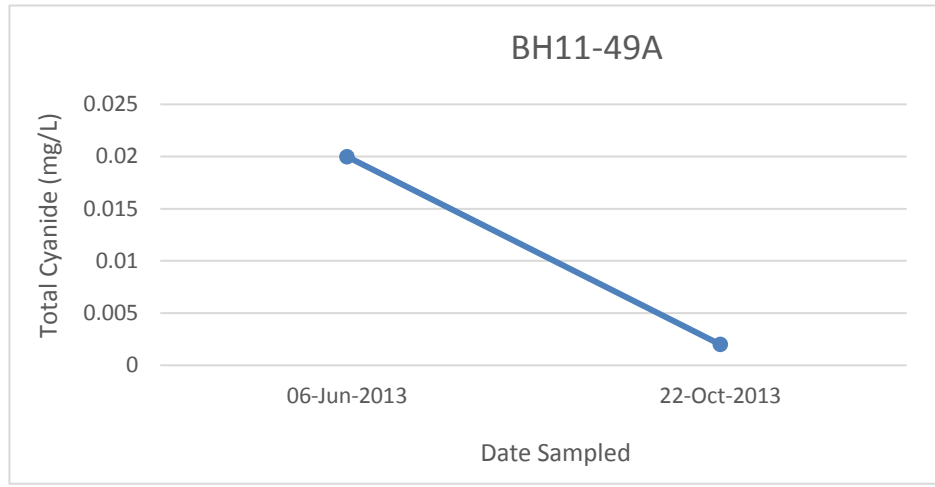

BH11-13A
Total Cyanide (mg/L)
0.0025
0.002
0.0015
0.001
0.0005
0
01-Nov-2012
Date Sampled

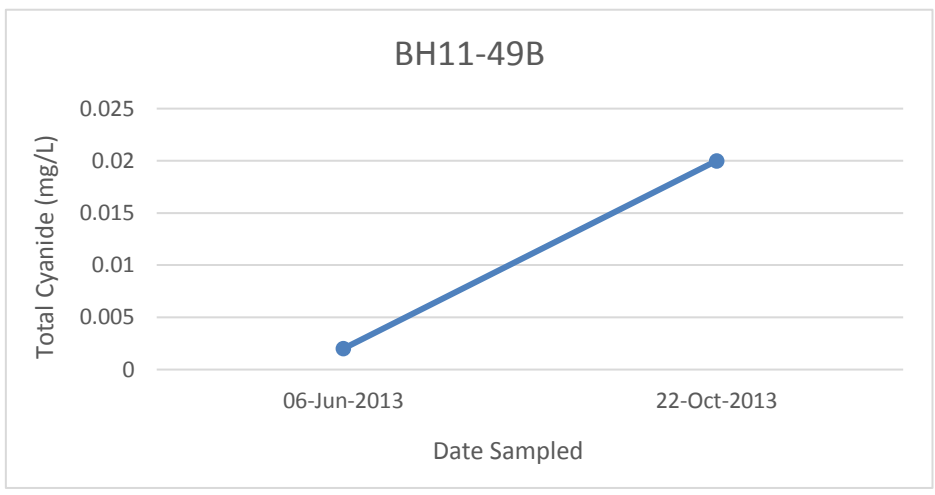

BH11-51A
Total Cyanide (mg/L)
0.0025
0.002
0.0015
0.001
0.0005
0
01-Nov-2012
06-Jun-2013
21-Oct-2013
Date Sampled

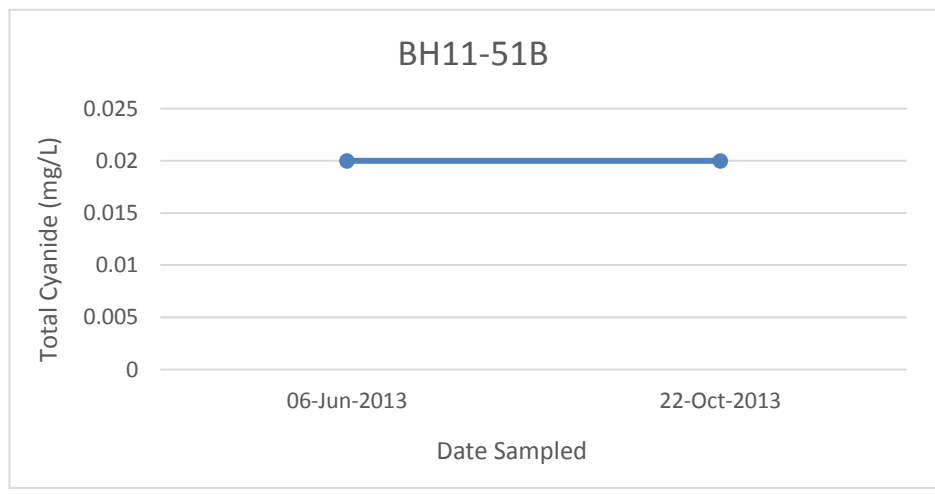

BH12-20
Total Cyanide (mg/L)
0.0025
0.002
0.0015
0.001
0.0005
0
01-Nov-2012
Date Sampled

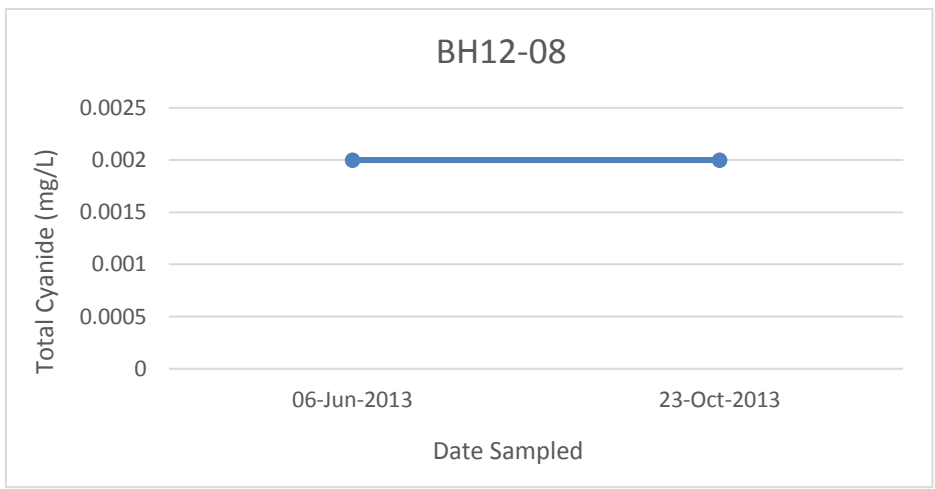

BH11-01B
Total Cyanide (mg/L)
0.025
0.02
0.015
0.01
0.005
0
06-Jun-2013
22-Oct-2013
Date Sampled


BH11-44B
Total Cyanide (mg/L)
0.025
0.02
0.015
0.01
0.005
0
06-Jun-2013
23-Oct-2013
Date Sampled


BH11-49A
Total Cyanide (mg/L)
0.025
0.02
0.015
0.01
0.005
0
06-Jun-2013
22-Oct-2013
Date Sampled


BH11-49B
Total Cyanide (mg/L)
0.025
0.02
0.015
0.01
0.005
0
06-Jun-2013
22-Oct-2013
Date Sampled


BH11-51B
Total Cyanide (mg/L)
0.025
0.02
0.015
0.01
0.005
0
06-Jun-2013
22-Oct-2013
Date Sampled


BH12-08
Total Cyanide (mg/L)
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0.0015
0.001
0.0005
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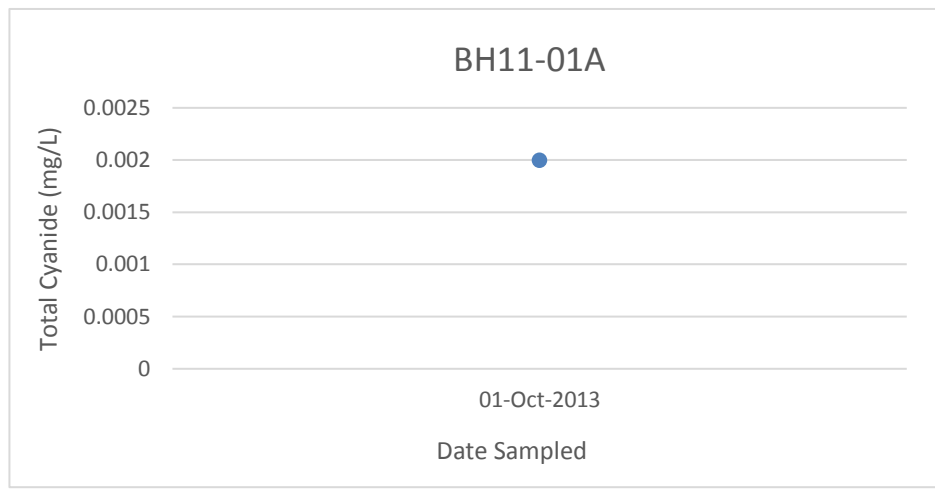
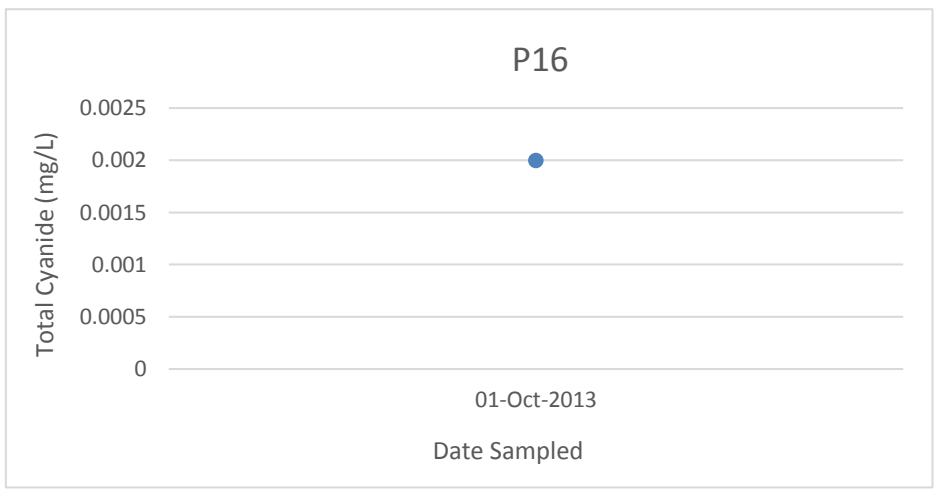
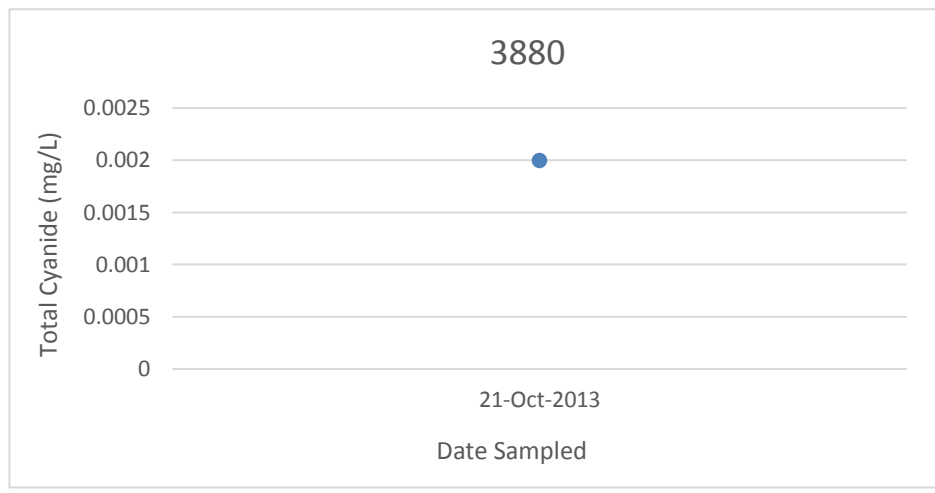
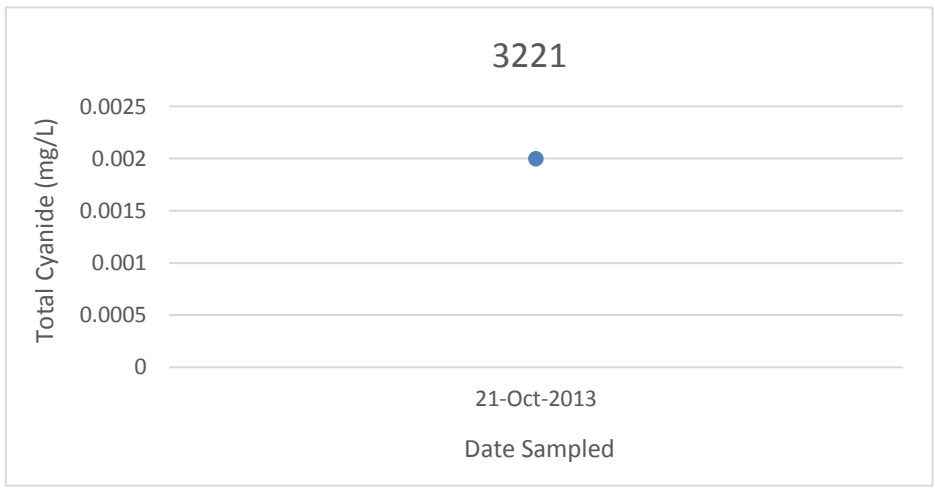
06-Jun-2013
23-Oct-2013
Date Sampled


BH11-01A
Total Cyanide (mg/L)
0.0025
0.002
0.0015
0.001
0.0005
0
01-Oct-2013
Date Sampled


P16
Total Cyanide (mg/L)
0.0025
0.002
0.0015
0.001
0.0005
0
01-Oct-2013
Date Sampled


3880
Total Cyanide (mg/L)
0.0025
0.002
0.0015
0.001
0.0005
0
21-Oct-2013
Date Sampled


3221
Total Cyanide (mg/L)
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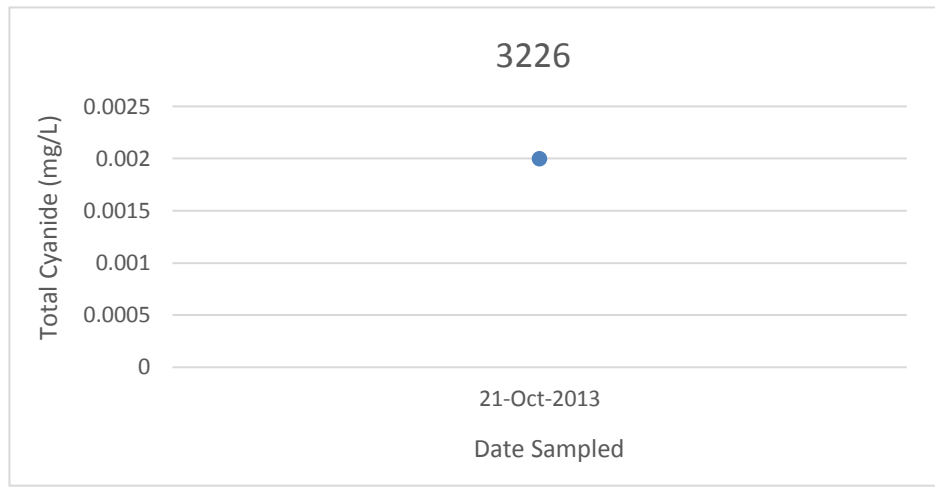
0.002
0.0015
0.001
0.0005
0
21-Oct-2013
Date Sampled


3226
Total Cyanide (mg/L)
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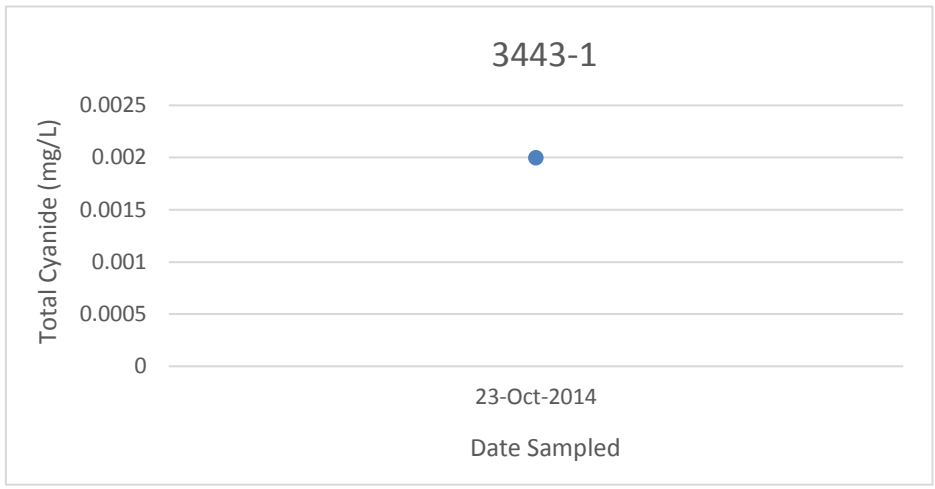
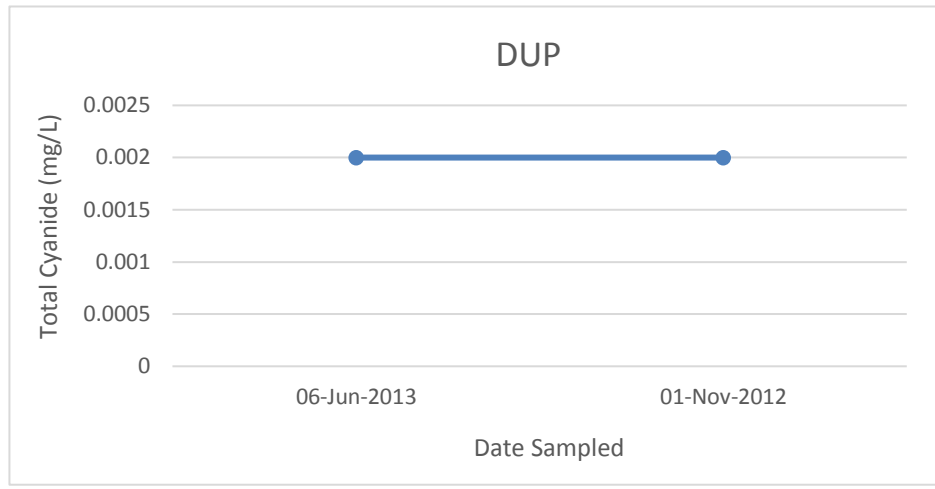
0.002
0.0015
0.001
0.0005
0
21-Oct-2013
Date Sampled


3443-1
Total Cyanide (mg/L)
0.0025
0.002
0.0015
0.001
0.0005
0
23-Oct-2014
Date Sampled


DUP
Total Cyanide (mg/L)
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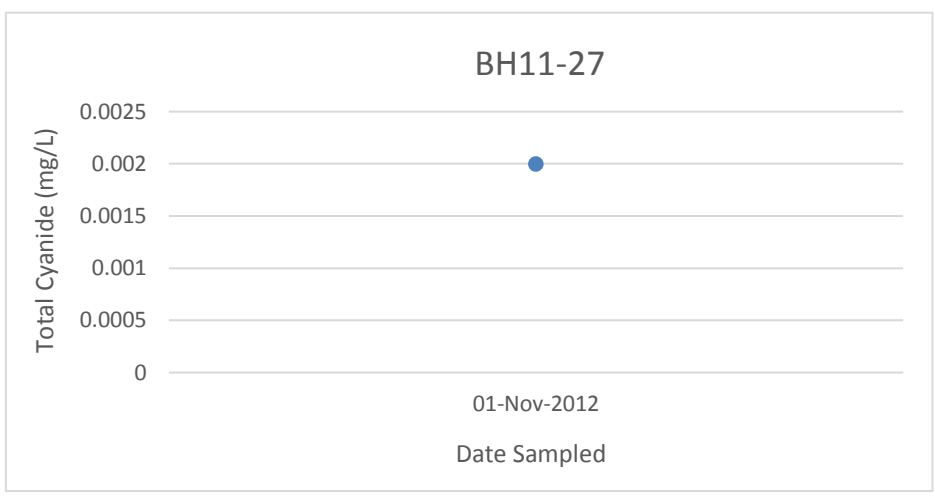
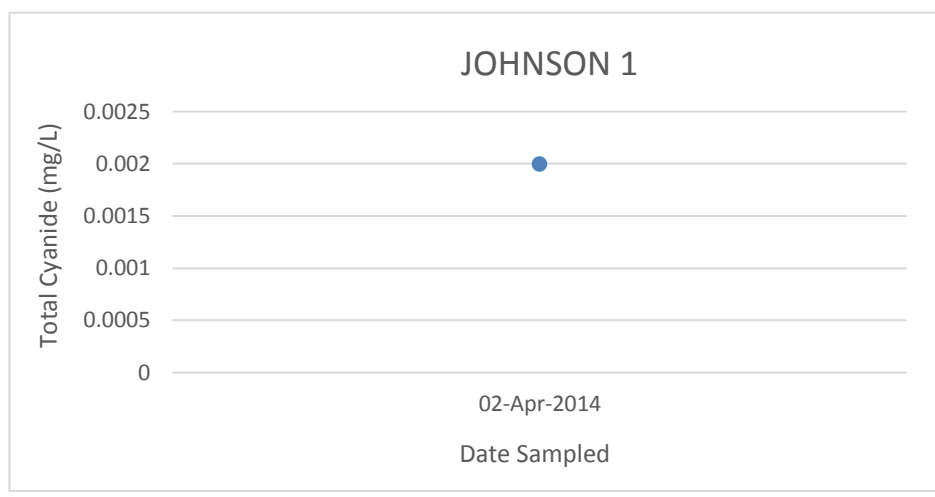
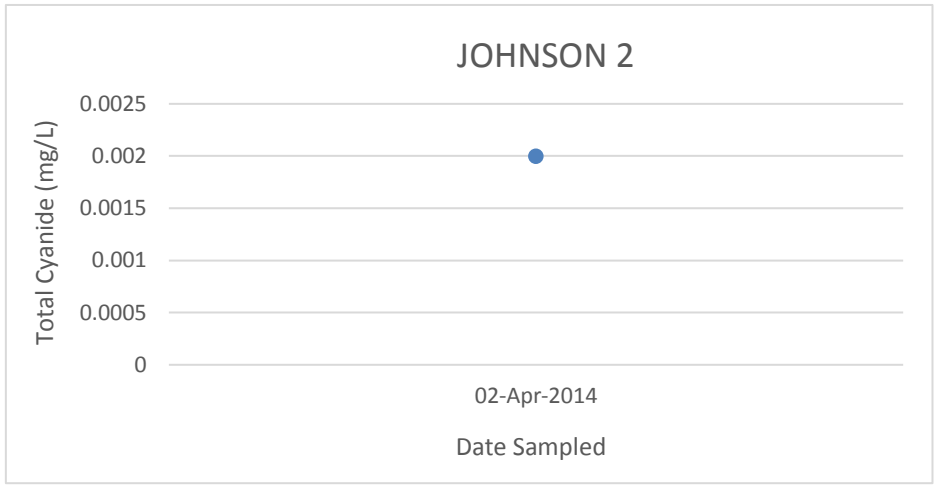
0.002
0.0015
0.001
0.0005
0
06-Jun-2013
01-Nov-2012
Date Sampled


BH11-27
Total Cyanide (mg/L)
0.0025
0.002
0.0015
0.001
0.0005
0
01-Nov-2012
Date Sampled


JOHNSON 1
Total Cyanide (mg/L)
0.0025
0.002
0.0015
0.001
0.0005
0
02-Apr-2014
Date Sampled


JOHNSON 2
Total Cyanide (mg/L)
0.0025
0.002
0.0015
0.001
0.0005
0
02-Apr-2014
Date Sampled

APPENDIX F

2015 GROUNDWATER CHEMISTRY

Results Summary L1632725

Job Reference GROUND WATER
Report To Mark Vancook / Jesse Tom, New Gold Inc. Rainy River Project
Date Received 25-Jun-2015 12:40
Report Date 10-Jul-2015 14:02
Report Revision 1

Client Sample ID			PIT 3A	PIT 3B	DUP	TMA 4A	TMA 4B	PIT 1	FIELD BLANK	P16	TMA3A	TMA3B	TMA5A	TRIP BLANK
Date Sampled			24-Jun-2015	24-Jun-2015	23-Jun-2015	23-Jun-2015	23-Jun-2015	23-Jun-2015	23-Jun-2015	23-Jun-2015	23-Jun-2015	23-Jun-2015	23-Jun-2015	23-Jun-2015
Time Sampled			9:00	8:30	10:26	12:45	15:00	11:24	11:35	10:26	8:00	13:00	14:00	0:01
ALS Sample ID			L1632725-1	L1632725-2	L1632725-3	L1632725-4	L1632725-5	L1632725-6	L1632725-7	L1632725-8	L1632725-9	L1632725-10	L1632725-11	L1632725-12
Parameter	Lowest Detection Limit	Units	Effluent	Effluent	Effluent	Effluent	Effluent	Effluent	Effluent	Effluent	Effluent	Effluent	Effluent	Effluent
Physical Tests (Water)														
Hardness (as CaCO3)	10	mg/L	331	380	149	333	623	583	<10	149	205	409	423	<10
Anions and Nutrients (Water)														
Chloride (Cl)	0.10	mg/L	4.11	2.95	15.2	1.64	10.8	<0.50	<0.10	15.0	0.52	1.71	1.22	<0.10
Physical Tests (Effluent)														
Conductivity (EC)	3.0	uS/cm	650	804	703	694	1400	1060	0.6	705	471	966	867	1.8
pH	0.10	pH	7.56	7.27	8.05	7.58	7.25	7.41	6.21	8.05	7.79	7.51	7.52	5.24
Total Dissolved Solids	10	mg/L	330	390	405	385	885	710	<5	395	275	575	505	<5
Anions and Nutrients (Effluent)														
Alkalinity, Total (as CaCO3)	2.0	mg/L	365	432	313	349	545	510	1.2	300	252	380	467	<0.2
Ammonia, Total (as N)	0.020	mg/L	0.202	0.272	0.424	0.376	0.726	0.098	<0.002	0.440	0.348	0.652	0.602	0.344
Nitrate (as N)	0.020	mg/L	0.005	0.005	0.025	<0.005	<0.005	0.05	<0.005	0.020	0.010	0.04	<0.005	<0.005
Nitrite (as N)	0.010	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001	0.002	<0.001	0.001	<0.001	<0.001	<0.001	0.001
Sulfate (SO4)	0.30	mg/L	13.4	46.6	62.3	59.9	326	149	0.02	61.6	10.2	195	58.0	0.14
Cyanides (Effluent)														
Cyanide, Weak Acid Diss	0.0020	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Cyanide, Total	0.0020	mg/L	<0.001	<0.001	<0.001	<0.001	0.001	<0.001	<0.001	<0.001	<0.001	0.001	<0.001	<0.001
Cyanide, Free	0.0050	mg/L	<0.001	<0.001	<0.001	<0.001	0.003	<0.001	<0.001	<0.001	<0.001	0.004	<0.001	<0.001
Total Metals (Effluent)														
Aluminum (Al)-Total	0.0050	mg/L	26.5	136	0.0025	24.7	325	11.8	0.0015	0.0020	0.0690	313	0.0010	0.0005
Antimony (Sb)-Total	0.00060	mg/L	0.0016	0.0006	0.00002	0.0002	0.0002500	0.0018	<0.00001	0.00002	<0.00001	0.002	0.00002	<0.00001
Arsenic (As)-Total	0.0010	mg/L	0.032	0.061	<0.0001	0.005	0.14	0.005	<0.0001	<0.0001	0.0198	0.26	0.0096	<0.0001
Barium (Ba)-Total	0.010	mg/L	0.32	1.49	0.020	0.13	7.3	0.16	<0.00002	0.020	0.056	4.9	0.052	<0.00002
Beryllium (Be)-Total	0.0010	mg/L	0.0003200	0.006	<0.00001	0.0006	0.05	0.0005	<0.00001	<0.00001	<0.00001	0.03	<0.00001	<0.00001
Bismuth (Bi)-Total	0.0010	mg/L	0.0001800	0.002	<0.00002	0.0001200	0.000300	0.0001400	<0.00002	<0.00002	<0.00002	0.010	<0.00002	<0.00002
Boron (B)-Total	0.050	mg/L	0.09	0.5	0.500	0.12	1.8	0.17	0.001	0.498	0.124	1.3	0.143	0.002
Cadmium (Cd)-Total	0.000017	mg/L	0.00006	0.00211	<0.000005	0.00008	0.0420	0.00266	<0.000005	<0.000005	<0.000005	0.0109	<0.000005	<0.000005
Calcium (Ca)-Total	0.20	mg/L	101	406	36.5	113	9010	177	0.04	36.1	59.2	1930	102	0.04
Chromium (Cr)-Total	0.0010	mg/L	0.047	0.352	0.0002	0.198	0.93	0.030	<0.0001	0.0003	0.0002	0.60	<0.0001	<0.0001
Cobalt (Co)-Total	0.00050	mg/L	0.0123	0.107	0.00004	0.0186	0.759	0.0075	0.00001	0.00003	0.00014	0.284	0.00011	<0.00001
Copper (Cu)-Total	0.0010	mg/L	0.056	0.408	0.0018	0.126	2.02	0.019	<0.0001	0.0028	0.0001	0.68	0.0002	0.0001
Iron (Fe)-Total	0.020	mg/L	18.2	194	0.030	75.3	494	14.8	<0.01	0.030	0.490	458	1.61	<0.01
Lead (Pb)-Total	0.0010	mg/L	0.006	0.098	0.0001	0.004	0.78	0.012	<0.00001	0.0002	0.000020000	0.54	<0.00001	<0.00001
Lithium (Li)-Total	0.050	mg/L	0.04	0.30	0.006	0.03	1.2	0.11	<0.0002	0.006	0.039	0.6	0.031	<0.0002
Magnesium (Mg)-Total	0.020	mg/L	39.8	184	15.0	36.9	2570	94.0	<0.002	15.1	18.1	628	41.7	<0.002
Manganese (Mn)-Total	0.0010	mg/L	0.540	4.36	0.0550	0.783	48.8	0.439	<0.0001	0.0552	0.154	14.0	0.262	<0.0001
Mercury (Hg)-Total	0.000010	mg/L	0.000006	0.000024	<0.000002	0.000012	0.00008	<0.000002	<0.000002	<0.000002	<0.000002	0.0000980000	<0.000002	<0.000002
Molybdenum (Mo)-Total	0.0010	mg/L	0.006	0.012	0.0010	0.009	0.01	0.006	<0.00002	0.0010	0.0019	0.02	0.0020	<0.00002
Nickel (Ni)-Total	0.0020	mg/L	0.026	0.292	0.0003	0.053	2.20	0.020	<0.0001	0.0005	0.0005	0.82	0.0001	<0.0001
Potassium (K)-Total	0.50	mg/L	4.7	31.7	1.91	5.9	96	6.0	<0.01	1.93	3.19	83	4.63	<0.01
Selenium (Se)-Total	0.0010	mg/L	<0.0002	0.003	<0.0002	<0.0002	0.01	0.0004000	<0.0002	<0.0002	<0.0002	0.01	<0.0002	<0.0002
Silver (Ag)-Total	0.00010	mg/L	0.0077	0.0039	<0.00001	0.0020	0.0001500	0.0003	<0.00001	<0.00001	<0.00001	0.001	<0.00001	<0.00001
Sodium (Na)-Total	0.50	mg/L	10.2	33	103	21.8	128	17.9	<0.02	95.7	16.0	81	31.9	<0.02
Strontium (Sr)-Total	0.0010	mg/L	0.488	1.18	0.694	0.783	10.5	0.751	<0.0001	0.710	0.383	4.74	0.702	<0.0001
Thallium (Tl)-Total	0.00030	mg/L	0.0004	0.0025	<0.000002	0.0001	0.010	0.0002	<0.000002	<0.000002	<0.000002	0.009	<0.000002	<0.000002
Tin (Sn)-Total	0.0010	mg/L	0.0001400	0.0008	0.000020000	0.0005	0.000800	0.0006	0.000040000	<0.00002	0.000020000	0.000800	0.000020000	<0.00002
Titanium (Ti)-Total	0.0020	mg/L	0.156	2.60	0.0002	0.609	0.11	0.409	0.0001	0.0002	0.0047	0.88	0.00005	0.00005
Tungsten (W)-Total	0.010	mg/L	0.05	0.02	0.009870	0.01	0.0013	0.00275	<0.00001	0.009610	0.0002100	0.00038	<0.00001	<0.00001
Uranium (U)-Total	0.0050	mg/L	0.001	0.027	0.0001	0.0009	0.24	0.017	<0.000001	0.0001	0.0009	0.19	0.0008	<0.000001
Vanadium (V)-Total	0.0010	mg/L	0.026	0.374	0.0001	0.239	0.48	0.038	<0.00005	0.0001	0.0004	0.73	0.00005	0.0001
Zinc (Zn)-Total	0.0030	mg/L	0.052	0.712	0.0025	0.056	4.12	0.052	<0.0005	0.0085	0.0005	1.89	0.0005	0.0010
Zirconium (Zr)-Total	0.0010	mg/L	0.010	0.016	0.0005	0.003	0.005	0.007	<0.00002	0.0005	0.0001	0.02	0.0001	<0.00002

Results Summary L1632725

Job Reference GROUND WATER
Report To Mark Vancook / Jesse Tom, New Gold Inc. Rainy River Project
Date Received 25-Jun-2015 12:40
Report Date 10-Jul-2015 14:02
Report Revision 1

Client Sample ID			PIT 3A	PIT 3B	DUP	TMA 4A	TMA 4B	PIT 1	FIELD BLANK	P16	TMA3A	TMA3B	TMA5A	TRIP BLANK
Date Sampled			24-Jun-2015	24-Jun-2015	23-Jun-2015	23-Jun-2015	23-Jun-2015	23-Jun-2015	23-Jun-2015	23-Jun-2015	23-Jun-2015	23-Jun-2015	23-Jun-2015	23-Jun-2015
Time Sampled			9:00	8:30	10:26	12:45	15:00	11:24	11:35	10:26	8:00	13:00	14:00	0:01
ALS Sample ID			L1632725-1	L1632725-2	L1632725-3	L1632725-4	L1632725-5	L1632725-6	L1632725-7	L1632725-8	L1632725-9	L1632725-10	L1632725-11	L1632725-12
Parameter	Lowest Detection Limit	Units	Effluent	Effluent	Effluent	Effluent	Effluent	Effluent	Effluent	Effluent	Effluent	Effluent	Effluent	Effluent
Dissolved Metals (Effluent)														
Dissolved Mercury Filtration Location		-	FIELD	FIELD	FIELD	FIELD	FIELD	FIELD	FIELD	FIELD	FIELD	FIELD	FIELD	FIELD
Dissolved Metals Filtration Location		-	FIELD	FIELD	FIELD	FIELD	FIELD	FIELD	FIELD	FIELD	FIELD	FIELD	FIELD	FIELD
Aluminum (Al)-Dissolved	0.0050	mg/L	0.0450	0.0050	0.0010	0.0010	0.0040	0.0020	<0.001	0.0020	0.0010	0.0050	<0.001	<0.001
Antimony (Sb)-Dissolved	0.00060	mg/L	0.00006	0.00010	0.00002	0.00001	0.00061	0.00015	<0.00001	0.00002	<0.00001	0.00121	0.00001	<0.00001
Arsenic (As)-Dissolved	0.0010	mg/L	0.0092	0.0043	0.00006	0.0034	0.0168	0.0006	<0.00001	0.00006	0.0194	0.0101	0.0096	<0.00001
Barium (Ba)-Dissolved	0.010	mg/L	0.073	0.094	0.021	0.061	0.022	0.042	0.0001800	0.021	0.059	0.025	0.052	<0.00002
Beryllium (Be)-Dissolved	0.0010	mg/L	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001
Bismuth (Bi)-Dissolved	0.0010	mg/L	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002
Boron (B)-Dissolved	0.050	mg/L	0.059	0.305	0.468	0.097	0.417	0.119	0.006	0.463	0.130	0.606	0.137	0.007
Cadmium (Cd)-Dissolved	0.000017	mg/L	<0.000005	0.000010	<0.000005	<0.000005	0.000005	0.000360	<0.000005	<0.000005	<0.000005	0.000015	<0.000005	<0.000005
Calcium (Ca)-Dissolved	0.20	mg/L	84.1	88.5	35.5	90.2	158	116	0.02	35.6	54.3	106	103	<0.02
Chromium (Cr)-Dissolved	0.0010	mg/L	0.0002	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Cobalt (Co)-Dissolved	0.00050	mg/L	0.00010	0.00121	0.00003	0.00005	0.00040	0.00051	<0.00001	0.00003	0.00009	0.00045	0.00009	<0.00001
Copper (Cu)-Dissolved	0.0010	mg/L	0.0002	0.0006	0.0044	<0.0001	0.0006	0.0005	<0.0001	0.0032	<0.0001	0.0006	<0.0001	<0.0001
Iron (Fe)-Dissolved	0.020	mg/L	2.52	0.770	<0.01	2.78	0.420	0.060	<0.01	<0.01	0.370	0.040	1.42	<0.01
Lead (Pb)-Dissolved	0.0010	mg/L	0.000010000	0.000040000	0.0003	<0.00001	0.000040000	0.000030000	<0.00001	0.0002	<0.00001	0.00005	<0.00001	<0.00001
Lithium (Li)-Dissolved	0.050	mg/L	0.016	0.083	0.006	0.018	0.154	0.085	<0.0002	0.006	0.037	0.150	0.033	<0.0002
Magnesium (Mg)-Dissolved	0.020	mg/L	29.5	38.7	14.7	26.1	55.3	71.0	0.010	14.6	16.9	35.2	40.2	0.004
Manganese (Mn)-Dissolved	0.0010	mg/L	0.281	0.405	0.0534	0.229	0.191	0.117	<0.0001	0.0532	0.145	0.211	0.264	<0.0001
Mercury (Hg)-Dissolved	0.000010	mg/L	<0.000002	<0.000002	<0.000002	0.000002	<0.000002	<0.000002	<0.000002	<0.000002	<0.000002	<0.000002	<0.000002	<0.000002
Molybdenum (Mo)-Dissolved	0.0010	mg/L	0.0028	0.0051	0.0009	0.0031	0.0075	0.0035	<0.00002	0.0009	0.0016	0.0064	0.0017	<0.00002
Nickel (Ni)-Dissolved	0.0020	mg/L	0.0003	0.0026	0.0004	0.0002	0.0015	0.0016	<0.0001	0.0003	0.0003	0.0013	<0.0001	<0.0001
Potassium (K)-Dissolved	0.50	mg/L	3.11	3.69	1.98	4.11	6.95	2.67	<0.01	1.99	3.27	4.28	4.84	<0.01
Selenium (Se)-Dissolved	0.0010	mg/L	<0.0002	<0.0002	<0.0002	<0.0002	0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Silver (Ag)-Dissolved	0.00010	mg/L	0.00002	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001
Sodium (Na)-Dissolved	0.10	mg/L	8.50	34.0	97.5	19.5	88.5	15.5	<0.5	97.0	15.5	55.5	30.5	<0.5
Strontium (Sr)-Dissolved	0.0010	mg/L	0.356	0.509	0.653	0.632	1.03	0.620	0.0001	0.643	0.331	0.662	0.627	<0.0001
Thallium (Tl)-Dissolved	0.00030	mg/L	<0.000002	0.00000200000	<0.000002	<0.000002	<0.000002	0.00000400000	<0.000002	<0.000002	<0.000002	0.00001	<0.000002	<0.000002
Tin (Sn)-Dissolved	0.0010	mg/L	<0.00002	0.000020000	<0.00002	<0.00002	<0.00002	0.000020000	<0.00002	<0.00002	<0.00002	0.000040000	<0.00002	<0.00002
Titanium (Ti)-Dissolved	0.0020	mg/L	0.0003	0.0002	<0.00005	<0.00005	0.0002	0.0001	<0.00005	0.0001	<0.00005	<0.00005	<0.00005	<0.00005
Tungsten (W)-Dissolved	0.010	mg/L	0.005	0.002	0.009	0.002	0.0009	0.0003200	<0.00001	0.009	0.0002100	0.0003900	0.00003000	<0.00001
Uranium (U)-Dissolved	0.0050	mg/L	0.0007	0.0091	0.0001	0.0004	0.0160	0.0150	0.0000090000	0.0001	0.0008	0.0120	0.0008	0.0000030000
Vanadium (V)-Dissolved	0.0010	mg/L	0.0001	0.0004	<0.00005	0.00005	0.0004	0.0004	<0.00005	0.00005	0.0002	0.0004	<0.00005	<0.00005
Zinc (Zn)-Dissolved	0.0030	mg/L	0.0005	0.0045	0.0055	0.0010	0.0045	0.0025	0.0015	0.0050	0.0005	0.0050	0.0005	<0.0005
Zirconium (Zr)-Dissolved	0.0010	mg/L	0.0002	0.0002	0.0004	0.000020000	0.0001	0.0001	<0.00002	0.0004	0.000040000	0.00006	0.00006	<0.00002

Qualifier Legend

<T	A Measurable Trace Amount: Interpret With Caution
<DL	Recorded value = measured amount <LMDL (non-zero)
<W	No Measurable Response (Zero): < Reported Value
DLA	Detection Limit adjusted for required dilution

Results Summary L1701294

Job Reference GROUND WATER
Report To Garnet Cornell / Jesse Tom, New Gold Inc. Rainy River Project
Date Received 12-Nov-2015 9:30
Report Date 20-Nov-2015 14:26
Report Version 1

Client Sample ID			TMA 4A	TMA 3A	PIT 1	PIT 3A	PIT 3B	TMA 3B	TMA 5A	TMA 5B	SEALED TRAVEL BLANK
Date Sampled			11-Nov-2015	11-Nov-2015	11-Nov-2015	11-Nov-2015	11-Nov-2015	11-Nov-2015	11-Nov-2015	11-Nov-2015	11-Nov-2015
Time Sampled			11:45	12:10	9:15	14:30	14:35	12:45	10:30	10:45	15:00
ALS Sample ID			L1701294-1	L1701294-2	L1701294-3	L1701294-4	L1701294-5	L1701294-6	L1701294-7	L1701294-8	L1701294-9
Parameter	Lowest Detection Limit	Units	Effluent	Effluent	Effluent	Effluent	Effluent	Effluent	Effluent	Effluent	Effluent
Anions and Nutrients (Water)											
Chloride (Cl)	0.10	mg/L	1.71	0.69	<0.50	4.19	4.15	1.58	0.66	1.82	<0.10
Physical Tests (Effluent)											
Conductivity (EC)	3.0	uS/cm	706	484	1070	666	667	979	909	1290	0.4
Hardness (as CaCO3)	0.51	mg/L	355	229	601	355	394	414	470	560	<0.51
pH	0.10	pH	7.61	7.81	7.24	7.33	7.41	7.63	7.46	7.44	6.67
Total Dissolved Solids	10	mg/L	415	290	680	380	425	610	525	895	<5
Anions and Nutrients (Effluent)											
Alkalinity, Total (as CaCO3)	2.0	mg/L	345	262	502	361	363	376	503	432	<0.2
Ammonia, Total (as N)	0.020	mg/L	0.466	0.428	0.022	0.244	0.402	1.33	0.478	0.710	0.010
Nitrate (as N)	0.020	mg/L	0.010	0.035	0.31	<0.005	0.080	0.080	<0.005	0.03	<0.005
Nitrite (as N)	0.010	mg/L	<0.001	<0.001	<0.001	<0.001	0.006	<0.001	<0.001	<0.001	<0.001
Sulfate (SO4)	0.30	mg/L	57.6	10.6	150	14.9	18.0	202	40.9	295	<0.02
Cyanides (Effluent)											
Cyanide, Weak Acid Diss	0.0020	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001	0.001	<0.001	<0.001	<0.001
Cyanide, Total	0.0020	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Cyanide, Free	0.0050	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Total Metals (Effluent)											
Aluminum (Al)-Total	0.0050	mg/L	14.4	4.10	2.27	0.375	51.4	524	0.0035	116	0.0025
Antimony (Sb)-Total	0.00060	mg/L	0.00010	0.00015	0.00040	0.00006	0.0008	0.00373	0.00001	0.009	<0.00001
Arsenic (As)-Total	0.0010	mg/L	0.0053	0.0214	0.0020	0.0106	0.03	0.3	0.0102	0.2	<0.0001
Barium (Ba)-Total	0.010	mg/L	0.112	0.095	0.068	0.072	0.6	9	0.057	1	0.00004000
Beryllium (Be)-Total	0.0010	mg/L	0.0004	0.0001	0.0001	<0.00001	0.00285	0.044	<0.00001	0.0066	<0.00001
Bismuth (Bi)-Total	0.0010	mg/L	0.00008	0.00006	0.000040000	<0.00002	0.00130	0.021	<0.00002	<0.00002	0.000020000
Boron (B)-Total	0.050	mg/L	0.104	0.144	0.154	0.065	0.4	2	0.119	10	<0.0005
Cadmium (Cd)-Total	0.000017	mg/L	0.000065	0.000045	0.000740	<0.000005	0.0009	0.014	<0.000005	0.004	<0.000005
Calcium (Ca)-Total	0.20	mg/L	104	67.9	130	86.3	236	2430	111	720	<0.02
Chromium (Cr)-Total	0.0010	mg/L	0.112	0.0093	0.0059	0.0007	0.13	0.8	<0.0001	0.2	<0.0001
Cobalt (Co)-Total	0.00050	mg/L	0.0106	0.00308	0.00178	0.00021	0.040	0.35	0.00010	0.09	<0.00001
Copper (Cu)-Total	0.0010	mg/L	0.0704	0.0081	0.0039	0.0010	0.16	0.9	<0.0001	1.0	<0.0001
Iron (Fe)-Total	0.020	mg/L	43.3	5.38	2.97	2.64	75.7	654	1.94	176	<0.01
Lead (Pb)-Total	0.0010	mg/L	0.0031	0.0019	0.0021	0.0001	0.04	0.7	0.000010000	0.10	<0.00001
Lithium (Li)-Total	0.050	mg/L	0.029	0.044	0.110	0.018	0.2	1	0.041	0.1	<0.0002
Magnesium (Mg)-Total	0.020	mg/L	32.8	22.8	81.8	31.6	99.4	787	45.9	264	<0.002
Manganese (Mn)-Total	0.0010	mg/L	0.539	0.270	0.116	0.270	1.69	16.6	0.319	4.3	<0.0001
Mercury (Hg)-Total	0.000010	mg/L	0.000004	0.000002	0.000004	<0.000002	0.000030	0.000016	<0.000002	0.000006	<0.000002
Molybdenum (Mo)-Total	0.0010	mg/L	0.0055	0.0024	0.0046	0.0027	0.006	0.039	0.0021	0.07	<0.00002
Nickel (Ni)-Total	0.0020	mg/L	0.0291	0.0074	0.0054	0.0005	0.11	1.0	0.0001	0.3	<0.0001
Potassium (K)-Total	0.50	mg/L	5.64	4.53	4.02	3.12	15	170	4.63	50	<0.01
Selenium (Se)-Total	0.0010	mg/L	<0.0002	<0.0002	<0.0002	<0.0002	0.00120	0.017	<0.0002	0.010	<0.0002
Silver (Ag)-Total	0.00010	mg/L	0.00128	0.00007	0.00009	0.00011	0.002	0.006	<0.00001	0.01	<0.00001
Sodium (Na)-Total	0.10	mg/L	20.5	18.5	18.1	9.08	27	100	26.9	410	<0.02
Strontium (Sr)-Total	0.0010	mg/L	0.706	0.446	0.674	0.364	0.82	6.7	0.652	1.7	<0.0001
Tellurium (Te)-Total	0.0010	mg/L	0.0001	0.00008	0.0001	0.00007	0.00132	0.0057	0.00009	<0.00001	<0.00001
Thallium (Tl)-Total	0.00030	mg/L	0.00007	0.00005	0.00005	0.000006	0.001	0.01	<0.000002	0.007	<0.000002
Tin (Sn)-Total	0.0010	mg/L	0.0006	0.0008	0.0003	0.000020000	0.000880	0.0093	0.00006	<0.00002	0.000020000
Titanium (Ti)-Total	0.0020	mg/L	0.264	0.214	0.0777	0.0027	0.77	3.1	0.0002	2.4	<0.00005
Tungsten (W)-Total	0.010	mg/L	0.008	0.001	0.0007	0.004	0.0061	0.01	0.00009000	0.02	<0.00001
Uranium (U)-Total	0.0050	mg/L	0.0011	0.0014	0.0168	0.0008	0.01	0.2	0.0011	0.031	<0.000001
Vanadium (V)-Total	0.0010	mg/L	0.137	0.0119	0.0080	0.0004	0.11	1.2	<0.00005	0.4	<0.00005
Zinc (Zn)-Total	0.0030	mg/L	0.0360	0.0155	0.0115	0.0015	0.30	2.7	0.0010	1.0	<0.0005
Zirconium (Zr)-Total	0.0010	mg/L	0.00096000	0.0013	0.0011	0.0003	0.005	0.019	0.00006	0.019	<0.00002

Results Summary L1701294

Job Reference GROUND WATER
Report To Garnet Cornell / Jesse Tom, New Gold Inc. Rainy River Project
Date Received 12-Nov-2015 9:30
Report Date 20-Nov-2015 14:26
Report Version 1

Client Sample ID			TMA 4A	TMA 3A	PIT 1	PIT 3A	PIT 3B	TMA 3B	TMA 5A	TMA 5B	SEALED TRAVEL BLANK
Date Sampled			11-Nov-2015	11-Nov-2015	11-Nov-2015	11-Nov-2015	11-Nov-2015	11-Nov-2015	11-Nov-2015	11-Nov-2015	11-Nov-2015
Time Sampled			11:45	12:10	9:15	14:30	14:35	12:45	10:30	10:45	15:00
ALS Sample ID			L1701294-1	L1701294-2	L1701294-3	L1701294-4	L1701294-5	L1701294-6	L1701294-7	L1701294-8	L1701294-9
Parameter	Lowest Detection Limit	Units	Effluent	Effluent	Effluent	Effluent	Effluent	Effluent	Effluent	Effluent	Effluent
Dissolved Metals (Effluent)											
Dissolved Mercury Filtration Location		-	FIELD	FIELD	FIELD	FIELD	FIELD	FIELD	FIELD	FIELD	FIELD
Dissolved Metals Filtration Location		-	FIELD	FIELD	FIELD	FIELD	FIELD	FIELD	FIELD	FIELD	FIELD
Aluminum (Al)-Dissolved	0.0050	mg/L	0.0010	0.0020	0.0010	0.0050	0.0030	0.0080	0.0020	0.0020	<0.001
Antimony (Sb)-Dissolved	0.00060	mg/L	0.00001	0.00003	0.00014	0.00002	0.00038	0.00047	<0.00001	0.00030	<0.00001
Arsenic (As)-Dissolved	0.0010	mg/L	0.0042	0.0173	0.0009	0.0104	0.0038	0.0144	0.0098	0.0465	<0.00001
Barium (Ba)-Dissolved	0.010	mg/L	0.058	0.065	0.048	0.070	0.099	0.026	0.058	0.041	<0.00002
Beryllium (Be)-Dissolved	0.0010	mg/L	0.000020000	0.000020000	0.000010000	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001
Bismuth (Bi)-Dissolved	0.0010	mg/L	0.0002	0.0001	0.000040000	0.000020000	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002
Boron (B)-Dissolved	0.050	mg/L	0.092	0.134	0.142	0.063	0.246	0.524	0.115	0.460	<0.0005
Cadmium (Cd)-Dissolved	0.000017	mg/L	0.000005	<0.000005	0.000335	0.000010	0.000005	<0.000005	<0.000005	<0.000005	<0.000005
Calcium (Ca)-Dissolved	0.20	mg/L	97.1	59.3	119	88.6	91.0	104	111	137	<0.02
Chromium (Cr)-Dissolved	0.0010	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Cobalt (Co)-Dissolved	0.00050	mg/L	0.00006	0.00034	0.00015	0.00005	0.00102	0.00044	0.00011	0.00134	<0.00001
Copper (Cu)-Dissolved	0.0010	mg/L	0.0002	<0.0001	0.0007	<0.0001	0.0002	0.0002	0.0001	0.0002	<0.0001
Iron (Fe)-Dissolved	0.020	mg/L	3.13	0.550	0.020	2.35	0.360	0.050	1.63	1.02	<0.01
Lead (Pb)-Dissolved	0.0010	mg/L	0.000020000	0.000010000	0.000020000	0.000010000	0.000020000	0.00006	0.000020000	0.000020000	<0.00001
Lithium (Li)-Dissolved	0.050	mg/L	0.021	0.040	0.103	0.019	0.076	0.151	0.041	0.156	<0.0002
Magnesium (Mg)-Dissolved	0.020	mg/L	27.4	19.7	73.9	32.4	40.5	37.3	46.9	52.5	0.004
Manganese (Mn)-Dissolved	0.0010	mg/L	0.239	0.187	0.0255	0.269	0.378	0.224	0.332	0.238	<0.0001
Mercury (Hg)-Dissolved	0.000010	mg/L	<0.000002	<0.000002	<0.000002	<0.000002	<0.000002	<0.000002	<0.000002	<0.000002	<0.000002
Molybdenum (Mo)-Dissolved	0.0010	mg/L	0.0032	0.0020	0.0041	0.0027	0.0048	0.0050	0.0020	0.0055	<0.00002
Nickel (Ni)-Dissolved	0.0020	mg/L	0.0003	0.0004	0.0018	0.0002	0.0021	0.0016	0.0002	0.0025	<0.0001
Potassium (K)-Dissolved	0.50	mg/L	4.09	3.43	3.24	3.05	3.94	4.35	4.59	5.75	<0.01
Selenium (Se)-Dissolved	0.0010	mg/L	<0.0002	0.0004	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Silver (Ag)-Dissolved	0.00010	mg/L	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001
Sodium (Na)-Dissolved	0.10	mg/L	19.6	18.0	17.4	9.36	26.5	57.8	28.6	90.1	<0.02
Strontium (Sr)-Dissolved	0.0010	mg/L	0.671	0.399	0.637	0.368	0.514	0.646	0.610	0.850	<0.0001
Tellurium (Te)-Dissolved	0.0010	mg/L	0.0001	0.00006	0.00007	0.000040000	0.00005	0.00007	0.00006	0.00006	<0.00001
Thallium (Tl)-Dissolved	0.00030	mg/L	<0.000002	<0.000002	0.00001	<0.000002	0.000006	0.00001	<0.000002	<0.000002	<0.000002
Tin (Sn)-Dissolved	0.0010	mg/L	0.000040000	0.0001	0.000020000	<0.00002	0.000040000	0.000020000	<0.00002	<0.00002	<0.00002
Titanium (Ti)-Dissolved	0.0020	mg/L	0.00005	0.0001	0.00005	0.0002	0.0001	0.0002	0.00005	<0.00005	<0.00005
Tungsten (W)-Dissolved	0.010	mg/L	0.002	0.002	0.0003000	0.003	0.003	0.0003300	0.0001000	0.002	<0.00001
Uranium (U)-Dissolved	0.0050	mg/L	0.0004	0.0009	0.0163	0.0009	0.0083	0.0102	0.0011	0.0111	<0.000001
Vanadium (V)-Dissolved	0.0010	mg/L	0.0002	0.0003	0.0005	0.0001	0.0015	0.0004	<0.00005	0.0006	<0.00005
Zinc (Zn)-Dissolved	0.0030	mg/L	0.0020	0.0020	0.0025	0.0095	0.0015	0.0020	0.0020	0.0020	<0.0005
Zirconium (Zr)-Dissolved	0.0010	mg/L	0.00006	0.00008	0.0001	0.0001	0.0001	0.00006	0.00008	0.00008	<0.00002

Qualifier Legend

<DL	Recorded value = measured amount <LMDL (non-zero)
<W	No Measurable Response (Zero): < Reported Value
<T	A Measurable Trace Amount: Interpret With Caution
DLM	Detection Limit Adjusted due to sample matrix effects.
DTC	Dissolved concentration exceeds total. Results were confirmed by re-analysis.

Newgold Inc. Rainy River Project
Groundwater Sampling Field Sheet

Date:		Jun-23-15			Time on site	6:45 Am to 5:15 pm		
Weather		sunny +10 c to + 24 C				V = pi(r2)H		
original Monitoring Well No.	Current Monitoring Well No.	Water Level mbtc*	Depth of Well (mbtc)	Length of Water in Well (m)	Diameter of Well (m)	Volume of Water L/m	Volume Purged Calculated	Volume Purged Actual (L)
BH 10-05	Pit 1	1.29	6.94	5.65	0.05	2.0	33.9	15
BH 10-07A	TMA 1	destroyed by tree clearing crew			0.035	1.0		
BH 11-1A	TMA 3A	> 2.17	17.53	17.53	0.25	0.5	flw	
BH 11 -1B	TMA 3B	0.01	9.24	9.23	0.25	0.5	13.8	4
BH 11-44A	Pit 3 MRS 1A				0.25	0.5		
BH 11-44B	Pit 3 MRS 1B				0.25	0.5		
BH 11-49A	TMA 4A	0.94	21.51	20.57	0.25	0.5	30.3	33
BH 11-49 B	TMA 4B	1.02	10.75	9.73	0.25	0.5	14.6	6
BH 11-51A	TMA 5A	1.07			0.25	0.5	flw	
BH 11-51B	TMA 5 B	monitoring well under water			0.25	0.5		
BH 12-08	Pit2/TMA 2	destroyed by tree clearing crew			0.25	0.5		
P3	TMA 6	cannot access						
P16	P 16	>30.4 m	do not know	could not calc	0.15	17.7		

Date	Jun-23-15				weather			
		pH	Temp	cond	DO	ORP		
		pH units	o C	ms/cm	mg/L			
BH 10-05	Pit 1	6.98	8.88	0.803	5.06	192.7		
BH 10-07A	TMA 1	could not sample, well destroyed						
BH 11-1A	TMA 3A	6.83	8.57	0.370	1.43	9.2		
BH 11 -1B	TMA 3B	7.25	9.81	0.816	4.10	9.5		
BH 11-44A	Pit 3 MRS 1A							
BH 11-44B	Pit 3 MRS 1B							
BH 11-49A	TMA 4A	6.85	8.63	0.583	1.2	-27.1		
BH 11-49 B	TMA 4B	7.1	10.19	1.125	1.09	-14.8		
BH 11-51A	TMA 5A	7.04	7.60	0.656	0.58	-66.9		
BH 11-51B	TMA 5 B							
BH 12-08	Pit2/TMA 2							
P16	P16	7.55	8.16	0.511	3.11	189.7		

Notes

metres above top of well casing

duplicate sample taken at P16

Field blank with di-ionized water prepared at Pit 1

P 16 water ran at 1 L/10 sec for 20 min prior to sampling=120 L purged

amec foster wheeler

94°6'0"W 94°4'0"W 94°2'0"W 94°0'0"W 93°58'0"W 93°56'0"W 93°54'0"W

48°53'0"N 48°52'0"N 48°51'0"N 48°50'0"N 48°49'0"N 48°48'0"N

5414000 5412000 5410000 5408000 5406000

418000 420000 422000 424000 426000 428000 430000 432000 434000

Split Rock Road
Richardson Road
Marr Road
Split Rock River East Branch
230 KV TRANSMISSION LINE AND 40M CORRIDOR
HIGHWAY 71
McCallum Creek
TAILINGS MANAGEMENT AREA
Muskrat Lake
FINLAND
Korpi Road
Lampi Road
7133351
7133352
5400731
5401589
5400730
MILL
Eliuk Road
Georgeson Road
CONSTRUCTED WETLAND
5401899
OVERBURDEN STOCKPILE
Roen Road
5401835
COARSE ORE CRUSHING
ROAD CLOSURE (MTO)
5401590
WEST MINE ROCK STOCKPILE
OPEN PIT
West Creek
7150802
7150801
7150803
7150805
5402298
LOW GRADE ORE STOCKPILE
Unnamed (Waste Disposal) Road
Galenger Road
White Road
EAST MINE ROCK STOCKPILE
Loslo Road
Mirt Creek
Pinewood River
MINE ROCK POND
Clark Creek
5400481
Teeple Road
Westra Road
Heatwole Road
HIGHWAY 600 REALIGNMENT
Tait Road
5401081
5401079
5402371
Black Hawk
HIGHWAY 600
HIGHWAY 615
Barwick Road
Caul Road
Atkinson Road

PRIVATE WELLS WITH ZOI

(envelope of all sensitivity runs)

MODEL PREDICTED 1M ZOI
(ENVELOPE OF ALL SENSITIVITY RUNS)

PRIVATE WELL LOCATIONS:

- **ON NGD LANDS, WITHIN ZOI**
- ON NGD LANDS, OUTSIDE OF ZOI
- NOT ON NGD LANDS

ESA PROJECT SITE BOUNDARY, MNRF
NGD LANDS (PATENTED, LEASED)
MINE FOOTPRINT

0 1 2 3
Kilometers

newgold™

Rainy River Project

GIS GROUP, THUNDER BAY

1:42,000

T:\GIS\MAP DOCUMENTS\RAINY RIVER PROJECT\2016\2016-08-04 EC 2015 ANNUAL REPORT MAPS\2016-08-08 ZOI (EC 2015 ANNUAL REPORT MAPS).MXD

Rainy River Project
2015 Fish Tissue Monitoring Program

Prepared For:
New Gold Inc.
Thunder Bay, ON

Prepared By:
Minnow Environmental Inc.
Georgetown, ON

February 2016

Rainy River Project
2015 Fish Tissue Monitoring Program

Report Prepared for:

New Gold Inc.
Rainy River Project

Report Prepared by:
Minnow Environmental Inc.

<Original signed by>

Jess Tester, B.Sc.
Project Manager

<Original signed by>

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Project Principal

February 2016

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1.0 INTRODUCTION

1.1 Site Description

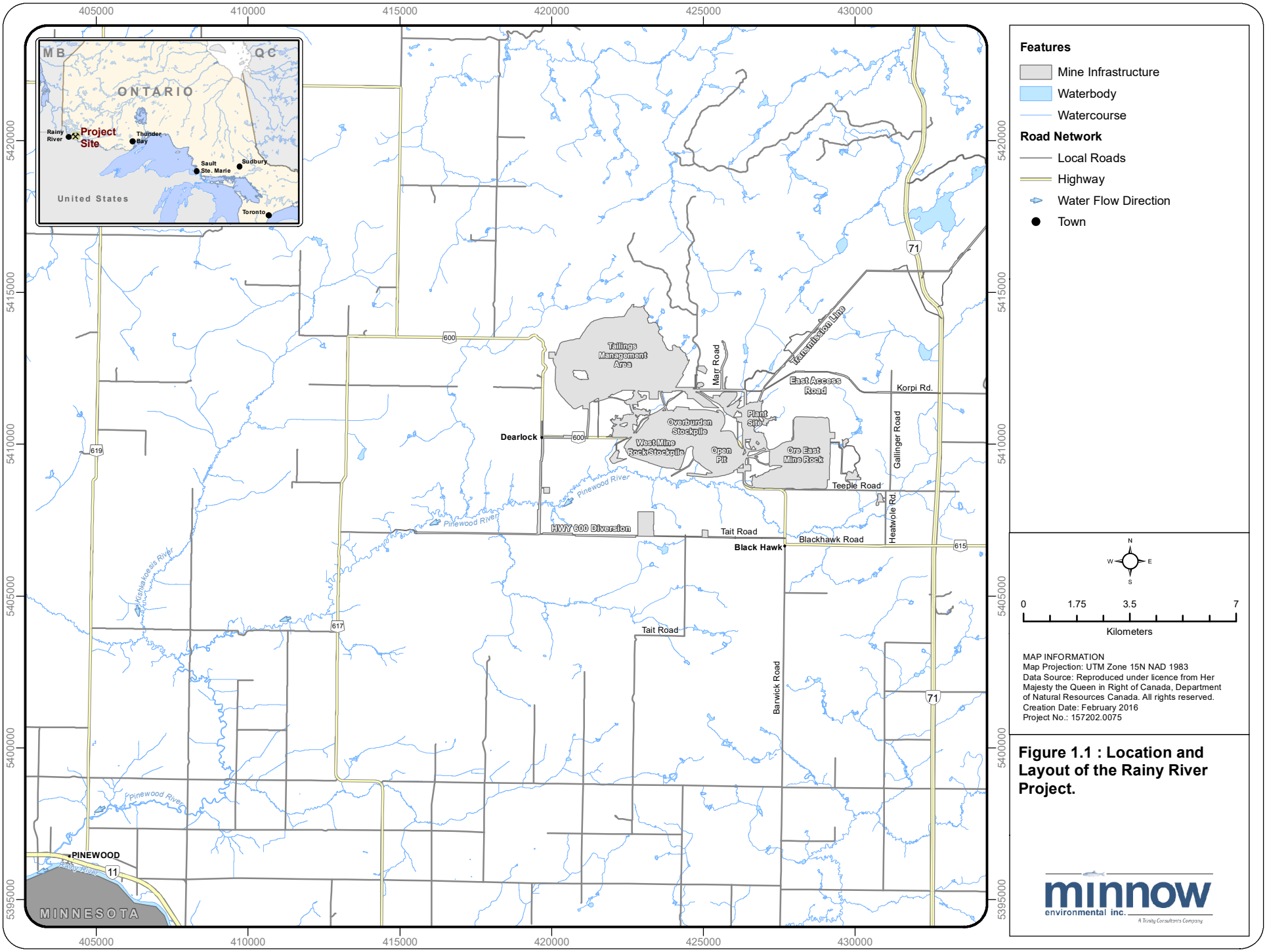
New Gold Inc. owns the Rainy River Project (RRP) in northwestern Ontario, located in the Township of Chapple and District of Rainy River, approximately 42 kilometers east of the Town of Rainy River, Ontario (Figure 1.1). The RRP is located within the Pinewood River watershed. The Pinewood River flows through the site and drains into the Rainy River (approximately 37 km downstream from the site). Exploration of the RRP began in 1967. The Project was acquired by New Gold Inc. in 2013 and an Environmental Assessment (EA) report was submitted in 2014 (AMEC 2014). Site construction began following provincial and federal EA approvals in 2015, and is ongoing. The RRP site construction includes an underground gold mine portal and crusher, a process plant, ore storage facilities, and a Tailings Management Area (TMA; Figure 1.1). Mine commissioning is predicted for 2017.

1.2 Project Background and Objective

The fish tissue monitoring program is one part of RRP's comprehensive environmental monitoring activities and is a requirement of the Federal EA Approval to monitor for key contaminants. The objective of the fish tissue monitoring is to characterize concentrations of contaminants of potential concern (COPC; arsenic, boron, cadmium, cobalt, copper, chromium, iron, lead, manganese, mercury, molybdenum, nickel, selenium and zinc) in muscle and liver tissues of two sport fish species, northern pike (*Esox lucius*) and walleye (*Sander vitreus*), collected in the Pinewood River. COPC concentration data will be used to determine whether the RRP has affected these concentrations, and, if it has, to communicate any potential risk to human health from the consumption of the sentinel sport fish. Fish tissue COPC concentrations are to be monitored starting one year after the start of commercial production, and at three year intervals thereafter. Although the RRP is presently pre-commercial production, the mine decided to collect data in order to characterize current conditions and monitor fish tissue quality during the mine construction phase.

1.3 Study Design

The 2015 study included fish assessment throughout the Pinewood River downstream of the RRP extending to approximately 450 m upstream of the confluence with the Rainy River (Figure 1.2). The study focused on the collection of tissue samples from two sport fish species, northern pike and walleye. Three types of tissue were sampled: muscle and liver samples were collected to meet regulatory requirements, while additional ovary tissues were sampled (as available), as it has yet to be confirmed whether roe is regularly eaten from fish caught in



MAP INFORMATION
Map Projection: UTM Zone 15N NAD 1983
Data Source: Reproduced under licence from Her Majesty the Queen in Right of Canada, Department of Natural Resources Canada. All rights reserved.
Creation Date: February 2016
Project No.: 157202.0075

Figure 1.1 : Location and Layout of the Rainy River Project.

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the Pinewood River. Fifteen individuals of each species (i.e., northern pike and walleye) were targeted. Data were compared to provincial, federal and international health-based criteria (Health Canada 2007, Health Canada 2010, MOECC 2015, IRIS 2016) as well as baseline concentration values (AMEC 2013).

1.4 Report Overview

This report is presented in five sections, the first of which is this introduction (Section 1.0). Section 2.0 provides an overview of the methods used in this study and Section 3.0 provides the results and discussion of the fish tissue monitoring. Section 4.0 provides the conclusions and recommendations of the monitoring, while Section 5.0 provides all the references cited throughout the report.

2.0 METHODS

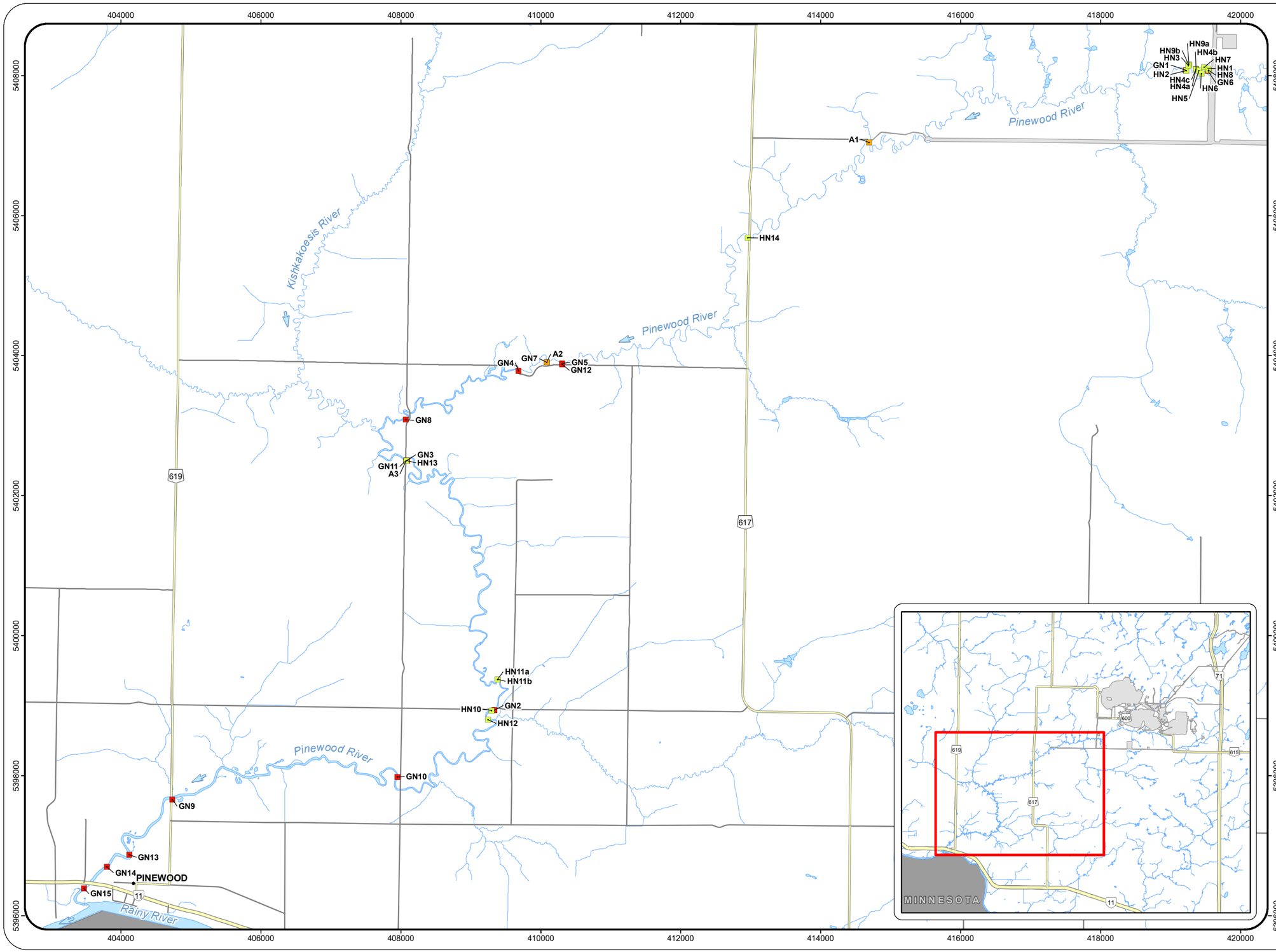
The RRP Fish Tissue Monitoring Program was conducted from September 29nd to October 3rd, 2015. The program focused on fish tissue assessment, targeting northern pike and walleye in the Pinewood River downstream of the RRP. All fish collection locations were recorded using handheld GPS and maps, and were chosen based on habitat characteristics preferred by the target species.

2.1 Field Data Collection

Fish sampling was performed under an Ontario Ministry of Natural Resources Licence to Collect Fish for Scientific Purposes (Licence No. 1081405; Appendix B). Fishing was conducted throughout the Pinewood River downstream of the RRP using gill nets, hoop nets, and angling (Figure 2.1). Gill nets were standard 100 and 200-ft lengths with mesh sizes of 2", 3", and 4". Both medium (0.75 m diameter hoops, 1" 2.5 cm stretched mesh) and small (0.61 m diameter hoops, 1.3 cm stretched mesh) hoop nets were used. Time of deployment and retrieval were recorded for every net set. Start and end times were recorded for each angling effort.

Upon retrieval of each net, captured fish were identified and counted, and results were recorded on catch data sheets. Only northern pike and walleye of edible size were retained for sampling (>30 cm total length, based on the Ministry of the Environment and Climate Change [MOECC] recommendations for Rainy River; MOECC 2015). A total of 17 northern pike and one walleye were retained for detailed assessment. Any live by-catch or additional target species captured were released.

All retained northern pike and walleye were measured to determine length (fork and total) and weight. Lengths were measured to the nearest millimetre on a fish board while weights were recorded to the nearest 1 to 5% of total weight using Pesola™ spring scales. Two ageing structures (scales and either cleithra [northern pike] or dorsal spines [walleye]) were collected from each sacrificed fish. Livers and gonads were removed using clean implements (cutting boards, fillet knives and tweezers) and weighed to the nearest 0.001 g (with ± 1% precision) using a Scout Pro balance. Tissue samples of boneless, skinless muscle tissue, whole livers, and whole ovaries (where present and developed) were collected from each fish and placed in clean, labeled Whirl-Pak™ bags and frozen until analysis. Quality Assurance/Quality Control (QA/QC) measures included 10% field duplicate samples (duplicate fillets, split liver, and split ovary samples). Upon completion of the sampling program, tissue samples were submitted to ALS Environmental in Burnaby, British Columbia, along with a chain-of-custody record, a list of expected Method Detection Limits (MDLs) and laboratory QA/QC requirements



Fishing Locations

- Gill Net
- Angling
- Hoop Net
- Mine Infrastructure
- Waterbody
- Watercourse

Road Network

- Local Roads
- Highway
- Water Flow Direction
- Town

N
W E
S

0 0.5 1 2
Kilometers

MAP INFORMATION
Map Projection: UTM Zone 15N NAD 1983
Data Source: Reproduced under licence from Her Majesty the Queen in Right of Canada, Department of Natural Resources Canada. All rights reserved.
Creation Date: February 2016
Project No.: 157202.0075

Figure 2.1 : Map of Fishing Locations, Rainy River Project Fish Tissue Monitoring, Fall 2015.

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(Appendix A). Ageing structures were shipped to North Shore Environmental Services in Thunder Bay, Ontario, along with a chain-of-custody record for determination of fish ages.

2.2 Analysis of Catch and Meristic Data

Fish catch data were compiled and summarized. The catch compilations, along with data on the gill net set, hoop net set, and angling durations were used to calculate total and species-specific catch-per-unit effort (CPUE) for each capture method in the Pinewood River.

2.3 Analysis of Chemical Data

Upon receipt of the chemical data from ALS, a data quality assessment (DQA) was performed. This included the assessment of field precision, laboratory precision and laboratory accuracy against data quality objectives (DQOs) established at the outset of the project (Appendix A). A minimum of 10% of the analyses represented quality control samples. In instances where the DQA revealed potential issues with data quality, results were verified with the laboratory. Overall, the DQA indicated excellent data quality. After DQA, summary statistics were calculated for each analyte (i.e., mean, standard deviation, minimum, and maximum).

Mercury is the only metal[1] for which a commercial guideline and various consumption level advisories have been established for fish muscle tissue (Health Canada 2007, MOECC 2015). Health Canada has established a standard of 0.5 mg/kg wet weight (w.w.) as the maximum acceptable concentration of mercury in commercially sold fish, enforceable by the Canadian Food Inspection Agency (Health Canada 2007). Although this guideline is only applicable to commercially sold fish, 0.5 mg/kg w.w. is also the level at which a complete consumption restriction is advised for vulnerable populations (i.e., women of child-bearing age and children under 15; Table 2.1; MOECC 2015). Accordingly, this is the main benchmark used in this study to evaluate concentrations of mercury in fish tissue. In addition to evaluating mercury concentrations relative to health criteria, relationships between mercury concentrations in fish muscle tissue and age were explored graphically. Mercury concentrations were also compared to baseline data (AMEC 2013).

Concentrations of other metals in muscle, liver, and ovary tissue were evaluated relative to consumption benchmarks (Table 2.2). These benchmarks were derived based on the lowest reported tolerable daily intake (TDI; Health Canada 2010, IRIS 2016) and established consumption rates for fish eating populations (Richardson 1997, USEPA 1997, OHM 1990, Health Canada 2010), assuming a typical adult body weight of 70 kg where:

Fish Consumption Limit Benchmark = TDL mg/kg x 70 kg/ consumption rate (kg).

[1] Here and elsewhere in this document, “metal” includes metalloids, such as arsenic and selenium.

Table 2.1: Fish consumption advisories for vulnerable populations and for the general population based on fish tissue mercury concentrations (MOECC 2015).

Advisory recommended maximum number of meals per month	Fish tissue mercury concentration (mg/kg w.w.)	
	As consumed by vulnerable populations[a]	As consumed by the general population
32	0	0
16	0.06	0.15
12	0.12	0.3
8	0.16	0.4
4	0.25	0.6
2	-	1.2
0	0.5	1.8

[a] i.e., women of child-bearing age and children under 15.
w.w. - wet weight.

Table 2.2: Consumption benchmarks for metals (including all COPC) in fish tissue (mg/kg).

Analyte	Tolerable Daily Intake (mg/kg day)[1]	Fish Concentration Benchmarks (mg/kg) Based on		
		6.5 g/day[2]	21.8 g/day[3]	111 g/day[4]
Antimony	0.0004 [5]	4.3	1.3	0.3
Arsenic	0.0003 [5]	3.2	1.0	0.2
Barium	0.2 [5,6]	2,153.8	642.2	126
Beryllium	0.002 [5]	21.5	6.4	1.3
Boron	0.1 [5]	1,076.9	321.1	63.1
Cadmium	0.001 [5,6]	10.8	3.2	0.6
Chromium	0.001 [6]	10.8	3.2	0.6
Cobalt	none available	-	-	-
Copper	0.091 [6,8]	980.0	292.2	57.4
Iron	none available	-	-	-
Lead	0.0036 [6]	38.8	11.6	2.3
Manganese	0.122 [6,8]	1,313.8	391.7	76.9
Molybdenum	0.005 [5]	53.8	16.1	3.2
Nickel	0.0011 [6,7]	11.8	3.5	0.7
Selenium	0.005 [5]	53.8	16.1	3.2
Silver	0.005 [5]	53.8	16.1	3.2
Strontium	0.6 [5]	6,462	1,927	378
Uranium	0.0006 [6]	6.5	1.9	0.4
Zinc	0.3 [5]	3,231	963	189

Selected benchmark.

COPC - Contaminants of Potential Concern.

[1] Where values were reported by both IRIS (2014) and Health Canada (2010), the lowest value was used to derive a conservative benchmark.

[2] USEPA (1997) mean consumption rate for general population; mean value for anglers is 8.0 g/day, 95th percentile for anglers is 25 g/day.

[3] Upper limit consumption rate for Canadian population based on high caloric intake (OHM 1990). Also the highest consumption level considered in development of fish advisories in Ontario.

[4] Health Canada (2010) consumption rate for screening level risk assessments, from Richardson (1997). Exceeds the average value for fishing subsistence populations (70 g/day; USEPA 1997).

[5] IRIS (2016).

[6] Health Canada (2010).

[7] Based on nickel chloride.

[8] Most conservative concentration (tolerable daily intakes are defined on an age-group specific basis).

Investigations during the EA determined that the RRP area does not support a significant commercial or recreational fishery and that no traditional activities are currently undertaken within the RRP area by local First Nation and Métis people (AMEC 2014). However, in order to use the most conservative benchmark values, the highest consumption rate category of 111 g/d was used in deriving the benchmarks (Table 2.1; Richardson 1997). Benchmarks were derived for antimony, arsenic, barium, beryllium, boron, cadmium, chromium, copper, lead, manganese, molybdenum, nickel, selenium, silver, strontium, uranium, and zinc. Of the COPC, only cobalt and iron do not have applicable health criteria or TDI values (i.e., benchmarks could not be calculated), so concentrations were only compared to baseline data.

3.0 RESULTS

3.1 Fish Communities and Catch-per-unit-effort

A total of eight fish species were captured using gill nets and hoop nets in the Pinewood River (Table 3.1). Northern pike were the most abundant fish in the Pinewood River, followed by black crappie and white sucker (Table 3.1). Consistent with previous findings, monitoring indicated low catch-per-unit-effort (CPUE) for walleye, but moderately high CPUE for northern pike (Table 3.1; AMEC 2013). Only one of the desired 15 walleye was caught, despite targeted effort of the Pinewood close to the confluence with Rainy River (where walleye have been caught in the past; AMEC 2013) and the use of overnight net sets to take advantage of the nocturnal feeding habits of walleye (Holmes et al. 2010, Scott and Crossman 1998).

3.2 Tissue Chemistry

3.2.1 Muscle Tissue Chemistry

Muscle tissue samples contained metal concentrations that were well below human consumption benchmarks (established in Section 2.3) except for three samples which were above the mercury benchmark (Tables 3.2 and C.5). Despite these three exceptions, average muscle tissue mercury concentrations were below benchmark in both species (Table 3.2). It should be noted that this benchmark is the guideline for commercially sold fish and is also the complete consumption restriction level for women of child-bearing age and children under 15. Consumption of fish with muscle tissue concentrations above this benchmark is still permissible for the general population (Table 2.1; Health Canada 2007, MOECC 2015). For the general population, the advisory recommends a maximum of four fish meals per month when fish mercury concentrations are between 0.6 mg/kg and 1.2 mg/kg (i.e., for the highest concentration observed in this study, 0.73 mg/kg; Table 2.1; MOECC 2015). All fish muscle tissue mercury concentrations were well below the complete consumption restriction level for the general population (1.8 mg/kg; Table 2.1, Figures 3.1 and 3.2; MOECC 2015).

Naturally elevated mercury concentrations are often observed in predatory fish species in northern lakes and depositional rivers due to naturally high mercury levels, atmospheric deposition of mercury, and biogeochemical conditions that favour mercury methylation (Evers et al. 2011). Methylated mercury is biomagnified through the food chain resulting in elevated concentrations in predatory fish species such as walleye and northern pike (Evers et al. 2011). In addition to this, methylated mercury has a long residence time in tissues and, with continued exposure, will bioaccumulate over the organism's lifetime (Evers et al. 2011). Bioaccumulation

Table 3.1: Summary of fishing effort in the Pinewood River, Rainy River Project Fish Monitoring, 2015.

a) Fish catch numbers by sampling method.

Species	Gill Nets	Medium Hoop Nets	Small Hoop Nets	Angling	Total Catch
Northern Pike	20	11	0	0	31
Walleye	0	1	0	0	1
Brown Bullhead	0	0	2	0	2
Black Crappie	25	0	0	0	25
Mimic Shiner	0	0	1	0	1
Rock Bass	2	0	0	0	2
Trout-perch	0	0	1	0	1
White Sucker	1	15	2	0	18

b) Catch-per-unit-effort (CPUE) by sampling method.

Species	Gill Nets (fish per 100 m*hr)	Medium Hoop Nets (fish per trap*day)	Small Hoop Nets (fish per trap*day)	Angling (fish per hr)
Northern Pike	0.49	1.13	0	0
Walleye	0	0.10	0	0
Brown Bullhead	0	0	0.30	0
Black Crappie	0.61	0	0	0
Mimic Shiner	0	0	0.15	0
Rock Bass	0.05	0	0	0
Trout-perch	0	0	0.15	0
White Sucker	0.02	1.55	0.30	0
Total CPUE	41.1	9.7	6.7	0.5

Table 3.2: Metal concentrations in fish tissue, Rainy River Project Fish Tissue Monitoring, 2015.

Parameter		Lowest Detection Limit	Units	Benchmark[1,2]	Northern Pike												Walleye	
					Muscle				Liver				Ovary				Muscle	Liver
					Average	SD	Minimum	Maximum	Average	SD	Minimum	Maximum	Average	SD	Minimum	Maximum		
% Moisture		0.25	%	-	77.8	1.07	76.1	79.6	71.7	5.77	60.6	79.2	78.1	2.64	74.4	82.4	79.1	69.4
Total Metals	Aluminum (Al)	2.0	mg/kg w.w.	-	0.9	0.62	<0.45	2.7	1.3	0.64	<0.49	2.6	0.60	0.25	<0.43	1.1	0.5	<1.5
	Antimony (Sb)	0.010	mg/kg w.w.	0.3	0.0022	0.00015	<0.0020	0.0026	0.0047	0.0046	<0.0024	0.020	0.0023	0.00033	<0.0018	0.0029	<0.0021	<0.0031
	Arsenic (As)	0.020	mg/kg w.w.	0.2	0.0934	0.0211	0.0637	0.133	0.0435	0.0202	0.0172	0.0812	0.025	0.0056	0.017	0.034	0.102	0.060
	Barium (Ba)	0.050	mg/kg w.w.	126	0.0406	0.0221	0.0120	0.0890	0.0149	0.00289	0.0104	0.0197	0.0675	0.0441	0.0133	0.134	0.018	<0.015
	Beryllium (Be)	0.010	mg/kg w.w.	1.3	<0.0022	0.00011	<0.0020	<0.0024	<0.0028	0.00058	<0.0021	<0.0039	<0.0022	0.00026	<0.0018	<0.0026	<0.0021	<0.0031
	Bismuth (Bi)	0.010	mg/kg w.w.	-	0.0025	0.00044	<0.0020	0.0034	0.0047	0.0031	<0.0025	0.012	0.0023	0.00028	<0.0018	0.0027	<0.0021	<0.0031
	Boron (B)	1.0	mg/kg w.w.	63.1	<0.22	0.011	<0.20	<0.24	<0.28	0.058	<0.21	<0.39	<0.22	0.026	<0.18	<0.26	<0.21	<0.31
	Cadmium (Cd)	0.0050	mg/kg w.w.	0.6	0.0018	0.0016	<0.0010	0.0073	0.054	0.038	0.0074	0.136	0.0076	0.0026	0.0044	0.013	<0.0010	0.58
	Calcium (Ca)	20	mg/kg w.w.	-	280	146	114	557	39.4	10.1	26.7	64.7	136	26.0	94.5	174	127	119
	Cesium (Cs)	0.0050	mg/kg w.w.	-	0.00582	0.00263	0.00295	0.0120	0.00314	0.00155	0.00176	0.00659	0.00347	0.00102	0.00212	0.00483	0.00640	0.00444
	Chromium (Cr)	0.050	mg/kg w.w.	0.6	0.024	0.023	<0.010	0.088	0.039	0.039	<0.010	0.15	0.017	0.012	<0.0088	0.044	<0.010	<0.061
	Cobalt (Co)	0.020	mg/kg w.w.	-	0.0045	0.00024	<0.0042	0.0051	0.043	0.017	0.020	0.081	0.067	0.015	0.043	0.089	<0.0042	0.234
	Copper (Cu)	0.10	mg/kg w.w.	57.4	0.183	0.0406	0.122	0.275	25.0	12.4	9.65	54.0	1.18	0.160	0.926	1.49	0.146	3.12
	Iron (Fe)	3.0	mg/kg w.w.	-	4.29	6.08	1.14	26.1	122	112	15.9	449	54.9	11.1	38.4	71.5	2.15	120
	Lead (Pb)	0.020	mg/kg w.w.	2.3	0.012	0.018	<0.0043	0.074	0.044	0.13	<0.0049	0.50	0.0076	0.0071	<0.0040	0.026	0.0067	<0.015
	Lithium (Li)	0.50	mg/kg w.w.	-	<0.11	0.0054	<0.10	<0.12	<0.14	0.03	<0.10	<0.20	<0.11	0.013	<0.088	<0.13	<0.10	<0.15
	Magnesium (Mg)	2.0	mg/kg w.w.	-	345	31.9	297	437	175	21.7	128	212	288	39.2	229	340	368	203
	Manganese (Mn)	0.050	mg/kg w.w.	76.9	0.441	0.254	0.192	1.02	1.44	0.576	0.845	2.88	35.4	11.8	22.4	56.4	0.163	4.22
	Mercury (Hg)	0.0050	mg/kg w.w.	0.5	0.342	0.198	0.142	0.731	0.139	0.103	0.0587	0.386	0.0310	0.0176	0.0175	0.0666	0.299	0.128
	Molybdenum (Mo)	0.020	mg/kg w.w.	3.2	0.0056	0.0020	<0.0041	0.0096	0.15	0.042	0.079	0.23	0.042	0.0073	0.028	0.051	<0.0042	0.13
	Nickel (Ni)	0.20	mg/kg w.w.	0.7	<0.044	0.0021	<0.041	<0.048	<0.057	0.012	<0.042	<0.079	<0.044	0.0053	<0.035	<0.051	<0.042	<0.061
	Phosphorus (P)	10	mg/kg w.w.	-	2,486	230	2,136	2,990	2,974	424	2,259	3,687	3,208	193	2,928	3,558	2,508	3,152
	Potassium (K)	20	mg/kg w.w.	-	4,325	377	3,870	5,037	2,983	356	2,439	3,615	3,627	261	3,392	4,151	4,514	2,751
	Rubidium (Rb)	0.050	mg/kg w.w.	-	5.05	0.589	4.22	6.15	5.99	1.40	3.75	8.43	4.74	0.481	3.76	5.42	7.0	4.7
	Selenium (Se)	0.050	mg/kg w.w.	3.2	0.207	0.0313	0.173	0.266	1.51	0.376	0.985	2.34	1.17	0.287	0.796	1.70	0.29	1.13
	Sodium (Na)	20	mg/kg w.w.	-	294	34.1	228	346	692	121	541	1,000	754	124	630	983	249	1,013
	Strontium (Sr)	0.050	mg/kg w.w.	378	0.154	0.0752	0.0329	0.283	0.0306	0.00784	0.0218	0.0447	0.117	0.0438	0.0540	0.172	0.047	0.05
	Tellurium (Te)	0.020	mg/kg w.w.	-	<0.0044	0.00021	<0.0041	<0.0048	0.0058	0.0011	<0.0045	0.0079	<0.0044	0.00053	<0.0035	<0.0051	<0.0042	<0.0061
	Thallium (Tl)	0.0020	mg/kg w.w.	-	0.00289	0.000794	0.00200	0.00481	0.00454	0.00191	0.00242	0.0101	0.0049	0.00072	0.0038	0.0059	0.0051	0.0161
	Tin (Sn)	0.10	mg/kg w.w.	-	0.062	0.028	0.033	0.14	0.087	0.060	0.039	0.27	0.041	0.030	<0.022	0.12	0.08	0.20
	Uranium (U)	0.0020	mg/kg w.w.	0.4	<0.00044	0.000021	<0.00041	<0.00048	0.00061	0.00016	<0.00042	0.0010	<0.00044	0.000053	<0.00035	<0.00051	0.00052	<0.00061
	Vanadium (V)	0.10	mg/kg w.w.	-	<0.022	0.0011	<0.020	<0.024	0.15	0.15	0.039	0.61	0.033	0.020	<0.021	0.084	<0.021	0.046
	Zinc (Zn)	0.50	mg/kg w.w.	189	4.55	2.57	2.93	13.6	46.9	15.6	26.0	83.3	80.0	19.8	64.2	127	3.16	45.6
	Zirconium (Zr)	0.20	mg/kg w.w.	-	<0.044	0.0021	<0.041	<0.048	<0.057	0.012	<0.042	<0.079	<0.044	0.0053	<0.035	<0.051	<0.042	<0.061

Indicates value greater than benchmark.

w.w. - wet weight

[1] Mercury guideline for women of child-bearing age and children under 15 (see Table 2.1, MOECC 2015).

[2] See Table 2.2 for Consumption Benchmark References.

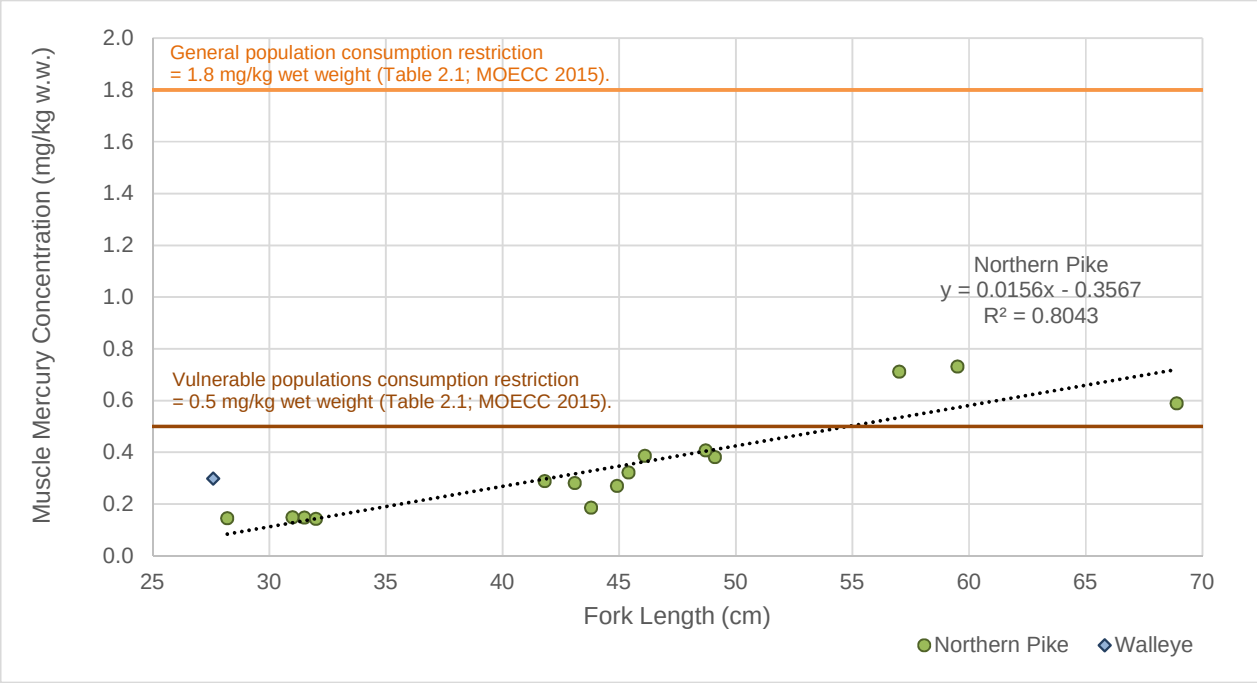

Figure 3.1: Muscle mercury concentration vs fork length of fish from the Pinewood River, Rainy River Project Fish Tissue Monitoring, 2015.

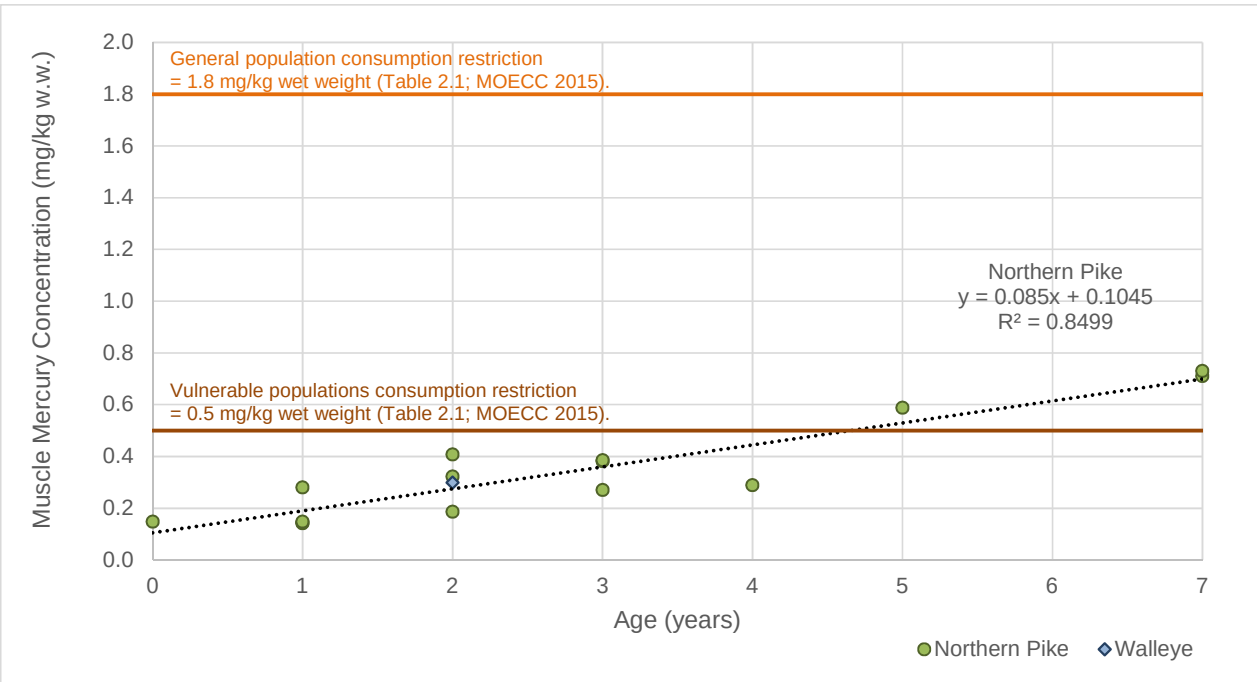

Figure 3.2: Muscle mercury concentration vs age of fish from the Pinewood River, Rainy River Project Fish Tissue Monitoring, 2015.

in northern pike in the Pinewood River is characterized by the relationship between mercury concentration in muscle tissue and fish size (i.e., fork length and age; Figures 3.1 and 3.2).

The 2015 muscle mercury concentrations were also compared to baseline data. The assessment was made by comparing concentrations at length, due to the established relationship between mercury concentrations and fish size. Comparison with baseline data showed that concentrations have generally remained within the same range, despite vastly different sample sizes (Figure 3.3; AMEC 2013). Notably, the longest and oldest fish captured for baseline were only 54 cm and 5 years old, while the 2015 data set included fish up to 69 cm long and 7 years old. Generally, average muscle concentrations were within the range of baseline 2012 data for all metals (Table 3.3; AMEC 2013).

Overall, the majority of metal concentrations in fish muscle were below human consumption benchmarks. Mercury concentrations in three muscle samples were above the consumption restriction guideline for vulnerable populations, but not for the general population. Based on comparison to baseline data, it appears that ongoing construction at the RRP has not influenced metal concentrations in tissues of in exposed northern pike.

3.2.2 Liver Tissue Chemistry

Fish liver tissue is not recommended for human consumption (MOECC 2015); however, since it has yet to be confirmed whether organs of fish caught in the Pinewood River are regularly eaten, concentrations of metals in livers have been screened against benchmarks. Additionally, many metals are known to accumulate to higher concentrations in liver tissue than in muscle tissue (e.g., chromium, lead), and liver is more likely to contain quantifiable chemical concentrations.

Liver tissue samples contained metal concentrations that were well below human consumption benchmarks for metals with established tolerable daily intake (TDI) values (Tables 3.2 and C.6). Generally, average liver concentrations were within the range of baseline 2012 data for all metals (Table 3.4; AMEC 2013).

3.2.3 Ovary Tissue Chemistry

It has yet to be confirmed whether organs of fish caught in the Pinewood River are regularly eaten, however, concentrations of metals in ovaries have been screened against benchmarks as a precaution. Additionally, some metals are known to accumulate to higher concentrations in ovary tissue than in muscle tissue (e.g., selenium).

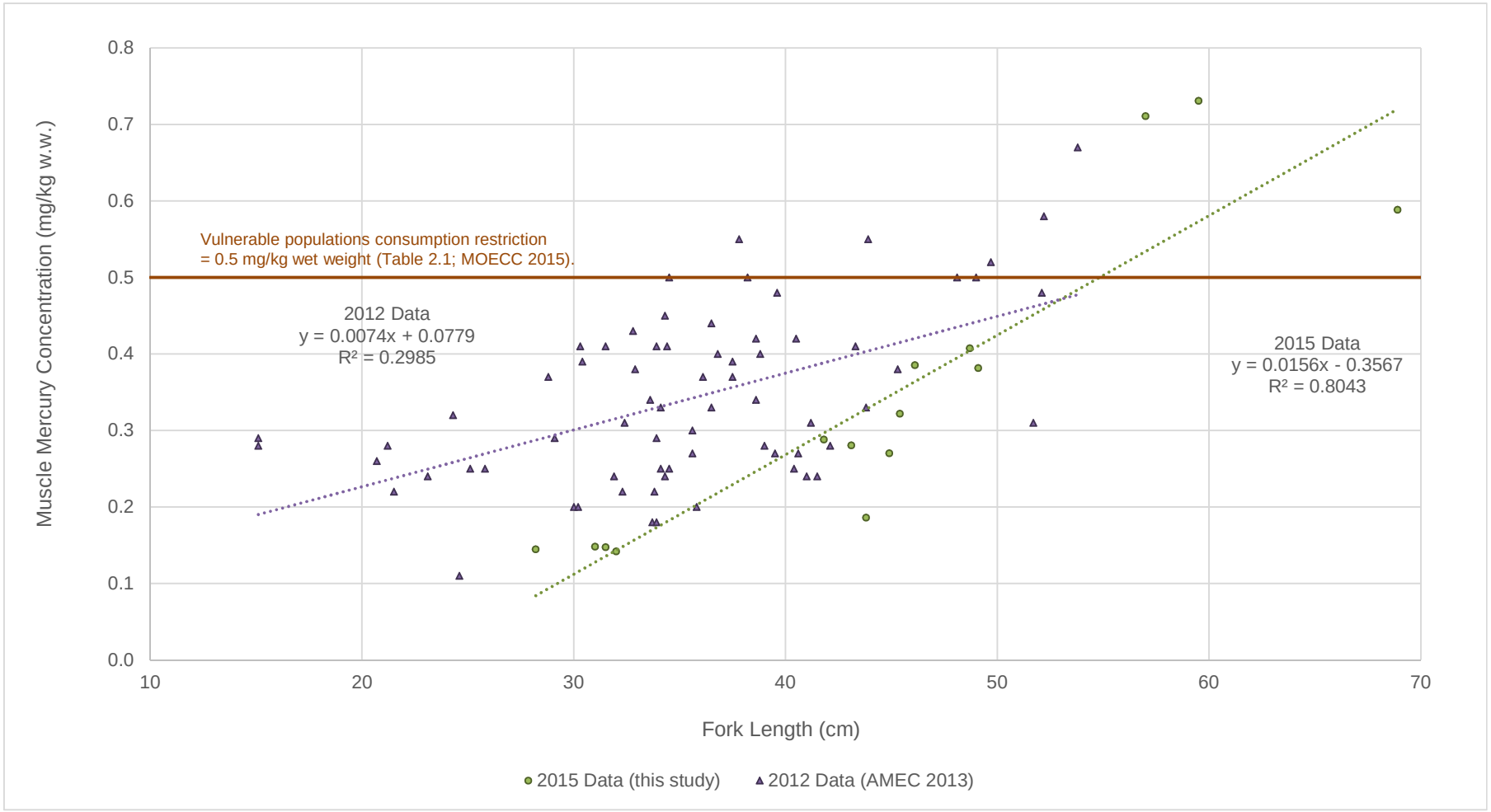

Figure 3.3: Muscle mercury concentration vs fork length of fish from the Pinewood River, comparing fish caught in 2012 (n = 70) and 2015 (n = 15), Rainy River Project Fish Tissue Monitoring, 2015.

Table 3.3: Average (mean ± standard deviation) concertations of contaminants of potential concern (COPC) in fish muscle tissue, comparing baseline (2012) and 2015 data, Rainy River Project Fish Tissue Monitoring.

COPC	Units	Benchmark[1,2]	Muscle Tissue Average ± SD	
			Baseline 2012 Data (n = 70; AMEC 2013)	2015 Data (n = 15; This Study)
Arsenic (As)	mg/kg w.w.	0.2	0.10 ± 0	0.093 ± 0.021
Boron (B)	mg/kg w.w.	63.1	<0.50 ± 0	<0.22 ± 0.011
Cadmium (Cd)	mg/kg w.w.	0.6	<0.01 ± 0	0.0018 ± 0.0016
Chromium (Cr)	mg/kg w.w.	0.6	<0.30 ± 0	0.024 ± 0.023
Cobalt (Co)	mg/kg w.w.	-	0.01 ± 0.00051	0.0045 ± 0.00024
Copper (Cu)	mg/kg w.w.	57.4	0.51 ± 0.048	0.18 ± 0.041
Iron (Fe)	mg/kg w.w.	-	3.23 ± 0.52	2.76 ± 0.88
Lead (Pb)	mg/kg w.w.	2.3	0.03 ± 0	0.012 ± 0.018
Manganese (Mn)	mg/kg w.w.	76.9	0.78 ± 0.73	0.44 ± 0.25
Mercury (Hg)	mg/kg w.w.	0.5	0.34 ± 0.11	0.34 ± 0.20
Molybdenum (Mo)	mg/kg w.w.	3.2	0.05 ± 0.012	0.0056 ± 0.0020
Nickel (Ni)	mg/kg w.w.	0.7	0.10 ± 0.44	<0.044 ± 0.0021
Selenium (Se)	mg/kg w.w.	3.2	0.20 ± 0.017	0.21 ± 0.031
Zinc (Zn)	mg/kg w.w.	189	5.0 ± 1.8	4.6 ± 2.6

w.w. - wet weight.

[1] Mercury guideline for women of child-bearing age and children under 15 (see Table 2.1; MOECC 2015).

[2] See Table 2.2 for Consumption Benchmark References.

Table 3.4: Average (mean ± standard deviation) concertations of contaminants of potential concern (COPC) in fish liver tissue, comparing baseline (2012) and 2015 data, Rainy River Project Fish Tissue Monitoring.

COPC	Units	Benchmark[1,2]	Liver Tissue Average ± SD	
			Baseline 2012 Data (n = 64; AMEC 2013)	2015 Data (n = 15; This Study)
Arsenic (As)	mg/kg w.w.	0.2	0.10 ± 0.013	0.044 ± 0.020
Boron (B)	mg/kg w.w.	63.1	<0.50 ± 0	<0.28 ± 0.058
Cadmium (Cd)	mg/kg w.w.	0.6	0.051 ± 0.050	0.054 ± 0.038
Chromium (Cr)	mg/kg w.w.	0.6	<0.30 ± 0	0.039 ± 0.039
Cobalt (Co)	mg/kg w.w.	-	0.056 ± 0.057	0.043 ± 0.017
Copper (Cu)	mg/kg w.w.	57.4	13 ± 9.3	25 ± 12
Iron (Fe)	mg/kg w.w.	-	112 ± 73	122 ± 112
Lead (Pb)	mg/kg w.w.	2.3	0.031 ± 0.0075	0.044 ± 0.13
Manganese (Mn)	mg/kg w.w.	76.9	1.5 ± 0.49	1.4 ± 0.58
Mercury (Hg)	mg/kg w.w.	0.5	0.18 ± 0.16	0.14 ± 0.10
Molybdenum (Mo)	mg/kg w.w.	3.2	0.17 ± 0.046	0.15 ± 0.042
Nickel (Ni)	mg/kg w.w.	0.7	0.05 ± 0	<0.057 ± 0.012
Selenium (Se)	mg/kg w.w.	3.2	1.3 ± 0.39	1.5 ± 0.38
Zinc (Zn)	mg/kg w.w.	189	34 ± 13	47 ± 16

w.w. - wet weight.

[1] Mercury guideline for women of child-bearing age and children under 15 (see Table 2.1; MOECC 2015).

[2] See Table 2.2 for Consumption Benchmark References.

Screening of ovary tissue samples showed that ovaries contained metal concentrations that were well below human consumption benchmarks for metals with established tolerable daily intake (TDI) values (Tables 3.2 and C.7). Ovaries have not been previously sampled, so concentrations could not be compared to baseline data.

4.0 CONCLUSIONS AND RECOMMENDATIONS

4.1 Conclusions

Conclusions of the fish assessment undertaken in the Pinewood River downstream from the Rainy River Project in the fall of 2015 are listed below.

1. Fish communities and CPUE were consistent with the results of previous sampling efforts. Monitoring indicated low CPUE for walleye, but moderately high CPUE for northern pike.

2. Muscle, liver, and ovary tissue samples contained metal concentrations that were well below human consumption benchmarks for metals with established tolerable daily intake (TDI) values, except for mercury in a few muscle samples. Mean concentrations of mercury were below the benchmark for all tissue sample types and within the range of baseline for muscle and liver samples.

3. Screening of metal concentrations in fish muscle tissue indicated that mercury in northern pike occurs at concentrations above consumption benchmarks in larger fish (greater than approximately 55 cm in length). These concentrations are consistent with baseline values. Mercury concentrations in fish muscle tissue of larger predatory fish are often naturally high in northern environments and do not indicate that the RRP has influenced fish tissue quality.

Overall, the data indicate that the Rainy River Project has not had any influence effect on the concentrations of metals in muscle and liver tissues of sentinel fish species (northern pike and walleye).

4.2 Recommendations

Based on information acquired during the 2015 fish tissue monitoring study, recommendations for future monitoring include:

1. Organize a discussion with local First Nation and Métis people prior to planning the next fish tissue field program in order to determine whether the Pinewood River is regularly used for fishing, and if so:

    a. Whether fishing frequency varies with season;
    b. Which fish species are caught and consumed;
    c. What is considered an edible size of fish;
    d. Which fish tissues (fillet, organs, roe) are consumed; and,

e. What is a typical consumption rate of Pinewood River fish.

2. Use the information gathered in discussion with local Nation and Métis people to inform future study design and to best tailor the project to its human health-focused objective. This may include some of the following approaches:

    a. Switch the sampling season to reflect use by fisherpersons and to maximize CPUE of target species (e.g., walleye residency in the Pinewood River may increase during the spring);

    b. If other fish species are regularly consumed, following discussion with appropriate regulatory agencies, switch the target species to northern pike and a fish with greater CPUE rates than walleye (e.g., white sucker, black crappie) to provide a larger sample size;

    c. Target fish only of a size considered edible by local fisherpersons. Fish at the current length minimum (as recommended by MOECC 2015) may be considered too small for the amount to effort required to clean and fillet the fish;

    d. Discontinue the monitoring of roe if not regularly consumed; and,

    e. Reassess benchmark levels. Previous investigations have determined that the Pinewood River is not a significant commercial, recreational, or traditional Aboriginal fishery (AMEC 2014). Therefore it may be more appropriate to select benchmarks based on the average Canadian fish consumption rate rather than on the rate for subsistence populations. Comparison to higher benchmarks would not change the conclusions in this report.

3. A reference river could be selected in order to use a BACI approach in the next study design. This would allow future fish tissue concentrations to be assessed in the context of local levels as well as by temporal trends.

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APPENDIX A

Data Quality Assessment

APPENDIX A: DATA QUALITY ASSESSMENT

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A1.0 INTRODUCTION

Data Quality Assessment (DQA) was conducted on data collected as part of the Rainy River Project (RRP) 2015 Fish Tissue Monitoring Program. The objective of DQA is to define the overall quality of the data presented in the report, and, by extension, the confidence with which the data can be used to derive conclusions.

A1.1 Background

A variety of factors can influence the physical, chemical and biological measurements made in an environmental study and thus affect the accuracy and/or precision of the data. Depending on the magnitude of the problem, inaccuracy or imprecision have the potential to affect the reliability of any conclusions made from the data. Therefore, it is important to ensure that programs incorporate appropriate steps to control the non-natural sources of data variability (i.e., minimize the variability that does not reflect natural spatial and temporal variability in the environment) and thus assure the quality of the data.

Data quality as a concept is meaningful only when it relates to the intended use of the data. That is, one must know the context in which the data will be interpreted in order to establish a relevant basis for judging whether or not the data set is adequate. DQA involves comparison of actual field and laboratory measurement performance to data quality objectives (DQOs) established for a particular study, such as evaluation of method detection limits, blank sample data, data precision (based on field and laboratory duplicate samples), and data accuracy (based on matrix spike recoveries and/or analysis of standards or certified reference materials). A trusted analytical laboratory certified by Canadian Association for Laboratory Accreditation (CALA) with a rigorous internal quality assurance program was selected to ensure the highest possible quality.

DQOs were established a-priori to reflect reasonable and achievable performance expectations. Programs involving a large number of samples and analytes usually yield some results that exceed the DQOs. This is particularly so for multi-element scans since the analytical conditions are not necessarily optimal for every element included in the scan. Generally, scan results may be considered acceptable if no more than 20% of the parameters fail to meet the DQOs. Overall, the intent of DQA is not to reject any measurement that did not meet a DQO, but to ensure that any questionable data received more scrutiny to determine what effect, if any, this had on interpretation of results within the context of this project.

A1.2 Types of Quality Control Samples

Several types of quality control (QC) samples were assessed based on samples collected (or prepared) in the field and laboratory. These samples include the following:

- **Blanks** are samples of de-ionized water and/or appropriate reagent(s) that are handled and analyzed the same way as regular samples. These samples will reflect any contamination that occurred in the laboratory (in the case of laboratory or method blanks). Analyte concentrations should be non-detectable, although a data quality objective of twice the method detection limit allows for slight "noise" around the detection limit.
- **Field Duplicates** are sub-sample pairs collected from a randomly selected field station using identical collection and handling methods that are then analyzed separately in the laboratory. The duplicate samples are handled and analyzed in an identical manner in the laboratory. The data from field duplicate samples reflect natural variability, as well as the variability associated with sample collection methods, and therefore provide a measure of field precision.
- **Laboratory Duplicates** are sub-sample pairs created in the laboratory from randomly selected field samples which are sub-sampled and then analyzed independently using identical analytical methods. The laboratory duplicate sample results reflect any variability introduced during laboratory sample handling and analysis and thus provide a measure of laboratory precision.
- **Certified Reference Materials and QC Standards** are samples containing known chemical concentrations that are processed and analyzed along with batches of environmental samples. The sample results are then compared to target results to provide a measure of analytical accuracy. The results are reported as the percent of the known amount that was recovered in the analysis.

A2.0 FISH TISSUE SAMPLES

A2.1 Holding Time and General Laboratory Flags

All tissue analyses were conducted within ALS Environmental's recommended hold times. There were no general laboratory flags associated with the analytical report (i.e., ALS Environmental Report L1704817; Appendix C).

A2.2 Method Detection Limits

The analytical laboratory report (Appendix C) was examined to provide an inventory of analytes for which sample results were less than the method detection limit (MDL). Nineteen of 35 analytes had results reported as less than MDL (Table A.1). All of the achieved MDL were lower than applicable benchmarks. Thus, the achieved MDLs were appropriate for the study and instances of results reported as <MDL did not adversely affect data interpretability.

A2.3 Laboratory Blank Sample Analysis

All of the reported method blank results were non-detectable (Appendix C). Thus, the method blank results for this study suggest no inadvertent sample contamination within the laboratory.

A2.4 Data Precision

Investigation of Erroneous Data

One northern pike muscle tissue sample (PINR-NP8-M) had an iron concentration that was exceptionally higher than all other muscle tissue samples (i.e., 5- to 20-times greater than all other muscle tissue samples; Appendix C). To investigate the causes, this sample was re-analyzed twice by the laboratory. In both instances, re-analysis showed the iron concentrations to be within the range of other muscle samples. All other metal concentrations from reanalysis match the original concentrations, indicating no sample mix-up. The lab investigated potential sources of contamination and concluded that this was not the cause of variation. It is concluded that sample heterogeneity was the cause (possibly from a relatively blood-rich area of the tissue, as blood is high in iron). The original iron concentration was treated as erroneous, and so the reanalysis value was used in this report. All other analytes showed typical population variability for each tissue type and required no further investigation (Tables C.2 to C.4).

Table A.1: Laboratory method detection limit (MDL) evaluation for tissue chemistry analyses relative to criteria. Only analytes with <MDL values are reported. Highlighted values indicate MDL greater than Benchmark.

Analyte		Benchmark[1,2]	MDL Achieved	
			mg/kg dry weight	mg/kg wet weight[3]
Total Metals	Aluminum (Al)	-	2.0	0.42
	Antimony (Sb)	0.3	0.010	0.0018
	Barium (Ba)	10.1	0.050	0.010
	Beryllium (Be)	1.3	0.010	0.0018
	Bismuth (Bi)	-	0.010	0.0018
	Boron (B)	11	1.0	0.18
	Cadmium (Cd)	0.5	0.0050	0.0010
	Chromium (Cr)	0.6	0.050	0.0088
	Cobalt (Co)	-	0.020	0.0042
	Lead (Pb)	2.3	0.020	0.0040
	Lithium (Li)	-	0.50	0.088
	Molybdenum (Mo)	3.2	0.020	0.0041
	Nickel (Ni)	0.8	0.20	0.035
	Strontium (Sr)	378.4	0.10	0.020
	Tellurium (Te)	-	0.020	0.0035
	Tin (Sn)	-	0.10	0.022
	Uranium (U)	0.4	0.0020	0.00035
	Vanadium (V)	-	0.10	0.020
	Zirconium (Zr)	-	0.20	0.035

[1] Mercury guideline for women of child-bearing age and children under 15 (see Table 2.1, MOECC 2015).

[2] See Table 2.2 for Consumption Benchmark References.

[3] Calculated from mg/kg dry weight results.

Laboratory Duplicate Samples

Three laboratory duplicate samples were evaluated for moisture and another three laboratory duplicate samples were evaluated for metals (Appendix C). Almost all laboratory duplicate results (106 in total) met ALS Environmental's applicable DQOs. The only exceptions were six results (arsenic, barium, calcium, manganese, strontium, and vanadium; Appendix C) in one muscle tissue sample. This occurred due to sample tissue heterogeneity despite laboratory homogenization by digestion with nitric and hydrochloric acids in combination with addition of hydrogen peroxide. Of these analytes, only arsenic and manganese are considered contaminants of potential concern (COPC). Arsenic achieved an RPD of 40%, and so was only barely above the DQO of <40% RPD. Muscle tissue manganese concentrations were so small relative to the benchmark (i.e., the benchmark was at least 75-times greater than all muscle manganese concentrations) that potential sample heterogeneity should not impact the human health-related interpretation of results (Table C.6). Overall, laboratory precision achieved in this study is considered good.

Field Duplicate Samples

Four field duplicate samples (two muscle tissue, one liver, and one ovary) were collected for quality assurance (Table A.2). The ovary duplicate samples had excellent agreement, with only one analyte, calcium, slightly exceeding the DQO of ≤40% RPD (Table A.2). This is not a COPC and so does not affect the interpretation of results. The three muscle and liver samples collectively failed to meet the DQO for 13 analytes (Table A.2). Although results for barium, bismuth, iron, lead, strontium, thallium, tin, and vanadium did not always achieve the DQO, the absolute differences in concentration between duplicate samples were low, particularly considering that concentrations were approaching the corresponding MDLs (i.e., within 10-times the MDL). Concentrations of calcium, copper, manganese, mercury and sodium were well above the MDLs (Table A.2; Appendix C). Of these, copper, manganese and mercury are all COPC, but only failed to meet the DQO in one of four field duplicates and had excellent agreement in the other three samples. Samples were split in the field prior to laboratory homogenization, so the differences between duplicate samples may reflect natural spatial variability of fish tissues. However, it is more likely to be due to apparent laboratory difficulty with complete sample homogenization of muscle tissue (Laboratory Duplicate Samples; Appendix C). Overall, the data suggest that reported sample data were reasonably precise representations of tissue conditions at the time of sampling.

Table A.2: Field duplicate results. Highlighted values did not meet the data quality objective of ≤ 40% Relative Percent Difference (RPD).

Lab Report L1704817														
Client Sample ID:			PINR-NP17-M	PINR-NPX-M	RPD (%)	PINR-NP12-M	PINR-NPY-M	RPD (%)	PINR-NP2-L	PINR-NPX-L	RPD (%)	PINR-NP16-G	PINR-NPX-G	RPD (%)
Date Sampled:			3-Oct-2015	3-Oct-2015		2-Oct-2015	2-Oct-2015		1-Oct-2015	3-Oct-2015		3-Oct-2015	3-Oct-2015	
ALS Sample ID:			L1704817-15	L1704817-16		L1704817-10	L1704817-17		L1704817-19	L1704817-33		L1704817-42	L1704817-43	
Analytes	**Units**	**Lowest MDL**												
% Moisture	%	0.25	77.7	77.8	0.1	78.8	77.5	2	75.2	78.8	5	79.2	79.2	0
Aluminum (Al)	mg/kg d.w.	2.0	2.2	<2.0	10	<2.0	3.0	40	2.7	3.4	23	2.4	<2.0	18
Antimony (Sb)	mg/kg d.w.	0.010	<0.010	<0.010	0	<0.010	0.014	33	<0.010	0.012	18	0.010	<0.010	0
Arsenic (As)	mg/kg d.w.	0.020	0.457	0.437	4	0.419	0.392	7	0.123	0.092	29	0.113	0.115	2
Barium (Ba)	mg/kg d.w.	0.050	0.24	0.063	117	0.060	<0.050	18	<0.050	<0.050	0	0.241	0.220	9
Beryllium (Be)	mg/kg d.w.	0.010	<0.010	<0.010	0	<0.010	<0.010	0	<0.010	<0.010	0	<0.010	<0.010	0
Bismuth (Bi)	mg/kg d.w.	0.010	0.014	0.016	13	0.011	0.020	58	<0.010	0.019	62	0.013	0.011	17
Boron (B)	mg/kg d.w.	1.0	<1.0	<1.0	0	<1.0	<1.0	0	<1.0	<1.0	0	<1.0	<1.0	0
Cadmium (Cd)	mg/kg d.w.	0.0050	<0.005	<0.005	0	<0.0050	<0.0050	0	0.154	0.192	22	0.0293	0.0341	15
Calcium (Ca)	mg/kg d.w.	20	1,740	426	121	675	380	56	142	158	11	1,020	656	43
Cesium (Cs)	mg/kg d.w.	0.0050	0.0393	0.0377	4	0.0288	0.0266	8	0.0179	0.0250	33	0.0241	0.0217	10
Chromium (Cr)	mg/kg d.w.	0.050	<0.2	<0.15	29	<0.050	<0.050	0	<0.050	<0.050	0	<0.050	<0.050	0
Cobalt (Co)	mg/kg d.w.	0.020	<0.020	<0.020	0	<0.020	<0.020	0	0.122	0.124	2	0.223	0.226	1
Copper (Cu)	mg/kg d.w.	0.10	0.88	0.81	8	0.59	0.58	2	42.7	65.2	42	4.88	5.11	5
Iron (Fe)	mg/kg d.w.	3.0	14.5	7.9	59	4.9	5.5	12	74.1	174	81	252	253	0.4
Lead (Pb)	mg/kg d.w.	0.020	0.021	<0.020	5	<0.020	<0.020	0	0.067	<0.020	108	0.021	<0.020	5
Lithium (Li)	mg/kg d.w.	0.50	<0.5	<0.5	0	<0.50	<0.50	0	<0.50	<0.50	0	<0.50	<0.50	0
Magnesium (Mg)	mg/kg d.w.	2.0	1,560	1,470	6	1570	1,440	9	700	642	9	1290	1340	4
Manganese (Mn)	mg/kg d.w.	0.050	2.06	0.587	111	1.04	0.729	35	9.94	8.83	12	104	111	7
Mercury (Hg)	mg/kg d.w.	0.0050	3.21	3.36	5	1.85	1.88	2	0.372	0.908	84	0.256	0.268	5
Molybdenum (Mo)	mg/kg d.w.	0.020	<0.020	<0.020	0	<0.020	<0.020	0	0.419	0.370	12	0.137	0.136	0.7
Nickel (Ni)	mg/kg d.w.	0.20	<0.20	<0.20	0	<0.20	<0.20	0	<0.20	<0.20	0	<0.20	<0.20	0
Phosphorus (P)	mg/kg d.w.	10	11,900	11,100	7	11,800	10,700	10	12,800	11,400	12	14,600	15,000	3
Potassium (K)	mg/kg d.w.	20	19,700	19,300	2	21,300	19,100	11	14,500	13,100	10	17,300	16,900	2
Rubidium (Rb)	mg/kg d.w.	0.050	28.0	27.3	3	26.2	24.9	5	38.9	29.8	26	24.9	24.3	2
Selenium (Se)	mg/kg d.w.	0.050	0.888	0.901	1	0.826	0.782	5	4.65	4.66	0.2	5.93	5.84	2
Sodium (Na)	mg/kg d.w.	20	1,210	1,100	10	1,120	970	14	2,340	3,820	48	4,510	4,940	9
Strontium (Sr)	mg/kg d.w.	0.050	0.834	0.135	144	0.218	0.087	86	0.093	0.097	4	0.710	0.528	29
Tellurium (Te)	mg/kg d.w.	0.020	<0.020	<0.020	0	<0.020	<0.020	0	<0.020	<0.020	0	<0.020	<0.020	0
Thallium (Tl)	mg/kg d.w.	0.0020	0.0115	0.0115	0	0.0147	0.0224	42	0.0164	0.0158	4	0.0185	0.0176	5
Tin (Sn)	mg/kg d.w.	0.10	0.15	0.22	38	0.21	0.52	85	0.27	0.20	30	0.17	0.22	26
Uranium (U)	mg/kg d.w.	0.0020	<0.0020	<0.0020	0	<0.0020	<0.0020	0	<0.0020	<0.0020	0	<0.0020	<0.0020	0
Vanadium (V)	mg/kg d.w.	0.10	<0.10	<0.10	0	<0.1	<0.1	0	0.19	0.46	83	<0.10	<0.10	0
Zinc (Zn)	mg/kg d.w.	0.50	61.7	60.7	2	14.4	12.5	14	114	112	2	312	311	0.3
Zirconium (Zr)	mg/kg d.w.	0.20	<0.20	<0.20	0	<0.20	<0.20	0	<0.20	<0.20	0	<0.20	<0.20	0

d.w. - dry weight.
MDL - Method Detection Limit.

A2.5 Data Accuracy

Data accuracy was evaluated based on results of certified reference materials (CRM), and laboratory control samples (LCS; Appendix C). Almost all CRM and LCS results (268 in total) met ALS Environmental's data quality objectives for accuracy, except for chromium in one CRM analysis (Appendix C). All results associated with this CRM were non-detect results; therefore, the results for chromium are considered reliable. Laboratory accuracy achieved in this study is considered excellent.

A3.0 DATA QUALITY STATEMENT

Data collected for the 2015 fish tissue monitoring at the Rainy River Project was of good quality as characterized by good detectability, negligible analyte concentrations in method blanks, good laboratory and field precision, and good laboratory accuracy. Therefore, associated data can be used with a high level of confidence in the derivation of conclusions.

APPENDIX B

Fish Catch and Meristic Data

Fish Catch Data
Fish Meristic Data
Fish Permit

Table B.1: Summary of gill net catch records in the Pinewood River, Rainy River Project Fish Tissue Monitoring, 2015.

Net Set ID	Mesh Size (in)	Length (m)	UTM (NAD83, 15U)		Set Date	Lift Date	Set Time	Lift Time	Time (hrs)	Effort (m*hrs/ 100 m)	Northern Pike		Black Crappie		Rock Bass		White Sucker	
			Easting	Northing							Catch	CPUE	Catch	CPUE	Catch	CPUE	Catch	CPUE
GN1	4	30.48	419219	5408077	30-Sep-15	30-Sep-15	11:04	17:40	6.60	2.01	0	0	0	0	0	0	0	0
GN2	3	45.72	409335	5398936	01-Oct-15	01-Oct-15	7:55	9:15	1.33	0.61	1	1.64	0	0	0	0	0	0
GN3	3	45.72	408086	5402502	01-Oct-15	01-Oct-15	10:00	14:29	4.48	2.05	1	0.49	0	0	0	0	0	0
GN4	4	30.48	409679	5403786	01-Oct-15	01-Oct-15	10:40	14:50	4.17	1.27	0	0	0	0	0	0	0	0
GN5	3	45.72	410302	5403889	01-Oct-15	01-Oct-15	11:30	15:00	3.50	1.60	2	1.25	0	0	0	0	0	0
GN6	3	45.72	419535	5408068	01-Oct-15	01-Oct-15	12:28	17:10	4.70	2.15	0	0	0	0	0	0	0	0
GN7	3	45.72	410082	5403907	01-Oct-15	01-Oct-15	15:21	18:05	2.73	1.25	0	0	0	0	0	0	0	0
GN8	3	45.72	408068	5403083	01-Oct-15	01-Oct-15	15:50	18:38	2.80	1.28	0	0	0	0	0	0	0	0
GN9	3	45.72	404735	5397659	02-Oct-15	02-Oct-15	8:25	17:23	8.97	4.10	1	0.24	1	0.24	0	0	0	0
GN10	3	45.72	407948	5397979	02-Oct-15	02-Oct-15	9:03	17:09	8.10	3.70	4	1.08	0	0	0	0	0	0
GN11	2,3,4	30.48	408072	5402501	02-Oct-15	02-Oct-15	12:20	16:37	4.28	1.31	1	0.77	0	0	0	0	0	0
GN12	3	45.72	410306	5403879	02-Oct-15	02-Oct-15	12:50	16:18	3.47	1.58	2	1.26	0	0	0	0	0	0
GN13	3	45.72	404116	5396869	02-Oct-15	03-Oct-15	18:07	9:05	14.97	6.84	2	0.29	8	1.17	1	0.15	0	0
GN14	4	30.48	403797	5396696	02-Oct-15	03-Oct-15	18:21	8:21	14.00	4.27	2	0.47	2	0.47	0	0	0	0
GN15	3	45.72	403469	5396389	02-Oct-15	03-Oct-15	18:30	9:55	15.42	7.05	4	0.57	14	1.99	1	0.14	1	0.14
									Total	**41.1**	**20**	**0.49**	**25**	**0.61**	**2**	**0.05**	**1**	**0.02**

CPUE = catch-per-unit-effort, expressed as the number of fish per 100 m/hr.

Table B.2: Summary of hoop net catch records in the Pinewood River, Rainy River Project Fish Tissue Monitoring, 2015.

a) Medium sized hoop nets (2.5' [0.75 m] diameter hoops, 1" [2.5 cm] stretched mesh).

Net Set ID	Net Size	UTM (NAD83, 15U)		Set Date	Lift Date	Set Time	Lift Time	Time (hrs)	Effort (trap*days)	Northern Pike		Walleye		White Sucker		Brown Bullhead		Trout-perch		Mimic Shiner	
		Easting	Northing							Catch	CPUE	Catch	CPUE	Catch	CPUE	Catch	CPUE	Catch	CPUE	Catch	CPUE
HN1	m	419530	5408098	29-Sep-15	30-Sep-15	14:38	9:05	18.45	0.77	0	0	0	0	1	1.30	0	0	0	0	0	0
HN2	m	419225	5408071	29-Sep-15	30-Sep-15	15:22	9:50	18.47	0.77	0	0	0	0	0	0	0	0	0	0	0	0
HN4a	m	419365	5408089	29-Sep-15	30-Sep-15	16:57	9:22	16.42	0.68	4	5.85	0	0	8	11.70	0	0	0	0	0	0
HN4b	m	419365	5408089	30-Sep-15	01-Oct-15	9:37	12:50	27.22	1.13	1	0.88	0	0	0	0	0	0	0	0	0	0
HN4c	m	419365	5408089	01-Oct-15	02-Oct-15	13:00	14:12	25.20	1.05	0	0	0	0	0	0	0	0	0	0	0	0
HN5	m	419405	5408070	29-Sep-15	30-Sep-15	17:12	9:15	16.05	0.67	0	0	0	0	1	1.50	0	0	0	0	0	0
HN9a	m	419261	5408155	30-Sep-15	01-Oct-15	10:02	13:00	26.97	1.12	2	1.78	0	0	2	1.78	0	0	0	0	0	0
HN9b	m	419261	5408155	01-Oct-15	02-Oct-15	13:17	14:23	25.10	1.05	2	1.91	0	0	2	1.91	0	0	0	0	0	0
HN10	m	409295	5398932	30-Sep-15	01-Oct-15	15:42	7:58	16.27	0.68	0	0	0	0	0	0	0	0	0	0	0	0
HN11a	m	409381	5399377	30-Sep-15	01-Oct-15	16:07	8:24	16.28	0.68	1	1.47	1	1.47	1	1.47	0	0	0	0	0	0
HN11b	m	409381	5399377	01-Oct-15	02-Oct-15	8:35	11:00	26.42	1.10	1	0.91	0	0	0	0	0	0	0	0	0	0
HN12[a]	m	409246	5398800	01-Oct-15	02-Oct-15	9:05	10:36	25.52	1.06	0	0	0	0	0	0	0	0	0	0	0	0
								Total	**9.7**	**11**	**1.13**	**1**	**0.10**	**15**	**1.55**	**0**	**0**	**0**	**0**	**0**	**0**

b) Small sized hoop nets (2' [0.61 m] diameter hoops, 0.5" [1.3 cm] stretched mesh).

Net Set ID	Net Size	UTM (NAD83, 15U)		Set Date	Lift Date	Set Time	Lift Time	Time (hrs)	Effort (trap*days)	Northern Pike		Walleye		White Sucker		Brown Bullhead		Trout-perch		Mimic Shiner	
		Easting	Northing							Catch	CPUE	Catch	CPUE	Catch	CPUE	Catch	CPUE	Catch	CPUE	Catch	CPUE
HN3	s	419252	5408148	29-Sep-15	30-Sep-15	16:37	9:40	17.05	0.71	0	0	0	0	1	1.41	0	0	0	0	0	0
HN6	s	419440	5408032	29-Sep-15	30-Sep-15	17:40	9:09	15.48	0.65	0	0	0	0	0	0	0	0	0	0	0	0
HN7	s	419478	5408119	29-Sep-15	30-Sep-15	17:53	9:06	15.22	0.63	0	0	0	0	0	0	0	0	0	0	0	0
HN8	s	419544	5408076	29-Sep-15	30-Sep-15	18:03	10:37	16.57	0.69	0	0	0	0	0	0	2	2.90	0	0	0	0
HN13	s	408078	5402503	01-Oct-15	03-Oct-15	10:00	11:04	49.07	2.04	0	0	0	0	0	0	0	0	0	0	0	0
HN14	s	412958	5405686	01-Oct-15	03-Oct-15	11:00	11:20	48.33	2.01	0	0	0	0	1	0.50	0	0	1	0.50	1	0.50
								Total	**6.74**	**0**	**0.00**	**0**	**0.00**	**2**	**0.30**	**2**	**0.30**	**1**	**0.15**	**1**	**0.15**

CPUE = catch-per-unit-effort, expressed as the number of fish per trap*day.

[a] A large hole was found in the net at the time of retrieval (likely chewed by snapping turtle). Any fish in the net would have escaped. This net set is excluded from CPUE calculations

Table B.3: Summary of angling catch records in the Pinewood River, Rainy River Project Fish Tissue Monitoring, 2015.

Attempt ID	Number of Fishing Rods	UTM (NAD83, 15U)		Date	Start Time	End Time	Time (hrs)	Northern Pike	
		Easting	Northing					Catch	CPUE
A1	1	414691	5407046	30-Sep-15	14:00	14:10	0.17	0	0
A2	1	410082	5403907	01-Oct-15	17:50	18:00	0.17	0	0
A3	1	408077	5402504	03-Oct-15	11:20	11:30	0.17	0	0
							0.50	**0**	**0**

CPUE = catch-per-unit-effort, expressed as the number of fish per hour.

Table B.4: Northern pike data for fish caught in the Pinewood River, Rainy River Project Fish Monitoring, 2015.

Date	Fish ID	Sex	Fork Length (cm)	Total Length (cm)	Body Weight (g)	Mercury Concentration (mg/kg w.w.)			Age	Abnormalities
						Muscle	Liver	Ovary		
01-Oct-15	PINR-NP01	F	49.1	52.1	755	0.382	0.0911	0.0282	3	-
01-Oct-15	PINR-NP02	F	44.9	48.0	705	0.270	0.142	0.0238	3	-
01-Oct-15	PINR-NP03	F	46.1	49.1	800	0.386	0.149	0.0299	3	-
01-Oct-15	PINR-NP04	F	43.1	46.2	570	0.281	0.0894	0.0175	1	-
01-Oct-15	PINR-NP05	F	45.4	48.5	665	0.322	0.0865	0.0193	2	-
01-Oct-15	PINR-NP06	M	31.0	33.1	205	-	-	-	-	-
01-Oct-15	PINR-NP07	M	31.5	33.6	195	0.148	0.0684	-	0	-
01-Oct-15	PINR-NP08	M	32.0	33.8	210	0.142	0.0587	-	1	-
02-Oct-15	PINR-NP09	M	43.8	46.2	510	0.186	0.0736	-	2	-
02-Oct-15	PINR-NP10	M	41.8	44.1	460	0.288	0.0927	-	4	-
02-Oct-15	PINR-NP11	M	44.3	47.1	610	-	-	-	-	-
02-Oct-15	PINR-NP12	F	48.7	51.8	835	0.408	0.123	0.0192	2	-
02-Oct-15	PINR-NP13	F	57.0	62.1	1,420	0.711	0.386	0.0666	7	-
02-Oct-15	PINR-NP14	M	28.2	30.3	149	0.145	0.0867	-	1	-
02-Oct-15	PINR-NP15	F	31.0	33.1	175	0.148	0.0755	0.0197	1	-
03-Oct-15	PINR-NP16	F	68.9	73.0	2,200	0.589	0.206	0.0545	5	-
03-Oct-15	PINR-NP17	M	59.5	63.3	1,450	0.731	0.362	-	7	-
Mean			43.9	46.8	701	0.342	0.139	0.0310	3	-
Minimum			28.2	30.3	149	0.142	0.0587	0.0175	0	-
Maximum			68.9	73.0	2,200	0.731	0.386	0.0666	7	-
Standard Deviation			11.1	11.9	548	0.198	0.103	0.0176	2	-

w.w. - wet weight.

Table B.5: Walleye data for fish caught in the Pinewood River, Rainy River Project Fish Monitoring, 2015.

Date	Fish ID	Sex	Fork Length (cm)	Total Length (cm)	Body Weight (g)	Mercury Concentration (mg/kg w.w.)		Age	Abnormalities
						Muscle	Liver		
01-Oct-15	PINR-Wa01	undev. F	27.6	30.0	220	0.299	0.128	2	-

w.w. - wet weight.

Ontario

Ministry of Natural Resources

Ministère des Richesses naturelles

Licence to Collect Fish for Scientific Purposes
Permis pour faire la collecte de poissons à des fins scientifiques

Licence No. / N° de permis	1081405
Local Reference No. / N° de référence local	2015-875
Issuer Account No. / N° de compte du délivreur de permis	10003004

This licence is issued under Part I of the Fish Licensing Regulation made under the Fish and Wildlife Conservation Act, 1997 to:

Ce permis est délivré en vertu de la Partie I du règlement sur la délivrance de permis de pêche formulé conformément à la Loi sur la protection du poisson et de la faune de 1997 à:

	Last Name / Nom de famille	First Name / Prénom	Middle Name / Second Prénom
Name of Licencee / Nom du titulaire du permis	Mr. Tester	Jess	

Name of Business/Organization/Affiliation (if applicable) / Nom de l'entreprise/de l'organisme/de l'affiliation (le cas échéant)

Minnow Environmental Inc

	Street Name & No./PO Box/RR#/Gen. Del./ N° rue/C.P./R.R./poste restante		
Mailing address of Licencee / *Adresse postale du titulaire du permis*	2 Lamb Street		
	City/Town/Municipality / Ville/village/municipalité	Province/State / Province/État	Postal Code/Zip Code / Code Postal/Zip
	Georgetown	ON	L7G 3M9

to collect the species, size and quantites of fish from the waters as set out below.
Pour faire la collecte des espèces suivantes (stade et nombre indiqués ci-dessous):

Species / Espèces	Eggs / Oeuf	Juvenile / Fraîn	Adults / Adulte	Numbers / Nombre	Name of Waterbody / Nom de l'étendue d'eau
	X	X	X		
Northern Pike			X	15	Pinewood River
Walleye			X	15	Pinewood River

Yes/Oui ☐ Additional species/Waterbody list attached / Liste d'espèces/d'étendue d'eau additionnelles ci-jointe

Purpose of collection / *But de la collecte*: Fish tissue monitoring as a requirement of the Federal ESA approval

Licence Dates / *Dates du permis*	Effective Date / Date d'entrée en vigueur (YYYY-MM-DD)	Expiry Date / Date d'expiration (YYYY-MM-DD)
	2015-09-27	2015-10-31

Licence conditions: This licence is subject to the conditions contained in Schedule A if included. / Ce permis doit respecter les conditions de l'annexe A si celle-ci est jointe.

Conditions du permis: Yes/Oui ☒ No/Non ☐ Schedule A included. / Annexe A ci-jointe

Issued by (please print) / Délivré par (veuillez écrire en caractères d'imprimerie)	Signature of issuer / Signature du délivreur	Date of Issue/Date de délivrance (YYYY-MM-DD)
Matt Myers	<Original signed by>	2015-09-15

Signature of Licencee / Signature du titulaire du permis	Date (YYYY-MM-DD)
<Original signed by>	2015-09-15

Personal information contained on this form is collected under the authority of the Fish and Wildlife Conservation Act, 1997 and will be used for the purpose of licencing, administration, enforcement, resource management and customer service surveys. Please direct further inquiries to the District Manager of the MNR issuing district.

Les renseignements personnels dans ce formulaire sont recueillis conformément à la Loi sur la protection du poisson de la faune, 1997 , et ils seront utilisés aux fins de délivrance de permis, d'identification, d'application des règlements, de gestion des ressources et de sondage sur les services a la clientèle. Veuillez communiquer avec le chef du district du MRN qui délivré le permis si vous avez des questions.

FW0032 (04/00)

Ontario

Licence to Collect Fish for Scientific Purposes
Schedule A – Licence Conditions

Licence No. **1081405**
Local Reference No. **2015-875**
Issuer Account No. **10003004**

This licence is subject to the conditions listed below.

1. Mandatory report forms documenting the sampling conducted under this licence must be submitted to the licence issuer within 30 days of the termination date, but in no case later than January 31 next following the year of issue. The digital Mandatory Report form (Part 1) must be completed for each Sampling Program and the digital Site Collection Reports (Part 2) must be completed for each collection site. A separate map clearly indicating the location of each collection site must be attached to the Site Collection Reports. Submit Mandatory Report forms to the Fort Frances District MNRF office. The submission of a satisfactory report is a prerequisite to any subsequent renewals.

2. Sampling locations must be reported using GPS location data using: Projection: Universal Transverse Mercator (UTM); Datum: North American 1983 (NAD83), Canadian Transformation (CNT); Zone: 15 N; Units: metres.

3. Before carrying out any operation under this licence, any person authorized under this licence is required to consult with the Fort Frances Ministry of Natural Resources District Manager at least one week prior to anticipated start of sampling and obtain approval from the respective Manager for the proposed sampling activity. Also, any person authorized under this licence must advise the respective Manager of the date, time and location of all sampling.

4. A copy of the signed original licence must be carried by the licenced person when working at the designated sites. An assistant of the licenced person who is carrying out activities under this licence during the absence of the licenced person shall carry the licence on his or her person.

5. All collection gear shall be clearly marked with the licenced person's and the organization's name.

6. This licence is not valid in Provincial Parks, park reserves, Conservation Authority property or National Parks without written permission from the authorized person in charge of the area concerned.
http://www.ontarioparks.com/email/research

7. Capture gear shall be inspected regularly and live holding traps must be inspected at least once daily.

8. This licence does not allow access to any property without permission of the landowner.

9. The licensee shall follow the best management practices for the collection, handling, transportation and holding of fish identified in **FPS Technical Bulletin (Dec. 15, 2011)** included with the licence in order to minimize the risk of spreading aquatic invasive species and diseases.

10. All field equipment must be de-contaminated prior to use on each water body in order to prevent the spread of exotic species and disease.

11. This licence does not authorize any activity that is prohibited under the federal ***Species at Risk Act*** or the provincial ***Endangered Species Act.***

12. All SAR fish and mussels must also be reported to the OMNR Natural Heritage Information Centre on the appropriate form at:
http://nhic.mnr.gov.on.ca/MNR/nhic/species/species_report.cfm

13. This licence does not authorize the possession of specially protected fish under the ***Ontario Fishery Regulations.***

14. This licence does not authorize the collection of any species of fish protected under the ***Species at Risk Act, Endangered Species Act, or Ontario Fishery Regulations.*** If these species are accidentally captured they must be returned to the water immediately.

15. **This licence ONLY allows for the following capture gear to be used:**

    Hoop net, Gill net, Angling gear

16. **Persons authorized under this licence include the following:**

    Jess Tester, Michael White

17. ***The following MNRF Class Animal Care Protocols will be adhered to as appropriate for the project activity:***
    - ***Capture Methods- Electrofishing***
    - ***Capture Methods- Seining***
    - ***Capture Methods- Impounding Gear***
    - ***Handling and Marking- Biological Sampling***
    - ***Containment- Short term Containment***

Signature of Licensee

<Original signed by>

X_____

Date

24-Sept-15

APPENDIX C

Fish Tissue Quality

Fish Tissue Chemistry
Laboratory Analytical Data Report

Table C.1: Average dry weight (d.w.) metal concentrations in fish tissue, Rainy River Project Fish Monitoring, 2015.

Parameter		Lowest Detection Limit	Units	Northern Pike												Walleye	
				Muscle				Liver				Ovary				Muscle	Liver
				Average (n=15)	SD	Minimum	Maximum	Average (n=15)	SD	Minimum	Maximum	Average (n=9)	SD	Minimum	Maximum		
% Moisture		0.25	%	77.8	1.1	76.1	79.6	72.0	5.8	60.6	79.2	78.3	2.5	74.4	82.4	79.1	69.4
Total Metals	Aluminum (Al)	2.0	µg/g d.w.	4.3	2.9	<2.0	13.0	4.2	1.9	2.0	9.1	2.8	1.3	2.0	5.1	2.4	<5.0
	Antimony (Sb)	0.010	µg/g d.w.	0.010	0.0005	<0.010	0.012	0.018	0.021	0.010	0.088	0.011	0.0019	0.010	0.0160	<0.010	<0.010
	Arsenic (As)	0.020	µg/g d.w.	0.423	0.102	0.271	0.586	0.150	0.062	0.062	0.286	0.118	0.0339	0.0680	0.184	0.489	0.197
	Barium (Ba)	0.050	µg/g d.w.	0.183	0.097	0.055	0.392	0.0531	0.00861	0.0500	0.0800	0.292	0.173	0.0600	0.576	0.0870	<0.050
	Beryllium (Be)	0.010	µg/g d.w.	<0.010	0	<0.010	<0.010	<0.010	0	<0.010	<0.010	<0.010	0	<0.010	<0.010	<0.010	<0.010
	Bismuth (Bi)	0.010	µg/g d.w.	0.011	0.0021	<0.010	0.016	0.018	0.015	0.010	0.054	0.011	0.0014	0.010	0.014	<0.010	<0.010
	Boron (B)	1.0	µg/g d.w.	<1.0	0	<1.0	<1.0	<1.0	0	<1.0	<1.0	<1.0	0	<1.0	<1.0	<1.0	<1.0
	Cadmium (Cd)	0.0050	µg/g d.w.	0.0080	0.0078	<0.0050	0.0352	0.201	0.153	0.0304	0.600	0.0350	0.0119	0.0190	0.0600	<0.0050	1.9
	Calcium (Ca)	20	µg/g d.w.	1,254	632	528	2,420	144	45	81	285	643	141	537	1,020	607	388
	Cesium (Cs)	0.0050	µg/g d.w.	0.0263	0.0121	0.0137	0.0530	0.0123	0.00728	0.00540	0.0302	0.0171	0.00643	0.00830	0.0264	0.0306	0.0145
	Chromium (Cr)	0.050	µg/g d.w.	0.11	0.098	<0.050	0.370	0.12	0.10	0.050	0.37	0.072	0.050	0.050	0.20	<0.050	<0.20
	Cobalt (Co)	0.020	µg/g d.w.	0.0203	0.000704	<0.020	0.0220	0.158	0.0740	0.0710	0.357	0.307	0.0980	0.169	0.484	<0.020	0.764
	Copper (Cu)	0.10	µg/g d.w.	0.823	0.169	0.580	1.15	87.0	46.6	34.7	238	5.40	0.620	4.72	6.69	0.7	10.2
	Iron (Fe)	3.0	µg/g d.w.	12.5	4.0	5.2	19.0	420	460	57	1,980	253	52.0	168	333	10.3	393
	Lead (Pb)	0.020	µg/g d.w.	0.057	0.084	<0.020	0.35	0.17	0.54	0.020	2.21	0.035	0.038	0.020	0.14	0.032	<0.050
	Lithium (Li)	0.50	µg/g d.w.	<0.50	0	<0.50	<0.50	<0.50	0	<0.50	<0.50	<0.50	0	<0.50	<0.50	<0.50	<0.50
	Magnesium (Mg)	2.0	µg/g d.w.	1,555	107	1,370	1,830	641	136	446	878	1,316	71.5	1,200	1,430.0	1,760	665
	Manganese (Mn)	0.050	µg/g d.w.	1.97	1.07	0.885	4.28	5.59	2.69	2.79	10.2	156	48.8	104	245	0.778	13.8
	Mercury (Hg)	0.0050	µg/g d.w.	1.57	0.940	0.594	3.370	0.548	0.447	0.175	1.70	0.160	0.101	0.0752	0.364	1.43	0.419
	Molybdenum (Mo)	0.020	µg/g d.w.	0.0250	0.00826	<0.020	0.040	0.520	0.140	0.285	0.834	0.189	0.0518	0.132	0.277	<0.020	0.433
	Nickel (Ni)	0.20	µg/g d.w.	<0.20	0	<0.20	<0.20	<0.20	0	<0.20	<0.20	<0.20	0	<0.20	<0.20	<0.20	<0.20
	Phosphorus (P)	10	µg/g d.w.	11,220	943	9,050	13,000	11,029	2,862	7,160	15,300	14,800	1,183	13,800	17,600	12,000	10,300
	Potassium (K)	20	µg/g d.w.	19,520	1,548	16,400	22,100	11,218	2,992	6,440	15,200	16,920	2,856	13,400	22,200	21,600	8,990
	Rubidium (Rb)	0.050	µg/g d.w.	22.8	2.63	18.6	27.65	22.8	7.57	10.4	38.9	22.4	3.94	14.7	27.6	33.4	15.5
	Selenium (Se)	0.050	µg/g d.w.	0.931	0.116	0.804	1.170	5.44	1.66	3.56	10.3	5.47	1.53	3.91	8.42	1.41	3.68
	Sodium (Na)	20	µg/g d.w.	1,328	157	1,045	1,580	2,571	726	1,650	4,040	3,655	960	2,460	4,940	1190	3310
	Strontium (Sr)	0.050	µg/g d.w.	0.696	0.335	0.153	1.230	0.108	0.0230	0.080	0.1590	0.535	0.161	0.307	0.748	0.225	0.17
	Tellurium (Te)	0.020	µg/g d.w.	<0.020	0	<0.020	<0.020	0.021	0.0015	0.020	0.025	<0.20	0	<0.20	<0.20	<0.020	<0.020
	Thallium (Tl)	0.0020	µg/g d.w.	0.0131	0.00364	0.00900	0.0212	0.0171	0.0100	0.00870	0.0487	0.0223	0.00441	0.0173	0.02930	0.0245	0.0525
	Tin (Sn)	0.10	µg/g d.w.	0.28	0.13	0.14	0.65	0.32	0.26	0.14	1.2	0.19	0.13	0.10	0.53	0.39	0.64
	Uranium (U)	0.0020	µg/g d.w.	<0.0020	0	<0.0020	<0.0020	0.0022	0.00065	0.0020	0.0046	<0.20	0	<0.20	<0.20	0.0025	<0.0020
	Vanadium (V)	0.10	µg/g d.w.	<0.10	0	<0.10	<0.10	0.56	0.63	0.12	2.67	0.15	0.11	0.10	0.46	<0.10	0.15
	Zinc (Zn)	0.50	µg/g d.w.	20.5	11.5	13.5	61.2	162	44.7	112	274	365	93.6	260	571	15.1	149
	Zirconium (Zr)	0.20	µg/g d.w.	<0.20	0	<0.20	<0.20	<0.20	0	<0.20	<0.20	<0.20	0	<0.20	<0.20	<0.20	<0.20

SD - Standard Deviation.

Table C.2: Dry weight (d.w.) metal concentrations in fish muscle tissue, Rainy River Project Fish Monitoring, 2015.

Parameter		Lowest Detection Limit	Units	Northern Pike														Walleye
				PINR-NP1-M	PINR-NP2-M	PINR-NP3-M	PINR-NP4-M	PINR-NP5-M	PINR-NP7-M	PINR-NP8-M	PINR-NP9-M	PINR-NP10-M	PINR-NP12-M	PINR-NP13-M	PINR-NP14-M	PINR-NP15-M	PINR-NP16-M	PINR-NP17-M	PINR-WA1-M
				1-Oct-2015	1-Oct-2015	1-Oct-2015	1-Oct-2015	1-Oct-2015	1-Oct-2015	1-Oct-2015	2-Oct-2015	2-Oct-2015	2-Oct-2015	2-Oct-2015	2-Oct-2015	2-Oct-2015	3-Oct-2015	3-Oct-2015	1-Oct-2015
% Moisture		0.25	%	78.2	77.1	79.6	78.9	76.5	78.0	76.1	78.3	77.3	78.2	78.9	77.0	76.4	79.2	77.8	79.1
Total Metals	Aluminum (Al)	2.0	µg/g d.w.	3.3	8.3	13.0	3.2	2.7	<5.0	<5.0	2.2	<2.0	2.5	3.8	<2.0	<5.0	3.9	2.1	2.4
	Antimony (Sb)	0.010	µg/g d.w.	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.012	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
	Arsenic (As)	0.020	µg/g d.w.	0.576	0.355	0.586	0.304	0.271	0.320	0.337	0.412	0.585	0.406	0.502	0.448	0.373	0.429	0.447	0.489
	Barium (Ba)	0.050	µg/g d.w.	0.187	0.279	0.243	0.157	0.085	0.151	0.149	0.226	0.392	0.055	0.096	0.343	0.105	0.124	0.152	0.087
	Beryllium (Be)	0.010	µg/g d.w.	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
	Bismuth (Bi)	0.010	µg/g d.w.	0.010	<0.010	<0.010	0.012	<0.010	0.010	<0.010	<0.010	0.010	0.016	0.015	<0.010	<0.010	0.011	0.015	<0.010
	Boron (B)	1.0	µg/g d.w.	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	Cadmium (Cd)	0.0050	µg/g d.w.	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.010	<0.010	<0.0050	<0.0050	<0.0050	0.0055	<0.0050	<0.010	0.0352	<0.0050	<0.0050
	Calcium (Ca)	20	µg/g d.w.	1,140	1,350	1,840	1,210	744	628	1,990	1,220	2,390	528	681	2,420	968	618	1,083	607
	Cesium (Cs)	0.0050	µg/g d.w.	0.0269	0.0205	0.0203	0.0140	0.0169	0.0214	0.0232	0.0137	0.0530	0.0277	0.0437	0.0206	0.0141	0.0406	0.0385	0.0306
	Chromium (Cr)	0.050	µg/g d.w.	<0.050	<0.10	0.056	<0.050	<0.050	<0.20	0.37	<0.050	<0.050	<0.050	<0.050	<0.050	0.25	<0.050	<0.18	<0.050
	Cobalt (Co)	0.020	µg/g d.w.	<0.020	<0.020	0.022	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	0.022	<0.020	<0.020	<0.020	<0.020
	Copper (Cu)	0.10	µg/g d.w.	0.76	0.86	0.86	0.75	0.60	0.86	1.15	1.02	0.69	0.59	0.58	1.00	0.81	0.98	0.85	0.70
	Iron (Fe)	3.0	µg/g d.w.	14.5	19.0	15.7	10.0	6.6	10.3	13.2	13.0	14.3	5.2	17.0	7.5	15.6	14.2	11.2	10.3
	Lead (Pb)	0.020	µg/g d.w.	0.039	0.052	0.084	0.021	0.023	<0.050	0.059	<0.020	<0.020	<0.020	0.353	<0.020	<0.050	0.022	0.021	0.032
	Lithium (Li)	0.50	µg/g d.w.	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	Magnesium (Mg)	2.0	µg/g d.w.	1,510	1,430	1,610	1,610	1,490	1,530	1,830	1,370	1,560	1,505	1,580	1,670	1,520	1,590	1,515	1,760
	Manganese (Mn)	0.050	µg/g d.w.	1.59	2.40	2.79	1.35	1.19	1.17	4.28	1.66	3.58	0.88	1.19	3.48	1.48	1.14	1.32	0.778
	Mercury (Hg)	0.0050	µg/g d.w.	1.75	1.18	1.89	1.33	1.37	0.671	0.594	0.858	1.27	1.87	3.37	0.629	0.628	2.83	3.29	1.43
	Molybdenum (Mo)	0.020	µg/g d.w.	<0.020	<0.020	<0.020	<0.020	<0.020	<0.040	<0.040	0.023	<0.020	<0.020	0.021	<0.020	<0.040	0.031	<0.020	<0.020
	Nickel (Ni)	0.20	µg/g d.w.	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
	Phosphorus (P)	10	µg/g d.w.	10,800	10,800	11,300	12,400	11,800	10,100	10,900	10,700	12,100	11,250	11,300	13,000	9,050	11,300	11,500	12,000
	Potassium (K)	20	µg/g d.w.	18,300	18,300	19,000	22,100	21,300	18,100	19,000	18,400	20,100	20,200	19,900	21,900	16,400	20,300	19,500	21,600
	Rubidium (Rb)	0.050	µg/g d.w.	20.9	21.3	20.7	23.6	19.3	22.2	24.2	22.4	24.1	25.6	20.7	23.9	18.6	26.7	27.7	33.4
	Selenium (Se)	0.050	µg/g d.w.	1.08	0.979	0.873	0.821	0.925	0.85	0.81	0.934	1.17	0.804	0.861	1.00	1.12	0.846	0.895	1.41
	Sodium (Na)	20	µg/g d.w.	1,380	1,510	1,430	1,580	1,390	1,260	1,390	1,250	1,080	1,045	1,490	1,250	1,280	1,430	1,155	1,190
	Strontium (Sr)	0.050	µg/g d.w.	0.806	0.849	1.01	0.762	0.232	0.32	0.75	0.979	1.19	0.153	0.351	1.23	0.63	0.697	0.485	0.225
	Tellurium (Te)	0.020	µg/g d.w.	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
	Thallium (Tl)	0.0020	µg/g d.w.	0.0134	0.0130	0.0156	0.0167	0.0109	0.0091	0.0113	0.0147	0.0212	0.0186	0.0097	0.0117	0.0090	0.0097	0.0115	0.0245
	Tin (Sn)	0.10	µg/g d.w.	0.65	0.32	0.37	0.28	0.23	0.38	0.14	0.27	0.18	0.37	0.26	0.20	0.14	0.23	0.19	0.39
	Uranium (U)	0.0020	µg/g d.w.	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	0.0025
	Vanadium (V)	0.10	µg/g d.w.	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
	Zinc (Zn)	0.50	µg/g d.w.	18.5	18.5	17.1	17.6	23.1	17.6	17.6	19.5	15.9	13.5	18.4	16.7	17.5	14.8	61.2	15.1
	Zirconium (Zr)	0.20	µg/g d.w.	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20

Table C.3: Dry weight (d.w.) metal concentrations in fish liver tissue, Rainy River Project Fish Monitoring, 2015.

Parameter		Lowest Detection Limit	Units	Northern Pike															Walleye
				PINR-NP1-L	PINR-NP2-L	PINR-NP3-L	PINR-NP4-L	PINR-NP5-L	PINR-NP7-L	PINR-NP8-L	PINR-NP9-L	PINR-NP10-L	PINR-NP12-L	PINR-NP13-L	PINR-NP14-L	PINR-NP15-L	PINR-NP16-L	PINR-NP17-L	PINR-WA1-L
				1-Oct-2015	1-Oct-2015	1-Oct-2015	1-Oct-2015	1-Oct-2015	1-Oct-2015	1-Oct-2015	2-Oct-2015	2-Oct-2015	2-Oct-2015	2-Oct-2015	2-Oct-2015	2-Oct-2015	3-Oct-2015	3-Oct-2015	1-Oct-2015
% Moisture		0.25	%	75.5	77.0	75.9	75.5	72.2	60.9	67.4	69.6	66.4	75.0	77.3	60.6	70.4	79.2	71.9	69.4
Total Metals	Aluminum (Al)	2.0	µg/g d.w.	3.9	3.1	2.5	<2.0	2.1	<5.0	<5.0	<5.0	<5.0	2.6	6.5	<5.0	<5.0	3.1	9.1	<5.0
	Antimony (Sb)	0.010	µg/g d.w.	<0.010	0.011	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.010	0.088	<0.010	<0.010	0.046	0.017	<0.010
	Arsenic (As)	0.020	µg/g d.w.	0.286	0.108	0.159	0.104	0.062	0.175	0.125	0.110	0.118	0.114	0.237	0.206	0.239	0.126	0.121	0.197
	Barium (Ba)	0.050	µg/g d.w.	<0.050	<0.050	0.069	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	0.080	<0.050	<0.050	<0.050	<0.050	<0.050
	Beryllium (Be)	0.010	µg/g d.w.	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
	Bismuth (Bi)	0.010	µg/g d.w.	<0.010	0.0145	0.011	0.012	<0.010	0.010	<0.010	<0.010	<0.010	0.016	0.051	0.012	<0.010	0.054	0.031	<0.010
	Boron (B)	1.0	µg/g d.w.	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	Cadmium (Cd)	0.0050	µg/g d.w.	0.251	0.173	0.279	0.0304	0.148	0.072	0.073	0.083	0.282	0.170	0.600	0.069	0.112	0.237	0.458	1.90
	Calcium (Ca)	20	µg/g d.w.	126	150	171	109	126	130	118	131	81	126	285	126	126	180	163	388
	Cesium (Cs)	0.0050	µg/g d.w.	0.0127	0.0215	0.0073	0.0072	0.0073	0.0056	0.0090	0.0064	0.0196	0.0104	0.0132	0.0054	0.0110	0.0302	0.0093	0.0145
	Chromium (Cr)	0.050	µg/g d.w.	<0.050	<0.050	<0.050	<0.050	<0.050	<0.20	<0.20	<0.20	<0.20	<0.050	<0.050	0.37	<0.20	<0.050	0.065	<0.20
	Cobalt (Co)	0.020	µg/g d.w.	0.171	0.123	0.236	0.130	0.071	0.090	0.103	0.163	0.104	0.240	0.357	0.139	0.100	0.149	0.224	0.764
	Copper (Cu)	0.10	µg/g d.w.	101	54.0	59.1	78.0	34.7	70.9	49.0	111	84.2	82.8	238	121	81.7	85.5	87.5	10.2
	Iron (Fe)	3.0	µg/g d.w.	266	124.1	594	202	57.1	286	189	486	513	112	1980	588	320	198	675	393
	Lead (Pb)	0.020	µg/g d.w.	0.021	0.044	0.037	<0.020	0.032	<0.050	<0.050	<0.050	<0.050	<0.020	2.21	<0.050	<0.050	0.027	0.022	<0.050
	Lithium (Li)	0.50	µg/g d.w.	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	Magnesium (Mg)	2.0	µg/g d.w.	654	671	878	763	671	446	502	587	472	738	825	491	686	742	457	665
	Manganese (Mn)	0.050	µg/g d.w.	6.34	9.39	6.76	4.23	3.18	3.57	2.79	4.08	4.51	3.38	5.21	3.37	9.74	10.2	3.24	13.8
	Mercury (Hg)	0.0050	µg/g d.w.	0.372	0.640	0.620	0.365	0.311	0.175	0.180	0.242	0.276	0.493	1.70	0.220	0.255	0.992	1.29	0.419
	Molybdenum (Mo)	0.020	µg/g d.w.	0.495	0.395	0.565	0.560	0.285	0.439	0.448	0.768	0.522	0.541	0.834	0.458	0.488	0.462	0.660	0.433
	Nickel (Ni)	0.20	µg/g d.w.	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
	Phosphorus (P)	10	µg/g d.w.	11,500	12,100	15,300	13,900	11,800	7,510	7,590	9,140	7,160	13,900	15,000	7,530	10,800	13,100	8,040	10,300
	Potassium (K)	20	µg/g d.w.	13,300	13,800	15,000	12,500	11,600	6,440	7,780	9,870	7,710	11,300	15,200	7,110	10,800	14,600	8,680	8,990
	Rubidium (Rb)	0.050	µg/g d.w.	28.8	34.4	24.5	20.3	13.5	10.4	15.3	25.2	25.1	21.6	23.6	14.0	22.4	32.9	18.6	15.5
	Selenium (Se)	0.050	µg/g d.w.	6.51	4.66	6.68	4.02	3.56	4.35	4.02	5.99	5.19	5.77	10.3	3.78	5.23	5.48	6.81	3.68
	Sodium (Na)	20	µg/g d.w.	2,530	3,080	3,180	2,210	2,150	1,840	2,280	2,530	1,730	2,250	2,820	1,650	2,210	4,040	3,560	3,310
	Strontium (Sr)	0.050	µg/g d.w.	0.096	0.095	0.129	0.089	0.080	<0.10	<0.10	0.13	<0.10	0.088	0.153	0.10	<0.10	0.112	0.159	0.17
	Tellurium (Te)	0.020	µg/g d.w.	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	0.024	0.025	<0.020
	Thallium (Tl)	0.0020	µg/g d.w.	0.0148	0.0161	0.0150	0.0164	0.0087	0.0108	0.0087	0.0125	0.0173	0.0191	0.0311	0.0089	0.0140	0.0487	0.0159	0.0525
	Tin (Sn)	0.10	µg/g d.w.	0.16	0.24	0.17	0.53	0.15	0.14	0.24	0.28	0.34	0.42	1.20	0.19	0.41	0.24	0.17	0.64
	Uranium (U)	0.0020	µg/g d.w.	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	0.0046	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020
	Vanadium (V)	0.10	µg/g d.w.	0.71	0.33	0.43	0.16	0.16	0.22	0.12	0.41	0.56	0.34	2.67	0.36	0.32	0.55	1.28	0.15
	Zinc (Zn)	0.50	µg/g d.w.	153	113	179	135	112	131	169	274	171	138	231	153	199	135	184	149
	Zirconium (Zr)	0.20	µg/g d.w.	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20

Table C.4: Dry weight (d.w.) metal concentrations in fish ovaries, Rainy River Project Fish Monitoring, 2015.

Parameter		Lowest Detection Limit	Units	Northern Pike								
				PINR-NP1-G	PINR-NP2-G	PINR-NP3-G	PINR-NP4-G	PINR-NP5-G	PINR-NP12-G	PINR-NP13-G	PINR-NP15-G	PINR-NP16-G
				1-Oct-2015	1-Oct-2015	1-Oct-2015	1-Oct-2015	1-Oct-2015	2-Oct-2015	2-Oct-2015	2-Oct-2015	3-Oct-2015
% Moisture		0.25	%	82.4	75.6	76.8	77.0	74.4	78.4	81.7	77.8	79.2
Total Metals	Aluminum (Al)	2.0	µg/g d.w.	3.1	<2.0	<2.0	<2.0	<2.0	<2.0	5.1	<5.0	2.2
	Antimony (Sb)	0.010	µg/g d.w.	<0.010	0.010	0.010	<0.010	<0.010	<0.010	0.016	<0.010	0.010
	Arsenic (As)	0.020	µg/g d.w.	0.184	0.139	0.113	0.085	0.068	0.099	0.155	0.105	0.114
	Barium (Ba)	0.050	µg/g d.w.	0.102	0.251	0.576	0.570	0.344	0.352	0.208	0.060	0.231
	Beryllium (Be)	0.010	µg/g d.w.	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
	Bismuth (Bi)	0.010	µg/g d.w.	<0.010	0.011	<0.010	<0.010	<0.010	0.010	0.014	<0.010	0.012
	Boron (B)	1.0	µg/g d.w.	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	Cadmium (Cd)	0.0050	µg/g d.w.	0.0472	0.0292	0.0249	0.0190	0.0356	0.0295	0.0409	0.0600	0.0317
	Calcium (Ca)	20	µg/g d.w.	537	681	663	576	555	577	594	572	838
	Cesium (Cs)	0.0050	µg/g d.w.	0.0227	0.0138	0.0111	0.0094	0.0083	0.0166	0.0264	0.0173	0.0229
	Chromium (Cr)	0.050	µg/g d.w.	<0.050	<0.050	<0.050	<0.050	0.116	<0.050	<0.050	<0.20	<0.20
	Cobalt (Co)	0.020	µg/g d.w.	0.408	0.261	0.289	0.287	0.169	0.403	0.484	0.323	0.225
	Copper (Cu)	0.10	µg/g d.w.	5.26	4.72	5.32	5.49	4.72	5.86	5.92	6.69	5.00
	Iron (Fe)	3.0	µg/g d.w.	218	201	252	311	168	237	333	309	253
	Lead (Pb)	0.020	µg/g d.w.	0.023	<0.020	<0.020	<0.020	<0.020	<0.020	0.140	<0.050	0.021
	Lithium (Li)	0.50	µg/g d.w.	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	Magnesium (Mg)	2.0	µg/g d.w.	1340	1320	1200	1410	1330	1430	1250	1250	1315
	Manganese (Mn)	0.050	µg/g d.w.	149	122	153	245	130	198	128	222	108
	Mercury (Hg)	0.0050	µg/g d.w.	0.160	0.0976	0.129	0.0762	0.0752	0.0889	0.364	0.0889	0.262
	Molybdenum (Mo)	0.020	µg/g d.w.	0.264	0.158	0.205	0.197	0.132	0.211	0.277	0.173	0.137
	Nickel (Ni)	0.20	µg/g d.w.	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
	Phosphorus (P)	10	µg/g d.w.	17,600	13,900	13,800	14,600	13,900	14,500	16,000	14,100	14,800
	Potassium (K)	20	µg/g d.w.	22,200	13,900	15,100	15,300	13,400	15,800	20,600	18,700	17,100
	Rubidium (Rb)	0.050	µg/g d.w.	27.6	18.1	20.0	20.4	14.7	23.8	25.4	24.4	24.6
	Selenium (Se)	0.050	µg/g d.w.	8.42	5.25	4.02	4.63	3.91	4.70	4.35	7.68	5.89
	Sodium (Na)	20	µg/g d.w.	4,590	3,160	3,070	2,760	2,460	2,930	4,890	3,240	4,725
	Strontium (Sr)	0.050	µg/g d.w.	0.307	0.620	0.674	0.748	0.551	0.539	0.322	0.35	0.619
	Tellurium (Te)	0.020	µg/g d.w.	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
	Thallium (Tl)	0.0020	µg/g d.w.	0.0293	0.0219	0.0256	0.0225	0.0182	0.0246	0.0279	0.0173	0.0181
	Tin (Sn)	0.10	µg/g d.w.	0.24	0.14	0.11	0.15	<0.10	<0.10	0.14	0.53	0.20
	Uranium (U)	0.0020	µg/g d.w.	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020
	Vanadium (V)	0.10	µg/g d.w.	0.20	<0.10	0.14	<0.10	<0.10	<0.10	0.46	0.12	<0.10
	Zinc (Zn)	0.50	µg/g d.w.	385	263	335	396	260	364	449	571	312
	Zirconium (Zr)	0.20	µg/g d.w.	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20

Table C.5: Wet weight (w.w.) metal concentrations in fish muscle tissue, Rainy River Project Fish Tissue Monitoring, 2015.

Parameter		Lowest Detection Limit	Units	Benchmark[1,2]	Northern Pike														Walleye
					PINR-NP1-M	PINR-NP2-M	PINR-NP3-M	PINR-NP4-M	PINR-NP5-M	PINR-NP7-M	PINR-NP8-M	PINR-NP9-M	PINR-NP10-M	PINR-NP12-M	PINR-NP13-M	PINR-NP14-M	PINR-NP15-M	PINR-NP16-M	PINR-NP17-M	PINR-WA1-M
					1-Oct-2015	1-Oct-2015	1-Oct-2015	1-Oct-2015	1-Oct-2015	1-Oct-2015	1-Oct-2015	2-Oct-2015	2-Oct-2015	2-Oct-2015	2-Oct-2015	2-Oct-2015	2-Oct-2015	3-Oct-2015	3-Oct-2015	1-Oct-2015
	% Moisture	0.25	%	-	78.2	77.1	79.6	78.9	76.5	78.0	76.1	78.3	77.3	78.2	78.9	77.0	76.4	79.2	77.8	79.1
Total Metals	Aluminum (Al)	2.0	mg/kg w.w.	-	0.7	1.9	2.7	0.7	0.6	<1.1	<1.2	0.5	<0.45	0.55	0.8	<0.46	<1.2	0.8	0.5	0.5
	Antimony (Sb)	0.010	mg/kg w.w.	0.3	<0.0022	<0.0023	<0.0020	<0.0021	<0.0024	<0.0022	<0.0024	<0.0022	<0.0023	0.0026	<0.0021	<0.0023	<0.0024	<0.0021	<0.0022	<0.0021
	Arsenic (As)	0.020	mg/kg w.w.	0.2	0.126	0.081	0.120	0.064	0.064	0.070	0.081	0.089	0.133	0.089	0.106	0.103	0.088	0.089	0.099	0.102
	Barium (Ba)	0.050	mg/kg w.w.	126	0.041	0.064	0.050	0.033	0.020	0.033	0.036	0.049	0.089	0.012	0.020	0.079	0.025	0.026	0.034	0.018
	Beryllium (Be)	0.010	mg/kg w.w.	1.3	<0.0022	<0.0023	<0.0020	<0.0021	<0.0024	<0.0022	<0.0024	<0.0022	<0.0023	<0.0022	<0.0021	<0.0023	<0.0024	<0.0021	<0.0022	<0.0021
	Bismuth (Bi)	0.010	mg/kg w.w.	-	0.002	<0.0023	<0.0020	0.003	<0.0024	0.002	<0.0024	<0.0022	0.002	0.003	0.003	<0.0023	<0.0024	0.002	0.003	<0.0021
	Boron (B)	1.0	mg/kg w.w.	63.1	<0.22	<0.23	<0.20	<0.21	<0.24	<0.22	<0.24	<0.22	<0.23	<0.22	<0.21	<0.23	<0.24	<0.21	<0.22	<0.21
	Cadmium (Cd)	0.0050	mg/kg w.w.	0.6	<0.0011	<0.0011	<0.0010	<0.0011	<0.0012	<0.0022	<0.0024	<0.0011	<0.0011	<0.0011	0.0012	<0.0012	<0.0024	0.0073	0.0011	<0.0010
	Calcium (Ca)	20	mg/kg w.w.	-	249	309	375	255	175	138	476	265	543	114	144	557	228	129	241	127
	Cesium (Cs)	0.0050	mg/kg w.w.	-	0.0059	0.0047	0.0041	0.0030	0.0040	0.0047	0.0055	0.0030	0.0120	0.0060	0.0092	0.0047	0.0033	0.0084	0.0086	0.0064
	Chromium (Cr)	0.050	mg/kg w.w.	0.6	<0.011	<0.023	0.011	<0.011	<0.012	<0.044	0.09	<0.011	<0.011	<0.011	<0.011	<0.012	0.06	<0.010	<0.039	<0.010
	Cobalt (Co)	0.020	mg/kg w.w.	-	<0.0044	<0.0046	0.004	<0.0042	<0.0047	<0.0044	<0.0048	<0.0043	<0.0045	<0.0044	<0.0042	0.005	<0.0047	<0.0042	<0.0045	<0.0042
	Copper (Cu)	0.10	mg/kg w.w.	57.4	0.17	0.20	0.18	0.16	0.14	0.19	0.27	0.22	0.16	0.13	0.12	0.23	0.19	0.20	0.19	0.15
	Iron (Fe)	3.0	mg/kg w.w.	-	3.2	4.4	3.2	2.1	1.6	2.3	3.2	2.8	3.2	1.1	3.6	1.7	3.7	3.0	2.5	2.2
	Lead (Pb)	0.020	mg/kg w.w.	2.3	0.009	0.012	0.017	0.004	0.005	<0.011	0.014	<0.0043	<0.0045	<0.0044	0.074	<0.005	<0.012	0.005	0.005	0.007
	Lithium (Li)	0.50	mg/kg w.w.	-	<0.11	<0.11	<0.10	<0.11	<0.12	<0.11	<0.12	<0.11	<0.11	<0.11	<0.11	<0.12	<0.12	<0.10	<0.11	<0.10
	Magnesium (Mg)	2.0	mg/kg w.w.	-	329	327	328	340	350	337	437	297	354	328	333	384	359	331	337	368
	Manganese (Mn)	0.050	mg/kg w.w.	76.9	0.35	0.55	0.57	0.28	0.28	0.26	1.02	0.36	0.81	0.19	0.25	0.80	0.35	0.24	0.29	0.163
	Mercury (Hg)	0.0050	mg/kg w.w.	0.5	0.382	0.270	0.386	0.281	0.322	0.148	0.142	0.186	0.288	0.408	0.711	0.145	0.148	0.589	0.731	0.299
	Molybdenum (Mo)	0.020	mg/kg w.w.	3.2	<0.0044	<0.0046	<0.0041	<0.0042	<0.0047	<0.0088	<0.0096	0.005	<0.0045	<0.0044	0.004	<0.0046	<0.0094	0.006	<0.0045	<0.0042
	Nickel (Ni)	0.20	mg/kg w.w.	0.7	<0.044	<0.046	<0.041	<0.042	<0.047	<0.044	<0.048	<0.043	<0.045	<0.044	<0.042	<0.046	<0.047	<0.042	<0.045	<0.042
	Phosphorus (P)	10	mg/kg w.w.	-	2,354	2,473	2,305	2,616	2,773	2,222	2,605	2,322	2,747	2,455	2,384	2,990	2,136	2,350	2,559	2,508
	Potassium (K)	20	mg/kg w.w.	-	3,989	4,191	3,876	4,663	5,006	3,982	4,541	3,993	4,563	4,407	4,199	5,037	3,870	4,222	4,339	4,514
	Rubidium (Rb)	0.050	mg/kg w.w.	-	4.6	4.9	4.2	5.0	4.5	4.9	5.8	4.9	5.5	5.6	4.4	5.5	4.4	5.6	6.2	7.0
	Selenium (Se)	0.050	mg/kg w.w.	3.2	0.24	0.224	0.178	0.173	0.217	0.19	0.19	0.203	0.27	0.176	0.182	0.23	0.26	0.176	0.199	0.29
	Sodium (Na)	20	mg/kg w.w.	-	301	346	292	333	327	277	332	271	245	228	314	288	302	297	257	249
	Strontium (Sr)	0.050	mg/kg w.w.	378	0.176	0.194	0.21	0.161	0.055	0.07	0.18	0.212	0.27	0.033	0.074	0.28	0.15	0.145	0.108	0.047
	Tellurium (Te)	0.020	mg/kg w.w.	-	<0.0044	<0.0046	<0.0041	<0.0042	<0.0047	<0.0044	<0.0048	<0.0043	<0.0045	<0.0044	<0.0042	<0.0046	<0.0047	<0.0042	<0.0045	<0.0042
	Thallium (Tl)	0.0020	mg/kg w.w.	-	0.0029	0.0030	0.0032	0.0035	0.0026	0.0020	0.0027	0.0032	0.0048	0.0041	0.0020	0.0027	0.0021	0.0020	0.0026	0.0051
	Tin (Sn)	0.10	mg/kg w.w.	-	0.14	0.07	0.08	0.06	0.05	0.08	0.03	0.06	0.04	0.08	0.05	0.05	0.03	0.05	0.04	0.08
	Uranium (U)	0.0020	mg/kg w.w.	0.4	<0.00044	<0.00046	<0.00041	<0.00042	<0.00047	<0.00044	<0.00048	<0.00043	<0.00045	<0.00044	<0.00042	<0.00046	<0.00047	<0.00042	<0.00045	0.0005
	Vanadium (V)	0.10	mg/kg w.w.	-	<0.022	<0.023	<0.020	<0.021	<0.024	<0.022	<0.024	<0.022	<0.023	<0.022	<0.021	<0.023	<0.024	<0.021	<0.022	<0.021
	Zinc (Zn)	0.50	mg/kg w.w.	189	4.0	4.2	3.5	3.7	5.4	3.9	4.2	4.2	3.6	2.9	3.9	3.8	4.1	3.1	13.6	3.2
	Zirconium (Zr)	0.20	mg/kg w.w.	-	<0.044	<0.046	<0.041	<0.042	<0.047	<0.044	<0.048	<0.043	<0.045	<0.044	<0.042	<0.046	<0.047	<0.042	<0.045	<0.042

Indicates value greater than benchmark.

[1] Mercury guideline for women of child-bearing age and children under 15 (see Table 2.1, MOECC 2015).

[2] See Table 2.2 for Consumption Benchmark References.

Table C.6: Wet weight (w.w.) metal concentrations in fish liver tissue, Rainy River Project Fish Tissue Monitoring, 2015.

Parameter		Lowest Detection Limit	Units	Benchmark[1,2]	Northern Pike														Walleye
					PINR-NP1-L	PINR-NP2-L	PINR-NP3-L	PINR-NP4-L	PINR-NP5-L	PINR-NP7-L	PINR-NP8-L	PINR-NP9-L	PINR-NP10-L	PINR-NP12-L	PINR-NP13-L	PINR-NP14-L	PINR-NP15-L	PINR-NP16-L	PINR-NP17-L	PINR-WA1-L
					1-Oct-2015	1-Oct-2015	1-Oct-2015	1-Oct-2015	1-Oct-2015	1-Oct-2015	1-Oct-2015	2-Oct-2015	2-Oct-2015	2-Oct-2015	2-Oct-2015	2-Oct-2015	2-Oct-2015	3-Oct-2015	3-Oct-2015	1-Oct-2015
% Moisture		0.25	%	-	75.5	77.0	75.9	75.5	72.2	60.9	67.4	69.6	66.4	75.0	77.3	60.6	70.4	79.2	71.9	69.4
Total Metals	Aluminum (Al)	2.0	mg/kg w.w.	-	1.0	0.7	0.6	<0.49	0.6	<2.0	<1.6	<1.5	<1.7	0.7	1.5	<2.0	<1.5	0.6	2.6	<1.5
	Antimony (Sb)	0.010	mg/kg w.w.	0.3	<0.0025	0.0025	<0.0024	<0.0025	<0.0028	<0.0039	<0.0033	<0.0030	<0.0034	0.003	0.020	<0.0039	<0.0030	0.010	0.005	<0.0031
	Arsenic (As)	0.020	mg/kg w.w.	0.2	0.070	0.025	0.038	0.025	0.017	0.068	0.041	0.033	0.040	0.029	0.054	0.081	0.071	0.026	0.034	0.060
	Barium (Ba)	0.050	mg/kg w.w.	126	<0.012	<0.012	0.017	<0.012	<0.014	<0.020	<0.016	<0.015	<0.017	<0.013	0.018	<0.020	<0.015	<0.010	<0.014	<0.015
	Beryllium (Be)	0.010	mg/kg w.w.	1.3	<0.0025	<0.0023	<0.0024	<0.0025	<0.0028	<0.0039	<0.0033	<0.0030	<0.0034	<0.0025	<0.0023	<0.0039	<0.0030	<0.0021	<0.0028	<0.0031
	Bismuth (Bi)	0.010	mg/kg w.w.	-	<0.0025	0.0033	0.003	0.003	<0.0028	0.004	<0.0033	<0.0030	<0.0034	0.004	0.012	0.005	<0.0030	0.011	0.009	<0.0031
	Boron (B)	1.0	mg/kg w.w.	63.1	<0.25	<0.23	<0.24	<0.25	<0.28	<0.39	<0.33	<0.30	<0.34	<0.25	<0.23	<0.39	<0.30	<0.21	<0.28	<0.31
	Cadmium (Cd)	0.0050	mg/kg w.w.	0.6	0.061	0.039	0.067	0.0074	0.041	0.028	0.024	0.025	0.095	0.043	0.136	0.027	0.033	0.049	0.129	0.58
	Calcium (Ca)	20	mg/kg w.w.	-	31	34	41	27	35	51	38	40	27	32	65	50	37	37	46	119
	Cesium (Cs)	0.0050	mg/kg w.w.	-	0.0031	0.0049	0.0018	0.0018	0.0020	0.0022	0.0029	0.0019	0.0066	0.0026	0.0030	0.0021	0.0033	0.0063	0.0026	0.0044
	Chromium (Cr)	0.050	mg/kg w.w.	0.6	<0.012	<0.012	<0.012	<0.012	<0.014	<0.078	<0.065	<0.061	<0.067	<0.013	<0.011	0.15	<0.059	<0.010	0.018	<0.061
	Cobalt (Co)	0.020	mg/kg w.w.	-	0.042	0.028	0.057	0.032	0.020	0.035	0.034	0.050	0.035	0.060	0.081	0.055	0.030	0.031	0.063	0.234
	Copper (Cu)	0.10	mg/kg w.w.	57.4	25	12.2	14.2	19.1	9.6	27.7	16.0	34	28.3	20.7	54	48	24.2	17.8	24.6	3.1
	Iron (Fe)	3.0	mg/kg w.w.	-	65	27.6	143	49	15.9	112	62	148	172	28	449	232	95	41	190	120
	Lead (Pb)	0.020	mg/kg w.w.	2.3	0.005	0.010	0.009	<0.005	0.009	<0.020	<0.016	<0.015	<0.017	<0.0050	0.50	<0.020	<0.015	0.006	0.006	<0.015
	Lithium (Li)	0.50	mg/kg w.w.	-	<0.12	<0.12	<0.12	<0.12	<0.14	<0.20	<0.16	<0.15	<0.17	<0.13	<0.11	<0.20	<0.15	<0.10	<0.14	<0.15
	Magnesium (Mg)	2.0	mg/kg w.w.	-	160	155	212	187	187	174	164	178	159	185	187	193	203	154	128	203
	Manganese (Mn)	0.050	mg/kg w.w.	76.9	1.55	2.17	1.63	1.04	0.88	1.40	0.91	1.24	1.52	0.85	1.18	1.33	2.88	2.1	0.91	4.2
	Mercury (Hg)	0.0050	mg/kg w.w.	0.5	0.091	0.142	0.149	0.0894	0.0865	0.0684	0.0587	0.0736	0.0927	0.123	0.386	0.0867	0.0755	0.206	0.362	0.128
	Molybdenum (Mo)	0.020	mg/kg w.w.	3.2	0.121	0.091	0.136	0.137	0.079	0.172	0.146	0.233	0.175	0.135	0.189	0.180	0.144	0.096	0.185	0.132
	Nickel (Ni)	0.20	mg/kg w.w.	0.7	<0.049	<0.046	<0.048	<0.049	<0.056	<0.078	<0.065	<0.061	<0.067	<0.050	<0.045	<0.079	<0.059	<0.042	<0.056	<0.061
	Phosphorus (P)	10	mg/kg w.w.	-	2,818	2,796	3,687	3,406	3,280	2,936	2,474	2,779	2,406	3,475	3,405	2,967	3,197	2,725	2,259	3,152
	Potassium (K)	20	mg/kg w.w.	-	3,259	3,187	3,615	3,063	3,225	2,518	2,536	3,000	2,591	2,825	3,450	2,801	3,197	3,037	2,439	2,751
	Rubidium (Rb)	0.050	mg/kg w.w.	-	7.1	8.0	5.9	5.0	3.8	4.1	5.0	7.7	8.4	5.4	5.4	5.5	6.6	6.8	5.2	4.7
	Selenium (Se)	0.050	mg/kg w.w.	3.2	1.59	1.07	1.61	0.98	0.99	1.70	1.31	1.82	1.74	1.44	2.3	1.49	1.55	1.14	1.91	1.13
	Sodium (Na)	20	mg/kg w.w.	-	620	695	766	541	598	719	743	769	581	563	640	650	654	840	1,000	1,013
	Strontium (Sr)	0.050	mg/kg w.w.	378	0.024	0.022	0.031	0.022	0.022	<0.0391	<0.0326	0.04	<0.0336	0.022	0.035	0.04	<0.0296	0.023	0.045	0.05
	Tellurium (Te)	0.020	mg/kg w.w.	-	<0.0049	<0.0046	<0.0048	<0.0049	<0.0056	<0.0078	<0.0065	<0.0061	<0.0067	<0.0050	<0.0045	<0.0079	<0.0059	0.005	0.007	<0.0061
	Thallium (Tl)	0.0020	mg/kg w.w.	-	0.0036	0.0037	0.0036	0.0040	0.0024	0.0042	0.0028	0.0038	0.0058	0.0048	0.0071	0.0035	0.0041	0.0101	0.0045	0.0161
	Tin (Sn)	0.10	mg/kg w.w.	-	0.04	0.05	0.04	0.13	0.04	0.05	0.08	0.09	0.11	0.11	0.27	0.07	0.12	0.05	0.05	0.20
	Uranium (U)	0.0020	mg/kg w.w.	0.4	<0.00049	<0.00046	<0.00048	<0.00049	<0.00056	<0.00078	<0.00065	<0.00061	<0.00067	<0.00050	0.0010	<0.00079	<0.00059	<0.00042	<0.00056	<0.00061
	Vanadium (V)	0.10	mg/kg w.w.	-	0.17	0.07	0.10	0.04	0.04	0.09	0.04	0.12	0.19	0.09	0.61	0.14	0.09	0.11	0.36	0.05
	Zinc (Zn)	0.50	mg/kg w.w.	189	37	26	43	33	31	51	55	83	57	35	52	60	59	28	52	46
	Zirconium (Zr)	0.20	mg/kg w.w.	-	<0.049	<0.046	<0.048	<0.049	<0.056	<0.078	<0.065	<0.061	<0.067	<0.050	<0.045	<0.079	<0.059	<0.042	<0.056	<0.061

Indicates value greater than benchmark.

[1] Mercury guideline for women of child-bearing age and children under 15 (see Table 2.1, MOECC 2015).

[2] See Table 2.2 for Consumption Benchmark References.

Table C.7: Wet weight (w.w.) metal concentrations in fish ovaries, Rainy River Project Fish Tissue Monitoring, 2015.

Parameter		Lowest Detection Limit	Units	Benchmark[1,2]	Northern Pike								
					PINR-NP1-G	PINR-NP2-G	PINR-NP3-G	PINR-NP4-G	PINR-NP5-G	PINR-NP12-G	PINR-NP13-G	PINR-NP15-G	PINR-NP16-G
					1-Oct-2015	1-Oct-2015	1-Oct-2015	1-Oct-2015	1-Oct-2015	2-Oct-2015	2-Oct-2015	2-Oct-2015	3-Oct-2015
	% Moisture	0.25	%	-	82.4	75.6	76.8	77.0	74.4	78.4	81.7	77.8	79.2
Total Metals	Aluminum (Al)	2.0	mg/kg w.w.	-	0.5	<0.49	<0.46	<0.46	<0.51	<0.43	0.9	<1.1	0.46
	Antimony (Sb)	0.010	mg/kg w.w.	0.3	<0.0018	0.002	0.002	<0.0023	<0.0026	<0.0022	0.003	<0.0022	0.0021
	Arsenic (As)	0.020	mg/kg w.w.	0.2	0.032	0.034	0.026	0.020	0.017	0.021	0.028	0.023	0.024
	Barium (Ba)	0.050	mg/kg w.w.	126	0.018	0.061	0.134	0.131	0.088	0.076	0.038	0.013	0.048
	Beryllium (Be)	0.010	mg/kg w.w.	1.3	<0.0018	<0.0024	<0.0023	<0.0023	<0.0026	<0.0022	<0.0018	<0.0022	<0.0021
	Bismuth (Bi)	0.010	mg/kg w.w.	-	<0.0018	0.003	<0.0023	<0.0023	<0.0026	0.002	0.003	<0.0022	0.0025
	Boron (B)	1.0	mg/kg w.w.	63.1	<0.18	<0.24	<0.23	<0.23	<0.26	<0.22	<0.18	<0.22	<0.21
	Cadmium (Cd)	0.0050	mg/kg w.w.	0.6	0.0083	0.0071	0.0058	0.0044	0.0091	0.0064	0.0075	0.013	0.0066
	Calcium (Ca)	20	mg/kg w.w.	-	95	166	154	132	142	125	109	127	174
	Cesium (Cs)	0.0050	mg/kg w.w.	-	0.0040	0.0034	0.0026	0.0022	0.0021	0.0036	0.0048	0.0038	0.0048
	Chromium (Cr)	0.050	mg/kg w.w.	0.6	<0.0088	<0.012	<0.012	<0.012	0.030	<0.011	<0.0092	<0.044	<0.010
	Cobalt (Co)	0.020	mg/kg w.w.	-	0.072	0.064	0.067	0.066	0.043	0.087	0.089	0.072	0.047
	Copper (Cu)	0.10	mg/kg w.w.	57.4	0.93	1.15	1.23	1.26	1.21	1.27	1.08	1.49	1.04
	Iron (Fe)	3.0	mg/kg w.w.	-	38	49	58	72	43	51	61	69	52.5
	Lead (Pb)	0.020	mg/kg w.w.	2.3	0.004	<0.0049	<0.0046	<0.0046	<0.0051	<0.0043	0.026	<0.011	0.0043
	Lithium (Li)	0.50	mg/kg w.w.	-	<0.09	<0.12	<0.12	<0.12	<0.13	<0.11	<0.09	<0.11	<0.10
	Magnesium (Mg)	2.0	mg/kg w.w.	-	236	322	278	324	340	309	229	278	273.5
	Manganese (Mn)	0.050	mg/kg w.w.	76.9	26	30	35	56	33	43	23	49	22.4
	Mercury (Hg)	0.0050	mg/kg w.w.	0.5	0.0282	0.0238	0.0299	0.0175	0.0193	0.0192	0.0666	0.0197	0.0545
	Molybdenum (Mo)	0.020	mg/kg w.w.	3.2	0.046	0.039	0.048	0.045	0.034	0.046	0.051	0.038	0.028
	Nickel (Ni)	0.20	mg/kg w.w.	0.7	<0.035	<0.049	<0.046	<0.046	<0.051	<0.043	<0.037	<0.044	<0.042
	Phosphorus (P)	10	mg/kg w.w.	-	3,098	3,392	3,202	3,358	3,558	3,132	2,928	3,130	3,078
	Potassium (K)	20	mg/kg w.w.	-	3,907	3,392	3,503	3,519	3,430	3,413	3,770	4,151	3,557
	Rubidium (Rb)	0.050	mg/kg w.w.	-	4.9	4.4	4.6	4.7	3.8	5.1	4.6	5.4	5.12
	Selenium (Se)	0.050	mg/kg w.w.	3.2	1.48	1.28	0.93	1.06	1.00	1.02	0.80	1.70	1.22
	Sodium (Na)	20	mg/kg w.w.	-	808	771	712	635	630	633	895	719	982.8
	Strontium (Sr)	0.050	mg/kg w.w.	378	0.054	0.151	0.156	0.172	0.141	0.116	0.059	0.08	0.129
	Tellurium (Te)	0.020	mg/kg w.w.	-	<0.0035	<0.0049	<0.0046	<0.0046	<0.0051	<0.0043	<0.0037	<0.0044	<0.0042
	Thallium (Tl)	0.0020	mg/kg w.w.	-	0.0052	0.0053	0.0059	0.0052	0.0047	0.0053	0.0051	0.0038	0.00375
	Tin (Sn)	0.10	mg/kg w.w.	-	0.04	0.03	0.03	0.03	<0.0256	<0.0216	0.03	0.12	0.041
	Uranium (U)	0.0020	mg/kg w.w.	0.4	<0.00035	<0.00049	<0.00046	<0.00046	<0.00051	<0.00043	<0.00037	<0.00044	<0.00042
	Vanadium (V)	0.10	mg/kg w.w.	-	0.04	<0.024	0.03	<0.023	<0.026	<0.022	0.08	0.03	0.0208
	Zinc (Zn)	0.50	mg/kg w.w.	189	68	64	78	91	67	79	82	127	64.8
	Zirconium (Zr)	0.20	mg/kg w.w.	-	<0.035	<0.049	<0.046	<0.046	<0.051	<0.043	<0.037	<0.044	<0.042

Indicates value greater than benchmark.

[1] Mercury guideline for women of child-bearing age and children under 15 (see Table 2.1, MOECC 2015).

[2] See Table 2.2 for Consumption Benchmark References.

MINNOW ENVIRONMENTAL INC.
ATTN: Jess Tester
2 Lamb Street
Georgetown ON L7G 3M9

Date Received: 19-NOV-15
Report Date: 18-FEB-16 16:28 (MT)
Version: FINAL REV. 2

Client Phone: 905-873-3371

Certificate of Analysis

Lab Work Order #: L1704817

Project P.O. #: NOT SUBMITTED
Job Reference: 157202.0075
C of C Numbers:
Legal Site Desc:

Comments: ADDITIONAL 17-FEB-16 16:10

18-FEB-2016 Revision 2: This revision includes additional iron data obtained via re-analysis of the sample ALS identify as L1704817-7 as requested.

<Original signed by>

Can Dang
Senior Account Manager

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ALS ENVIRONMENTAL ANALYTICAL REPORT

Grouping	Analyte	L1704817-1 Tissue 01-OCT-15 PINR-NP1-M	L1704817-2 Tissue 01-OCT-15 PINR-NP2-M	L1704817-3 Tissue 01-OCT-15 PINR-NP3-M	L1704817-4 Tissue 01-OCT-15 PINR-NP4-M	L1704817-5 Tissue 01-OCT-15 PINR-NP5-M
TISSUE						
Physical Tests	% Moisture (%)	78.2	77.1	79.6	78.9	76.5
Metals	Aluminum (Al)-Total (mg/kg)	3.3	8.3	13.0	3.2	2.7
	Antimony (Sb)-Total (mg/kg)	<0.010	<0.010	<0.010	<0.010	<0.010
	Arsenic (As)-Total (mg/kg)	0.576	0.355	0.586	0.304	0.271
	Barium (Ba)-Total (mg/kg)	0.187	0.279	0.243	0.157	0.085
	Beryllium (Be)-Total (mg/kg)	<0.010	<0.010	<0.010	<0.010	<0.010
	Bismuth (Bi)-Total (mg/kg)	0.010	<0.010	<0.010	0.012	<0.010
	Boron (B)-Total (mg/kg)	<1.0	<1.0	<1.0	<1.0	<1.0
	Cadmium (Cd)-Total (mg/kg)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
	Calcium (Ca)-Total (mg/kg)	1140	1350	1840	1210	744
	Cesium (Cs)-Total (mg/kg)	0.0269	0.0205	0.0203	0.0140	0.0169
	Chromium (Cr)-Total (mg/kg)	<0.050	<0.10 DLB	0.056	<0.050	<0.050
	Cobalt (Co)-Total (mg/kg)	<0.020	<0.020	0.022	<0.020	<0.020
	Copper (Cu)-Total (mg/kg)	0.76	0.86	0.86	0.75	0.60
	Iron (Fe)-Total (mg/kg)	14.5	19.0	15.7	10.0	6.6
	Lead (Pb)-Total (mg/kg)	0.039	0.052	0.084	0.021	0.023
	Lithium (Li)-Total (mg/kg)	<0.50	<0.50	<0.50	<0.50	<0.50
	Magnesium (Mg)-Total (mg/kg)	1510	1430	1610	1610	1490
	Manganese (Mn)-Total (mg/kg)	1.59	2.40	2.79	1.35	1.19
	Mercury (Hg)-Total (mg/kg)	1.75	1.18	1.89	1.33	1.37
	Molybdenum (Mo)-Total (mg/kg)	<0.020	<0.020	<0.020	<0.020	<0.020
	Nickel (Ni)-Total (mg/kg)	<0.20	<0.20	<0.20	<0.20	<0.20
	Phosphorus (P)-Total (mg/kg)	10800	10800	11300	12400	11800
	Potassium (K)-Total (mg/kg)	18300	18300	19000	22100	21300
	Rubidium (Rb)-Total (mg/kg)	20.9	21.3	20.7	23.6	19.3
	Selenium (Se)-Total (mg/kg)	1.08	0.979	0.873	0.821	0.925
	Sodium (Na)-Total (mg/kg)	1380	1510	1430	1580	1390
	Strontium (Sr)-Total (mg/kg)	0.806	0.849	1.01	0.762	0.232
	Tellurium (Te)-Total (mg/kg)	<0.020	<0.020	<0.020	<0.020	<0.020
	Thallium (Tl)-Total (mg/kg)	0.0134	0.0130	0.0156	0.0167	0.0109
	Tin (Sn)-Total (mg/kg)	0.65	0.32	0.37	0.28	0.23
	Uranium (U)-Total (mg/kg)	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020
	Vanadium (V)-Total (mg/kg)	<0.10	<0.10	<0.10	<0.10	<0.10
	Zinc (Zn)-Total (mg/kg)	18.5	18.5	17.1	17.6	23.1
	Zirconium (Zr)-Total (mg/kg)	<0.20	<0.20	<0.20	<0.20	<0.20

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Grouping	Analyte	L1704817-6 Tissue 01-OCT-15 PINR-NP7-M	L1704817-7 Tissue 01-OCT-15 PINR-NP8-M	L1704817-8 Tissue 02-OCT-15 PINR-NP9-M	L1704817-9 Tissue 02-OCT-15 PINR-NP10-M	L1704817-10 Tissue 02-OCT-15 PINR-NP12-M
TISSUE						
Physical Tests	% Moisture (%)	78.0	76.1	78.3	77.3	78.8
Metals	Aluminum (Al)-Total (mg/kg)	<5.0	<5.0	2.2	<2.0	<2.0
	Antimony (Sb)-Total (mg/kg)	<0.010	<0.010	<0.010	<0.010	<0.010
	Arsenic (As)-Total (mg/kg)	0.320	0.337	0.412	0.585	0.419
	Barium (Ba)-Total (mg/kg)	0.151	0.149	0.226	0.392	0.060
	Beryllium (Be)-Total (mg/kg)	<0.010	<0.010	<0.010	<0.010	<0.010
	Bismuth (Bi)-Total (mg/kg)	0.010	<0.010	<0.010	0.010	0.011
	Boron (B)-Total (mg/kg)	<1.0	<1.0	<1.0	<1.0	<1.0
	Cadmium (Cd)-Total (mg/kg)	<0.010	<0.010	<0.0050	<0.0050	<0.0050
	Calcium (Ca)-Total (mg/kg)	628	1990	1220	2390	675
	Cesium (Cs)-Total (mg/kg)	0.0214	0.0232	0.0137	0.0530	0.0288
	Chromium (Cr)-Total (mg/kg)	<0.20	0.37	<0.050	<0.050	<0.050
	Cobalt (Co)-Total (mg/kg)	<0.020	<0.020	<0.020	<0.020	<0.020
	Copper (Cu)-Total (mg/kg)	0.86	1.15	1.02	0.69	0.59
	Iron (Fe)-Total (mg/kg)	10.3	109	13.0	14.3	4.9
	Lead (Pb)-Total (mg/kg)	<0.050	0.059	<0.020	<0.020	<0.020
	Lithium (Li)-Total (mg/kg)	<0.50	<0.50	<0.50	<0.50	<0.50
	Magnesium (Mg)-Total (mg/kg)	1530	1830	1370	1560	1570
	Manganese (Mn)-Total (mg/kg)	1.17	4.28	1.66	3.58	1.04
	Mercury (Hg)-Total (mg/kg)	0.671	0.594	0.858	1.27	1.85
	Molybdenum (Mo)-Total (mg/kg)	<0.040	<0.040	0.023	<0.020	<0.020
	Nickel (Ni)-Total (mg/kg)	<0.20	<0.20	<0.20	<0.20	<0.20
	Phosphorus (P)-Total (mg/kg)	10100	10900	10700	12100	11800
	Potassium (K)-Total (mg/kg)	18100	19000	18400	20100	21300
	Rubidium (Rb)-Total (mg/kg)	22.2	24.2	22.4	24.1	26.2
	Selenium (Se)-Total (mg/kg)	0.85	0.81	0.934	1.17	0.826
	Sodium (Na)-Total (mg/kg)	1260	1390	1250	1080	1120
	Strontium (Sr)-Total (mg/kg)	0.32	0.75	0.979	1.19	0.218
	Tellurium (Te)-Total (mg/kg)	<0.020	<0.020	<0.020	<0.020	<0.020
	Thallium (Tl)-Total (mg/kg)	0.0091	0.0113	0.0147	0.0212	0.0147
	Tin (Sn)-Total (mg/kg)	0.38	0.14	0.27	0.18	0.21
	Uranium (U)-Total (mg/kg)	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020
	Vanadium (V)-Total (mg/kg)	<0.10	<0.10	<0.10	<0.10	<0.10
	Zinc (Zn)-Total (mg/kg)	17.6	17.6	19.5	15.9	14.4
	Zirconium (Zr)-Total (mg/kg)	<0.20	<0.20	<0.20	<0.20	<0.20

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Grouping	Analyte	L1704817-11 Tissue 02-OCT-15 PINR-NP13-M	L1704817-12 Tissue 02-OCT-15 PINR-NP14-M	L1704817-13 Tissue 02-OCT-15 PINR-NP15-M	L1704817-14 Tissue 03-OCT-15 PINR-NP16-M	L1704817-15 Tissue 03-OCT-15 PINR-NP17-M
TISSUE						
Physical Tests	% Moisture (%)	78.9	77.0	76.4	79.2	77.7
Metals	Aluminum (Al)-Total (mg/kg)	3.8	<2.0	<5.0	3.9	2.2
	Antimony (Sb)-Total (mg/kg)	<0.010	<0.010	<0.010	<0.010	<0.010
	Arsenic (As)-Total (mg/kg)	0.502	0.448	0.373	0.429	0.457
	Barium (Ba)-Total (mg/kg)	0.096	0.343	0.105	0.124	0.240
	Beryllium (Be)-Total (mg/kg)	<0.010	<0.010	<0.010	<0.010	<0.010
	Bismuth (Bi)-Total (mg/kg)	0.015	<0.010	<0.010	0.011	0.014
	Boron (B)-Total (mg/kg)	<1.0	<1.0	<1.0	<1.0	<1.0
	Cadmium (Cd)-Total (mg/kg)	0.0055	<0.0050	<0.010	0.0352	<0.0050
	Calcium (Ca)-Total (mg/kg)	681	2420	968	618	1740
	Cesium (Cs)-Total (mg/kg)	0.0437	0.0206	0.0141	0.0406	0.0393
	Chromium (Cr)-Total (mg/kg)	<0.050	<0.050	0.25	<0.050	<0.20
	Cobalt (Co)-Total (mg/kg)	<0.020	0.022	<0.020	<0.020	<0.020
	Copper (Cu)-Total (mg/kg)	0.58	1.00	0.81	0.98	0.88
	Iron (Fe)-Total (mg/kg)	17.0	7.5	15.6	14.2	14.5
	Lead (Pb)-Total (mg/kg)	0.353	<0.020	<0.050	0.022	0.021
	Lithium (Li)-Total (mg/kg)	<0.50	<0.50	<0.50	<0.50	<0.50
	Magnesium (Mg)-Total (mg/kg)	1580	1670	1520	1590	1560
	Manganese (Mn)-Total (mg/kg)	1.19	3.48	1.48	1.14	2.06
	Mercury (Hg)-Total (mg/kg)	3.37	0.629	0.628	2.83	3.21
	Molybdenum (Mo)-Total (mg/kg)	0.021	<0.020	<0.040	0.031	<0.020
	Nickel (Ni)-Total (mg/kg)	<0.20	<0.20	<0.20	<0.20	<0.20
	Phosphorus (P)-Total (mg/kg)	11300	13000	9050	11300	11900
	Potassium (K)-Total (mg/kg)	19900	21900	16400	20300	19700
	Rubidium (Rb)-Total (mg/kg)	20.7	23.9	18.6	26.7	28.0
	Selenium (Se)-Total (mg/kg)	0.861	1.00	1.12	0.846	0.888
	Sodium (Na)-Total (mg/kg)	1490	1250	1280	1430	1210
	Strontium (Sr)-Total (mg/kg)	0.351	1.23	0.63	0.697	0.834
	Tellurium (Te)-Total (mg/kg)	<0.020	<0.020	<0.020	<0.020	<0.020
	Thallium (Tl)-Total (mg/kg)	0.0097	0.0117	0.0090	0.0097	0.0115
	Tin (Sn)-Total (mg/kg)	0.26	0.20	0.14	0.23	0.15
	Uranium (U)-Total (mg/kg)	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020
	Vanadium (V)-Total (mg/kg)	<0.10	<0.10	<0.10	<0.10	<0.10
	Zinc (Zn)-Total (mg/kg)	18.4	16.7	17.5	14.8	61.7
	Zirconium (Zr)-Total (mg/kg)	<0.20	<0.20	<0.20	<0.20	<0.20

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Grouping	Analyte	L1704817-16 Tissue 03-OCT-15 PINR-NPX-M	L1704817-17 Tissue 02-OCT-15 PINR-NPY-M	L1704817-18 Tissue 01-OCT-15 PINR-NP1-L	L1704817-19 Tissue 01-OCT-15 PINR-NP2-L	L1704817-20 Tissue 01-OCT-15 PINR-NP3-L
TISSUE						
Physical Tests	% Moisture (%)	77.8	77.5	75.5	75.2	75.9
Metals	Aluminum (Al)-Total (mg/kg)	<2.0	3.0	3.9	2.7	2.5
	Antimony (Sb)-Total (mg/kg)	<0.010	0.014	<0.010	<0.010	<0.010
	Arsenic (As)-Total (mg/kg)	0.437	0.392	0.286	0.123	0.159
	Barium (Ba)-Total (mg/kg)	0.063	<0.050	<0.050	<0.050	0.069
	Beryllium (Be)-Total (mg/kg)	<0.010	<0.010	<0.010	<0.010	<0.010
	Bismuth (Bi)-Total (mg/kg)	0.016	0.020	<0.010	<0.010	0.011
	Boron (B)-Total (mg/kg)	<1.0	<1.0	<1.0	<1.0	<1.0
	Cadmium (Cd)-Total (mg/kg)	<0.0050	<0.0050	0.251	0.154	0.279
	Calcium (Ca)-Total (mg/kg)	426	380	126	142	171
	Cesium (Cs)-Total (mg/kg)	0.0377	0.0266	0.0127	0.0179	0.0073
	Chromium (Cr)-Total (mg/kg)	<0.15 DLB	<0.050	<0.050	<0.050	<0.050
	Cobalt (Co)-Total (mg/kg)	<0.020	<0.020	0.171	0.122	0.236
	Copper (Cu)-Total (mg/kg)	0.81	0.58	101	42.7	59.1
	Iron (Fe)-Total (mg/kg)	7.9	5.5	266	74.1	594
	Lead (Pb)-Total (mg/kg)	<0.020	<0.020	0.021	0.067	0.037
	Lithium (Li)-Total (mg/kg)	<0.50	<0.50	<0.50	<0.50	<0.50
	Magnesium (Mg)-Total (mg/kg)	1470	1440	654	700	878
	Manganese (Mn)-Total (mg/kg)	0.587	0.729	6.34	9.94	6.76
	Mercury (Hg)-Total (mg/kg)	3.36	1.88	0.372	0.372	0.620
	Molybdenum (Mo)-Total (mg/kg)	<0.020	<0.020	0.495	0.419	0.565
	Nickel (Ni)-Total (mg/kg)	<0.20	<0.20	<0.20	<0.20	<0.20
	Phosphorus (P)-Total (mg/kg)	11100	10700	11500	12800	15300
	Potassium (K)-Total (mg/kg)	19300	19100	13300	14500	15000
	Rubidium (Rb)-Total (mg/kg)	27.3	24.9	28.8	38.9	24.5
	Selenium (Se)-Total (mg/kg)	0.901	0.782	6.51	4.65	6.68
	Sodium (Na)-Total (mg/kg)	1100	970	2530	2340	3180
	Strontium (Sr)-Total (mg/kg)	0.135	0.087	0.096	0.093	0.129
	Tellurium (Te)-Total (mg/kg)	<0.020	<0.020	<0.020	<0.020	<0.020
	Thallium (Tl)-Total (mg/kg)	0.0115	0.0224	0.0148	0.0164	0.0150
	Tin (Sn)-Total (mg/kg)	0.22	0.52	0.16	0.27	0.17
	Uranium (U)-Total (mg/kg)	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020
	Vanadium (V)-Total (mg/kg)	<0.10	<0.10	0.71	0.19	0.43
	Zinc (Zn)-Total (mg/kg)	60.7	12.5	153	114	179
	Zirconium (Zr)-Total (mg/kg)	<0.20	<0.20	<0.20	<0.20	<0.20

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Grouping	Analyte	L1704817-21 Tissue 01-OCT-15 PINR-NP4-L	L1704817-22 Tissue 01-OCT-15 PINR-NP5-L	L1704817-23 Tissue 01-OCT-15 PINR-NP7-L	L1704817-24 Tissue 01-OCT-15 PINR-NP8-L	L1704817-25 Tissue 02-OCT-15 PINR-NP9-L
Sample ID / Description / Sampled Date / Sampled Time / Client ID						
TISSUE						
Physical Tests	% Moisture (%)	75.5	72.2	60.9	67.4	69.6
Metals	Aluminum (Al)-Total (mg/kg)	<2.0	2.1	<5.0	<5.0	<5.0
	Antimony (Sb)-Total (mg/kg)	<0.010	<0.010	<0.010	<0.010	<0.010
	Arsenic (As)-Total (mg/kg)	0.104	0.062	0.175	0.125	0.110
	Barium (Ba)-Total (mg/kg)	<0.050	<0.050	<0.050	<0.050	<0.050
	Beryllium (Be)-Total (mg/kg)	<0.010	<0.010	<0.010	<0.010	<0.010
	Bismuth (Bi)-Total (mg/kg)	0.012	<0.010	0.010	<0.010	<0.010
	Boron (B)-Total (mg/kg)	<1.0	<1.0	<1.0	<1.0	<1.0
	Cadmium (Cd)-Total (mg/kg)	0.0304	0.148	0.072	0.073	0.083
	Calcium (Ca)-Total (mg/kg)	109	126	130	118	131
	Cesium (Cs)-Total (mg/kg)	0.0072	0.0073	0.0056	0.0090	0.0064
	Chromium (Cr)-Total (mg/kg)	<0.050	<0.050	<0.20	<0.20	<0.20
	Cobalt (Co)-Total (mg/kg)	0.130	0.071	0.090	0.103	0.163
	Copper (Cu)-Total (mg/kg)	78.0	34.7	70.9	49.0	111
	Iron (Fe)-Total (mg/kg)	202	57.1	286	189	486
	Lead (Pb)-Total (mg/kg)	<0.020	0.032	<0.050	<0.050	<0.050
	Lithium (Li)-Total (mg/kg)	<0.50	<0.50	<0.50	<0.50	<0.50
	Magnesium (Mg)-Total (mg/kg)	763	671	446	502	587
	Manganese (Mn)-Total (mg/kg)	4.23	3.18	3.57	2.79	4.08
	Mercury (Hg)-Total (mg/kg)	0.365	0.311	0.175	0.180	0.242
	Molybdenum (Mo)-Total (mg/kg)	0.560	0.285	0.439	0.448	0.768
	Nickel (Ni)-Total (mg/kg)	<0.20	<0.20	<0.20	<0.20	<0.20
	Phosphorus (P)-Total (mg/kg)	13900	11800	7510	7590	9140
	Potassium (K)-Total (mg/kg)	12500	11600	6440	7780	9870
	Rubidium (Rb)-Total (mg/kg)	20.3	13.5	10.4	15.3	25.2
	Selenium (Se)-Total (mg/kg)	4.02	3.56	4.35	4.02	5.99
	Sodium (Na)-Total (mg/kg)	2210	2150	1840	2280	2530
	Strontium (Sr)-Total (mg/kg)	0.089	0.080	<0.10	<0.10	0.13
	Tellurium (Te)-Total (mg/kg)	<0.020	<0.020	<0.020	<0.020	<0.020
	Thallium (Tl)-Total (mg/kg)	0.0164	0.0087	0.0108	0.0087	0.0125
	Tin (Sn)-Total (mg/kg)	0.53	0.15	0.14	0.24	0.28
	Uranium (U)-Total (mg/kg)	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020
	Vanadium (V)-Total (mg/kg)	0.16	0.16	0.22	0.12	0.41
	Zinc (Zn)-Total (mg/kg)	135	112	131	169	274
	Zirconium (Zr)-Total (mg/kg)	<0.20	<0.20	<0.20	<0.20	<0.20

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Grouping	Analyte	L1704817-26 Tissue 02-OCT-15 PINR-NP10-L	L1704817-27 Tissue 02-OCT-15 PINR-NP12-L	L1704817-28 Tissue 02-OCT-15 PINR-NP13-L	L1704817-29 Tissue 02-OCT-15 PINR-NP14-L	L1704817-30 Tissue 02-OCT-15 PINR-NP15-L
TISSUE						
Physical Tests	% Moisture (%)	66.4	75.0	77.3	60.6	70.4
Metals	Aluminum (Al)-Total (mg/kg)	<5.0	2.6	6.5	<5.0	<5.0
	Antimony (Sb)-Total (mg/kg)	<0.010	0.010	0.088	<0.010	<0.010
	Arsenic (As)-Total (mg/kg)	0.118	0.114	0.237	0.206	0.239
	Barium (Ba)-Total (mg/kg)	<0.050	<0.050	0.080	<0.050	<0.050
	Beryllium (Be)-Total (mg/kg)	<0.010	<0.010	<0.010	<0.010	<0.010
	Bismuth (Bi)-Total (mg/kg)	<0.010	0.016	0.051	0.012	<0.010
	Boron (B)-Total (mg/kg)	<1.0	<1.0	<1.0	<1.0	<1.0
	Cadmium (Cd)-Total (mg/kg)	0.282	0.170	0.600	0.069	0.112
	Calcium (Ca)-Total (mg/kg)	81	126	285	126	126
	Cesium (Cs)-Total (mg/kg)	0.0196	0.0104	0.0132	0.0054	0.0110
	Chromium (Cr)-Total (mg/kg)	<0.20	<0.050	<0.050	0.37	<0.20
	Cobalt (Co)-Total (mg/kg)	0.104	0.240	0.357	0.139	0.100
	Copper (Cu)-Total (mg/kg)	84.2	82.8	238	121	81.7
	Iron (Fe)-Total (mg/kg)	513	112	1980	588	320
	Lead (Pb)-Total (mg/kg)	<0.050	<0.020	2.21	<0.050	<0.050
	Lithium (Li)-Total (mg/kg)	<0.50	<0.50	<0.50	<0.50	<0.50
	Magnesium (Mg)-Total (mg/kg)	472	738	825	491	686
	Manganese (Mn)-Total (mg/kg)	4.51	3.38	5.21	3.37	9.74
	Mercury (Hg)-Total (mg/kg)	0.276	0.493	1.70	0.220	0.255
	Molybdenum (Mo)-Total (mg/kg)	0.522	0.541	0.834	0.458	0.488
	Nickel (Ni)-Total (mg/kg)	<0.20	<0.20	<0.20	<0.20	<0.20
	Phosphorus (P)-Total (mg/kg)	7160	13900	15000	7530	10800
	Potassium (K)-Total (mg/kg)	7710	11300	15200	7110	10800
	Rubidium (Rb)-Total (mg/kg)	25.1	21.6	23.6	14.0	22.4
	Selenium (Se)-Total (mg/kg)	5.19	5.77	10.3	3.78	5.23
	Sodium (Na)-Total (mg/kg)	1730	2250	2820	1650	2210
	Strontium (Sr)-Total (mg/kg)	<0.10	0.088	0.153	0.10	<0.10
	Tellurium (Te)-Total (mg/kg)	<0.020	<0.020	<0.020	<0.020	<0.020
	Thallium (Tl)-Total (mg/kg)	0.0173	0.0191	0.0311	0.0089	0.0140
	Tin (Sn)-Total (mg/kg)	0.34	0.42	1.20	0.19	0.41
	Uranium (U)-Total (mg/kg)	<0.0020	<0.0020	0.0046	<0.0020	<0.0020
	Vanadium (V)-Total (mg/kg)	0.56	0.34	2.67	0.36	0.32
	Zinc (Zn)-Total (mg/kg)	171	138	231	153	199
	Zirconium (Zr)-Total (mg/kg)	<0.20	<0.20	<0.20	<0.20	<0.20

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Grouping	Analyte	L1704817-31 Tissue 03-OCT-15 PINR-NP16-L	L1704817-32 Tissue 03-OCT-15 PINR-NP17-L	L1704817-33 Tissue 03-OCT-15 PINR-NPX-L	L1704817-34 Tissue 01-OCT-15 PINR-NP1-G	L1704817-35 Tissue 01-OCT-15 PINR-NP2-G
Sample ID / Description / Sampled Date / Sampled Time / Client ID						
TISSUE						
Physical Tests	% Moisture (%)	79.2	71.9	78.8	82.4	75.6
Metals	Aluminum (Al)-Total (mg/kg)	3.1	9.1	3.4	3.1	<2.0
	Antimony (Sb)-Total (mg/kg)	0.046	0.017	0.012	<0.010	0.010
	Arsenic (As)-Total (mg/kg)	0.126	0.121	0.092	0.184	0.139
	Barium (Ba)-Total (mg/kg)	<0.050	<0.050	<0.050	0.102	0.251
	Beryllium (Be)-Total (mg/kg)	<0.010	<0.010	<0.010	<0.010	<0.010
	Bismuth (Bi)-Total (mg/kg)	0.054	0.031	0.019	<0.010	0.011
	Boron (B)-Total (mg/kg)	<1.0	<1.0	<1.0	<1.0	<1.0
	Cadmium (Cd)-Total (mg/kg)	0.237	0.458	0.192	0.0472	0.0292
	Calcium (Ca)-Total (mg/kg)	180	163	158	537	681
	Cesium (Cs)-Total (mg/kg)	0.0302	0.0093	0.0250	0.0227	0.0138
	Chromium (Cr)-Total (mg/kg)	<0.050	0.065	<0.050	<0.050	<0.050
	Cobalt (Co)-Total (mg/kg)	0.149	0.224	0.124	0.408	0.261
	Copper (Cu)-Total (mg/kg)	85.5	87.5	65.2	5.26	4.72
	Iron (Fe)-Total (mg/kg)	198	675	174	218	201
	Lead (Pb)-Total (mg/kg)	0.027	0.022	<0.020	0.023	<0.020
	Lithium (Li)-Total (mg/kg)	<0.50	<0.50	<0.50	<0.50	<0.50
	Magnesium (Mg)-Total (mg/kg)	742	457	642	1340	1320
	Manganese (Mn)-Total (mg/kg)	10.2	3.24	8.83	149	122
	Mercury (Hg)-Total (mg/kg)	0.992	1.29	0.908	0.160	0.0976
	Molybdenum (Mo)-Total (mg/kg)	0.462	0.660	0.370	0.264	0.158
	Nickel (Ni)-Total (mg/kg)	<0.20	<0.20	<0.20	<0.20	<0.20
	Phosphorus (P)-Total (mg/kg)	13100	8040	11400	17600	13900
	Potassium (K)-Total (mg/kg)	14600	8680	13100	22200	13900
	Rubidium (Rb)-Total (mg/kg)	32.9	18.6	29.8	27.6	18.1
	Selenium (Se)-Total (mg/kg)	5.48	6.81	4.66	8.42	5.25
	Sodium (Na)-Total (mg/kg)	4040	3560	3820	4590	3160
	Strontium (Sr)-Total (mg/kg)	0.112	0.159	0.097	0.307	0.620
	Tellurium (Te)-Total (mg/kg)	0.024	0.025	<0.020	<0.020	<0.020
	Thallium (Tl)-Total (mg/kg)	0.0487	0.0159	0.0158	0.0293	0.0219
	Tin (Sn)-Total (mg/kg)	0.24	0.17	0.20	0.24	0.14
	Uranium (U)-Total (mg/kg)	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020
	Vanadium (V)-Total (mg/kg)	0.55	1.28	0.46	0.20	<0.10
	Zinc (Zn)-Total (mg/kg)	135	184	112	385	263
	Zirconium (Zr)-Total (mg/kg)	<0.20	<0.20	<0.20	<0.20	<0.20

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Grouping	Analyte	L1704817-36 Tissue 01-OCT-15 PINR-NP3-G	L1704817-37 Tissue 01-OCT-15 PINR-NP4-G	L1704817-38 Tissue 01-OCT-15 PINR-NP5-G	L1704817-39 Tissue 02-OCT-15 PINR-NP12-G	L1704817-40 Tissue 02-OCT-15 PINR-NP13-G
TISSUE						
Physical Tests	% Moisture (%)	76.8	77.0	74.4	78.4	81.7
Metals	Aluminum (Al)-Total (mg/kg)	<2.0	<2.0	<2.0	<2.0	5.1
	Antimony (Sb)-Total (mg/kg)	0.010	<0.010	<0.010	<0.010	0.016
	Arsenic (As)-Total (mg/kg)	0.113	0.085	0.068	0.099	0.155
	Barium (Ba)-Total (mg/kg)	0.576	0.570	0.344	0.352	0.208
	Beryllium (Be)-Total (mg/kg)	<0.010	<0.010	<0.010	<0.010	<0.010
	Bismuth (Bi)-Total (mg/kg)	<0.010	<0.010	<0.010	0.010	0.014
	Boron (B)-Total (mg/kg)	<1.0	<1.0	<1.0	<1.0	<1.0
	Cadmium (Cd)-Total (mg/kg)	0.0249	0.0190	0.0356	0.0295	0.0409
	Calcium (Ca)-Total (mg/kg)	663	576	555	577	594
	Cesium (Cs)-Total (mg/kg)	0.0111	0.0094	0.0083	0.0166	0.0264
	Chromium (Cr)-Total (mg/kg)	<0.050	<0.050	0.116	<0.050	<0.050
	Cobalt (Co)-Total (mg/kg)	0.289	0.287	0.169	0.403	0.484
	Copper (Cu)-Total (mg/kg)	5.32	5.49	4.72	5.86	5.92
	Iron (Fe)-Total (mg/kg)	252	311	168	237	333
	Lead (Pb)-Total (mg/kg)	<0.020	<0.020	<0.020	<0.020	0.140
	Lithium (Li)-Total (mg/kg)	<0.50	<0.50	<0.50	<0.50	<0.50
	Magnesium (Mg)-Total (mg/kg)	1200	1410	1330	1430	1250
	Manganese (Mn)-Total (mg/kg)	153	245	130	198	128
	Mercury (Hg)-Total (mg/kg)	0.129	0.0762	0.0752	0.0889	0.364
	Molybdenum (Mo)-Total (mg/kg)	0.205	0.197	0.132	0.211	0.277
	Nickel (Ni)-Total (mg/kg)	<0.20	<0.20	<0.20	<0.20	<0.20
	Phosphorus (P)-Total (mg/kg)	13800	14600	13900	14500	16000
	Potassium (K)-Total (mg/kg)	15100	15300	13400	15800	20600
	Rubidium (Rb)-Total (mg/kg)	20.0	20.4	14.7	23.8	25.4
	Selenium (Se)-Total (mg/kg)	4.02	4.63	3.91	4.70	4.35
	Sodium (Na)-Total (mg/kg)	3070	2760	2460	2930	4890
	Strontium (Sr)-Total (mg/kg)	0.674	0.748	0.551	0.539	0.322
	Tellurium (Te)-Total (mg/kg)	<0.020	<0.020	<0.020	<0.020	<0.020
	Thallium (Tl)-Total (mg/kg)	0.0256	0.0225	0.0182	0.0246	0.0279
	Tin (Sn)-Total (mg/kg)	0.11	0.15	<0.10	<0.10	0.14
	Uranium (U)-Total (mg/kg)	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020
	Vanadium (V)-Total (mg/kg)	0.14	<0.10	<0.10	<0.10	0.46
	Zinc (Zn)-Total (mg/kg)	335	396	260	364	449
	Zirconium (Zr)-Total (mg/kg)	<0.20	<0.20	<0.20	<0.20	<0.20

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Grouping	Analyte	L1704817-41 Tissue 02-OCT-15 PINR-NP15-G	L1704817-42 Tissue 03-OCT-15 PINR-NP16-G	L1704817-43 Tissue 03-OCT-15 PINR-NPX-G	L1704817-44 Tissue 01-OCT-15 PINR-WA1-M	L1704817-45 Tissue 01-OCT-15 PINR-WA1-L
TISSUE						
Physical Tests	% Moisture (%)	77.8	79.2	79.2	79.1	69.4
Metals	Aluminum (Al)-Total (mg/kg)	<5.0	2.4	<2.0	2.4	<5.0
	Antimony (Sb)-Total (mg/kg)	<0.010	0.010	<0.010	<0.010	<0.010
	Arsenic (As)-Total (mg/kg)	0.105	0.113	0.115	0.489	0.197
	Barium (Ba)-Total (mg/kg)	0.060	0.241	0.220	0.087	<0.050
	Beryllium (Be)-Total (mg/kg)	<0.010	<0.010	<0.010	<0.010	<0.010
	Bismuth (Bi)-Total (mg/kg)	<0.010	0.013	0.011	<0.010	<0.010
	Boron (B)-Total (mg/kg)	<1.0	<1.0	<1.0	<1.0	<1.0
	Cadmium (Cd)-Total (mg/kg)	0.060	0.0293	0.0341	<0.0050	1.90
	Calcium (Ca)-Total (mg/kg)	572	1020	656	607	388
	Cesium (Cs)-Total (mg/kg)	0.0173	0.0241	0.0217	0.0306	0.0145
	Chromium (Cr)-Total (mg/kg)	<0.20	<0.050	<0.050	<0.050	<0.20
	Cobalt (Co)-Total (mg/kg)	0.323	0.223	0.226	<0.020	0.764
	Copper (Cu)-Total (mg/kg)	6.69	4.88	5.11	0.70	10.2
	Iron (Fe)-Total (mg/kg)	309	252	253	10.3	393
	Lead (Pb)-Total (mg/kg)	<0.050	0.021	<0.020	0.032	<0.050
	Lithium (Li)-Total (mg/kg)	<0.50	<0.50	<0.50	<0.50	<0.50
	Magnesium (Mg)-Total (mg/kg)	1250	1290	1340	1760	665
	Manganese (Mn)-Total (mg/kg)	222	104	111	0.778	13.8
	Mercury (Hg)-Total (mg/kg)	0.0889	0.256	0.268	1.43	0.419
	Molybdenum (Mo)-Total (mg/kg)	0.173	0.137	0.136	<0.020	0.433
	Nickel (Ni)-Total (mg/kg)	<0.20	<0.20	<0.20	<0.20	<0.20
	Phosphorus (P)-Total (mg/kg)	14100	14600	15000	12000	10300
	Potassium (K)-Total (mg/kg)	18700	17300	16900	21600	8990
	Rubidium (Rb)-Total (mg/kg)	24.4	24.9	24.3	33.4	15.5
	Selenium (Se)-Total (mg/kg)	7.68	5.93	5.84	1.41	3.68
	Sodium (Na)-Total (mg/kg)	3240	4510	4940	1190	3310
	Strontium (Sr)-Total (mg/kg)	0.35	0.710	0.528	0.225	0.17
	Tellurium (Te)-Total (mg/kg)	<0.020	<0.020	<0.020	<0.020	<0.020
	Thallium (Tl)-Total (mg/kg)	0.0173	0.0185	0.0176	0.0245	0.0525
	Tin (Sn)-Total (mg/kg)	0.53	0.17	0.22	0.39	0.64
	Uranium (U)-Total (mg/kg)	<0.0020	<0.0020	<0.0020	0.0025	<0.0020
	Vanadium (V)-Total (mg/kg)	0.12	<0.10	<0.10	<0.10	0.15
	Zinc (Zn)-Total (mg/kg)	571	312	311	15.1	149
	Zirconium (Zr)-Total (mg/kg)	<0.20	<0.20	<0.20	<0.20	<0.20

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

	Sample ID	L1704817-46				
	Description	Tissue				
	Sampled Date	01-OCT-15				
	Sampled Time					
	Client ID	PINR-NP8-M (RECHECK)				
Grouping	**Analyte**					
TISSUE						
Physical Tests	% Moisture (%)	76.1 RRV				
Metals	Aluminum (Al)-Total (mg/kg)					
	Antimony (Sb)-Total (mg/kg)					
	Arsenic (As)-Total (mg/kg)					
	Barium (Ba)-Total (mg/kg)					
	Beryllium (Be)-Total (mg/kg)					
	Bismuth (Bi)-Total (mg/kg)					
	Boron (B)-Total (mg/kg)					
	Cadmium (Cd)-Total (mg/kg)					
	Calcium (Ca)-Total (mg/kg)					
	Cesium (Cs)-Total (mg/kg)					
	Chromium (Cr)-Total (mg/kg)					
	Cobalt (Co)-Total (mg/kg)					
	Copper (Cu)-Total (mg/kg)					
	Iron (Fe)-Total (mg/kg)	13.2				
	Lead (Pb)-Total (mg/kg)					
	Lithium (Li)-Total (mg/kg)					
	Magnesium (Mg)-Total (mg/kg)					
	Manganese (Mn)-Total (mg/kg)					
	Mercury (Hg)-Total (mg/kg)					
	Molybdenum (Mo)-Total (mg/kg)					
	Nickel (Ni)-Total (mg/kg)					
	Phosphorus (P)-Total (mg/kg)					
	Potassium (K)-Total (mg/kg)					
	Rubidium (Rb)-Total (mg/kg)					
	Selenium (Se)-Total (mg/kg)					
	Sodium (Na)-Total (mg/kg)					
	Strontium (Sr)-Total (mg/kg)					
	Tellurium (Te)-Total (mg/kg)					
	Thallium (Tl)-Total (mg/kg)					
	Tin (Sn)-Total (mg/kg)					
	Uranium (U)-Total (mg/kg)					
	Vanadium (V)-Total (mg/kg)					
	Zinc (Zn)-Total (mg/kg)					
	Zirconium (Zr)-Total (mg/kg)					

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

Reference Information

QC Samples with Qualifiers & Comments:

QC Type Description	Parameter	Qualifier	Applies to Sample Number(s)
Duplicate	Arsenic (As)-Total	DUP-H	L1704817-13, -23, -24, -25, -26, -29, -30, -41, -45, -6, -7
Duplicate	Calcium (Ca)-Total	DUP-H	L1704817-13, -23, -24, -25, -26, -29, -30, -41, -45, -6, -7
Duplicate	Manganese (Mn)-Total	DUP-H	L1704817-13, -23, -24, -25, -26, -29, -30, -41, -45, -6, -7
Duplicate	Strontium (Sr)-Total	DUP-H	L1704817-13, -23, -24, -25, -26, -29, -30, -41, -45, -6, -7
Duplicate	Vanadium (V)-Total	DUP-H	L1704817-13, -23, -24, -25, -26, -29, -30, -41, -45, -6, -7
Duplicate	Barium (Ba)-Total	DUP-H	L1704817-13, -23, -24, -25, -26, -29, -30, -41, -45, -6, -7
Certified Reference Material	Chromium (Cr)-Total	RM-H	L1704817-1, -10, -11, -12, -14, -16, -18, -19, -2, -21, -3, -4, -5, -8, -9

Qualifiers for Individual Parameters Listed:

Qualifier	Description
DLB	Detection Limit Raised. Analyte detected at comparable level in Method Blank.
DUP-H	Duplicate results outside ALS DQO, due to sample heterogeneity.
RM-H	Reference Material recovery was above ALS DQO. Non-detected sample results are considered reliable. Other results, if reported, have been qualified.
RRV	Reported Result Verified By Repeat Analysis

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
HG-DRY-CVAFS-N-VA	Tissue	Mercury in Tissue by CVAFS (DRY)	EPA 200.3, EPA 245.7

This method is conducted following British Columbia Lab Manual method "Metals in Animal Tissue and Vegetation (Biota) - Prescriptive". Tissue samples are homogenized and sub-sampled prior to hotblock digestion with nitric and hydrochloric acids, in combination with addition of hydrogen peroxide. Analysis is by atomic fluorescence spectrophotometry or atomic absorption spectrophotometry, adapted from US EPA Method 245.7.

HG-DRY-MICR-CVAF-VA	Tissue	Mercury in Tissue by CVAFS Micro (DRY)	EPA 200.3, EPA 245.7

This method is adapted from US EPA Method 200.3 "Sample Procedures for Spectrochemical Determination of Total Recoverable Elements in Biological Tissues" (1996). Tissue samples are homogenized and sub-sampled prior to hotblock digestion with nitric and hydrochloric acids, in combination with repeated additions of hydrogen peroxide. Analysis is by atomic fluorescence spectrophotometry or atomic absorption spectrophotometry, adapted from US EPA Method 245.7.

MET-DRY-CCMS-N-VA	Tissue	Metals in Tissue by CRC ICPMS (DRY)	EPA 200.3/6020A

This method is conducted following British Columbia Lab Manual method "Metals in Animal Tissue and Vegetation (Biota) - Prescriptive". Tissue samples are homogenized and sub-sampled prior to hotblock digestion with nitric and hydrochloric acids, in combination with addition of hydrogen peroxide. Instrumental analysis is by collision cell inductively coupled plasma - mass spectrometry (modified from EPA Method 6020A).

Method Limitation: This method employs a strong acid/peroxide digestion, and is intended to provide a conservative estimate of bio-available metals. Near complete recoveries are achieved for most toxicologically important metals, but elements associated with recalcitrant minerals may be only partially recovered.

MET-DRY-MICR-HRMS-VA	Tissue	Metals in Tissue by HR-ICPMS Micro (DRY)	EPA 200.3/200.8

Trace metals in tissue are analyzed by high resolution inductively coupled plasma mass spectrometry (HR-ICPMS) modified from US EPA Method 200.8, (Revision 5.5). The sample preparation procedure is modified from US EPA 200.3. Analytical results are reported on dry weight basis.

Method Limitation: This method employs a strong acid/peroxide digestion, and is intended to provide a conservative estimate of bio-available metals. Near complete recoveries are achieved for most toxicologically important metals, but elements associated with recalcitrant minerals may be only partially recovered.

MOISTURE-TISS-VA	Tissue	% Moisture in Tissues	ASTM D2974-00 Method A

This analysis is carried out gravimetrically by drying the sample at 105 C for a minimum of six hours.

** ALS test methods may incorporate modifications from specified reference methods to improve performance.

The last two letters of the above test code(s) indicate the laboratory that performed analytical analysis for that test. Refer to the list below:

Laboratory Definition Code	Laboratory Location

Chain of Custody Numbers:

Reference Information

GLOSSARY OF REPORT TERMS

Surrogate - A compound that is similar in behaviour to target analyte(s), but that does not occur naturally in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery.
mg/kg - milligrams per kilogram based on dry weight of sample.
mg/kg wwt - milligrams per kilogram based on wet weight of sample.
mg/kg lwt - milligrams per kilogram based on lipid-adjusted weight of sample.
mg/L - milligrams per litre.
< - Less than.
D.L. - The reported Detection Limit, also known as the Limit of Reporting (LOR).
N/A - Result not available. Refer to qualifier code and definition for explanation.

Test results reported relate only to the samples as received by the laboratory.
UNLESS OTHERWISE STATED, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.
Analytical results in unsigned test reports with the DRAFT watermark are subject to change, pending final QC review.

Quality Control Report

Workorder: L1704817 Report Date: 18-FEB-16

Client: MINNOW ENVIRONMENTAL INC.
2 Lamb Street
Georgetown ON L7G 3M9
Contact: Jess Tester

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
HG-DRY-CVAFS-N-VA	**Tissue**							
Batch R3334433								
WG2231245-5 CRM		**VA-NRC-TORT3**						
Mercury (Hg)-Total			86.0		%		70-130	15-DEC-15
WG2231245-6 CRM		**VA-NIST-1566B**						
Mercury (Hg)-Total			102.7		%		70-130	15-DEC-15
WG2231245-3 DUP		**L1704817-22**						
Mercury (Hg)-Total		0.311	0.311		mg/kg	0.1	40	15-DEC-15
WG2231245-7 LCS								
Mercury (Hg)-Total			109.4		%		70-130	15-DEC-15
WG2231245-1 MB								
Mercury (Hg)-Total			<0.0050		mg/kg		0.005	15-DEC-15
WG2231245-2 MB								
Mercury (Hg)-Total			<0.0050		mg/kg		0.005	15-DEC-15
Batch R3342534								
WG2235323-3 CRM		**VA-NIST-1566B**						
Mercury (Hg)-Total			84.9		%		70-130	21-DEC-15
WG2235323-2 DUP		**L1704817-31**						
Mercury (Hg)-Total		0.992	0.824		mg/kg	18	40	21-DEC-15
WG2235323-4 LCS								
Mercury (Hg)-Total			101.0		%		70-130	21-DEC-15
WG2235323-1 MB								
Mercury (Hg)-Total			<0.0050		mg/kg		0.005	21-DEC-15
HG-DRY-MICR-CVAF-VA	**Tissue**							
Batch R3335894								
WG2228104-4 CRM		**VA-NIST-1566B**						
Mercury (Hg)-Total			90.0		%		70-130	16-DEC-15
WG2228104-3 DUP		**L1704817-6**						
Mercury (Hg)-Total		0.671	0.680		mg/kg	1.3	30	16-DEC-15
WG2228104-5 LCS								
Mercury (Hg)-Total			103.2		%		70-130	16-DEC-15
WG2228104-1 MB								
Mercury (Hg)-Total			<0.0050		mg/kg		0.005	16-DEC-15
WG2228104-2 MB								
Mercury (Hg)-Total			<0.0050		mg/kg		0.005	16-DEC-15
MET-DRY-CCMS-N-VA	**Tissue**							
Batch R3334294								
WG2231245-5 CRM		**VA-NRC-TORT3**						
Arsenic (As)-Total			101.9		%		70-130	15-DEC-15

Quality Control Report

Client: MINNOW ENVIRONMENTAL INC.
2 Lamb Street
Georgetown ON L7G 3M9
Contact: Jess Tester

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-DRY-CCMS-N-VA	**Tissue**							
Batch R3334294								
WG2231245-5 CRM		**VA-NRC-TORT3**						
Cadmium (Cd)-Total			91.7		%		70-130	15-DEC-15
Cobalt (Co)-Total			95.5		%		70-130	15-DEC-15
Copper (Cu)-Total			91.9		%		70-130	15-DEC-15
Iron (Fe)-Total			101.3		%		70-130	15-DEC-15
Lead (Pb)-Total			93.1		%		70-130	15-DEC-15
Manganese (Mn)-Total			87.9		%		70-130	15-DEC-15
Molybdenum (Mo)-Total			94.5		%		70-130	15-DEC-15
Nickel (Ni)-Total			117.9		%		70-130	15-DEC-15
Selenium (Se)-Total			89.7		%		70-130	15-DEC-15
Strontium (Sr)-Total			88.6		%		70-130	15-DEC-15
Vanadium (V)-Total			92.4		%		70-130	15-DEC-15
Zinc (Zn)-Total			88.6		%		70-130	15-DEC-15
WG2231245-6 CRM		**VA-NIST-1566B**						
Antimony (Sb)-Total			0.009		mg/kg		0-0.018	15-DEC-15
Arsenic (As)-Total			100.8		%		70-130	15-DEC-15
Barium (Ba)-Total			100.7		%		70-130	15-DEC-15
Boron (B)-Total			104.1		%		70-130	15-DEC-15
Cadmium (Cd)-Total			102.5		%		70-130	15-DEC-15
Calcium (Ca)-Total			98.2		%		70-130	15-DEC-15
Chromium (Cr)-Total			102.5		%		70-130	15-DEC-15
Cobalt (Co)-Total			98.3		%		70-130	15-DEC-15
Copper (Cu)-Total			97.9		%		70-130	15-DEC-15
Iron (Fe)-Total			102.0		%		70-130	15-DEC-15
Lead (Pb)-Total			106.6		%		70-130	15-DEC-15
Magnesium (Mg)-Total			99.2		%		70-130	15-DEC-15
Manganese (Mn)-Total			97.8		%		70-130	15-DEC-15
Molybdenum (Mo)-Total			105.5		%		70-130	15-DEC-15
Nickel (Ni)-Total			106.8		%		70-130	15-DEC-15
Phosphorus (P)-Total			109.2		%		70-130	15-DEC-15
Potassium (K)-Total			100.5		%		70-130	15-DEC-15
Rubidium (Rb)-Total			103.2		%		70-130	15-DEC-15
Selenium (Se)-Total			102.1		%		70-130	15-DEC-15
Sodium (Na)-Total			95.6		%		70-130	15-DEC-15
Strontium (Sr)-Total			92.9		%		70-130	15-DEC-15

Quality Control Report

Client: MINNOW ENVIRONMENTAL INC.
2 Lamb Street
Georgetown ON L7G 3M9
Contact: Jess Tester

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-DRY-CCMS-N-VA	**Tissue**							
Batch R3334294								
WG2231245-6 CRM		**VA-NIST-1566B**						
Uranium (U)-Total			99.6		%		70-130	15-DEC-15
Vanadium (V)-Total			100.2		%		70-130	15-DEC-15
Zinc (Zn)-Total			96.4		%		70-130	15-DEC-15
WG2231245-7 LCS								
Aluminum (Al)-Total			102.6		%		70-130	15-DEC-15
Antimony (Sb)-Total			105.7		%		70-130	15-DEC-15
Arsenic (As)-Total			103.1		%		70-130	15-DEC-15
Barium (Ba)-Total			102.7		%		70-130	15-DEC-15
Beryllium (Be)-Total			100.1		%		70-130	15-DEC-15
Bismuth (Bi)-Total			98.5		%		70-130	15-DEC-15
Boron (B)-Total			99.9		%		70-130	15-DEC-15
Cadmium (Cd)-Total			101.2		%		70-130	15-DEC-15
Calcium (Ca)-Total			101.3		%		70-130	15-DEC-15
Cesium (Cs)-Total			100.6		%		70-130	15-DEC-15
Chromium (Cr)-Total			101.1		%		70-130	15-DEC-15
Cobalt (Co)-Total			100.4		%		70-130	15-DEC-15
Copper (Cu)-Total			100.6		%		70-130	15-DEC-15
Iron (Fe)-Total			97.2		%		70-130	15-DEC-15
Lead (Pb)-Total			99.0		%		70-130	15-DEC-15
Lithium (Li)-Total			99.7		%		70-130	15-DEC-15
Magnesium (Mg)-Total			98.9		%		70-130	15-DEC-15
Manganese (Mn)-Total			100.1		%		70-130	15-DEC-15
Molybdenum (Mo)-Total			103.7		%		70-130	15-DEC-15
Nickel (Ni)-Total			99.2		%		70-130	15-DEC-15
Phosphorus (P)-Total			114.2		%		70-130	15-DEC-15
Potassium (K)-Total			100.9		%		70-130	15-DEC-15
Rubidium (Rb)-Total			103.4		%		70-130	15-DEC-15
Selenium (Se)-Total			102.9		%		70-130	15-DEC-15
Sodium (Na)-Total			99.5		%		70-130	15-DEC-15
Strontium (Sr)-Total			99.7		%		70-130	15-DEC-15
Tellurium (Te)-Total			103.5		%		70-130	15-DEC-15
Thallium (Tl)-Total			99.2		%		70-130	15-DEC-15
Tin (Sn)-Total			104.5		%		70-130	15-DEC-15
Uranium (U)-Total			98.6		%		70-130	15-DEC-15

Quality Control Report

Client: MINNOW ENVIRONMENTAL INC.
2 Lamb Street
Georgetown ON L7G 3M9
Contact: Jess Tester

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-DRY-CCMS-N-VA	**Tissue**							
Batch R3334294								
WG2231245-7 LCS								
Vanadium (V)-Total			102.0		%		70-130	15-DEC-15
Zinc (Zn)-Total			96.8		%		70-130	15-DEC-15
Zirconium (Zr)-Total			97.9		%		70-130	15-DEC-15
WG2231245-1 MB								
Aluminum (Al)-Total			<2.0		mg/kg		2	15-DEC-15
Antimony (Sb)-Total			<0.010		mg/kg		0.01	15-DEC-15
Arsenic (As)-Total			<0.020		mg/kg		0.02	15-DEC-15
Barium (Ba)-Total			<0.050		mg/kg		0.05	15-DEC-15
Beryllium (Be)-Total			<0.010		mg/kg		0.01	15-DEC-15
Bismuth (Bi)-Total			<0.010		mg/kg		0.01	15-DEC-15
Boron (B)-Total			<1.0		mg/kg		1	15-DEC-15
Cadmium (Cd)-Total			<0.0050		mg/kg		0.005	15-DEC-15
Calcium (Ca)-Total			<20		mg/kg		20	15-DEC-15
Cesium (Cs)-Total			<0.0050		mg/kg		0.005	15-DEC-15
Chromium (Cr)-Total			<0.050		mg/kg		0.05	15-DEC-15
Cobalt (Co)-Total			<0.020		mg/kg		0.02	15-DEC-15
Copper (Cu)-Total			<0.10		mg/kg		0.1	15-DEC-15
Iron (Fe)-Total			<3.0		mg/kg		3	15-DEC-15
Lead (Pb)-Total			<0.020		mg/kg		0.02	15-DEC-15
Lithium (Li)-Total			<0.50		mg/kg		0.5	15-DEC-15
Magnesium (Mg)-Total			<2.0		mg/kg		2	15-DEC-15
Manganese (Mn)-Total			<0.050		mg/kg		0.05	15-DEC-15
Molybdenum (Mo)-Total			<0.020		mg/kg		0.02	15-DEC-15
Nickel (Ni)-Total			<0.20		mg/kg		0.2	15-DEC-15
Phosphorus (P)-Total			<10		mg/kg		10	15-DEC-15
Potassium (K)-Total			<20		mg/kg		20	15-DEC-15
Rubidium (Rb)-Total			<0.050		mg/kg		0.05	15-DEC-15
Selenium (Se)-Total			<0.050		mg/kg		0.05	15-DEC-15
Sodium (Na)-Total			<20		mg/kg		20	15-DEC-15
Strontium (Sr)-Total			<0.050		mg/kg		0.05	15-DEC-15
Tellurium (Te)-Total			<0.020		mg/kg		0.02	15-DEC-15
Thallium (Tl)-Total			<0.0020		mg/kg		0.002	15-DEC-15
Tin (Sn)-Total			<0.10		mg/kg		0.1	15-DEC-15
Uranium (U)-Total			<0.0020		mg/kg		0.002	15-DEC-15

Quality Control Report

Client: MINNOW ENVIRONMENTAL INC.
2 Lamb Street
Georgetown ON L7G 3M9
Contact: Jess Tester

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-DRY-CCMS-N-VA	**Tissue**							
Batch R3334294								
WG2231245-1 MB								
Vanadium (V)-Total			<0.10		mg/kg		0.1	15-DEC-15
Zinc (Zn)-Total			<0.50		mg/kg		0.5	15-DEC-15
Zirconium (Zr)-Total			<0.20		mg/kg		0.2	15-DEC-15
WG2231245-2 MB								
Aluminum (Al)-Total			<2.0		mg/kg		2	15-DEC-15
Antimony (Sb)-Total			<0.010		mg/kg		0.01	15-DEC-15
Arsenic (As)-Total			<0.020		mg/kg		0.02	15-DEC-15
Barium (Ba)-Total			<0.050		mg/kg		0.05	15-DEC-15
Beryllium (Be)-Total			<0.010		mg/kg		0.01	15-DEC-15
Bismuth (Bi)-Total			<0.010		mg/kg		0.01	15-DEC-15
Boron (B)-Total			<1.0		mg/kg		1	15-DEC-15
Cadmium (Cd)-Total			<0.0050		mg/kg		0.005	15-DEC-15
Calcium (Ca)-Total			<20		mg/kg		20	15-DEC-15
Cesium (Cs)-Total			<0.0050		mg/kg		0.005	15-DEC-15
Chromium (Cr)-Total			<0.050		mg/kg		0.05	15-DEC-15
Cobalt (Co)-Total			<0.020		mg/kg		0.02	15-DEC-15
Copper (Cu)-Total			<0.10		mg/kg		0.1	15-DEC-15
Iron (Fe)-Total			<3.0		mg/kg		3	15-DEC-15
Lead (Pb)-Total			<0.020		mg/kg		0.02	15-DEC-15
Lithium (Li)-Total			<0.50		mg/kg		0.5	15-DEC-15
Magnesium (Mg)-Total			<2.0		mg/kg		2	15-DEC-15
Manganese (Mn)-Total			<0.050		mg/kg		0.05	15-DEC-15
Molybdenum (Mo)-Total			<0.020		mg/kg		0.02	15-DEC-15
Nickel (Ni)-Total			<0.20		mg/kg		0.2	15-DEC-15
Phosphorus (P)-Total			<10		mg/kg		10	15-DEC-15
Potassium (K)-Total			<20		mg/kg		20	15-DEC-15
Rubidium (Rb)-Total			<0.050		mg/kg		0.05	15-DEC-15
Selenium (Se)-Total			<0.050		mg/kg		0.05	15-DEC-15
Sodium (Na)-Total			<20		mg/kg		20	15-DEC-15
Strontium (Sr)-Total			<0.050		mg/kg		0.05	15-DEC-15
Tellurium (Te)-Total			<0.020		mg/kg		0.02	15-DEC-15
Thallium (Tl)-Total			<0.0020		mg/kg		0.002	15-DEC-15
Tin (Sn)-Total			<0.10		mg/kg		0.1	15-DEC-15
Uranium (U)-Total			<0.0020		mg/kg		0.002	15-DEC-15

Quality Control Report

Client: MINNOW ENVIRONMENTAL INC.
2 Lamb Street
Georgetown ON L7G 3M9
Contact: Jess Tester

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-DRY-CCMS-N-VA	**Tissue**							
Batch R3334294								
WG2231245-2 MB								
Vanadium (V)-Total			<0.10		mg/kg		0.1	15-DEC-15
Zinc (Zn)-Total			<0.50		mg/kg		0.5	15-DEC-15
Zirconium (Zr)-Total			<0.20		mg/kg		0.2	15-DEC-15
Batch R3337856								
WG2231245-5 CRM		**VA-NRC-TORT3**						
Chromium (Cr)-Total			186.8	RM-H	%		70-130	16-DEC-15
Batch R3341738								
WG2235975-3 CRM		**VA-NIST-1566B**						
Antimony (Sb)-Total			0.006		mg/kg		0-0.018	18-DEC-15
Arsenic (As)-Total			91.9		%		70-130	18-DEC-15
Barium (Ba)-Total			92.2		%		70-130	18-DEC-15
Boron (B)-Total			102.9		%		70-130	18-DEC-15
Cadmium (Cd)-Total			89.4		%		70-130	18-DEC-15
Calcium (Ca)-Total			91.9		%		70-130	18-DEC-15
Chromium (Cr)-Total			106.1		%		70-130	18-DEC-15
Cobalt (Co)-Total			86.2		%		70-130	18-DEC-15
Copper (Cu)-Total			88.2		%		70-130	18-DEC-15
Iron (Fe)-Total			95.2		%		70-130	18-DEC-15
Lead (Pb)-Total			91.6		%		70-130	18-DEC-15
Magnesium (Mg)-Total			94.4		%		70-130	18-DEC-15
Manganese (Mn)-Total			89.0		%		70-130	18-DEC-15
Molybdenum (Mo)-Total			88.7		%		70-130	18-DEC-15
Nickel (Ni)-Total			94.8		%		70-130	18-DEC-15
Phosphorus (P)-Total			99.4		%		70-130	18-DEC-15
Potassium (K)-Total			93.1		%		70-130	18-DEC-15
Rubidium (Rb)-Total			90.3		%		70-130	18-DEC-15
Selenium (Se)-Total			91.7		%		70-130	18-DEC-15
Sodium (Na)-Total			91.0		%		70-130	18-DEC-15
Strontium (Sr)-Total			83.9		%		70-130	18-DEC-15
Uranium (U)-Total			86.5		%		70-130	18-DEC-15
Vanadium (V)-Total			93.3		%		70-130	18-DEC-15
Zinc (Zn)-Total			84.8		%		70-130	18-DEC-15
WG2235975-2 DUP		**L1704817-22**						

Quality Control Report

Client: MINNOW ENVIRONMENTAL INC.
2 Lamb Street
Georgetown ON L7G 3M9
Contact: Jess Tester

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-DRY-CCMS-N-VA	**Tissue**							
Batch R3341738								
WG2235975-2 DUP		**L1704817-22**						
Aluminum (Al)-Total		2.1	2.5		mg/kg	17	40	18-DEC-15
Antimony (Sb)-Total		<0.010	<0.010	RPD-NA	mg/kg	N/A	40	18-DEC-15
Arsenic (As)-Total		0.062	0.067		mg/kg	8.2	40	18-DEC-15
Barium (Ba)-Total		<0.050	<0.050	RPD-NA	mg/kg	N/A	40	18-DEC-15
Beryllium (Be)-Total		<0.010	<0.010	RPD-NA	mg/kg	N/A	40	18-DEC-15
Bismuth (Bi)-Total		<0.010	<0.010	RPD-NA	mg/kg	N/A	40	18-DEC-15
Boron (B)-Total		<1.0	<1.0	RPD-NA	mg/kg	N/A	40	18-DEC-15
Cadmium (Cd)-Total		0.148	0.143		mg/kg	3.8	40	18-DEC-15
Calcium (Ca)-Total		126	126		mg/kg	0.2	60	18-DEC-15
Cesium (Cs)-Total		0.0073	0.0070		mg/kg	4.6	40	18-DEC-15
Chromium (Cr)-Total		<0.050	<0.050	RPD-NA	mg/kg	N/A	40	18-DEC-15
Cobalt (Co)-Total		0.071	0.068		mg/kg	4.0	40	18-DEC-15
Copper (Cu)-Total		34.7	34.9		mg/kg	0.3	40	18-DEC-15
Iron (Fe)-Total		57.1	57.1		mg/kg	0.0	40	18-DEC-15
Lead (Pb)-Total		0.032	0.029		mg/kg	12	40	18-DEC-15
Lithium (Li)-Total		<0.50	<0.50	RPD-NA	mg/kg	N/A	40	18-DEC-15
Magnesium (Mg)-Total		671	667		mg/kg	0.5	40	18-DEC-15
Manganese (Mn)-Total		3.18	3.07		mg/kg	3.5	40	18-DEC-15
Molybdenum (Mo)-Total		0.285	0.297		mg/kg	4.4	40	18-DEC-15
Nickel (Ni)-Total		<0.20	<0.20	RPD-NA	mg/kg	N/A	40	18-DEC-15
Phosphorus (P)-Total		11800	11700		mg/kg	0.8	40	18-DEC-15
Potassium (K)-Total		11600	11700		mg/kg	1.0	40	18-DEC-15
Rubidium (Rb)-Total		13.5	13.8		mg/kg	2.1	40	18-DEC-15
Selenium (Se)-Total		3.56	3.54		mg/kg	0.6	40	18-DEC-15
Sodium (Na)-Total		2150	2180		mg/kg	1.2	40	18-DEC-15
Strontium (Sr)-Total		0.080	0.080		mg/kg	0.8	60	18-DEC-15
Tellurium (Te)-Total		<0.020	<0.020	RPD-NA	mg/kg	N/A	40	18-DEC-15
Thallium (Tl)-Total		0.0087	0.0086		mg/kg	1.1	40	18-DEC-15
Tin (Sn)-Total		0.15	0.16		mg/kg	8.2	40	18-DEC-15
Uranium (U)-Total		<0.0020	<0.0020	RPD-NA	mg/kg	N/A	40	18-DEC-15
Vanadium (V)-Total		0.16	0.15		mg/kg	2.6	40	18-DEC-15
Zinc (Zn)-Total		112	109		mg/kg	2.4	40	18-DEC-15
Zirconium (Zr)-Total		<0.20	<0.20		mg/kg			18-DEC-15

Quality Control Report

Client: MINNOW ENVIRONMENTAL INC.
2 Lamb Street
Georgetown ON L7G 3M9
Contact: Jess Tester

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-DRY-CCMS-N-VA	**Tissue**							
Batch R3341738								
WG2235975-2 DUP		**L1704817-22**						
Zirconium (Zr)-Total		<0.20	<0.20	RPD-NA	mg/kg	N/A	40	18-DEC-15
WG2235975-1 MB								
Aluminum (Al)-Total			<2.0		mg/kg		2	18-DEC-15
Antimony (Sb)-Total			<0.010		mg/kg		0.01	18-DEC-15
Arsenic (As)-Total			<0.020		mg/kg		0.02	18-DEC-15
Barium (Ba)-Total			<0.050		mg/kg		0.05	18-DEC-15
Beryllium (Be)-Total			<0.010		mg/kg		0.01	18-DEC-15
Boron (B)-Total			<1.0		mg/kg		1	18-DEC-15
Cadmium (Cd)-Total			<0.0050		mg/kg		0.005	18-DEC-15
Calcium (Ca)-Total			<20		mg/kg		20	18-DEC-15
Cesium (Cs)-Total			<0.0050		mg/kg		0.005	18-DEC-15
Chromium (Cr)-Total			<0.050		mg/kg		0.05	18-DEC-15
Cobalt (Co)-Total			<0.020		mg/kg		0.02	18-DEC-15
Copper (Cu)-Total			<0.10		mg/kg		0.1	18-DEC-15
Iron (Fe)-Total			<3.0		mg/kg		3	18-DEC-15
Lead (Pb)-Total			<0.020		mg/kg		0.02	18-DEC-15
Lithium (Li)-Total			<0.50		mg/kg		0.5	18-DEC-15
Magnesium (Mg)-Total			<2.0		mg/kg		2	18-DEC-15
Manganese (Mn)-Total			<0.050		mg/kg		0.05	18-DEC-15
Molybdenum (Mo)-Total			<0.020		mg/kg		0.02	18-DEC-15
Nickel (Ni)-Total			<0.20		mg/kg		0.2	18-DEC-15
Phosphorus (P)-Total			<10		mg/kg		10	18-DEC-15
Potassium (K)-Total			<20		mg/kg		20	18-DEC-15
Rubidium (Rb)-Total			<0.050		mg/kg		0.05	18-DEC-15
Selenium (Se)-Total			<0.050		mg/kg		0.05	18-DEC-15
Sodium (Na)-Total			<20		mg/kg		20	18-DEC-15
Strontium (Sr)-Total			<0.050		mg/kg		0.05	18-DEC-15
Tellurium (Te)-Total			<0.020		mg/kg		0.02	18-DEC-15
Thallium (Tl)-Total			<0.0020		mg/kg		0.002	18-DEC-15
Tin (Sn)-Total			<0.10		mg/kg		0.1	18-DEC-15
Uranium (U)-Total			<0.0020		mg/kg		0.002	18-DEC-15
Vanadium (V)-Total			<0.10		mg/kg		0.1	18-DEC-15
Zinc (Zn)-Total			<0.50		mg/kg		0.5	18-DEC-15
Zirconium (Zr)-Total			<0.20		mg/kg		0.2	18-DEC-15

Quality Control Report

Client: MINNOW ENVIRONMENTAL INC.
2 Lamb Street
Georgetown ON L7G 3M9
Contact: Jess Tester

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-DRY-CCMS-N-VA	**Tissue**							
Batch R3342421								
WG2235323-3 CRM		**VA-NIST-1566B**						
Antimony (Sb)-Total			0.010		mg/kg		0-0.018	20-DEC-15
Arsenic (As)-Total			90.5		%		70-130	20-DEC-15
Barium (Ba)-Total			91.1		%		70-130	20-DEC-15
Boron (B)-Total			100.6		%		70-130	20-DEC-15
Cadmium (Cd)-Total			93.2		%		70-130	20-DEC-15
Calcium (Ca)-Total			93.1		%		70-130	20-DEC-15
Chromium (Cr)-Total			103.0		%		70-130	20-DEC-15
Cobalt (Co)-Total			91.6		%		70-130	20-DEC-15
Copper (Cu)-Total			89.1		%		70-130	20-DEC-15
Iron (Fe)-Total			89.6		%		70-130	20-DEC-15
Lead (Pb)-Total			100.2		%		70-130	20-DEC-15
Magnesium (Mg)-Total			88.2		%		70-130	20-DEC-15
Manganese (Mn)-Total			90.4		%		70-130	20-DEC-15
Molybdenum (Mo)-Total			99.0		%		70-130	20-DEC-15
Nickel (Ni)-Total			95.6		%		70-130	20-DEC-15
Phosphorus (P)-Total			98.3		%		70-130	20-DEC-15
Potassium (K)-Total			90.7		%		70-130	20-DEC-15
Rubidium (Rb)-Total			95.0		%		70-130	20-DEC-15
Selenium (Se)-Total			87.4		%		70-130	20-DEC-15
Sodium (Na)-Total			86.6		%		70-130	20-DEC-15
Strontium (Sr)-Total			89.5		%		70-130	20-DEC-15
Uranium (U)-Total			91.3		%		70-130	20-DEC-15
Vanadium (V)-Total			89.4		%		70-130	20-DEC-15
Zinc (Zn)-Total			86.1		%		70-130	20-DEC-15
WG2235323-2 DUP		**L1704817-31**						
Aluminum (Al)-Total		3.1	3.3		mg/kg	4.0	40	20-DEC-15
Antimony (Sb)-Total		0.046	0.029	J	mg/kg	0.017	0.02	20-DEC-15
Arsenic (As)-Total		0.126	0.111		mg/kg	13	40	20-DEC-15
Barium (Ba)-Total		<0.050	<0.050	RPD-NA	mg/kg	N/A	40	20-DEC-15
Beryllium (Be)-Total		<0.010	<0.010	RPD-NA	mg/kg	N/A	40	20-DEC-15
Bismuth (Bi)-Total		0.054	0.038		mg/kg	34	40	20-DEC-15
Boron (B)-Total		<1.0	<1.0	RPD-NA	mg/kg	N/A	40	20-DEC-15
Cadmium (Cd)-Total		0.237	0.225		mg/kg	5.4	40	20-DEC-15

Quality Control Report

Client: MINNOW ENVIRONMENTAL INC.
2 Lamb Street
Georgetown ON L7G 3M9
Contact: Jess Tester

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-DRY-CCMS-N-VA	**Tissue**							
Batch R3342421								
WG2235323-2 DUP		**L1704817-31**						
Calcium (Ca)-Total		180	163		mg/kg	10	60	20-DEC-15
Cesium (Cs)-Total		0.0302	0.0267		mg/kg	12	40	20-DEC-15
Chromium (Cr)-Total		<0.050	<0.050	RPD-NA	mg/kg	N/A	40	20-DEC-15
Cobalt (Co)-Total		0.149	0.138		mg/kg	8.1	40	20-DEC-15
Copper (Cu)-Total		85.5	82.1		mg/kg	4.1	40	20-DEC-15
Iron (Fe)-Total		198	192		mg/kg	3.3	40	20-DEC-15
Lead (Pb)-Total		0.027	0.020		mg/kg	30	40	20-DEC-15
Lithium (Li)-Total		<0.50	<0.50	RPD-NA	mg/kg	N/A	40	20-DEC-15
Magnesium (Mg)-Total		742	685		mg/kg	8.1	40	20-DEC-15
Manganese (Mn)-Total		10.2	9.44		mg/kg	7.4	40	20-DEC-15
Molybdenum (Mo)-Total		0.462	0.448		mg/kg	3.1	40	20-DEC-15
Nickel (Ni)-Total		<0.20	<0.20	RPD-NA	mg/kg	N/A	40	20-DEC-15
Phosphorus (P)-Total		13100	12300		mg/kg	6.2	40	20-DEC-15
Potassium (K)-Total		14600	14100		mg/kg	3.5	40	20-DEC-15
Rubidium (Rb)-Total		32.9	32.1		mg/kg	2.7	40	20-DEC-15
Selenium (Se)-Total		5.48	4.85		mg/kg	12	40	20-DEC-15
Sodium (Na)-Total		4040	3920		mg/kg	3.0	40	20-DEC-15
Strontium (Sr)-Total		0.112	0.102		mg/kg	9.6	60	20-DEC-15
Tellurium (Te)-Total		0.024	<0.020	RPD-NA	mg/kg	N/A	40	20-DEC-15
Thallium (Tl)-Total		0.0487	0.0340		mg/kg	35	40	20-DEC-15
Tin (Sn)-Total		0.24	0.24		mg/kg	0.9	40	20-DEC-15
Uranium (U)-Total		<0.0020	<0.0020	RPD-NA	mg/kg	N/A	40	20-DEC-15
Vanadium (V)-Total		0.55	0.51		mg/kg	9.0	40	20-DEC-15
Zinc (Zn)-Total		135	120		mg/kg	12	40	20-DEC-15
Zirconium (Zr)-Total		<0.20	<0.20	RPD-NA	mg/kg	N/A	40	20-DEC-15
WG2235323-4 LCS								
Aluminum (Al)-Total			99.9		%		70-130	20-DEC-15
Antimony (Sb)-Total			88.0		%		70-130	20-DEC-15
Arsenic (As)-Total			98.9		%		70-130	20-DEC-15
Barium (Ba)-Total			99.4		%		70-130	20-DEC-15
Beryllium (Be)-Total			84.5		%		70-130	20-DEC-15
Bismuth (Bi)-Total			84.2		%		70-130	20-DEC-15
Boron (B)-Total			88.8		%		70-130	20-DEC-15

Quality Control Report

Client: MINNOW ENVIRONMENTAL INC.
2 Lamb Street
Georgetown ON L7G 3M9
Contact: Jess Tester

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-DRY-CCMS-N-VA	**Tissue**							
Batch R3342421								
WG2235323-4 LCS								
Cadmium (Cd)-Total			93.9		%		70-130	20-DEC-15
Calcium (Ca)-Total			82.9		%		70-130	20-DEC-15
Cesium (Cs)-Total			84.1		%		70-130	20-DEC-15
Chromium (Cr)-Total			98.0		%		70-130	20-DEC-15
Cobalt (Co)-Total			99.0		%		70-130	20-DEC-15
Copper (Cu)-Total			96.4		%		70-130	20-DEC-15
Iron (Fe)-Total			91.2		%		70-130	20-DEC-15
Lead (Pb)-Total			84.0		%		70-130	20-DEC-15
Lithium (Li)-Total			84.3		%		70-130	20-DEC-15
Magnesium (Mg)-Total			99.4		%		70-130	20-DEC-15
Manganese (Mn)-Total			95.5		%		70-130	20-DEC-15
Molybdenum (Mo)-Total			86.3		%		70-130	20-DEC-15
Nickel (Ni)-Total			97.2		%		70-130	20-DEC-15
Potassium (K)-Total			112.5		%		70-130	20-DEC-15
Rubidium (Rb)-Total			112.6		%		70-130	20-DEC-15
Selenium (Se)-Total			92.5		%		70-130	20-DEC-15
Sodium (Na)-Total			99.4		%		70-130	20-DEC-15
Strontium (Sr)-Total			83.9		%		70-130	20-DEC-15
Tellurium (Te)-Total			86.2		%		70-130	20-DEC-15
Thallium (Tl)-Total			85.1		%		70-130	20-DEC-15
Tin (Sn)-Total			85.4		%		70-130	20-DEC-15
Uranium (U)-Total			80.6		%		70-130	20-DEC-15
Vanadium (V)-Total			100.6		%		70-130	20-DEC-15
Zinc (Zn)-Total			95.2		%		70-130	20-DEC-15
Zirconium (Zr)-Total			81.6		%		70-130	20-DEC-15
WG2235323-1 MB								
Aluminum (Al)-Total			<2.0		mg/kg		2	20-DEC-15
Antimony (Sb)-Total			<0.010		mg/kg		0.01	20-DEC-15
Arsenic (As)-Total			<0.020		mg/kg		0.02	20-DEC-15
Barium (Ba)-Total			<0.050		mg/kg		0.05	20-DEC-15
Beryllium (Be)-Total			<0.010		mg/kg		0.01	20-DEC-15
Bismuth (Bi)-Total			<0.010		mg/kg		0.01	20-DEC-15
Boron (B)-Total			<1.0		mg/kg		1	20-DEC-15
Cadmium (Cd)-Total			<0.0050		mg/kg		0.005	20-DEC-15

Quality Control Report

Client: MINNOW ENVIRONMENTAL INC.
2 Lamb Street
Georgetown ON L7G 3M9
Contact: Jess Tester

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-DRY-CCMS-N-VA	**Tissue**							
Batch R3342421								
WG2235323-1 MB								
Calcium (Ca)-Total			<20		mg/kg		20	20-DEC-15
Cesium (Cs)-Total			<0.0050		mg/kg		0.005	20-DEC-15
Chromium (Cr)-Total			<0.050		mg/kg		0.05	20-DEC-15
Cobalt (Co)-Total			<0.020		mg/kg		0.02	20-DEC-15
Copper (Cu)-Total			<0.10		mg/kg		0.1	20-DEC-15
Iron (Fe)-Total			<3.0		mg/kg		3	20-DEC-15
Lead (Pb)-Total			<0.020		mg/kg		0.02	20-DEC-15
Lithium (Li)-Total			<0.50		mg/kg		0.5	20-DEC-15
Magnesium (Mg)-Total			<2.0		mg/kg		2	20-DEC-15
Manganese (Mn)-Total			<0.050		mg/kg		0.05	20-DEC-15
Molybdenum (Mo)-Total			<0.020		mg/kg		0.02	20-DEC-15
Nickel (Ni)-Total			<0.20		mg/kg		0.2	20-DEC-15
Phosphorus (P)-Total			<10		mg/kg		10	20-DEC-15
Potassium (K)-Total			<20		mg/kg		20	20-DEC-15
Rubidium (Rb)-Total			<0.050		mg/kg		0.05	20-DEC-15
Selenium (Se)-Total			<0.050		mg/kg		0.05	20-DEC-15
Sodium (Na)-Total			<20		mg/kg		20	20-DEC-15
Strontium (Sr)-Total			<0.050		mg/kg		0.05	20-DEC-15
Tellurium (Te)-Total			<0.020		mg/kg		0.02	20-DEC-15
Thallium (Tl)-Total			<0.0020		mg/kg		0.002	20-DEC-15
Tin (Sn)-Total			<0.10		mg/kg		0.1	20-DEC-15
Uranium (U)-Total			<0.0020		mg/kg		0.002	20-DEC-15
Vanadium (V)-Total			<0.10		mg/kg		0.1	20-DEC-15
Zinc (Zn)-Total			<0.50		mg/kg		0.5	20-DEC-15
Zirconium (Zr)-Total			<0.20		mg/kg		0.2	20-DEC-15
Batch R3346673								
WG2235323-4 LCS								
Phosphorus (P)-Total			104.3		%		70-130	21-DEC-15
MET-DRY-MICR-HRMS-VA	**Tissue**							
Batch R3338775								
WG2228104-4 CRM		**VA-NIST-1566B**						
Antimony (Sb)-Total			0.005		mg/kg		0-0.018	16-DEC-15
Arsenic (As)-Total			80.8		%		70-130	16-DEC-15

Quality Control Report

Client: MINNOW ENVIRONMENTAL INC.
2 Lamb Street
Georgetown ON L7G 3M9
Contact: Jess Tester

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-DRY-MICR-HRMS-VA	**Tissue**							
Batch	**R3338775**							
WG2228104-4	**CRM**	**VA-NIST-1566B**						
Barium (Ba)-Total			83.6		%		70-130	16-DEC-15
Boron (B)-Total			76.8		%		70-130	16-DEC-15
Cadmium (Cd)-Total			104.5		%		70-130	16-DEC-15
Calcium (Ca)-Total			80.8		%		70-130	16-DEC-15
Chromium (Cr)-Total			0.20		mg/kg		0.06-0.46	16-DEC-15
Cobalt (Co)-Total			71.1		%		70-130	16-DEC-15
Copper (Cu)-Total			123.7		%		70-130	16-DEC-15
Iron (Fe)-Total			91.1		%		70-130	16-DEC-15
Lead (Pb)-Total			72.4		%		70-130	16-DEC-15
Magnesium (Mg)-Total			86.0		%		70-130	16-DEC-15
Manganese (Mn)-Total			122.9		%		70-130	16-DEC-15
Molybdenum (Mo)-Total			73.8		%		70-130	16-DEC-15
Nickel (Ni)-Total			88.2		%		70-130	16-DEC-15
Phosphorus (P)-Total			84.4		%		70-130	16-DEC-15
Potassium (K)-Total			80.0		%		70-130	16-DEC-15
Rubidium (Rb)-Total			90.9		%		70-130	16-DEC-15
Selenium (Se)-Total			82.0		%		70-130	16-DEC-15
Sodium (Na)-Total			86.7		%		70-130	16-DEC-15
Strontium (Sr)-Total			98.1		%		70-130	16-DEC-15
Uranium (U)-Total			88.3		%		70-130	16-DEC-15
Vanadium (V)-Total			80.4		%		70-130	16-DEC-15
Zinc (Zn)-Total			127.9		%		70-130	16-DEC-15
WG2228104-3	**DUP**	**L1704817-6**						
Antimony (Sb)-Total		<0.010	<0.010	RPD-NA	mg/kg	N/A	40	16-DEC-15
Arsenic (As)-Total		0.320	0.483	DUP-H	mg/kg	40	40	16-DEC-15
Beryllium (Be)-Total		<0.010	<0.010	RPD-NA	mg/kg	N/A	40	16-DEC-15
Cadmium (Cd)-Total		<0.010	<0.010	RPD-NA	mg/kg	N/A	40	16-DEC-15
Calcium (Ca)-Total		628	1280	DUP-H	mg/kg	68	60	16-DEC-15
Chromium (Cr)-Total		<0.20	<0.20	RPD-NA	mg/kg	N/A	40	16-DEC-15
Cobalt (Co)-Total		<0.020	<0.020	RPD-NA	mg/kg	N/A	40	16-DEC-15
Copper (Cu)-Total		0.86	0.91		mg/kg	5.3	40	16-DEC-15
Iron (Fe)-Total		10.3	14.9		mg/kg	36	40	16-DEC-15
Lead (Pb)-Total		<0.050	<0.050	RPD-NA	mg/kg	N/A	40	16-DEC-15

Quality Control Report

Client: MINNOW ENVIRONMENTAL INC.
2 Lamb Street
Georgetown ON L7G 3M9
Contact: Jess Tester

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-DRY-MICR-HRMS-VA	**Tissue**							
Batch R3338775								
WG2228104-3 DUP		**L1704817-6**						
Lithium (Li)-Total		<0.50	<0.50	RPD-NA	mg/kg	N/A	40	16-DEC-15
Magnesium (Mg)-Total		1530	1770		mg/kg	15	40	16-DEC-15
Manganese (Mn)-Total		1.17	2.21	DUP-H	mg/kg	62	40	16-DEC-15
Molybdenum (Mo)-Total		<0.040	<0.040	RPD-NA	mg/kg	N/A	40	16-DEC-15
Nickel (Ni)-Total		<0.20	<0.20	RPD-NA	mg/kg	N/A	40	16-DEC-15
Phosphorus (P)-Total		10100	10600		mg/kg	5.3	40	16-DEC-15
Potassium (K)-Total		18100	19200		mg/kg	5.9	40	16-DEC-15
Rubidium (Rb)-Total		22.2	23.1		mg/kg	4.2	40	16-DEC-15
Selenium (Se)-Total		0.85	0.91		mg/kg	6.2	40	16-DEC-15
Sodium (Na)-Total		1260	1350		mg/kg	6.8	40	16-DEC-15
Strontium (Sr)-Total		0.32	0.66	DUP-H	mg/kg	69	60	16-DEC-15
Tellurium (Te)-Total		<0.020	<0.020	RPD-NA	mg/kg	N/A	40	16-DEC-15
Thallium (Tl)-Total		0.0091	0.0105		mg/kg	14	40	16-DEC-15
Vanadium (V)-Total		<0.10	0.23	DUP-H	mg/kg	N/A	40	16-DEC-15
Zinc (Zn)-Total		17.6	18.0		mg/kg	2.3	40	16-DEC-15
WG2228104-5 LCS								
Aluminum (Al)-Total			82.1		%		70-130	16-DEC-15
Antimony (Sb)-Total			110.7		%		70-130	16-DEC-15
Arsenic (As)-Total			129.4		%		70-130	16-DEC-15
Barium (Ba)-Total			103.4		%		70-130	16-DEC-15
Beryllium (Be)-Total			127.5		%		70-130	16-DEC-15
Bismuth (Bi)-Total			122.8		%		70-130	16-DEC-15
Boron (B)-Total			103.7		%		70-130	16-DEC-15
Cadmium (Cd)-Total			128.5		%		70-130	16-DEC-15
Calcium (Ca)-Total			104.6		%		70-130	16-DEC-15
Cesium (Cs)-Total			99.0		%		70-130	16-DEC-15
Chromium (Cr)-Total			96.2		%		70-130	16-DEC-15
Cobalt (Co)-Total			123.9		%		70-130	16-DEC-15
Copper (Cu)-Total			118.1		%		70-130	16-DEC-15
Iron (Fe)-Total			102.4		%		70-130	16-DEC-15
Lead (Pb)-Total			106.1		%		70-130	16-DEC-15
Lithium (Li)-Total			86.1		%		70-130	16-DEC-15
Magnesium (Mg)-Total			100.5		%		70-130	16-DEC-15

Quality Control Report

Client: MINNOW ENVIRONMENTAL INC.
2 Lamb Street
Georgetown ON L7G 3M9
Contact: Jess Tester

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-DRY-MICR-HRMS-VA	**Tissue**							
Batch	**R3338775**							
WG2228104-5	**LCS**							
Molybdenum (Mo)-Total			99.0		%		70-130	16-DEC-15
Nickel (Ni)-Total			108.7		%		70-130	16-DEC-15
Potassium (K)-Total			92.2		%		70-130	16-DEC-15
Rubidium (Rb)-Total			96.2		%		70-130	16-DEC-15
Selenium (Se)-Total			95.0		%		70-130	16-DEC-15
Sodium (Na)-Total			100.7		%		70-130	16-DEC-15
Thallium (Tl)-Total			110.7		%		70-130	16-DEC-15
Tin (Sn)-Total			101.2		%		70-130	16-DEC-15
Uranium (U)-Total			100.8		%		70-130	16-DEC-15
Zinc (Zn)-Total			127.4		%		70-130	16-DEC-15
Zirconium (Zr)-Total			104.7		%		70-130	16-DEC-15
WG2228104-1	**MB**							
Aluminum (Al)-Total			<5.0		mg/kg		5	16-DEC-15
Antimony (Sb)-Total			<0.010		mg/kg		0.01	16-DEC-15
Arsenic (As)-Total			<0.030		mg/kg		0.03	16-DEC-15
Barium (Ba)-Total			<0.050		mg/kg		0.05	16-DEC-15
Beryllium (Be)-Total			<0.010		mg/kg		0.01	16-DEC-15
Bismuth (Bi)-Total			<0.010		mg/kg		0.01	16-DEC-15
Boron (B)-Total			<1.0		mg/kg		1	16-DEC-15
Cadmium (Cd)-Total			<0.010		mg/kg		0.01	16-DEC-15
Calcium (Ca)-Total			<20		mg/kg		20	16-DEC-15
Cesium (Cs)-Total			<0.0050		mg/kg		0.005	16-DEC-15
Chromium (Cr)-Total			<0.20		mg/kg		0.2	16-DEC-15
Cobalt (Co)-Total			<0.020		mg/kg		0.02	16-DEC-15
Copper (Cu)-Total			<0.20		mg/kg		0.2	16-DEC-15
Iron (Fe)-Total			<5.0		mg/kg		5	16-DEC-15
Lead (Pb)-Total			<0.050		mg/kg		0.05	16-DEC-15
Lithium (Li)-Total			<0.50		mg/kg		0.5	16-DEC-15
Magnesium (Mg)-Total			<2.0		mg/kg		2	16-DEC-15
Manganese (Mn)-Total			<0.050		mg/kg		0.05	16-DEC-15
Molybdenum (Mo)-Total			<0.040		mg/kg		0.04	16-DEC-15
Nickel (Ni)-Total			<0.20		mg/kg		0.2	16-DEC-15
Phosphorus (P)-Total			<10		mg/kg		10	16-DEC-15
Potassium (K)-Total			<20		mg/kg		20	16-DEC-15

Quality Control Report

Client: MINNOW ENVIRONMENTAL INC.
2 Lamb Street
Georgetown ON L7G 3M9
Contact: Jess Tester

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-DRY-MICR-HRMS-VA	**Tissue**							
Batch	**R3338775**							
WG2228104-1	**MB**							
Rubidium (Rb)-Total			<0.050		mg/kg		0.05	16-DEC-15
Selenium (Se)-Total			<0.10		mg/kg		0.1	16-DEC-15
Sodium (Na)-Total			<20		mg/kg		20	16-DEC-15
Strontium (Sr)-Total			<0.10		mg/kg		0.1	16-DEC-15
Tellurium (Te)-Total			<0.020		mg/kg		0.02	16-DEC-15
Thallium (Tl)-Total			<0.0020		mg/kg		0.002	16-DEC-15
Tin (Sn)-Total			<0.10		mg/kg		0.1	16-DEC-15
Uranium (U)-Total			<0.0020		mg/kg		0.002	16-DEC-15
Vanadium (V)-Total			<0.10		mg/kg		0.1	16-DEC-15
Zinc (Zn)-Total			<1.0		mg/kg		1	16-DEC-15
Zirconium (Zr)-Total			<0.20		mg/kg		0.2	16-DEC-15
WG2228104-2	**MB**							
Aluminum (Al)-Total			<5.0		mg/kg		5	16-DEC-15
Antimony (Sb)-Total			<0.010		mg/kg		0.01	16-DEC-15
Arsenic (As)-Total			<0.030		mg/kg		0.03	16-DEC-15
Barium (Ba)-Total			<0.050		mg/kg		0.05	16-DEC-15
Beryllium (Be)-Total			<0.010		mg/kg		0.01	16-DEC-15
Bismuth (Bi)-Total			<0.010		mg/kg		0.01	16-DEC-15
Boron (B)-Total			<1.0		mg/kg		1	16-DEC-15
Cadmium (Cd)-Total			<0.010		mg/kg		0.01	16-DEC-15
Calcium (Ca)-Total			<20		mg/kg		20	16-DEC-15
Cesium (Cs)-Total			<0.0050		mg/kg		0.005	16-DEC-15
Chromium (Cr)-Total			<0.20		mg/kg		0.2	16-DEC-15
Cobalt (Co)-Total			<0.020		mg/kg		0.02	16-DEC-15
Copper (Cu)-Total			<0.20		mg/kg		0.2	16-DEC-15
Iron (Fe)-Total			<5.0		mg/kg		5	16-DEC-15
Lead (Pb)-Total			<0.050		mg/kg		0.05	16-DEC-15
Lithium (Li)-Total			<0.50		mg/kg		0.5	16-DEC-15
Magnesium (Mg)-Total			<2.0		mg/kg		2	16-DEC-15
Manganese (Mn)-Total			<0.050		mg/kg		0.05	16-DEC-15
Molybdenum (Mo)-Total			<0.040		mg/kg		0.04	16-DEC-15
Nickel (Ni)-Total			<0.20		mg/kg		0.2	16-DEC-15
Phosphorus (P)-Total			<10		mg/kg		10	16-DEC-15
Potassium (K)-Total			<20		mg/kg		20	16-DEC-15

Quality Control Report

Client: MINNOW ENVIRONMENTAL INC.
2 Lamb Street
Georgetown ON L7G 3M9
Contact: Jess Tester

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-DRY-MICR-HRMS-VA	**Tissue**							
Batch	**R3338775**							
WG2228104-2	**MB**							
Rubidium (Rb)-Total			<0.050		mg/kg		0.05	16-DEC-15
Selenium (Se)-Total			<0.10		mg/kg		0.1	16-DEC-15
Sodium (Na)-Total			<20		mg/kg		20	16-DEC-15
Strontium (Sr)-Total			<0.10		mg/kg		0.1	16-DEC-15
Tellurium (Te)-Total			<0.020		mg/kg		0.02	16-DEC-15
Thallium (Tl)-Total			<0.0020		mg/kg		0.002	16-DEC-15
Tin (Sn)-Total			<0.10		mg/kg		0.1	16-DEC-15
Uranium (U)-Total			<0.0020		mg/kg		0.002	16-DEC-15
Vanadium (V)-Total			<0.10		mg/kg		0.1	16-DEC-15
Zinc (Zn)-Total			<1.0		mg/kg		1	16-DEC-15
Zirconium (Zr)-Total			<0.20		mg/kg		0.2	16-DEC-15
Batch	**R3343154**							
WG2228104-3	**DUP**	**L1704817-6**						
Aluminum (Al)-Total		<5.0	8.4	RPD-NA	mg/kg	N/A	40	19-DEC-15
Barium (Ba)-Total		0.151	0.970	DUP-H	mg/kg	146	40	19-DEC-15
Bismuth (Bi)-Total		0.010	<0.010	RPD-NA	mg/kg	N/A	40	19-DEC-15
Boron (B)-Total		<1.0	<1.0	RPD-NA	mg/kg	N/A	40	19-DEC-15
Cesium (Cs)-Total		0.0214	0.0176		mg/kg	19	40	19-DEC-15
Tin (Sn)-Total		0.38	0.38		mg/kg	1.5	40	19-DEC-15
Uranium (U)-Total		<0.0020	<0.0020	RPD-NA	mg/kg	N/A	40	19-DEC-15
Zirconium (Zr)-Total		<0.20	<0.20	RPD-NA	mg/kg	N/A	40	19-DEC-15
Batch	**R3354401**							
WG2238912-4	**CRM**	**VA-NIST-1566B**						
Chromium (Cr)-Total			0.21		mg/kg		0.06-0.46	22-DEC-15
WG2238912-3	**DUP**	**L1704817-15**						
Chromium (Cr)-Total		<0.20	<0.20	RPD-NA	mg/kg	N/A	40	22-DEC-15
WG2238912-5	**LCS**							
Chromium (Cr)-Total			102.6		%		70-130	22-DEC-15
WG2238912-1	**MB**							
Chromium (Cr)-Total			<0.20		mg/kg		0.2	22-DEC-15
WG2238912-2	**MB**							
Chromium (Cr)-Total			<0.20		mg/kg		0.2	22-DEC-15

Quality Control Report

Client: MINNOW ENVIRONMENTAL INC.
2 Lamb Street
Georgetown ON L7G 3M9
Contact: Jess Tester

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-DRY-MICR-HRMS-VA	**Tissue**							
Batch R3404164								
WG2262884-4 CRM		**VA-NIST-1566B**						
Iron (Fe)-Total			81.0		%		70-130	10-FEB-16
WG2262884-3 DUP		**L1704817-46**						
Iron (Fe)-Total		13.2	7.0	J	mg/kg	6.2	10	10-FEB-16
WG2262884-5 LCS								
Iron (Fe)-Total			113.6		%		70-130	10-FEB-16
WG2262884-1 MB								
Iron (Fe)-Total			<5.0		mg/kg		5	10-FEB-16
WG2262884-2 MB								
Iron (Fe)-Total			<5.0		mg/kg		5	10-FEB-16
MOISTURE-TISS-VA	**Tissue**							
Batch R3325553								
WG2226466-3 DUP		**L1704817-40**						
% Moisture		81.7	82.0		%	0.4	20	04-DEC-15
Batch R3325554								
WG2226458-3 DUP		**L1685945-42**						
% Moisture		86.8	86.1		%	0.8	20	04-DEC-15
Batch R3332714								
WG2228105-1 DUP		**L1704817-6**						
% Moisture		78.0	78.9		%	1.1	20	11-DEC-15

Quality Control Report

Workorder: L1704817 Report Date: 18-FEB-16

Client: MINNOW ENVIRONMENTAL INC.
2 Lamb Street
Georgetown ON L7G 3M9
Contact: Jess Tester

Legend:

Limit	ALS Control Limit (Data Quality Objectives)
DUP	Duplicate
RPD	Relative Percent Difference
N/A	Not Available
LCS	Laboratory Control Sample
SRM	Standard Reference Material
MS	Matrix Spike
MSD	Matrix Spike Duplicate
ADE	Average Desorption Efficiency
MB	Method Blank
IRM	Internal Reference Material
CRM	Certified Reference Material
CCV	Continuing Calibration Verification
CVS	Calibration Verification Standard
LCSD	Laboratory Control Sample Duplicate

Sample Parameter Qualifier Definitions:

Qualifier	Description
DUP-H	Duplicate results outside ALS DQO, due to sample heterogeneity.
J	Duplicate results and limits are expressed in terms of absolute difference.
RM-H	Reference Material recovery was above ALS DQO. Non-detected sample results are considered reliable. Other results, if reported, have been qualified.
RPD-NA	Relative Percent Difference Not Available due to result(s) being less than detection limit.

Hold Time Exceedances:

All test results reported with this submission were conducted within ALS recommended hold times.

ALS recommended hold times may vary by province. They are assigned to meet known provincial and/or federal government requirements. In the absence of regulatory hold times, ALS establishes recommendations based on guidelines published by the US EPA, APHA Standard Methods, or Environment Canada (where available). For more information, please contact ALS.

The ALS Quality Control Report is provided to ALS clients upon request. ALS includes comprehensive QC checks with every analysis to ensure our high standards of quality are met. Each QC result has a known or expected target value, which is compared against pre-determined data quality objectives to provide confidence in the accuracy of associated test results.

Please note that this report may contain QC results from anonymous Sample Duplicates and Matrix Spikes that do not originate from this Work Order.

Chain of Custody (COC) / Analytical Request Form

ALS Environmental
www.alsglobal.com

Canada Toll Free: 1 800 668 9878

L1704817-COFC

COC Number: 14 -

Page 1 of 4

Report To		Report Format / Distribution	Select Service Level Below (Rush Turnaround Time (TAT) is not available for all tests)
Company:	Minnow Environmental Inc.	Select Report Format: ☑ PDF ☑ EXCEL ☐ EDD (DIGITAL)	R ☑ Regular (Standard TAT if received by 3 pm - business days)
Contact:	Jess Tester	Quality Control (QC) Report with Report ☑ Yes ☐ No	P ☐ Priority (2-4 bus. days if received by 3pm) 50% surcharge - contact ALS to confirm TAT
Address:	2 Lamb Street Georgetown, ON, L7G 3M9	☐ Criteria on Report - provide details below if box checked Select Distribution: ☑ EMAIL ☐ MAIL ☐ FAX	E ☐ Emergency (1-2 bus. days if received by 3pm) 100% surcharge - contact ALS to confirm TAT E2 ☐ Same day or weekend emergency - contact ALS to confirm TAT and surcharge
Phone:	905-873-3371 x227	Email 1 or Fax jtester@minnow.ca	Specify Date Required for E2, E or P:
		Email 2	Analysis Request

Invoice To	Same as Report To ☐ Yes ☑ No	Invoice Distribution	Indicate Filtered (F), Preserved (P) or Filtered and Preserved (F/P) below
	Copy of Invoice with Report ☐ Yes ☑ No	Select Invoice Distribution: ☐ EMAIL ☐ MAIL ☐ FAX	
Company:	Calley Anderson, New Gold, 5967 Highway 11/71,	Email 1 or Fax	
Contact:	P.O. Box 5, Emo, ON, P0W IE0. T: (807) 707-3058	Email 2	

Project Information		Oil and Gas Required Fields (client use)	
ALS Quote #:	Q52338	Approver ID:	Cost Center:
Job #:	157202.0075	GL Account:	Routing Code:
PO / AFE:		Activity Code:	
LSD:		Location:	

ALS Lab Work Order # (lab use only)		ALS Contact: Can Dang	Sampler: JT/MW

ALS Sample # (lab use only)	Sample Identification and/or Coordinates (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	ICPMS Metals (Dry)	Total Mercury (Dry)	Moisture Content	Number of Containers
	PINR-NP1-M	1-Oct-15	-	Tissue	R	R	R	1
	PINR-NP2-M	1-Oct-15	-	Tissue	R	R	R	1
	PINR-NP3-M	1-Oct-15	-	Tissue	R	R	R	1
	PINR-NP4-M	1-Oct-15	-	Tissue	R	R	R	1
	PINR-NP5-M	1-Oct-15	-	Tissue	R	R	R	1
	PINR-NP7-M	1-Oct-15	-	Tissue	R	R	R	1
	PINR-NP8-M	1-Oct-15	-	Tissue	R	R	R	1
	PINR-NP9-M	2-Oct-15	-	Tissue	R	R	R	1
	PINR-NP10-M	2-Oct-15	-	Tissue	R	R	R	1
	PINR-NP12-M	2-Oct-15	-	Tissue	R	R	R	1
	PINR-NP13-M	2-Oct-15	-	Tissue	R	R	R	1
	PINR-NP14-M	2-Oct-15	-	Tissue	R	R	R	1

Drinking Water (DW) Samples[1] (client use)	Special Instructions / Specify Criteria to add on report (client Use)
Are samples taken from a Regulated DW System? ☐ Yes ☐ No Are samples for human drinking water use? ☐ Yes ☐ No	

SAMPLE CONDITION AS RECEIVED (lab use only)

Frozen	☐	SIF Observations	Yes ☐	No ☐	
Ice packs	Yes ☐	No ☐	Custody seal intact	Yes ☐	No ☐
Cooling Initiated	☐				

INITIAL COOLER TEMPERATURES °C			FINAL COOLER TEMPERATURES °C		
				1.1	4

SHIPMENT RELEASE (client use)			INITIAL SHIPMENT RECEPTION (lab use only)			FINAL SHIPMENT RECEPTION (lab use only)		
Released by: Jess Tester	Date: 18-Nov-15	Time: 1pm	Received by:	Date:	Time:	Received by: <Original signed by>	Date: NOV 19 2015	Time: 9 Am

<Original signed by>

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION

WHITE - LABORATORY COPY YELLOW - CLIENT C

NA-FM-0326e v09 Front/04 January 2014

Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY. By the use of this form the user acknowledges and agrees with the Terms and Conditions as specified on the back page of the white - report copy.

1. If any water samples are taken from a **Regulated Drinking Water (DW) System**, please submit using an **Authorized DW COC form**.

ALS Environmental

www.alsglobal.com

Chain of Custody (COC) / Analytical Request Form

Canada Toll Free: 1 800 668 9878

L1704817-COFC

COC Number: 14 -

Report To		Report Format / Distribution	Select Service Level Below (Rush Turnaround Time (TAT) is not available for all tests)
Company:	Minnow Environmental Inc.	Select Report Format: ☑ PDF ☑ EXCEL ☐ EDD (DIGITAL)	R ☑ Regular (Standard TAT if received by 3 pm - business days)
Contact:	Jess Tester	Quality Control (QC) Report with Report ☑ Yes ☐ No	P ☐ Priority (2-4 bus. days if received by 3pm) 50% surcharge - contact ALS to confirm TAT
Address:	2 Lamb Street Georgetown, ON, L7G 3M9	☐ Criteria on Report - provide details below if box checked Select Distribution: ☑ EMAIL ☐ MAIL ☐ FAX	E ☐ Emergency (1-2 bus. days if received by 3pm) 100% surcharge - contact ALS to confirm TAT E2 ☐ Same day or weekend emergency - contact ALS to confirm TAT and surcharge
Phone:	905-873-3371 x227	Email 1 or Fax jtester@minnow.ca	Specify Date Required for E2,E or P:
		Email 2	

Invoice To	Same as Report To ☐ Yes ☑ No	Invoice Distribution	Analysis Request
	Copy of Invoice with Report ☐ Yes ☑ No	Select Invoice Distribution: ☐ EMAIL ☐ MAIL ☐ FAX	Indicate Filtered (F), Preserved (P) or Filtered and Preserved (F/P) below
Company:	Cailey Anderson, New Gold, 5967 Highway 11/71,	Email 1 or Fax	
Contact:	P.O. Box 5, Emo, ON, P0W IE0. T: (807) 707-3058	Email 2	

Project Information		Oil and Gas Required Fields (client use)	
ALS Quote #:	Q52338	Approver ID:	Cost Center:
Job #:	157202.0075	GL Account:	Routing Code:
PO / AFE:		Activity Code:	
LSD:		Location:	

ALS Lab Work Order # (lab use only)		ALS Contact: Can Dang	Sampler: JT/MW

ALS Sample # (lab use only)	Sample Identification and/or Coordinates (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	ICPMS Metals (Dry)	Total Mercury (Dry)	Moisture Content	Number of Containers
	PINR-NP9-L	2-Oct-15	-	Tissue	R	R	R	1
	PINR-NP10-L	2-Oct-15	-	Tissue	R	R	R	1
	PINR-NP12-L	2-Oct-15	-	Tissue	R	R	R	1
	PINR-NP13-L	2-Oct-15	-	Tissue	R	R	R	1
	PINR-NP14-L	2-Oct-15	-	Tissue	R	R	R	1
	PINR-NP15-L	2-Oct-15	-	Tissue	R	R	R	1
	PINR-NP16-L	3-Oct-15	-	Tissue	R	R	R	1
	PINR-NP17-L	3-Oct-15	-	Tissue	R	R	R	1
	PINR-NPX-L	3-Oct-15	-	Tissue	R	R	R	1
	PINR-NP1-G	1-Oct-15	-	Tissue	R	R	R	1
	PINR-NP2-G	1-Oct-15	-	Tissue	R	R	R	1
	PINR-NP3-G	1-Oct-15	-	Tissue	R	R	R	1

Drinking Water (DW) Samples[1] (client use)	Special Instructions / Specify Criteria to add on report (client Use)
Are samples taken from a Regulated DW System? ☐ Yes ☐ No Are samples for human drinking water use? ☐ Yes ☐ No	

SAMPLE CONDITION AS RECEIVED (lab use only)

Frozen ☐ SIF Observations Yes ☐ No ☐

Ice packs Yes ☐ No ☐ Custody seal intact Yes ☐ No ☐

Cooling Initiated ☐

INITIAL COOLER TEMPERATURES °C			FINAL COOLER TEMPERATURES °C		
				1.1	C

SHIPMENT RELEASE (client use)			INITIAL SHIPMENT RECEPTION (lab use only)			FINAL SHIPMENT RECEPTION (lab use only)		
Released by:	Date:	Time:	Received by:	Date:	Time:	Received by: <Original signed by>	Date: NOV 19 2015	Time: 9AM

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION

WHITE - LABORATORY COPY YELLOW - CLIENT C

NA-FM-6228e-v09 Front/04 January 2014

Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY. By the use of this form the user acknowledges and agrees with the Terms and Conditions as specified on the back page of the white - report copy.

1. If any water samples are taken from a **Regulated Drinking Water (DW) System**, please submit using an **Authorized DW COC form**.

ALS Environmental

www.alsglobal.com

Chain of Custody (COC) / Analytical Request Form

Canada Toll Free: 1 800 668 9878

L1704817-COFC

COC Number: 14 -

Page 4 of 4

Report To		Report Format / Distribution	Select Service Level Below (Rush Turnaround Time (TAT) is not available for all tests)
Company:	Minnow Environmental Inc.	Select Report Format: ☑ PDF ☑ EXCEL ☐ EDD (DIGITAL)	R ☑ Regular (Standard TAT if received by 3 pm - business days)
Contact:	Jess Tester	Quality Control (QC) Report with Report ☑ Yes ☐ No	P ☐ Priority (2-4 bus. days if received by 3pm) 50% surcharge - contact ALS to confirm TAT
Address:	2 Lamb Street Georgetown, ON, L7G 3M9	☐ Criteria on Report - provide details below if box checked Select Distribution: ☑ EMAIL ☐ MAIL ☐ FAX	E ☐ Emergency (1-2 bus. days if received by 3pm) 100% surcharge - contact ALS to confirm TAT E2 ☐ Same day or weekend emergency - contact ALS to confirm TAT and surcharge
Phone:	905-873-3371 x227	Email 1 or Fax jtester@minnow.ca Email 2	Specify Date Required for E2,E or P:

Invoice To		Invoice Distribution	Analysis Request
	Same as Report To ☐ Yes ☑ No		Indicate Filtered (F), Preserved (P) or Filtered and Preserved (F/P) below
	Copy of Invoice with Report ☐ Yes ☑ No	Select Invoice Distribution: ☐ EMAIL ☐ MAIL ☐ FAX	
Company:	Calley Anderson, New Gold, 5967 Highway 11/71,	Email 1 or Fax	
Contact:	P.O. Box 5, Emo, ON, P0W IE0. T: (807) 707-3058	Email 2	

Project Information		Oil and Gas Required Fields (client use)	
ALS Quote #:	Q52338	Approver ID:	Cost Center:
Job #:	157202.0075	GL Account:	Routing Code:
PO / AFE:		Activity Code:	
LSD:		Location:	

ALS Lab Work Order # (lab use only) | **ALS Contact:** Can Dang | **Sampler:** JT/MW

ALS Sample # (lab use only)	Sample Identification and/or Coordinates (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	ICPMS Metals (Dry)	Total Mercury (Dry)	Moisture Content	Number of Containers
	PINR-NP4-G	1-Oct-15	-	Tissue	R	R	R	1
	PINR-NP5-G	1-Oct-15	-	Tissue	R	R	R	1
	PINR-NP12-G	2-Oct-15	-	Tissue	R	R	R	1
	PINR-NP13-G	2-Oct-15	-	Tissue	R	R	R	1
	PINR-NP15-G	2-Oct-15	-	Tissue	R	R	R	1
	PINR-NP16-G	3-Oct-15	-	Tissue	R	R	R	1
	PINR-NPX-G	3-Oct-15	-	Tissue	R	R	R	1
	PINR-Wa1-M	1-Oct-15	-	Tissue	R	R	R	1
	PINR-Wa1-L	1-Oct-15	-	Tissue	R	R	R	1

Drinking Water (DW) Samples[1] (client use)

Are samples taken from a Regulated DW System? ☐ Yes ☐ No

Are samples for human drinking water use? ☐ Yes ☐ No

Special Instructions / Specify Criteria to add on report (client Use)

SAMPLE CONDITION AS RECEIVED (lab use only)

Frozen ☐ | SIF Observations Yes ☐ No ☐

Ice packs Yes ☐ No ☐ | Custody seal intact Yes ☐ No ☐

Cooling Initiated ☐

INITIAL COOLER TEMPERATURES °C			FINAL COOLER TEMPERATURES °C	
			1.1 °C	

SHIPMENT RELEASE (client use)			INITIAL SHIPMENT RECEPTION (lab use only)			FINAL SHIPMENT RECEPTION (lab use only)		
Released by:	Date:	Time:	Received by:	Date:	Time:	Received by: <Original signed by>	Date: NOV 19 2015	Time: 9Am

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION

WHITE - LABORATORY COPY YELLOW - CLIENT C

NA-FM-0326e v08 Front/04 January 2014

Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY. By the use of this form the user acknowledges and agrees with the Terms and Conditions as specified on the back page of the white - report copy.

1. If any water samples are taken from a **Regulated Drinking Water (DW) System**, please submit using an **Authorized DW COC form.**

APPENDIX F

CONDITION 6
SUPPORTING DOCUMENTATION

94°6'0"W
94°4'0"W
94°2'0"W
94°0'0"W
93°58'0"W
93°56'0"W
93°54'0"W
48°53'0"N
48°52'0"N
48°51'0"N
48°50'0"N
48°49'0"N
48°48'0"N
5416000
5414000
5412000
5410000
5408000
5406000
418000
420000
422000
424000
426000
428000
430000
432000
434000

Split Rock Road
McCallum Creek
Richardson Road
Marr Road
SPLIT ROCK RIVER EAST BRANCH
230 KV TRANSMISSION LINE AND 40M CORRIDOR
HIGHWAY 71
Muskrat Lake
EXTENT OF 2009 LIDAR SURVEY
FINLAND
Korpi Road
Lampi Road
Clark Creek
White Road
Galenger Road
Unnamed (Waste Disposal) Road
Heatwole Road
Teeple Road
Pinewood River
Barwick Road
Caul Road
Jait Road
HIGHWAY 600
Black Hawk
DEARLOCK
Eliuk Road
Loslo Road
Georgeson Road
Roen Road
Mart Creek
West Creek
ROAD CLOSURE (MTO)

TAILINGS MANAGEMENT AREA
CONSTRUCTED WETLAND
OVERBURDEN STOCKPILE
MILL
COARSE ORE CRUSHING
WEST MINE ROCK STOCKPILE
OPEN PIT
LOW GRADE ORE STOCKPILE
EAST MINE ROCK STOCKPILE
MINE ROCK POND

STOCKPILES NOT TO SCALE!

TOP SOIL STOCKPILES

- ESA PROJECT SITE BOUNDARY, MNRF
- TOP SOIL STOCKPILES (2015)
- TOP SOIL STOCKPILES (PLANNED FOR 2016)
- MINE FOOTPRINT

0 1 2 3

Kilometers

newgold™

Rainy River Project

GIS GROUP, THUNDER BAY

T:\GIS\MAP DOCUMENTS\RAINY RIVER PROJECT\2016\2016-08-04 EC 2015 ANNUAL REPORT MAPS\2016-08-08 TOP SOIL STOCKPILES (EC 2015 ANNUAL REPORT MAPS).MXD

APPENDIX G

CONDITION 7
SUPPORTING DOCUMENTATION

RAINY RIVER PROJECT
ABORIGINAL CONSULTATION PLAN

PER PROVINCIAL ENVIRONMENTAL ASSESSMENT
NOTICE OF APPROVAL CONDITION 9

EA 05-09-02 / EAIMS 13102

VERSION 2

Date	Rev. #	Revision(s)	Originator
Jan. 21, 2015	0	Issued to MOECC	SD, Amec Foster Wheeler
Feb. 9, 2015	1	Issued to MOECC	KS, NG
Feb. 24, 2015	2	Principle Contact	KS, NG

February 2015
TC111504

Principal Contact: Stacey Jack
Senior Advisor, Community Relations
New Gold Inc.
PO Box 5, 5967 Highway 11/71
Emo, Ontario P0W 1E0
rrcomments@newgold.com
Telephone: (807) 482-0912
Facsimile: (807) 482-2834

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Appendix A Commitments Related to Aboriginal Communities

1.0 PROJECT BACKGROUND

New Gold Inc. (NG; formerly Rainy River Resources Limited) is planning to construct, operate and eventually reclaim a new open pit and underground gold mine, the Rainy River Project (RRP) to produce doré bars (gold with silver) for sale.

Physical works related to the RRP will consist primarily of:

- Open pit;
- Underground mine;
- Overburden, mine rock and low grade ore stockpiles;
- Primary crusher and process plant;
- Tailings management area;
- 230 kilovolt transmission line;
- Relocation of a portion of gravel-surfaced Highway 600; and
- Associated buildings, facilities and infrastructure, supported by related piping and power infrastructure as needed.

NG is committed throughout all phases of the RRP, to ensure that the local Aboriginal communities are kept informed regarding the project and provided opportunities to provide feedback.

2.0 REGULATORY FRAMEWORK

Rainy River Resources Ltd. predecessor to NG volunteered to be subject to an individual Environmental Assessment (EA) under the Ontario *Environmental Assessment Act*. On January 17, 2014, NG submitted documentation intended to fulfill the EA requirements as defined by the Provincially-approved Terms of Reference and Federal Environmental Impact Statement Guidelines:

- AMEC. 2014. Rainy River Project, Township of Chapple, Final Environmental Assessment Report (Environmental Impact Statement), Version 2. Prepared for Rainy River Resources Ltd.

This plan is intended to fulfill the following Provincial condition identified in the EA Notice of Approval for the RRP:

9. Consultation with Aboriginal Communities

9.1 The Proponent shall prepare and implement an Aboriginal Consultation Plan that sets forth:

a) How, during the detailed design and implementation of the Undertaking, the Proponent will consult with the Aboriginal communities that were notified of the Undertaking during the Environmental Assessment process;

b) How the Proponent will fulfill all commitments made to Aboriginal communities during the Environmental Assessment process, including ongoing consultation during the design and implementation of the Undertaking;

c) A Notification Protocol for how the Proponent will inform Aboriginal communities if archaeological resources or Aboriginal remains are encountered during construction;

d) How the Proponent will issue notices and updates on key steps in the design and implementation of the Undertaking;

9.2 The Proponent shall submit the Aboriginal Consultation Plan to the Director and the Aboriginal communities that were notified of the Undertaking during the Environmental Assessment process 30 days before the Start of Construction or by such other date as agreed to in writing by the Director.

9.3 The Proponent shall implement the Aboriginal Consultation Plan during construction, operations and closure of the Undertaking.

9.4 The Proponent shall continue to consult with the following Aboriginal communities: Rainy River First Nations, Naicatchewenin First Nation, Big Grassy River First Nation, Naotkamegwanning (Whitefish Bay) First Nation, Anishinaabeg of Naongashiing (Big Island) First Nation, Ojibways of Onigaming First Nation, and the Sunset Country Métis community (represented by Métis Nation of Ontario Region 1 Consultation Committee), to inform them of when impacting activities will occur. Before impacting activities occur, the Proponent shall provide interested Aboriginal communities with reasonable opportunity to carry out specific cultural practices, as those communities consider appropriate.

The cover of this procedure provides a means to track updates as required through the construction, operation and closure phases of the RRP.

3.0 ABORIGINAL CONSULTATION PLAN

3.1 Proposed Consultation during Detailed Design and Implementation

NG will consult with local Aboriginal communities in accordance with consultation requirements and communication protocols establish through Aboriginal Agreements as modified over the life of the project.

Where formal agreements are not in place, consultation and notification will continue to occur, consistent with existing relationships and any Regulatory requirements, which may include major project milestones such as the start of commercial production. Recognizing that each community is unique, consultation and notification efforts may include personal meetings, e-mail updates and updates in the newsletter. The RRP newsletter will be published at a minimum of two times a year. Typical newsletter content will include a project update, how and where to access further information on the project (such as jobs) and special feature stories such as events hosted at sites. All newsletters also contain contact information for the project.

3.2 Fulfilment of Commitments made to Aboriginal Communities during Detailed Design and Implementation

NG made a large number of commitments which have been tabulated and were disseminated through the associated Environmental Assessment documentation (Appendix A). NG intends to fulfil these commitments.

NG will maintain a Commitments Registry that tabulates the commitments made through the Environmental Assessment process and on-going status toward completion. The registry will be updated on a regular basis, and no less frequently than annually as part of the project follow up reporting. The updated Commitments Registry will be provided to the Aboriginal communities that were consulted and/or notified during the Provincial Environmental Assessment process on an annual basis during construction and operations, and if appropriate, thereafter until the commitments are fulfilled.

3.3 Notification Protocol for Aboriginal communities if Archaeological Resources or Human Remains are encountered during construction;

In the event of discovery of a suspected archaeological resource(s), work will stop in the immediate area of the discovery. If work needs to continue in the general area, barriers will be placed to cordon off the location of the potential archaeological resource, providing a minimum 100 metre zone (unless physically constrained from doing so, by topography or infrastructure for example) using available materials. Appropriate signage will also be placed to prevent further disturbance until notification and further identification can be made by a licensed archaeologist.

If the item is found not to be an archaeological resource, proposed Project activities will continue

with appropriate documentation of activities completed.

3.3.1 Management of Burial Sites of Human Remains

With specific reference to graves or human remains, NG is committed to the preservation or otherwise applicable management of any discovered burial sites or human remains, in a respectful manner and in accordance with Ontario *Heritage Act* requirements.

> *It is an offence under Sections 48 and 69 of the Ontario Heritage Act for any party other than a licensed archaeologist to make any alteration to a known archaeological site or to remove any artifact or other physical evidence of past human use or activity from the site, until such time as a licensed archaeologist has completed archaeological fieldwork on the site, submitted a report to the Minister stating that the site has no further cultural heritage value or interest, and the report has been file in the Ontario Public Register of Archaeological Reports referred to in Section 65.1 in the Ontario Heritage Act.*
>
> *Should previously undocumented archaeological resources be discovered, they may be a new archaeological site and therefore subject to section 48(1) of the Ontario Heritage Act. The proponent or person discovering the archaeological resources must cease alteration of the site immediately and engage a licensed consultant archaeologist to carry out archaeological fieldwork in compliance with Section 48(1) of the Ontario Heritage Act.*
>
> *The Cemeteries Act, R.S.O. 1990 c. C.4 and the Funeral, Burial and Cremation Services Act 2002, S.O. 2002, c.33 (when proclaimed in force) require that any persons discovering human remains must notify the police or coroner and the Registrar of Cemeteries at the Ministry of Government and Consumer Services.*

Unless absolutely certain otherwise, any bones discovered during the construction, operation, decommissioning and post-closure periods of the RRP, will be assumed to be human and represent a human burial site, and will be afforded protection until determined to be otherwise. While a human skull is readily recognizable, other bones may need to be identified by an expert. Since skulls and long bones can be crushed and shattered by frost heaves or soil subsidence, it may not be possible to recognise even these more obvious human remains without expert assistance.

Notification will be in accordance with Section 3.3.3 of this plan.

In consultation with the licensed archaeologist retained by NG and to confer the appropriate level of respect, the location and nature of the find will not be widely broadcast by NG, unless a determination is subsequently made that the bones are not human.

3.3.2 Management of Non-human Artifact Finds

The salvage and preservation of any artifacts discovered during the construction, operation, decommissioning and post-closure periods of the RRP, will be in accordance with Ontario *Heritage Act* requirements.

A number of mitigation measures are possible in accordance with the *Heritage Act*:

- Avoidance of the area and establishment of an agreed upon buffer area; or
- Removal of the heritage resource utilizing necessary scientific and cultural techniques by a qualified individual after appropriate investigation, with artifacts and site records appropriately protected.

Archaeological resources that require removal will be transferred to a public institution selected through consultation with local First Nations and Métis represented by the Métis Nation of Ontario Region 1 Consultation Committee, in consultation with MTCS. An MTCS collection transfer form will be completed by the surrendering licensee and the institution accepting the materials. Collection shall be curated to current standards.

3.3.3 Notification

In the event of discovery of a suspected archaeological resource, work will stop within 100 metres of the discovery. The General Manager will be immediately notified, who will contact the Community Coordinator who will take control of the site. The Community Coordinator or his/her designate will make all subsequent contacts, including to:

1) Archaeology Section of the Ministry of Tourism, Culture and Sport (MTCS)
   Contact: 416-212-8886

2) Potentially interested Aboriginal communities as recommended during consultation with the licensed archaeologist retained by NG:

In addition, with the discovery of bones suspected as being human remains, the Community Coordinator or her designate will notify:

3) Ontario Provincial Police, non-emergency, local detachment
   Contact: 1-888-310-1122

4) Cemeteries Registrar, Ministry of Government and Consumer Services, Cemeteries Regulations Unit
   Contact: 416-326-8404

3.4 Opportunity for Notification and Updates during Detailed Design and Implementation

The Community Coordinator will manage the provision of information to Aboriginal communities during the detailed design, construction, operation and decommissioning phases on an on-going basis, as well as in response to unique requests.

3.4.1 On-going Notification and Updates

The primary means of notification of Aboriginal community members during the detailed design, construction, operation and decommissioning phases of the RRP is anticipated to continue to be advertisements in local newspapers and the RRP newsletter sent to each community, as well as direct interaction of community members at the local New Gold office / with local staff. The RRP newsletter will be published at a minimum of two times a year. Typical newsletter content will include a project update, how and where to access further information on the project (such as jobs) and special feature stories such as events hosted at sites. All newsletters also contain contact information for the project. Other means including utilizing the Project website may be used as applicable going forward.

All notifications will provide Aboriginal community members with a means to request additional information. The Community Coordinator will maintain a database regarding individuals who have requested direct notification regarding the project, and track the completion of the notifications on an on-going basis.

NG will provide information and updates on a regular basis in accordance with communication protocols establish through Aboriginal Agreements. Where formal agreements are not in place, communications will continue consistent with existing relationships and any Regulatory requirements.

3.4.2 Response to Feedback

A telephone number and e-mail address is available to allow Aboriginal community members and others to provide direct feedback to NG regarding the RRP:

Telephone: (807) 622-8111
E-mail: rrcomments@newgold.com

This contact information will continue to be made publicly known through inclusion in all RRP newsletters, periodically through local newspaper advertisements, as well as by other means as appropriate.

Initial feedback will also be accepted through direct communications (written or verbal) with appropriate NG representatives; however the Aboriginal community member(s) will be directed to

provide feedback in a formal manner through the telephone number or e-mail address to ensure complete and timely responsiveness by the company. If the feedback arises through casual interaction, NG will confirm with the person(s) that they wish the feedback to be documented formally. The communication and follow up will be documented in a standardized form.

The Community Coordinator will maintain a database regarding individuals who have requested information regarding the project (Interested Persons). The Community Coordinator or his/her designate will follow up with the originator of a new request for information within five business days of the request, to let them know that the request was received. Follow-up actions may include:

- Provision of the information (one-time or on-going); or
- Explanation of the reason the information cannot be provided.

NG intends to maintain its history of transparency and responsiveness to Aboriginal communities and the public. NG may however at times be constrained from discussing certain matters in detail.

All requests for information received will be recorded in the Aboriginal and Stakeholder Communications Database along with proposed actions to follow up on the request. The Record of Contact will include actions required, timing and on-going status until completed. New Gold will attempt to provide the information in a timely manner whenever reasonable.

Further detail is provided in the RRP External Feedback and Complaint Protocol.

4.0 Opportunity for Aboriginal Cultural Practices

NG has committed to provide opportunity to Aboriginal Communities to carry out specific cultural practices at RRP site and nearby accessible areas to the Rainy River First Nation, Naicatchewenin First Nation, Anishinaabeg of Naongashiing First Nation (Big Island), Big Grassy River First Nation, Whitefish Bay, Ojibways of Onigaming and the Sunset Country Métis community as represented by the MNO Region 1 Consultation Committee.

NG requests a minimum of 48-hour advance notice prior to the requested time of a cultural practice occurring on site. The request should be made in writing (e-mail is acceptable) to the Construction Manager or General Manager and copied to the Community Coordinator. The request should include:

- Date and time requested;
- Length of time of the visit;
- Names of individuals requesting access; and
- The specific location (ideally with a sketch map).

Contact information is as follows:

Chris McGoldrick, Construction Director
Chris.McGoldrick@newgold.com

Grant Goddard, General Manager
Grant.Goddard@newgold.com

Stacey Jack, Senior Advisor - Community Relations (and licensed archaeologist)
Stacey.Jack@newgold.com
(807) 482-2501

NG will try to accommodate requests made in another manner, but for ease of access and to avoid unnecessary delay at security / disruption of site construction and operations, this approach is preferred.

Due to health and safety procedures, a NG team member will accompany any individuals/groups who access the site, while making best efforts to confer the appropriate level of cultural respect during cultural practices on the site. Additionally, some access may be limited to health and safety precautions.

APPENDIX A

RAINY RIVER PROJECT COMMITMENTS REGISTRY (VER. 12) – EXCERPTS

Commitments Related to Aboriginal Communities

#	*Environmental Assessment Commitments Specifically Related to Aboriginal Communities*	Project Phase
68	Proposed (subject to modification to ensure participation and data sharing is adequate to meet the expectations of Aboriginal groups) surface water sampling program would include a First Nation training component followed by a rotating schedule whereby a First Nation representative would accompany NG staff on the monthly surface water sampling program. Laboratory results will be received by NG, reviewed and submitted to the identified individuals of each participating First Nation along with a summary explanation.	C,O,D,P
91	A wildlife monitoring program will record the efficacy of these avoidance measures (will evaluate the effectiveness of the methods implemented) and annual reporting to Environment Canada (EC) and the Ministry of Natural Resources and Forestry (MNRF) will provide the information requested by the reviewer. NG will provide opportunities to Aboriginal groups to receive the annual reports.	C,O,D
92	A more detailed wildlife follow-up monitoring plan will be developed through consultation with the MNRF and EC. As suggested by the reviewer, additional control sites around the periphery of the mine footprint can be developed and monitored following mine construction and periodically throughout mine operations. A draft plan will be issued to MNRF and EC prior to commencement of construction. NG will provide opportunities to Aboriginal groups to participate in the development of the plan.	E,C,O
100	Breeding bird surveys are proposed to be carried out along portions of the preferred transmission line corridor in late Spring / early Summer, 2014. Prior to transmission line construction, additional data collection will be undertaken for that portion of the proposed transmission line routing (Alternative A) west of Highway 71, where there is a baseline data gap for breeding bird surveys. This additional data collection will be undertaken to support transmission line permitting, and would consist of point count surveys for breeding birds between late May and early July, spread across a 2 km corridor (1 km on either side the transmission line). Results will be made available to MNR once the report is complete. NG will provide opportunities to Aboriginal groups to receive the survey results.	E
115	Traditional Knowledge/Traditional Land Use (TK/TLU) data has been widely collected for the RRP, including from the closest communities of Big Grassy River First Nation (BGRFN), Rainy River First Nations and Naicatchewenin First Nation. All TK/TLU sessions were community driven, meaning that the method of data collection was community specific. The majority of the data has been broad and overreaching, which NG will continue to respect as it serves as the basis for Aboriginal Persons unique relationship to the land. TK/TLU collection will continue; information collected will be appropriately considered for construction, operation and closure phases. For example, NG will further investigate the historical travel corridor and incorporate appropriately any new information that may become available. (Letter to Chiefs from Kyle Stanfield, October 2013).	E,C,O,D,P
120	Aboriginal People will play an active role in the development of the mine Closure Plan, including development of the monitoring and mitigation programs. While the Closure Plan will be completed prior to construction, NG will consult on significant revisions periodically during operations to ensure incorporation of TK and best management practices. (Letter to Chiefs from Kyle Stanfield, October 2013).	E,C,O
121	Monitoring programs targeted at ungulates (moose, deer) will be coordinated with local Aboriginal people. (Letter to Chiefs from Kyle Stanfield, October 2013).	E,C,O,D
123	While the Draft EA has shown no impacts to Aboriginal or non-Aboriginal people's health, any new information that has a potential to impact health will be provided to Aboriginal people. (Letter to Chiefs from Kyle Stanfield, October 2013). Further, NG has committed to analyse ungulate organ meats voluntarily submitted to them by local hunters, with the results of any such analysis made available to local residents and Aboriginal communities.	E,C,O,D
124	NG will work with Aboriginal groups to ensure employee overall well-being. Programs to highlight the dangers of drug use combined with drug testing will be implemented. (Letter to Chiefs from Kyle Stanfield, October 2013).	C,O,D

#	*Environmental Assessment Commitments Specifically Related to Aboriginal Communities*	Project Phase
128	NG is consulting with First Nations and the Métis Nation of Ontario (MNO) on the Draft Closure Plan provided on March 19, 2014. NG has provided resources to these communities to undertake independent review the Draft document. Results of the independent review process will be used to help the Company develop any further commitments and/or mitigations to reduce potential impacts to Aboriginal and treaty rights. This process is expected to be completed concurrent with the conclusion of the EA process.	E
131	NG has committed to provide members of the BGRFN, Big Island First Nation, Ojibways of Onigaming First Nation, Naotkamegwanning First Nation, Rainy River First Nations, Naicatchewenin First Nation and Métis represented by the Métis Nation of Ontario (MNO) Region 1 Consultation Committee, the ability to access certain lands that NG is able to make available for gathering of wild medicines, berries or other vegetation. Access will be coordinated with the Aboriginal communities.	E,C,O,D,P
132	NG has committed to ensure that Aboriginal communities (including BGRFN, Big Island First Nation, Ojibways of Onigaming First Nation, Naotkamegwanning First Nation, Rainy River First Nations, Naicatchewenin First Nation and Métis represented by the MNO Region 1 Consultation Committee) have the ability to access the site for cultural and ceremonial purposes so that local Aboriginal people can undertake ceremonies at different times of the year to show respect for the land and its spiritual aspects. This will ensure that young people can participate in ceremonies and learn from elders and ceremonialists. Teaching through the generations will therefore be maintained.	E,C,O,D,P
135	Related to the transmission line: • Compensation will be provided for merchantable timber value where applicable; • Maintain transmission line set back distances of not less than 100 m from area lakes to provide effective visual screening from open waters; • Landscape screening to minimize the contrast in landscape character; for example by leaving shrub cover vegetation that will not affect the conductors (i.e., the wire) in the ROW at creek crossings; and Minimizing land use conflicts and concerns by consulting with other users and stakeholders (i.e., Aboriginal peoples, hunters, trappers, outdoor recreationalists) to identify and implement other means of conflict resolution.	E,C,O
144	While the Draft EA has shown no impacts to Aboriginal or non-Aboriginal people's health, any new information that has a potential to impact health will be provided to Aboriginal groups. (Letter to Chiefs from Kyle Stanfield, October 2013). NG has committed to analyse ungulate organ meats voluntarily submitted to them by local hunters, with the results of any such analysis made available to local residents and Aboriginal communities.	E,C,O,D
167	NG has committed to ensure that First Nations (including Rainy River First Nations, Naicatchewenin First Nation, Big Grassy River First Nation, Big Island First Nation, Naotkamegwanning First Nation, and Ojibways of Onigaming First Nation) and Métis community members have the: • Ability to access the site for cultural and ceremonial purposes, so that local Aboriginal people can undertake ceremonies at different times of the year to show respect for the land and its spiritual aspects. • All NG staff will undergo cultural awareness training. Temporary contractors will undergo an awareness program as part of the regular induction program when working at the mine (Letter to Chiefs from Kyle Stanfield, October 2013). This will ensure that people that work at the site are aware of indigenous culture and values, and are respectful of the principles and values of the Ojibwe people. This mitigation has been identified as a result of the Draft EA independent First Nation review and agreed to by NG. NG will follow up directly with the BGRFN regarding any additional mitigation and accommodation measures.	E,C,O,D,P

#	*Environmental Assessment Commitments Specifically Related to Aboriginal Communities*	Project Phase
168	NG is fully agreeable to work with local Aboriginal peoples on an ongoing basis to monitor metal concentrations in country foods (notably fish muscle and liver tissues, and White-tailed Deer liver tissue; and other wildlife tissues as appropriate. A commitment to work with local Aboriginal groups to sample White-tail Deer liver tissues [and other wildlife tissues as committed to herein] for metals analysis has been made. This analysis could be expanded to include testing for additional metals. NG will work with local Aboriginal hunters to determine the most effective path forward on this topic.	E,C,O
175	With regards to protection of cultural heritage values during transmission line construction: • Should human remains be identified during construction, all work in the vicinity of the discovery will be suspended immediately, and notification will be made to the Ontario Provincial Police, or local police, who will conduct a site investigation and contact the district coroner. Notification must also be made to the Ministry of Tourism, Culture and Sport, and the Registrar of Cemeteries, Ministry of Government Services. • Should cultural heritage resources (archaeological or historical materials or features) be identified during construction or operations, all activity in the vicinity of the find will be suspended and the Ministry of Tourism, Culture and Sport archaeologist be contacted. This condition provides for the potential for deeply buried sites not typically identified; and • In addition, NG will continue to engage Aboriginal people (including Rainy River First Nations, Naicatchewenin First Nation, Big Grassy River First Nation, Big Island First Nation, Naotkamegwanning First Nation, Ojibways of Onigaming First Nation and Métis community members) about the transmission line construction and will respond should additional culturally significant areas be identified that could be impacted by the construction.	C
176	Related to transmission line, construction will be supervised by a qualified archaeologist at identified areas of high archaeological potential. Regular, ongoing discussions with stakeholders, Aboriginal people and local communities will help to monitor any effects to the socio-cultural environment and identify mutually satisfactory ways to mitigate negative or enhance positive effects. A formal complaints procedure will be established to provide stakeholders and Aboriginal peoples a voice during the construction, operation and decommissioning phase of the transmission line project. A response protocol will also be established to ensure that follow up occurs.	C
194	NG is proposing to work with Aboriginal groups including Rainy River First Nations, Naicatchewenin First Nation, Big Grassy River First Nation, Big Island First Nation, Naotkamegwanning First Nation, Ojibways of Onigaming First Nation and Métis community members to provide access to alternative private lands for the purposes of supporting TLU on such lands; and potentially providing compensation or incentives through collaborative agreements between the Aboriginal groups and NG. Access will be coordinated with the Aboriginal groups.	E,C
195	NG will communicate with Aboriginal groups including Rainy River First Nations, Naicatchewenin First Nation, Big Grassy River First Nation, Big Island First Nation, Naotkamegwanning First Nation, Ojibways of Onigaming First Nation and Métis community members on traditional teachings and ceremony.	E,C
200	NG is committed to working closely with the area First Nations and the MNO. NG has provided resources to Aboriginal Groups to undertake traditional studies as well as technical reviews of both the Draft EA as well as the Draft Closure Plan. NG will continue to support First Nations as part of the EA process and as mine operations begin.	E,C,O

#	*Environmental Assessment Commitments Specifically Related to Aboriginal Communities*	Project Phase
203	NG is committed to further discussions with potentially affected Aboriginal groups with respect to development of a protocol for the preservation of artifacts. Where practical and reasonable, artifacts that require removal will be transferred to a public institution selected through consultation with local First Nations and Métis represented by the MNO Region 1 Consultation Committee, in consultation with the MTCS. A MTCS collection transfer form will be completed by the surrendering licensee and the institution accepting the materials. Collection shall be curated to current standards.	C,O

Commitment numbering relates to the Commitments Registry.

E: Engineering and procurement; C: Construction; O: Operations; D: Decommissioning and active closure; P: Post active closure

All commitments listed will be implemented by NG and/or its designated representatives / contractors.

APPENDIX H

CONDITION 8
SUPPORTING DOCUMENTATION

Species at Risk Monitoring Report addressing Condition 8 supporting documentation was also previously provided as support documentation for Condition 4 in Appendix D (pg 152, link to report within in this document can be found below:)

2015_SAR_Monitoring_Report_(Jan_15_2016)_Ver1.pdf