Appendix A
Annual Compliance Report
Condition Requirements
Condition 5

2016 Rainy River Project Annual Report

newgold™ Rainy River Project

Project Name:

Rainy River Project

Proponent:

New Gold Inc.

Decision Statement Issued:

Jan 12th 2015

CEARIS Ref Number:

80007

Reporting Period:

2016

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.

Figure 1: North Air Quality Monitoring Station, July 2016

Condition 5.1.1

Implementing fugitive dust best management practices;

Status: Ongoing

Supporting Analysis:

On the Rainy River Project dust is generated from vehicle traffic on gravel road surfaces, crushing and screening rock from onsite quarries for construction materials and drilling and blasting in the open pit.

In order to control dust RRP has been implementing the following methods;

- Following provincially approved Fugitive Dust Management Plans for the construction and operational phases of the project,
- Applying water and calcium chloride on road surfaces and parking lots as required,
- Use of water spraying devices in rock crushing and screening operations,
- Air quality monitoring, and
- Routine visual monitoring.

Moving into 2017 more construction material stockpiles will be generated onsite and New Gold RRP will require further monitoring and implementing soil and erosion control methodologies for controlling dust produced from these.

Condition 5.1.2

Maintaining site roadways to control silt loading;

Status: Ongoing

Supporting Analysis:

Gravel roadways and haul roads run throughout the project site and can create issues with silt loading and runoff primarily during spring melt and high rainfall events in the summer. To reduce the amount of silt loading New Gold has implemented a number of monitoring and mitigation measures to reduce the potential of such. These include;

- Regular road maintenance; application of road surfacing materials (crushed aggregate), calcium application and grading
- Installation of temporary erosion control products around culverts and drainage ditches such as straw bales, rock check dams, coir logs, silt fence and planting vegetation.
- During construction activities attempts are made to limit the impact on along road corridors on existing vegetation. Where economically feasible topsoil is reapplied in ditch lines to promote vigorous and substantial vegetation growth.
- In 2016 the project retained the consulting assistance of a Sediment Erosion Control Specialist who is responsible for monitoring construction designs and activities to ensure that adequate temporary and permanent sediment erosion control methods are implemented.
- Regular monitoring and testing of total suspended solids in creek channels is conducted throughout the Project footprint. These checks allow New Gold RRP to ensure that limited to no sediment is entering creek channels from construction activities and road use. In 2016 the project reported ten sediment related spills to the environment to the Ministry of Environment and Climate Change Spills Action Center. From the ten spills only one was associated with silt loading along a roadway which entered the Clark Creek Channel during spring melt.

Figure 2: South Air Quality Monitoring Station, July 2016

Condition 5.1.3

Using water sprays at the crusher and at active stockpiles;

Status: Ongoing

Supporting Analysis:

Water sprays have been installed at some of the active construction quarries on the project site. The Primary Crusher for rock extracted from the Open Pit will become operational in mid-2017 and is designed to have a water spray dust suppression system in place. As rock extraction advances in the open pit the project will need to monitor and review the expansion of stockpiles and make appropriate decisions on dust control where problems occur.

Condition 5.1.4

Using dust control equipment;

Status: Ongoing

Supporting Analysis:

During 2016 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 2017 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:

New Gold RRP Operations utilizes low-sulphur diesel and has pollution control equipment installed on mobile heavy equipment that meets the Canadian Environmental Protection Act for the emissions from equipment and vehicles. All New Gold RRP Operations heavy equipment mobile vehicles 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:

During the spring and summer of 2016 earthworks construction advanced significantly on the project. Final completion of some of these projects allowed for rehabilitation efforts in the form of topsoil and seed application to occur.

Figure 3: PM2.5 Sampler at North Air Quality Station, July 2016

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 east of the site on Gallinger Road, shown in Figure 1, and

one to the south of the site near the beginning of the Highway 600 reroute on Tait Road, shown in Figure 2.

These stations are equipped with hi-vol samplers (brush motor and mass flow controlled), PQ200 samplers, dustfall samplers, and passive sampling for SO_2 and NO_2.

The hi-vol samplers measure Total Suspended Particulate (TSP) and metal concentrations averaged over a 24-hour period. The metals and metalloids analyzed include 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 PQ200 samplers measure Particulate Matter 2.5 (PM2.5) concentrations averaged over a 24-hour period. The dustfall samplers measure total dustfall deposition over a 30-day period. Passive sampling measures SO_2 and NO_2 concentrations over a 30-day period. SD 5.2a contains details on the results of 2016.

Ministry of Environment and Climate Change (MOECC) performed an audit on July 28, 2016 on both stations. It was noted that the Gallinger Road Station had one tree located within the 20m allowance on the northwest side. This could potentially cause a problem for the dustfall sampler in several years. The tree was removed in August. Details of this audit can be found in SD 5.2b.

Figure 4: TSP Sampler at North Air Quality Station, July 2016

There were three air quality exceedances in 2016. One exceedance was of TSP at the Tait Road site on April 30, 2016. The Notice of Exceedance can be found in SD 5.2c. This exceedance was attributed to road traffic travelling on the newly graveled Highway 600 realignment.

The second and third exceedances were of $PM_{2.5}$ and both occurred on May 6, 2016 at both the Gallinger Road station (Notice of Exceedance in SD 5.2d) and the Tait Road station (Notice of Exceedance in SD 5.2e).

Aboriginal groups were not notified of these exceedance. In late 2016, RRP initiated a notification system to advise Aboriginal groups of exceedances and going forward Aboriginal groups will be notified.

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:

New Gold RRP submitted the Ambient Air Quality Monitoring Plan to the Province of Ontario in February 2016 (air quality monitoring stations were installed on site prior to this date). The Province accepted the plan in November 2016. There have been no exceedances in November and December.

In reviewing previous data (January through October), three exceedances were noted. On April 30th, the likely cause of the exceedance was dust from traffic on Highway 600. Two other exceedances (both on May 6th) were identified as being caused by forest fires in the region. Aboriginal groups were not notified of any of the exceedances; Aboriginal groups will be notified of all future exceedances.

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:

Through the consultation phase and up to 2016, New Gold RRP has not been informed of the locations of any wells utilized by Aboriginal groups within the proximal of the open pit dewatering zone of influence.

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 any wells used by Aboriginal groups within the Open Pit zone of influence therefore there is no need to alert Aboriginal groups.

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 2016 New Gold RRP 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. 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.

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. The data indicated that the Project did not have any influence on the concentrations of metals in muscle and liver tissues of the above fish species.

No new information was obtained or new impacts predicted during 2016 related to the RRP, that could affect the health of Aboriginal people. Further detail and data can be found in the SD 5.4a 2016 Fish Tissue Report attached in this document. Further studies will be conducted in 2017.

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:

The air quality exceedances discussed in Condition 5.2, are considered exceedances of provincial, federal or international health-based criteria. The Aboriginal groups were not notified at the time of the event but will be notified of all future exceedances with the implementation of a notification process in late 2016.

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:

New Gold RRP initiated community meetings and established Environmental Monitoring Boards in 2016. The purpose of the meetings and the boards is to ensure community members are engaged in environmental aspects of the project.

New Gold RRP also has regular communication meetings with several Aboriginal groups.

Figures

Supporting Documentation

SD 5.2a: RRP AQ Monitoring 2016
SD 5.2b: 2016.07.28 MOECC Air Quality Station Audit
SD 5.2c: NOE Tait TSP, 30 April 2016
SD 5.2d: NOE Gallinger PM2.5, 6 May 2016
SD 5.2e: NOE Tait PM2.5, 6 May 2016
SD 5.4a: RRP Fish Tissue Report 2016

AIR QUALITY MONITORING PROGRAM
FIRST QUARTER 2016 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
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October 2016

Amec Foster Wheeler Project No.: TC111504.2016.4

October 31, 2016

Amec Foster Wheeler Project No.: TC111504.2016.4

New Gold Inc.
1111 Victoria Avenue East
Thunder Bay, Ontario, P7C 1B7

Attention: Darrell Martindale
Director, Environment & Sustainability

Dear Mr. Martindale:

Re: Rainy River Project, First Quarter 2016 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) the attached summary report of the first quarter 2016 results for the ambient air quality monitoring program at the Rainy River Project.

The monitoring program consists of two air quality sampling stations that 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 are operated and maintained by New Gold staff.

There were no measured exceedances of Ministry of the Environment and Climate Change air quality standards, guidelines, or Ambient Air Quality Criteria; nor were there any exceedances of the Canadian Ambient Air Quality Standards for Particulate Matter $(PM)_{2.5}$ or other established criteria, as depicted in Figures CL-1 and CL-2.

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

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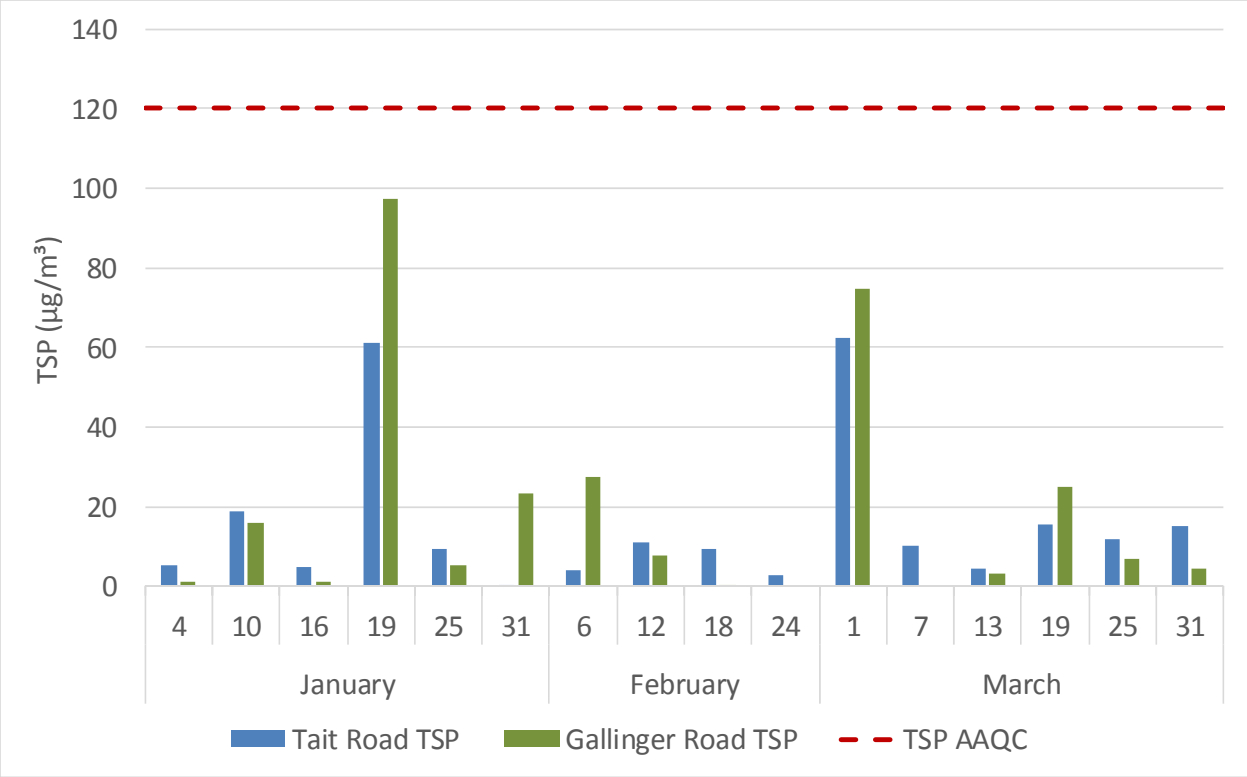

Figure CL-1: TSP Concentrations (2016 - Q1)

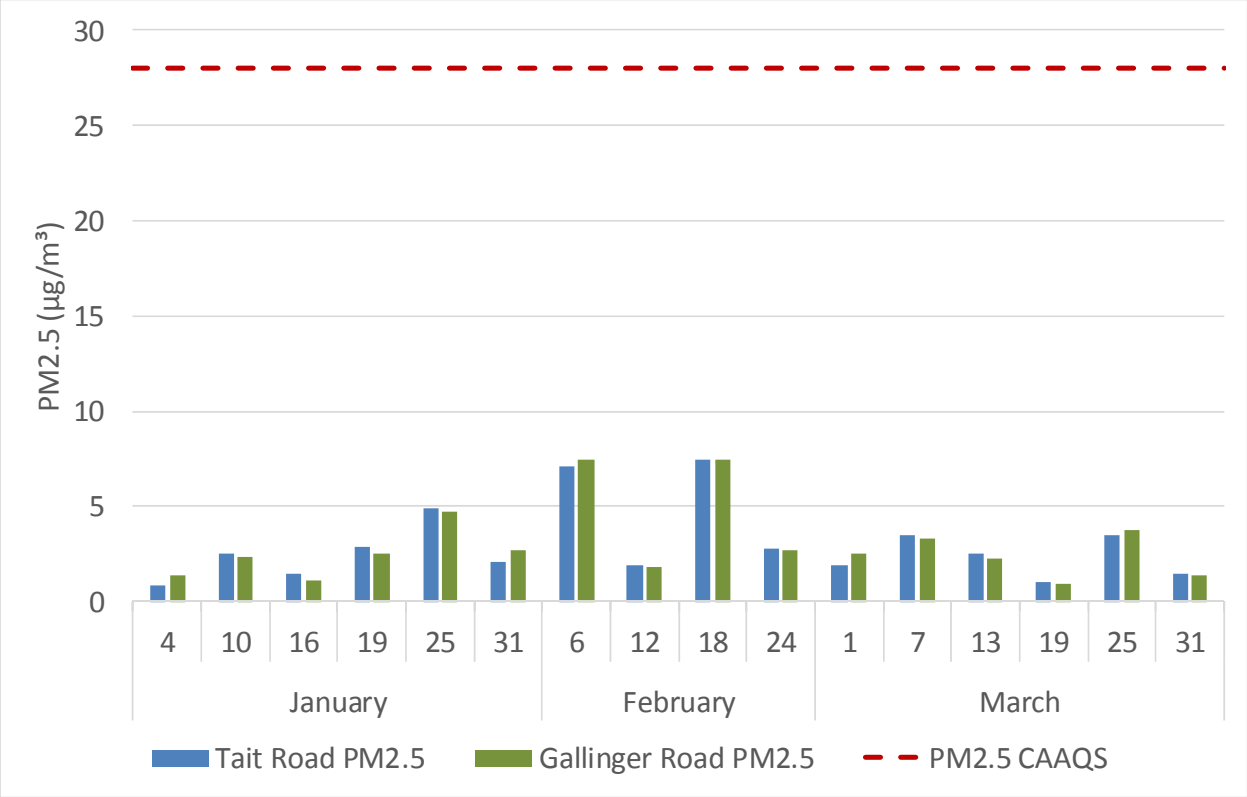

Figure CL-2: $PM_{2.5}$ Concentrations (2016 - Q1)

Revision	Date	Revised By	Description
A	31-March-2016	Caleb Vandenberg	Draft Report
0	1-November-2016	Caleb Vandenberg	Draft Report to NG

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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
US EPA	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 first quarter (Q1) 2016 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 µg/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 (2016) of 30 µg/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, perform flow calibration checks, and conduct preventative maintenance.

Two calibrations were performed that are relevant to this quarter's data. On 22 December 2015 and 22 March 2016, 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 US EPA 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.

Two calibrations were performed that are relevant to this quarter's data.

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 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 US EPA standard.

On 22 March 2016, 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 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 0.12% in the flow at standard conditions (Q_s) relative to the US EPA 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 Q1 2016 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 reported by the laboratory as 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 Q1 for the TSP and $PM_{2.5}$ concentrations are presented in Tables 1 and 2 respectively. During the quarter, the 1 in 6 day hi-vol sampling schedule comprised a possible total of sixteen (16) sampling days between 1 January and 31 March 2016.

A summary of the statistical analyses for Q1 2016 for the total dustfall data is presented below in Table 3. A summary of the statistical analysis for the first quarter of 2016 for the passive SO_2 and NO_2 results is presented in Table 4.

3.1 Total Suspended Particulates and Metals

The Tait Road station collected sixteen (16) valid samples in Q1 2016, resulting in 100% valid data. The Gallinger Road collected fourteen (14) valid samples in Q1 2016, resulting in 88% valid data. The Gallinger Road HiVol samples on 24 February and 7 March 2016 were both invalidated due to the average sample collection rate exceeding the MOECC criterion.

For the quarter, the arithmetic mean TSP concentrations were comparable, with the Tait Road station averaging 15.5 µg/m^3 and the Gallinger Road station averaging 21.0 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 62.4 µg/m^3 at the Tait Road station (1 March 2016), and 97.6 µg/m^3 at the Gallinger Road station (19 January 2016); there were no exceedances of the TSP AAQC measured in the quarter.

In the quarter, the 24-hour metal concentrations were all 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 Q1 2016 for TSP Data

Statistic	Q1	
	Tait Road (SW)	Gallinger Road (NE)
Geometric mean (µg/m^3)	8.67	57
Arithmetic mean (µg/m^3)	15.5	21.0
January Maximum (µg/m^3)	61.2	97.6
February Maximum (µg/m^3)	11.2	27.6
March Maximum (µg/m^3)	62.4	74.7
Maximum 24 hour (µg/m^3)	62.4 (1 Mar.)	97.6 (19 Jan.)
90th percentile	40.0	60.6
95th percentile	61.5	82.7
24-hour AAQC	120	120
No. of valid samples	16	14
% valid data	100	88
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, sixteen (16) valid samples were collected in Q1 2016, resulting in 100% valid data.

The arithmetic mean $PM_{2.5}$ concentrations for Q1 2016 were comparable with the Tait Road station averaging 2.98 µg/m^3 and the Gallinger Road station averaging 2.52 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 7.48 µg/m^3 at the Tait Road station (18 February 2016), and 7.41 µg/m^3 at the Gallinger Road station (6 and 18 February). Both values are lower than the $PM_{2.5}$ AAQC of 30 µg/m^3 and the CAAQS of 28 µg/m^3.

The Q1 $PM_{2.5}$ data is summarized in Table 2.

Table 2: Summary Statistics for Q1 2016 for $PM_{2.5}$ Data

Statistic	Q1	
	Tait Road (SW)	Gallinger Road (NE)
Geometric mean (µg/m^3)	2.49	2.52
Arithmetic mean (µg/m^3)	2.98	3.01
January Maximum (µg/m^3)	4.91	4.70
February Maximum (µg/m^3)	7.48	7.41
March Maximum (µg/m^3)	3.49	3.78
Maximum 24 hour (µg/m^3)	7.48 (18 Feb.)	7.41 (6,18 Feb.)
90th percentile	5.99	6.06
95th percentile	7.17	7.41
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 valid sample was collected at each station each month for dustfall during Q1 2016; 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. A summary of the results are presented in Table 3.

The monthly results are shown in Appendix B-2.

Table 3: Summary Statistics for Q1 2016 Total Dustfall Data

Statistic	Tait Road (SW)	Gallinger Road (NE)
Arithmetic mean (g/m^2/30d)	0.49	0.55
Maximum (g/m^2/30d)	0.75	0.75
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 Q1 of 2016, 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 sampling 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.

A summary of the passive results is presented in Table 4.

Table 4: Summary Statistics for Q1 2016 for Passive SO_2 and NO_2 Data

	Tait Road (SW)		Gallinger Road (NE)	
Statistic	**SO_2**	**NO_2**	**SO_2**	**NO_2**
Mean	0.4 µg/m^3	1.1 µg/m^3	0.4 µg/m^3	0.7 µg/m^3
Maximum	0.5 µg/m^3	1.3 µg/m^3	0.8 µg/m^3	1.7 µg/m^3
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 Q1 2016:

- Sixteen (16) and fourteen (14) valid TSP samples were collected at the Tait Road and Gallinger Road Stations respectively (100% and 88% valid data respectively), with metal analyses performed on each of the TSP filters;
- Sixteen (16) 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

Alberta Government. 2016. Alberta Ambient Air Quality Objectives and Guidelines Summary.

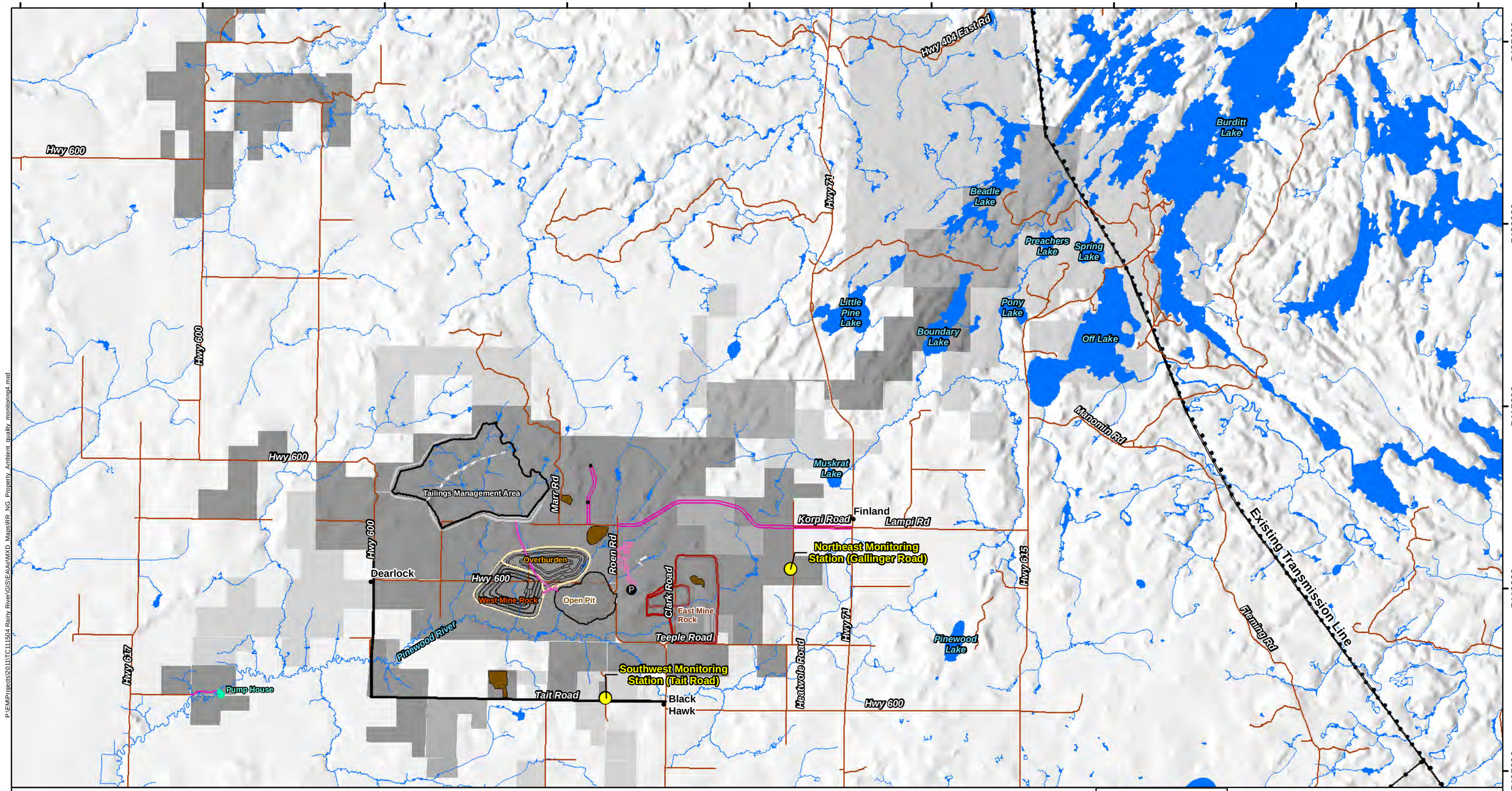
Environment and Climate Change Canada. 2013. Canadian Environmental Protection Act, 1999 *Sections 54 and 55.*

Ministry of the Environment. 2008. Operations Manual for Air Quality Monitoring in Ontario.

Ministry of the Environment. 2009. Procedure for Preparing and Emission Summary and Dispersion Modelling Report.

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

N W E S

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\AirMXD_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 (First Quarter 2016)
(results expressed in µg/m^3)

Date	TSP	PM2.5	As	Cd	Cr	Co	Cu	Fe	Pb	Mn	Ni	Se	V	Zn
January 4, 2016	5.47	0.873	*0.00041*	0.0000641	0.0028	0.000106	0.054	0.110	0.000471	0.00289	0.00049	*0.00041*	*0.00053*	0.0094
January 10, 2016	18.7	2.54	*0.00042*	0.000133	0.0036	0.000354	0.12	0.444	0.000677	0.0104	0.0011	*0.00042*	*0.00054*	0.0091
January 16, 2016	4.99	1.46	*0.00043*	0.000252	0.0034	0.000155	0.082	0.176	0.000509	0.00457	0.00085	*0.00043*	*0.00055*	0.0074
January 19, 2016	61.2	2.83	*0.00044*	0.0000436	0.0052	0.000427	0.080	0.756	0.000831	0.0187	0.0016	*0.00044*	*0.00056*	0.010
January 25, 2016	9.60	4.91	*0.00041*	0.0000943	0.0024	0.0000725	0.091	0.107	0.000525	0.00281	0.00040	*0.00041*	*0.00053*	0.0065
January 31, 2016	0.360	2.04	*0.00042*	0.0000359	0.0056	0.0000537	0.085	0.055	0.000583	0.00153	0.00060	*0.00042*	*0.00054*	0.0046
February 6, 2016	4.15	7.07	*0.00044*	0.000127	0.0053	0.000064	0.046	0.088	0.000961	0.00373	0.00069	*0.00044*	*0.00057*	0.0075
February 12, 2016	11.2	1.91	*0.00046*	0.0000509	0.0056	0.000202	0.068	0.312	0.00102	0.0065	0.0012	*0.00046*	*0.00059*	0.0054
February 18, 2016	9.27	7.48	*0.00044*	0.000112	0.0054	0.000110	0.043	0.113	0.00123	0.00400	0.00096	*0.00044*	*0.00057*	0.014
February 24, 2016	2.65	2.79	*0.00044*	0.0000338	0.0060	0.000110	0.095	0.0624	0.000343	0.00220	0.00079	*0.00044*	*0.00057*	0.0060
March 1, 2016	62.4	1.91	*0.00042*	0.0000649	0.012	0.000891	0.081	1.50	0.00167	0.0365	0.0031	*0.00042*	0.0021	0.011
March 7, 2016	10.3	3.49	*0.00040*	0.0000692	0.0061	0.000139	0.043	0.179	0.00128	0.00549	0.00083	*0.00040*	*0.00051*	0.0088
March 13, 2016	4.55	2.50	*0.00040*	0.0000778	0.0050	0.0000657	0.045	0.093	0.00129	0.00250	0.00062	*0.00040*	*0.00052*	0.0093
March 19, 2016	15.7	1.04	*0.00044*	0.000252	0.0060	0.000170	0.064	0.230	0.000326	0.00581	0.00095	*0.00044*	*0.00056*	0.0037
March 25, 2016	11.8	3.45	*0.00045*	0.0002159	0.0073	0.000136	0.045	0.189	0.001474	0.00685	0.00132	*0.00045*	*0.00058*	0.012
March 31, 2016	15.1	1.46	*0.00045*	0.0000523	0.0029	0.000182	0.040	0.275	0.000396	0.00769	0.00067	*0.00045*	*0.00058*	0.0058

Geometric mean	8.67	2.49	N/R	0.0000852	0.0049	0.000148	0.064	0.187	0.000744	0.00528	0.00089	N/R	N/R	0.0077
Arithmetic mean	15.5	2.98	N/R	0.0001049	0.0053	0.000202	0.068	0.293	0.000849	0.00764	0.0010	N/R	N/R	0.0082
Max. concentration	62.4	7.48	N/R	0.000252	0.012	0.000891	0.12	1.50	0.00167	0.0365	0.0031	N/R	N/R	0.014
Min. concentration	0.360	0.873	N/R	0.0000338	0.0024	0.0000537	0.040	0.055	0.000326	0.00153	0.00040	N/R	N/R	0.0037
90th percentile	40.0	5.99	N/R	0.000234	0.007	0.000390	0.093	0.600	0.00138	0.0146	0.0015	N/R	N/R	0.012
95th percentile	61.5	7.17	N/R	0.000252	0.008	0.000543	0.102	0.941	0.00152	0.0232	0.0020	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 (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	0	0	0	0	0	0	0	0	0	0	0	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	0	0	0	0	0	0	0	0	0	0	0	0
% valid data	100	100	100	100	100	100	100	100	100	100	100	100	100	100

Notes:
All non detectable results were reported as 1/2 detection limit and are denoted by italics and underlining
N/R: Statistics not reported due to high % of values <detection limit
N/A: Not applicable
—: Invalid Sample
*Canadian Ambient Air Quality Standard, 24-hour standard

Rainy River Project
Air Quality Monitoring Program
Q1 2016 Report

amec foster wheeler

Northeast Gallinger Road Monitoring Results for TSP and Metals (First Quarter 2016)
(results expressed in µg/m³)

Date	TSP	PM2.5	As	Cd	Cr	Co	Cu	Fe	Pb	Mn	Ni	Se	V	Zn
January 4, 2016	1.10	1.33	*0.00043*	0.0000549	0.0026	0.000142	0.11	0.0392	0.000378	0.00121	0.00042	*0.00043*	*0.00055*	0.0087
January 10, 2016	16.0	2.33	*0.00042*	0.0000627	0.0027	0.0000880	0.25	0.121	0.000504	0.00307	0.00058	*0.00042*	*0.00054*	0.0060
January 16, 2016	1.14	1.12	*0.00042*	0.0000821	0.0029	0.0000588	0.14	0.0407	0.000383	0.00107	0.00063	*0.00042*	*0.00054*	0.0076
January 19, 2016	97.6	2.50	*0.00042*	0.0000747	0.0059	0.000813	0.29	1.415	0.00114	0.0285	0.0023	*0.00042*	0.0014	0.01084
January 25, 2016	5.34	4.70	*0.00041*	0.0000769	0.0026	0.0000489	0.19	0.0569	0.000634	0.00134	0.00042	*0.00041*	*0.00053*	0.00804
January 31, 2016	23.5	2.66	*0.00041*	0.0000517	0.0061	0.000144	0.13	0.262	0.000701	0.00683	0.00092	*0.00041*	*0.00053*	0.00854
February 6, 2016	27.6	7.41	*0.00041*	0.000122	0.0053	0.000171	0.37	0.278	0.000752	0.00911	0.00093	*0.00041*	*0.00053*	0.0073
February 12, 2016	7.83	1.79	*0.00043*	0.000322	0.0071	0.0000978	0.74	0.0674	0.00118	0.00185	0.0014	*0.00043*	*0.00055*	0.0053
February 18, 2016	*0.0296*	7.41	*0.00041*	0.0000591	0.0051	0.0000668	0.0026	0.0633	0.0000786	0.00143	0.00074	*0.00041*	*0.00053*	0.0031
February 24, 2016	—	2.66	—	—	—	—	—	—	—	—	—	—	—	—
March 1, 2016	74.7	2.54	*0.00043*	0.0000642	0.0091	0.000409	0.51	0.673	0.00105	0.017171	0.0017	*0.00043*	*0.00056*	0.0075
March 7, 2016	—	3.29	—	—	—	—	—	—	—	—	—	—	—	—
March 13, 2016	3.07	2.25	*0.00040*	0.0000768	0.0060	0.0000666	0.28	0.107	0.000984	0.00285	0.00077	*0.00040*	*0.00051*	0.0077
March 19, 2016	25.1	0.957	*0.00040*	0.0000945	0.0075	0.000499	0.87	0.673	0.000387	0.0136	0.0014	*0.00040*	*0.00051*	0.0049
March 25, 2016	7.09	3.78	*0.00043*	0.000150	0.0055	0.0000819	0.22	0.102	0.00105	0.00344	0.00081	*0.00043*	*0.00055*	0.0081
March 31, 2016	4.37	1.37	*0.00043*	0.0000549	0.0028	0.0000893	0.39	0.076	0.000388	0.00181	0.00063	*0.00043*	*0.00055*	0.0049

Geometric mean	6.57	2.52	N/R	0.0000831	0.0047	0.000132	0.20	0.145	0.000574	0.00374	0.00086	N/R	N/R	0.0067
Arithmetic mean	21.0	3.01	N/R	0.0000962	0.0051	0.000198	0.32	0.284	0.000687	0.00666	0.00098	N/R	N/R	0.0070
Max. concentration	97.6	7.41	N/R	0.000322	0.0091	0.000813	0.87	1.42	0.00118	0.0285	0.0023	N/R	N/R	0.011
Min. concentration	0.030	0.957	N/R	0.0000517	0.0026	0.0000489	0.0026	0.0392	0.0000786	0.00107	0.00042	N/R	N/R	0.0031
90th percentile	60.6	6.06	N/R	0.000141	0.0074	0.000472	0.67	0.673	0.00111	0.0161	0.0016	N/R	N/R	0.0087
95th percentile	82.7	7.41	N/R	0.000210	0.0080	0.000609	0.79	0.933	0.00115	0.0211	0.0019	N/R	N/R	0.0095
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	14	16	14	14	14	14	14	14	14	14	14	14	14	14
No. samples < mdl	0	0	0	0	0	0	0	0	0	0	0	0	0	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	0	0	0	0	0	0	0	0	0	0	0	0
% valid data	88	100	88	88	88	88	88	88	88	88	88	88	88	88

Notes:
All non detectable results were reported as 1/2 detection limit and are denoted by italics and underlining
N/R: Statistics not reported due to more than 50% of values being less than the detection limit
N/A: Not applicable
—: Invalid Sample
*Canadian Ambient Air Quality Standard, 24-hour standard

APPENDIX B-2

TOTAL DUSTFALL SAMPLING RESULTS

Tait Road Monitoring Results for Dustfall (First Quarter 2016) (results expressed in g/m^2/30days)

Month	No. Exposure Days	Dustfall (insoluble)	Dustfall (soluble)	Dustfall (total)
January	38	0.2	0.15	0.33
February	24	0.20	0.20	0.39
March	28	0.51	0.15	0.75

Arithmetic mean	0.49
Max. concentration	0.75
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 (First Quarter 2016) (results expressed in g/m^2/30days)

Month	No. Exposure Days	Dustfall (insoluble)	Dustfall (soluble)	Dustfall (total)
January	38	0.33	0.2	0.5
February	24	0.20	0.20	0.42
March	28	0.57	0.15	0.75

Arithmetic mean	0.55
Max. concentration	0.75
Min. concentration	0.42
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: Statistics not reported due to high % of values <detection limit
N/A: Not applicable
—: 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 (First Quarter 2016)
(results expressed in µg/m^3)

	Tait Road		Gallinger Road	
Month	**SO_2**	**NO_2**	**SO_2**	**NO_2**
January	0.5	1.1	0.8	1.7
February	0.5	1.3	0.3	0.4
March	0.3	0.8	0.3	0.1
Arithmetic mean	0.4	1.1	0.4	0.7
Max. concentration	0.5	1.3	0.8	1.7
Min. concentration	0.3	0.8	0.3	0.1
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	1
Detection limit	0.26	0.19	0.26	0.19
Half detection limit	0.13	0.09	0.13	0.09

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: Statistics not reported due to high % of values <detection limit
N/A: Not applicable
—: Invalid Sample
*Ontario Ambient Air Quality Criteria

AIR QUALITY MONITORING PROGRAM
SECOND QUARTER 2016 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

October 2016

Amec Foster Wheeler Project No.: TC111504.2016.4

October 31, 2016

Amec Foster Wheeler Project No.: TC111504.2016.4

New Gold Inc.
1111 Victoria Avenue East
Thunder Bay, Ontario
P7C 1B7

Attention: Darrell Martindale
Director, Environment & Sustainability

Dear Mr. Martindale:

Re: Rainy River Project, Second Quarter 2016 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) the attached summary report of the second quarter 2016 results for the ambient air quality monitoring program at the Rainy River Project.

The monitoring program consists of two air quality sampling stations that 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 are operated and maintained by New Gold staff.

The key findings of the 2016 Q2 monitoring are as follow:

- On 6 May the Particulate Matter $(PM)_{2.5}$ measured at both stations was higher than the Canadian Ambient Air Quality Standards of 28 µg/m^3 with winds mainly from westerly directions. A Site Notice was issued on this day regarding smoke in the area from fires in Manitoba and the Kenora area.

- On 30 April, the measured Total Suspended Particulate (TSP) concentration exceeded the Ambient Air Quality Criteria of 120 µg/m^3 at the Tait Road Station; the winds on this day were mainly from the northeast such that the station was downwind of McMillan Road and the pre-bypass Highway 600.

Amec Foster Wheeler Environment & Infrastructure
160 Traders Blvd. E., Suite 110
Mississauga, Ontario, CANADA L4Z 3K7
Phone 905.568.2929

www.amecfw.com

The measured TSP and $PM_{2.5}$ concentrations for the second quarter 2016 are depicted in Figures CL-1 and CL-2.

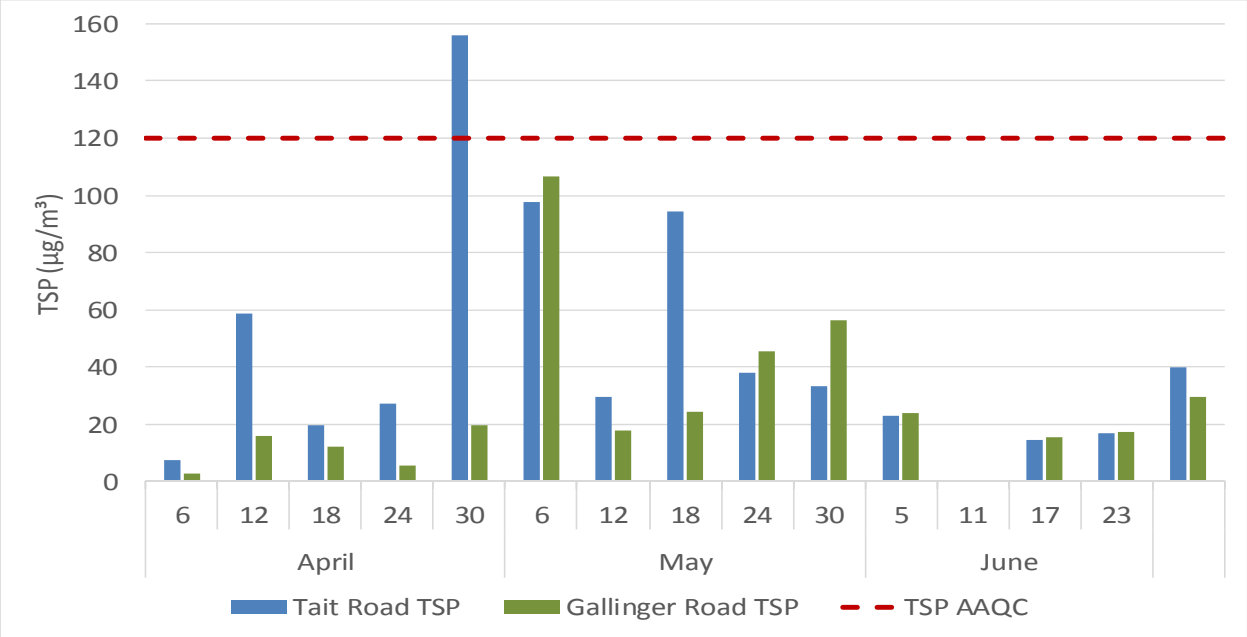

Figure CL-1: TSP Concentrations (2016 – Q2)

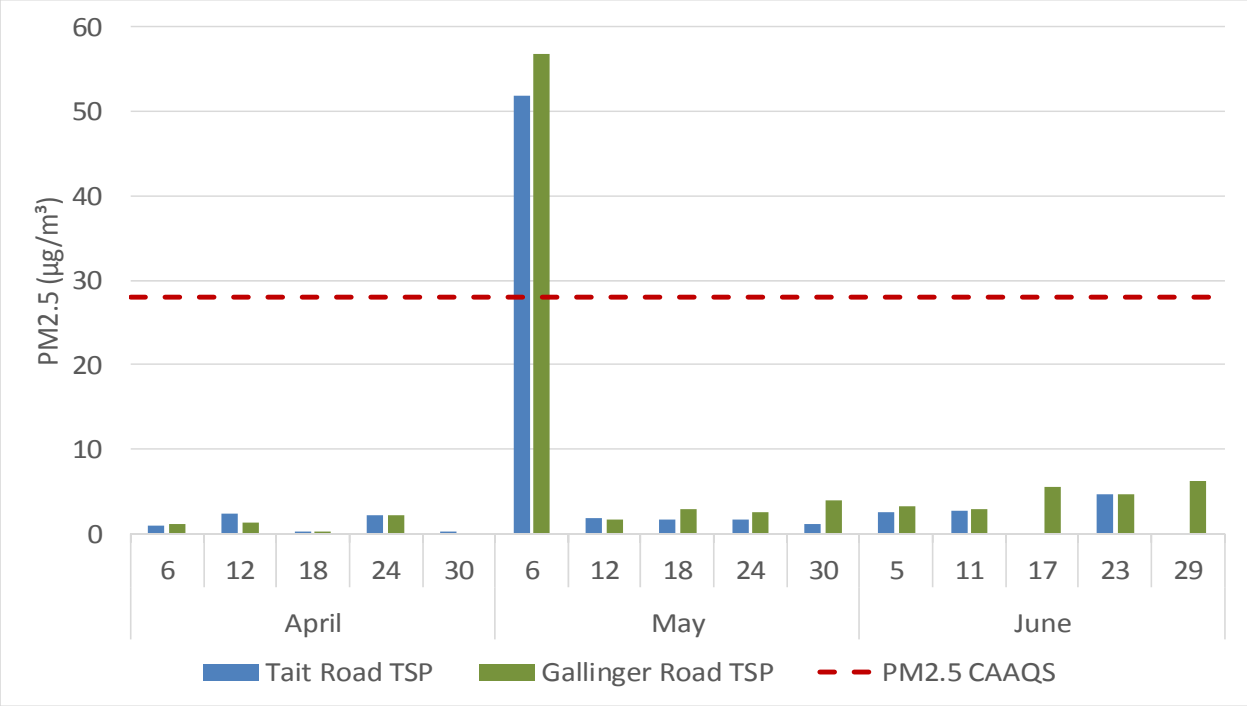

Figure CL-2: $PM_{2.5}$ Concentrations (2016 – Q2)

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

Caleb Vandenberg, P.Eng.
Air Quality Engineer

Tony van der Vooren P.Eng, Ph.D, QEP
Senior Air Quality Consultant

Revision	Date	Revised By	Description
A	29-September-2016	Caleb Vandenberg	Draft Report
0	1-November -2016	Caleb Vandenberg	Draft Report to NG

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LIST OF TABLES

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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 second quarter (Q2) 2016 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 US EPA 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 (8 September 1995). Standard dustfall samplers were used to measure total dustfall deposition. 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 µg/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 µg/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.

Two calibrations were performed that are relevant to this quarter's data. On 22 March 2016 and 3 June 2016, Amec Foster Wheeler staff calibrated the 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 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.

Two calibrations were performed that are relevant to this quarter's data.

On 22 March 2016, 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 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 0.12% in the flow at standard conditions (Q_s) relative to the USEPA standard.

On 2 June 2016, 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 NIST traceability in in December 2015. The overall uncertainty of the calibrator was determined to be 0.35% (ambient temperature, barometric pressure and flow), with an average error of 0.16% 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 Q2 2016 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 Q2 for the TSP and $PM_{2.5}$ concentrations are presented in Tables 1 and 2 respectively. During the quarter, the 1 in 6 day hi-vol sampling schedule comprised a possible total of fifteen (15) sampling days between 1 April and 30 June 2016.

A summary of the statistical analyses for Q2 2016 for the total dustfall data is presented below in Table 3. A summary of the statistical analysis for the second quarter of 2016 for the passive SO_2 and NO_2 results is presented in Table 4.

3.1 Total Suspended Particulates and Metals

Both the Tait Road and Gallinger Road stations collected fourteen (14) valid samples in Q2 2016, resulting in 93% valid data. The 11 June 2016 samples at both station were invalidated due to the runtime not meeting MOECC criteria.

For the quarter, the arithmetic mean TSP concentrations were 46.9 µg/m^3 for the Tait Road station and 28.1 µg/m^3 for the Gallinger Road station. 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 156 µg/m^3 at the Tait Road station (30 April 2016), and 107 µg/m^3 at the Gallinger Road station (6 May 2016). The 156 µg/m^3 measured at the Tait Road station on 30 April 2016 was the only exceedances of the TSP AAQC measured in the quarter.

In the quarter, the 24-hour metal concentrations were all below the 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 2016 for TSP Data

Statistic	Q2	
	Tait Road (SW)	Gallinger Road (NE)
Geometric mean (µg/m^3)	34.1	19.8
Arithmetic mean (µg/m^3)	46.9	28.1
April Maximum (µg/m^3)	156	19.7
May Maximum (µg/m^3)	97.6	107
June Maximum (µg/m^3)	40.0	29.7
Maximum 24 hour (µg/m^3)	156 (30 April)	107 (6 May)
90th percentile	96.4	53.3
95th percentile	118	74.1
24-hour AAQC	120	120
No. of valid samples	14	14
% valid data	93	93
No. samples > AAQC (particulate)	1	0
No. samples > AAQC (metals)	0	0
No. samples > AAQC (elements)	0	0

3.2 $PM_{2.5}$

The Tait Road station collected thirteen (13) valid samples in Q2 2016, resulting in 87% valid data. The Tait Road $PM_{2.5}$ samples on the 17 and 29 of June 2016 were invalidated due to power outages causing the runtimes not to meet MOECC criteria. The Gallinger Road collected fourteen (14) valid samples in Q2 2016, resulting in 93% valid data. The Gallinger Road $PM_{2.5}$ sample on 30 April 2016 was invalidated due to the runtime not meeting MOECC criteria.

The arithmetic mean $PM_{2.5}$ concentrations for Q2 2016 were comparable with the Tait Road station averaging 5.67 µg/m^3 and the Gallinger Road station averaging 6.80 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 51.9 µg/m^3 at the Tait Road station (6 May 2016), and 56.9 µg/m^3 at the Gallinger Road station (6 May 2016). The two maximum values were the only concentrations measured in Q2 that exceeded the $PM_{2.5}$ AAQC of 30 µg/m^3 and the CAAQS of 28 µg/m^3 and were measured coincident with a Site Notice regarding smoke from upwind forest fires in Manitoba and the Kenora area.

The Q2 $PM_{2.5}$ data is summarized in Table 2.

Table 2: Summary Statistics for Q2 2016 for $PM_{2.5}$ Data

Statistic	Q2	
	Tait Road (SW)	Gallinger Road (NE)
Geometric mean (µg/m^3)	1.44	2.92
Arithmetic mean (µg/m^3)	5.67	6.80
April Maximum (µg/m^3)	2.28	2.12
May Maximum (µg/m^3)	51.9	56.9
June Maximum (µg/m^3)	4.65	6.18
Maximum 24 hour (µg/m^3)	51.9 (6 May)	56.9 (6 May)
90th percentile	4.28	6.06
95th percentile	23.6	23.9
24-hour CAAQS	28	28
No. of valid samples	13	14
% valid data	87	93
No. samples > CAAQS	1	1

3.3 Total Dustfall

One sample was collected at each station each month for dustfall during Q2 2016; each dustfall jar was exposed for approximately 30-days to coincide with each calendar month in the quarter. The lab noted a "moderate amount of bugs and plant material" in each jar not noted in the previous quarter. Based on lab comments and the data validation techniques outlined in the Ambient Air Operations Manual (MOECC 2008) contamination by interfering insoluble materials (e.g. excessive algae growth, bird droppings, other significant objects/materials) was noted; only the soluble results were reported though these may has also been impacted by the contamination. As only soluble dustfall is being presented the total dustfall data may be underestimated. A summary of the results are presented in Table 3.

The monthly results are shown in Appendix B-2.

Table 3: Summary Statistics for Q2 2016 Total Dustfall Data

Statistic*	Tait Road (SW)	Gallinger Road (NE)
Arithmetic mean (g/m^2/30d)	1.23	5.89
Maximum (g/m^2/30d)	1.50	7.50
30-day AAQC	7	7
No. > AAQC	0	1
No. valid samples*	3	3
% Valid data	100	100

N/A: No applicable criteria
N/R: Not Reportable
*Only soluble results reported due to possible insoluble contamination

3.4 Passive SO_2 and NO_2

In Q2 2016, 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.

A summary of the passive results is presented in Table 4.

Table 4: Summary Statistics for Q2 2016 for Passive SO_2 and NO_2 Data (µg/m^3)

Statistic	Tait Road (SW)		Gallinger Road (NE)	
	SO_2	NO_2	SO_2	NO_2
Mean	0.3	0.7	0.3	0.8
Maximum	0.5	0.8	0.5	1.1
AAQC 24-hr converted to 30-day	N/A	78	N/A	78
Alberta Ambient Air Quality Objectives 2013	30	N/A	30	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 Q2 2016:

- Fourteen (14) valid TSP samples were collected at both the Tait and Gallinger Road Stations respectively (93% valid data), with metal analyses performed on each of the TSP filters. One (1) exceedance of the TSP AAQC was measured on 30 April 2016;
- There were no exceedances of MOECC AAQC for any of the twelve (12) metals analyzed as part of the hi-vol filter analysis;
- Thirteen (13) valid $PM_{2.5}$ samples were collected at the Tait Road station (87% valid data). An exceedance of the $PM_{2.5}$ AAQC was measured at both stations on 6 May 2016 coincident with a Site notice about smoke from upwind forest fires;
- Fourteen (14) valid $PM_{2.5}$ samples were collected at the Gallinger Road station (93% valid data). One (1) exceedance of the $PM_{2.5}$ AAQC was measured on 6 May 2016 coincident with a Site notice about smoke from upwind forest fires;
- One (1) exceedance of the dustfall AAQC was measured in Q2 based on the soluble fraction of the dustfall results. While the insoluble fraction of the results was removed due to noted contamination the insoluble results may have also been contaminated; and
- Three (3) valid passive samples for each of SO_2 and NO_2 at each of the two stations.

5.0 REFERENCES

Alberta Government. 2016. Alberta Ambient Air Quality Objectives and Guidelines Summary.

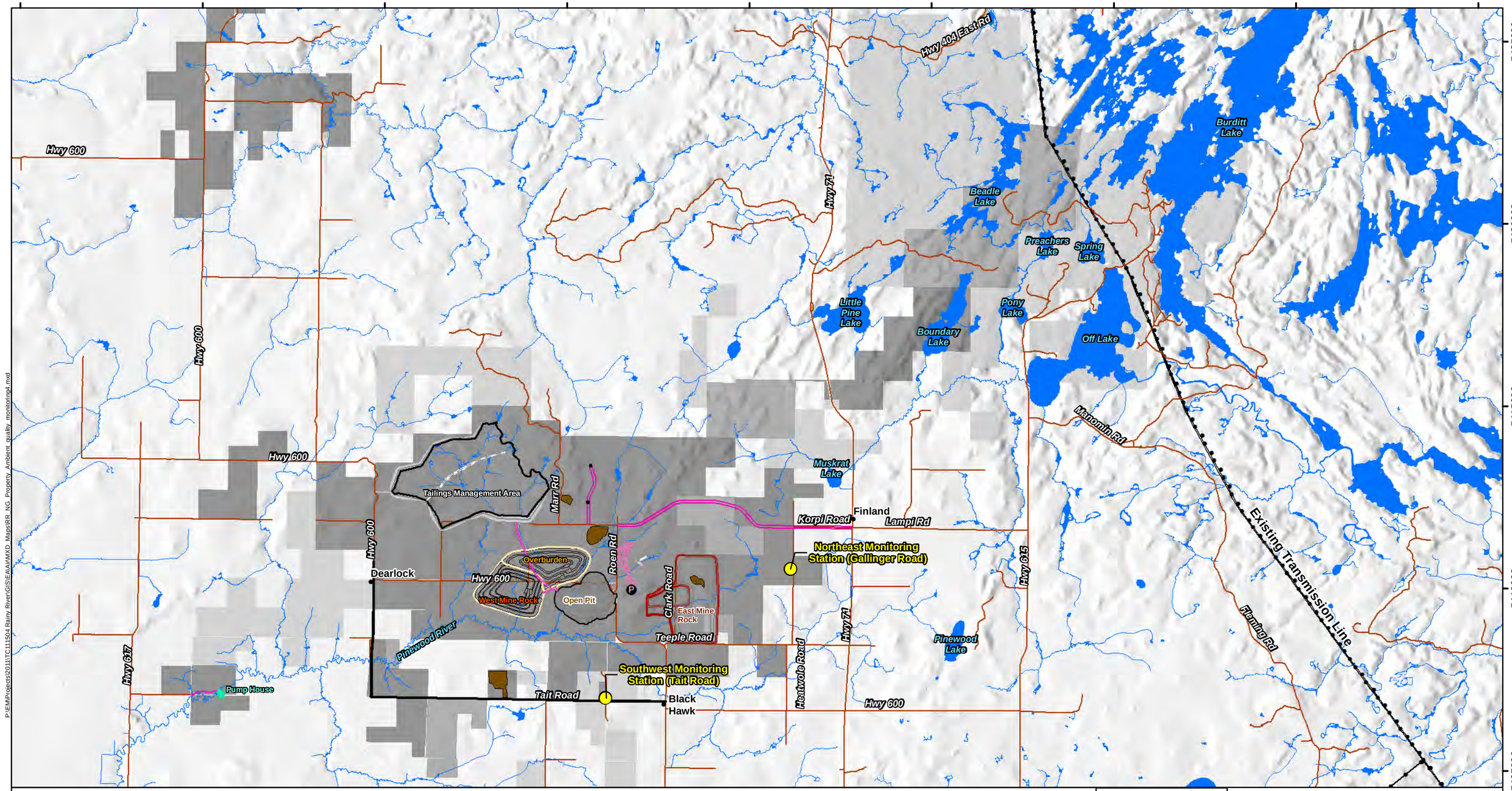
Environment and Climate Change Canada. 2013. Canadian Environmental Protection Act, 1999 *Sections 54 and 55.*

Ministry of the Environment. 2008. Operations Manual for Air Quality Monitoring in Ontario.

Ministry of the Environment. 2009. Procedure for Preparing and Emission Summary and Dispersion Modelling Report.

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

N W E S

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\AirMXD_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 (Second Quarter 2016)
(results expressed in μg/m^3)

Date	TSP	PM2.5	As	Cd	Cr	Co	Cu	Fe	Pb	Mn	Ni	Se	V	Zn
April 6, 2016	7.31	1.04	*0.00059*	0.0000529	0.0027	0.000137	0.054	0.0672	0.000496	0.00249	0.00047	*0.00059*	*0.00075*	0.0054
April 12, 2016	58.7	2.28	*0.00057*	0.0000907	0.0043	0.000434	0.072	0.610	0.000920	0.0182	0.0017	*0.00057*	0.0015	0.0069
April 18, 2016	19.8	0.125	*0.00058*	0.0000320	0.0028	0.000181	0.056	0.100	0.000314	0.00438	0.00042	*0.00058*	*0.00074*	0.0031
April 24, 2016	27.2	2.24	*0.00060*	0.0000379	0.0029	0.000208	0.032	0.262	0.000592	0.00798	0.00067	*0.00060*	*0.00076*	0.0045
April 30, 2016	156	*0.021*	*0.00059*	0.0000357	0.0077	0.00135	0.075	1.84	0.00145	0.0694	0.0038	*0.00059*	0.0040	0.012
May 6, 2016	97.6	51.9	*0.00044*	0.000451	0.0058	0.000417	0.076	0.552	0.00143	0.132	0.0014	*0.00044*	*0.00056*	0.040
May 12, 2016	29.7	1.75	*0.00044*	0.0000343	0.0076	0.000660	0.042	0.806	0.000185	0.0217	0.0013	*0.00044*	0.0012	0.0045
May 18, 2016	94.5	1.66	*0.00045*	0.0000855	0.0095	0.00117	0.056	1.07	0.000913	0.0344	0.0022	*0.00045*	0.0019	0.0089
May 24, 2016	37.9	1.58	*0.00043*	0.0000436	0.0065	0.000159	0.047	0.216	0.000327	0.00721	0.00056	*0.00043*	*0.00056*	0.0042
May 30, 2016	33.4	1.08	*0.00044*	0.0000789	0.0085	0.000121	0.055	0.140	0.000294	0.00646	0.00084	*0.00044*	*0.00056*	0.0068
June 5, 2016	23.2	2.62	*0.00043*	0.0000876	0.0050	0.000168	0.077	0.247	0.000288	0.00925	0.00076	*0.00043*	*0.00055*	0.0050
June 11, 2016	—	2.78	0.00016	0.0000441	0.0016	0.000432	0.10	0.720	0.000350	0.0183	0.00078	0.00015	0.0010	0.0046
June 17, 2016	14.7	—	*0.00044*	0.0000368	0.0056	0.000141	0.041	0.192	0.000396	0.00609	0.00090	*0.00044*	*0.00056*	0.0052
June 23, 2016	16.9	4.65	*0.00044*	0.0000480	0.0065	0.000336	0.079	0.474	0.000264	0.0122	0.0012	*0.00044*	*0.00056*	0.0050
June 29, 2016	40.0	—	*0.00044*	0.0000425	0.0065	0.00105	0.047	1.55	0.000524	0.0456	0.0022	*0.00044*	0.0025	0.0073

Geometric mean	34.1	1.44	N/R	0.0000579	0.0050	0.000333	0.058	0.389	0.000479	0.0146	0.0011	N/R	N/R	0.0064
Arithmetic mean	46.9	5.67	N/R	0.0000801	0.0056	0.000464	0.061	0.589	0.000583	0.0264	0.0013	N/R	N/R	0.0082
Max. concentration	156	51.9	N/R	0.000451	0.0095	0.00135	0.10	1.84	0.00145	0.132	0.0038	N/R	N/R	0.040
Min. concentration	7.31	0.021	N/R	0.0000320	0.0016	0.000121	0.032	0.0672	0.000185	0.00249	0.00042	N/R	N/R	0.0031
90th percentile	96.7	4.28	N/R	0.0000895	0.0082	0.00112	0.078	1.36	0.00123	0.0599	0.0022	N/R	N/R	0.011
95th percentile	118	23.6	N/R	0.000199	0.0088	0.00122	0.086	1.63	0.00144	0.0882	0.0027	N/R	N/R	0.020
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	1	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)	1	1	0	0	0	0	0	0	0	0	0	0	0	0
No. of valid samples	14	13	15	15	15	15	15	15	15	15	15	15	15	15
No. samples < mdl	1	3	14	0	0	0	0	0	0	0	0	14	9	0
Detection limit (μg)	100	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)	50	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	7	23	93	0	0	0	0	0	0	0	0	93	60	0
% valid data	93	87	100	100	100	100	100	100	100	100	100	100	100	100

Notes:
All non detectable results were reported as 1/2 detection limit and are denoted by italics and underlining
N/R: Statistics not reported due to high % of values <detection limit
N/A: Not applicable
INV: Invalid Sample
*Canadian Ambient Air Quality Standard, 24-hour standard

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Northeast Gallinger Road Monitoring Results for TSP and Metals (Second Quarter 2016)
(results expressed in µg/m^3)

Date	TSP	PM2.5	As	Cd	Cr	Co	Cu	Fe	Pb	Mn	Ni	Se	V	Zn
April 6, 2016	2.98	1.20	*0.00056*	0.0000404	0.0023	0.000174	0.32	0.0199	0.000441	0.000851	0.00045	*0.00056*	*0.00071*	0.0050
April 12, 2016	16.1	1.33	*0.00057*	0.0000428	0.0022	0.000160	0.34	0.155	0.000396	0.00414	0.00047	*0.00057*	*0.00073*	0.0039
April 18, 2016	12.1	0.25	*0.00057*	0.0000466	0.0025	0.000081	0.24	0.029	0.000214	0.00272	0.00032	*0.00057*	*0.00072*	0.0032
April 24, 2016	5.39	2.12	*0.00058*	0.0000199	0.0026	0.000085	0.098	0.042	0.000347	0.00172	0.00037	*0.00058*	*0.00074*	0.0037
April 30, 2016	19.7	—	*0.00054*	0.0000333	0.0024	0.000198	0.46	0.194	0.000381	0.00588	0.00053	*0.00054*	*0.00070*	0.0041
May 6, 2016	107	56.9	*0.00044*	0.000424	0.0049	0.000299	0.11	0.418	0.00134	0.138	0.0011	*0.00044*	*0.00057*	0.0367
May 12, 2016	17.8	1.66	*0.00044*	0.0000240	0.0054	0.0000740	0.09	0.0822	0.000205	0.00444	0.00034	*0.00044*	*0.00057*	0.0035
May 18, 2016	24.3	2.83	*0.00043*	0.0000592	0.0061	0.000131	0.47	0.169	0.000290	0.00617	0.00051	*0.00043*	*0.00056*	0.0038
May 24, 2016	45.7	2.53	*0.00042*	0.0000659	0.0061	0.000152	0.37	0.199	0.000381	0.00743	0.00053	*0.00042*	*0.00054*	0.0044
May 30, 2016	56.5	3.90	*0.00043*	0.0000932	0.0088	0.000224	0.30	0.301	0.000502	0.0120	0.0012	*0.00043*	*0.00055*	0.0099
June 5, 2016	23.9	3.28	*0.00044*	0.0000877	0.0055	0.000156	0.45	0.117	0.000358	0.00523	0.0011	*0.00044*	*0.00056*	0.0090
June 11, 2016	—	2.91	0.00017	0.0000645	0.0015	0.0000963	0.50	0.153	0.000452	0.00526	0.00046	*0.00008*	0.00030	0.0046
June 17, 2016	15.5	5.56	*0.00045*	0.0000747	0.0054	0.0000874	0.47	0.118	0.000689	0.00411	0.0010	*0.00045*	*0.00057*	0.0076
June 23, 2016	17.3	4.57	*0.00043*	0.0000669	0.0057	0.000110	0.62	0.145	0.000249	0.00407	0.00077	*0.00043*	*0.00056*	0.0052
June 29, 2016	29.7	6.18	*0.00045*	0.0000474	0.0058	0.000162	0.30	0.281	0.000500	0.0156	0.00094	*0.00045*	*0.00058*	0.0059

Geometric mean	19.8	2.92	N/R	0.0000577	0.0040	0.000135	0.30	0.123	0.000399	0.00573	0.00061	N/R	N/R	0.0056
Arithmetic mean	28.1	6.80	N/R	0.0000793	0.0045	0.000146	0.34	0.161	0.000450	0.0145	0.00067	N/R	N/R	0.0074
Max. concentration	107	56.9	N/R	0.000424	0.0088	0.000299	0.62	0.418	0.00134	0.138	0.0012	N/R	N/R	0.0367
Min. concentration	2.98	0.249	N/R	0.0000199	0.0015	0.0000740	0.092	0.0199	0.000205	0.000851	0.00032	N/R	N/R	0.0032
90th percentile	53.3	6.00	N/R	0.0000910	0.0061	0.000214	0.486	0.293	0.000614	0.0142	0.0011	N/R	N/R	0.0096
95th percentile	74.1	23.9	N/R	0.000192	0.0069	0.000247	0.533	0.336	0.000884	0.0524	0.0011	N/R	N/R	0.0180
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	1	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	1	0	0	0	0	0	0	0	0	0	0	0	0
No. of valid samples	14	14	15	15	15	15	15	15	15	15	15	15	15	15
No. samples < mdl	1	0	14	0	0	0	0	0	0	0	0	15	14	0
Detection limit (µg)	100	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)	50	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	7	0	93	0	0	0	0	0	0	0	0	100	93	0
% valid data	93	93	100	100	100	100	100	100	100	100	100	100	100	100

Notes:
All non detectable results were reported as 1/2 detection limit and are denoted by italics and underlining
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
*Canadian Ambient Air Quality Standard, 24-hour standard

APPENDIX B-2

TOTAL DUSTFALL SAMPLING RESULTS

Tait Road Monitoring Results for Dustfall (Second Quarter 2016)
(results expressed in g/m^2/30days)

Month	No. Exposure Days	Dustfall (insoluble)	Dustfall (soluble)	Dustfall (total)
April	30	—	1.50	—
May	29	—	1.44	—
June	28	—	0.75	—

Soluble Arithmetic mean	1.23
Soluble Max. concentration	1.50
Soluble Min. concentration	0.75
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 (Second Quarter 2016)
(results expressed in g/m^2/30days)

Month	No. Exposure Days	Dustfall (insoluble)	Dustfall (soluble)	Dustfall (total)
April	30	—	6.7	—
May	29	—	3.48	—
June	28	—	7.50	—

Soluble Arithmetic mean	5.89
Soluble Max. concentration	7.50
Soluble Min. concentration	3.48
AAQC	7
No. > AAQC value**	1
No. of valid samples	3
% Valid data	100
No. samples < mdl	0
Detection limit	0.3
Half detection limit	0.15

Notes:
N/R: Statistics not reported due to high % of values <detection limit
N/A: Not applicable
—: Invalid Sample
**Ontario Ambient Air Quality Criteria, 30-day standard

The Laboratory provided the following notes regarding the dustfall results on 3 October 2016
L1754376-11 (March) had very little particulate noted and no bugs.
L1766318-12 (April)was observed to have a moderate amount of bugs and brown liquid in container (likely decomposing organic material).
L1783884-2 (May) was observed to have a moderate amount of bugs and some plant matter (50% alcohol preservative).
L1795599-21 (June) was observed to have a moderate amount of bugs and was very difficult to filter (again, may be due to organic material).

APPENDIX B-3

SO_2 AND NO_2 PASSIVE SAMPLING RESULTS

Monitoring Results for Passive SO_2 and NO_2 (Second Quarter 2016)
(results expressed in µg/m^3)

	Tait Road		Gallinger Road	
Month	**SO_2**	**NO_2**	**SO_2**	**NO_2**
April	0.1	0.8	0.1	0.2
May	0.5	0.6	0.5	1.1
June	0.1	0.8	0.1	0.9
Arithmetic mean	0.3	0.7	0.3	0.8
Max. concentration	0.5	0.8	0.5	1.1
Min. concentration	0.1	0.6	0.1	0.2
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	2	0	2	0
Detection limit	0.26	0.19	0.26	0.19
Half detection limit	0.13	0.09	0.13	0.09

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: Statistics not reported due to high % of values <detection limit
N/A: Not applicable
—: Invalid Sample
*Ontario Ambient Air Quality Criteria

AIR QUALITY MONITORING PROGRAM
THIRD QUARTER 2016 REPORT
RAINY RIVER PROJECT

Submitted to:

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November 2016

Amec Foster Wheeler Project No.: TC111504.2016.4

Revision	Date	Revised By	Description
A	1-November -2016	Caleb Vandenberg	Draft Report
B	14-November-2016	Linda Lattner	Final Q3 Report

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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 third quarter (Q3) 2016 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 US EPA 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 (8 September 1995). Standard dustfall samplers were used to measure total dustfall deposition. 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 µg/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 µg/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.

Two calibrations were performed that are relevant to this quarter's data. On 3 June 2016 and Amec Foster Wheeler staff calibrated the 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 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.

On 16 September 2016 and Amec Foster Wheeler staff calibrated the hi-vol samplers with a TISCH Environmental flow calibration orfice which was sent to the manufacturer most recently for re-certification to National Institute of Standards and Technology (NIST) traceability in July 2016.

The coefficient of determination (R^2) for the flow calibration orifice was 0.99999 and the BGI DeltaCal had an overall uncertainty of 0.35% (ambient temperature, barometric pressure) 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.

Two calibrations were performed that are relevant to this quarter's data.

On 2 June 2016, 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 NIST traceability in December 2015. The overall uncertainty of the calibrator was determined to be 0.35% (ambient temperature, barometric pressure and flow), with an average error of 0.16% in the flow at standard conditions (Q_s) relative to the USEPA standard.

On 2 June 2016, 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 NIST traceability in May 2015. The overall uncertainty of the calibrator was determined to be 0.35% (ambient temperature, barometric pressure and flow), with an average error of -0.07% 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 Q3 2016 sampling program are presented in Appendix B-1 for the particulate/metals 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 with MOECC protocol, 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 Q2 for the TSP and $PM_{2.5}$ concentrations are presented in Tables 1 and 2 respectively. During the quarter, the 1 in 6 day sampling schedule comprised a possible total of fifteen (15) sampling days between 1 July and 30 September 2016.

A summary of the statistical analyses for Q3 2016 for the total dustfall data is presented below in Table 3. A summary of the statistical analysis for the third quarter of 2016 for the passive SO_2 and NO_2 results is presented in Table 4.

Sample were accidentally collected on 5 August 2016 rather than 4 August 2016 to be on the standard North American sampling schedule. The results were still included as they were considered to still be representative.

3.1 Total Suspended Particulates and Metals

Tait Road collected twelve (12) valid samples and Gallinger Road collected thirteen (13) valid samples in Q3 2016, resulting in 80% and 87% valid data respectively. The 23 July 2016 samples at both stations were invalid due to a sample volume that exceeded the MOECC criterion, and the 29 July 2016 samples were not collected. The 16 August 2016 Tait Road sample was invalidated due to an extended runtime that exceeded the MOECC criterion.

For the quarter, the geometric mean TSP concentrations were 15.4 µg/m^3 for the Tait Road station and 14.6 µg/m^3 for the Gallinger Road station. 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 32.6 µg/m^3 at the Tait Road station (5 July 2016), and 27.4 µg/m^3 at the Gallinger Road station (22 August 2016).

In the quarter, the 24-hour metal concentrations were all below the 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.

There were no exceedances of the MOECC AAQC measured for any of the analysed particulate sizes, metals, or elements.

Table 1: Summary Statistics for Q3 2016 for TSP Data

Statistic	Q3	
	Tait Road (SW)	Gallinger Road (NE)
Geometric mean (µg/m^3)	13.7	13.4
Arithmetic mean (µg/m^3)	15.4	14.6
July Maximum (µg/m^3)	32.6	21.9
August Maximum (µg/m^3)	17.0	27.4
September Maximum (µg/m^3)	21.0	22.2
Maximum 24 hour (µg/m^3)	32.6 (5 Jul.)	27.4 (22 Aug.)
90th percentile	21.6	22.2
95th percentile	26.6	24.3
24-hour AAQC	120	120
No. of valid samples	12	13
% valid data	80	87
No. samples > AAQC (particulate)	0	0
No. samples > AAQC (metals)	0	0
No. samples > AAQC (elements)	0	0

3.2 $PM_{2.5}$

The Tait Road station collected thirteen (13) valid samples in Q3 2016, resulting in 87% valid data. The Tait Road $PM_{2.5}$ sample on 29 July 2016 was accidentally not collected and the 28 August 2016 sample was not collected due to a sampler malfunction likely caused by line work along the new highway 600. The Gallinger Road collected thirteen (13) valid samples in Q3 2016, resulting in 87% valid data. The Gallinger Road $PM_{2.5}$ sample on 29 July 2016 was accidentally not collected and the 5 August 2016 sample runtime was not setup correctly resulting in no sample being collected.

The arithmetic mean $PM_{2.5}$ concentrations for Q3 2016 were comparable with the Tait Road station averaging 3.71 µg/m^3 and the Gallinger Road station averaging 4.57 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 7.49 µg/m^3 at the Tait Road station (17 July 2016), and 11.19 µg/m^3 at the Gallinger Road station (21 September 2016). There were no $PM_{2.5}$ exceedances of the AAQC of 30 µg/m^3 or CAAQS of 28 µg/m^3 measured in Q3.

The Q3 $PM_{2.5}$ data is summarized in Table 2.

Table 2: Summary Statistics for Q3 2016 for $PM_{2.5}$ Data

Statistic	Q2	
	Tait Road (SW)	Gallinger Road (NE)
Geometric mean (µg/m^3)	3.31	4.14
Arithmetic mean (µg/m^3)	3.71	4.57
July Maximum (µg/m^3)	7.49	7.20
August Maximum (µg/m^3)	4.62	4.20
September Maximum (µg/m^3)	4.29	11.2
Maximum 24 hour (µg/m^3)	7.49 (17 July)	11.2 (21 Sept.)
90th percentile	6.06	6.87
95th percentile	6.85	8.80
24-hour CAAQS	28	28
No. of valid samples	13	13
% valid data	87	87
No. samples > CAAQS	0	0

3.3 Total Dustfall

One sample was collected at each station each month for dustfall during Q3 2016; each dustfall jar was exposed for approximately 30-days to coincide with each calendar month in the quarter. A summary of the results are presented in Table 3.

The laboratory reported contamination of the dustfall samples, therefore sample validity has not yet been confirmed; the results in Table 3 are therefore cited as ‘pending’ and are dependent upon the outcome of discussions with the laboratory on sample validity.

The monthly results are shown in Appendix B-2.

Table 3: Summary Statistics for Q3 2016 Total Dustfall Data

Statistic*	Tait Road (SW)	Gallinger Road (NE)
Arithmetic mean (g/m^2/30d)	PENDING	PENDING
Maximum (g/m^2/30d)	PENDING	PENDING
30-day AAQC	7	7
No. > AAQC	PENDING	PENDING
No. valid samples*	3	3
% Valid data	100	100

N/A: No applicable criteria
N/R: Not Reportable
*Only soluble results reported due to possible insoluble contamination

3.4 Passive SO_2 and NO_2

In Q3 2016, 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.

A summary of the passive results is presented in Table 4.

Table 4: Summary Statistics for Q3 2016 for Passive SO_2 and NO_2 Data ($\mu g/m^3$)

Statistic	Tait Road (SW)		Gallinger Road (NE)	
	SO_2	NO_2	SO_2	NO_2
Mean	0.1	0.8	0.2	0.8
Maximum	0.1	1.1	0.3	0.9
AAQC 24-hr converted to 30-day	N/A	78	N/A	78
Alberta Ambient Air Quality Objectives 2013	30	N/A	30	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 2016:

- Twelve (12) and thirteen (13) valid TSP samples were collected at the Tait and Gallinger Road Stations respectively (80% and 87% valid data respectively), with metal analyses performed on each of the TSP filters. No exceedances of the TSP AAQC were measured in Q3 2016;
    - There were no exceedances of the MOECC AAQC measured for any of the twelve (12) metals analyzed as part of the hi-vol filter analysis;
- Thirteen (13) valid $PM_{2.5}$ samples at both the Tait Road and Gallinger Road stations (87% valid data each). No exceedances of the $PM_{2.5}$ AAQC were measured in Q3 2016;
- Three (3) dustfall samples at each of the two stations with the results pending due to potential contamination resulting in invalid samples; and
- Three (3) valid passive samples for each of SO_2 and NO_2 at each of the two stations.

5.0 REFERENCES

Alberta Government. 2016. Alberta Ambient Air Quality Objectives and Guidelines Summary.

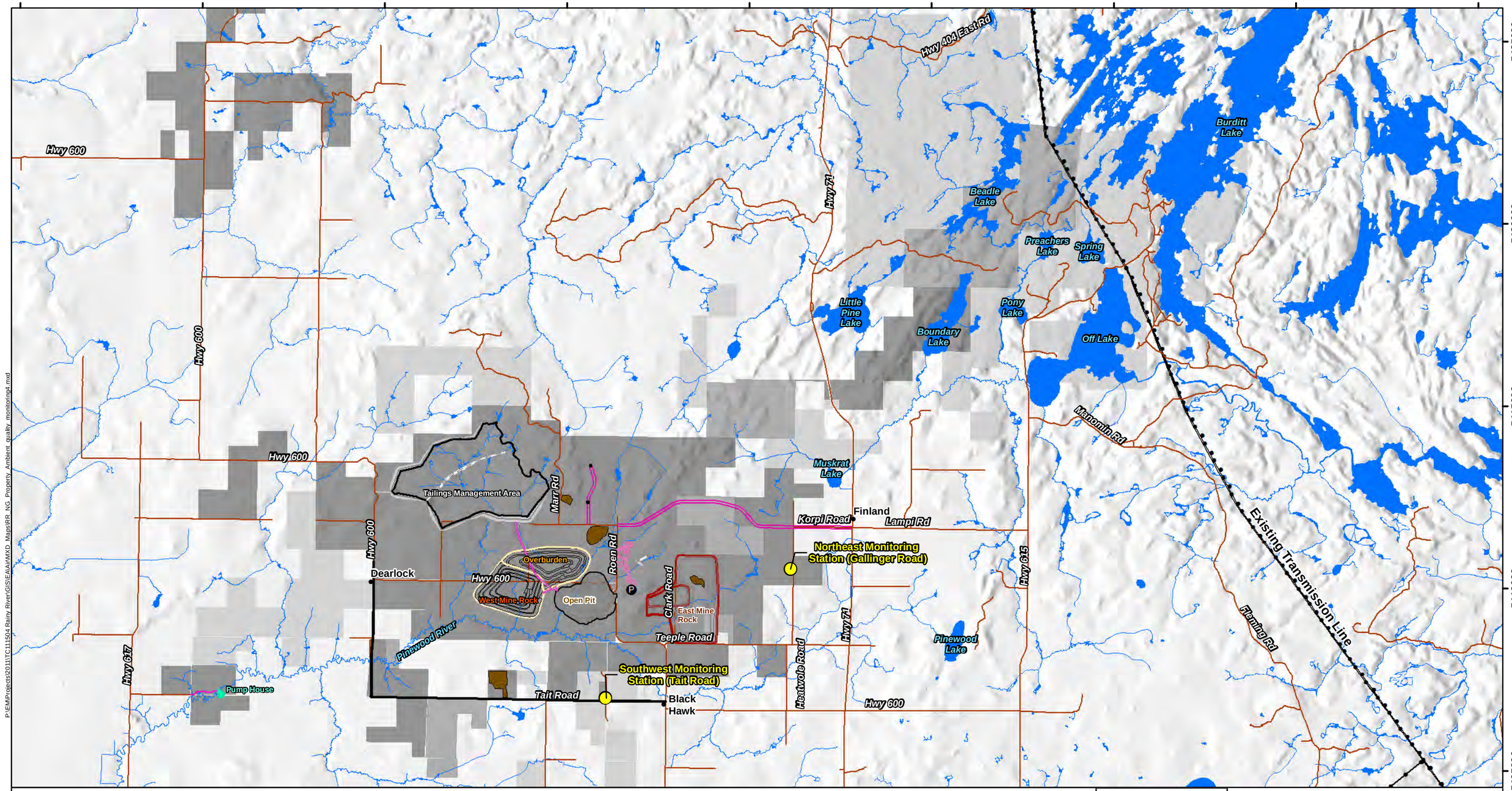
Environment and Climate Change Canada. 2013. Canadian Environmental Protection Act, 1999 S*ections 54 and 55.*

Ministry of the Environment. 2008. Operations Manual for Air Quality Monitoring in Ontario.

Ministry of the Environment. 2009. Procedure for Preparing and Emission Summary and Dispersion Modelling Report.

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

N W E S

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\AirMXD_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

newgold™ Rainy River Project

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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 (Third Quarter 2016)
(results expressed in µg/m^3)

Date	TSP	PM2.5	As	Cd	Cr	Co	Cu	Fe	Pb	Mn	Ni	Se	V	Zn
July 5, 2016	32.6	3.79	*0.00044*	0.0000532	0.0058	0.000433	0.0675	0.537	0.000492	0.0141	0.0013	*0.00044*	*0.00056*	0.0062
July 11, 2016	21.7	4.16	*0.00044*	0.0000651	0.0060	0.000212	0.0567	0.264	0.000758	0.00612	0.00092	*0.00044*	*0.00056*	0.0063
July 17, 2016	21.0	7.49	*0.00043*	0.0000619	0.0260	0.000200	0.0724	0.260	0.000705	0.00687	0.00071	*0.00043*	*0.00056*	0.0069
July 23, 2016	—	6.42	—	—	—	—	—	—	—	—	—	—	—	—
July 29, 2016	—	—	—	—	—	—	—	—	—	—	—	—	—	—
August 5, 2016	7.07	1.58	*0.00045*	0.0000310	0.046	0.0000591	0.104	0.0440	0.000203	0.00582	0.00047	*0.00045*	*0.00057*	0.0050
August 10, 2016	9.44	1.88	*0.00042*	0.0000296	0.046	0.0000675	0.0795	0.0753	0.000168	0.00259	0.00051	*0.00042*	*0.00054*	0.0030
August 16, 2016	—	4.62	—	—	—	—	—	—	—	—	—	—	—	—
August 22, 2016	17.0	4.08	*0.00043*	0.0000546	0.060	0.000139	0.0858	0.213	0.000644	0.00901	0.00072	*0.00043*	*0.00055*	0.0064
August 28, 2016	13.1	—	*0.00042*	0.0000507	0.051	0.000107	0.0771	0.110	0.000952	0.00777	0.00092	*0.00042*	*0.00054*	0.010
September 3, 2016	21.0	4.29	*0.00093*	0.0000651	0.042	0.0000874	0.0595	0.123	0.00106	0.00775	0.00045	*0.00040*	*0.00155*	0.0077
September 9, 2016	13.9	2.29	*0.00094*	0.0000332	0.0034	0.000145	0.150	0.170	0.000507	0.00623	0.00041	*0.00041*	*0.00156*	0.0041
September 15, 2016	9.41	3.29	*0.00096*	0.0000781	0.0039	0.000106	0.0896	0.113	0.000723	0.00616	0.00081	*0.00042*	*0.00160*	0.0063
September 21, 2016	12.6	2.75	*0.00087*	0.0000319	0.0030	0.0000788	0.0695	0.0887	0.000191	0.00417	0.00070	*0.00038*	*0.00145*	0.0038
September 27, 2016	5.89	1.54	*0.00092*	0.0000215	0.0026	0.0000657	0.0575	0.0730	0.000117	0.00245	0.00031	*0.00040*	*0.00153*	0.0041

Geometric mean	13.7	3.31	N/R	0.0000446	0.013	0.000118	0.0777	0.137	0.000436	0.00593	0.00064	N/R	N/R	0.0055
Arithmetic mean	15.4	3.71	N/R	0.0000480	0.025	0.000142	0.0808	0.173	0.000543	0.00659	0.00069	N/R	N/R	0.0058
Max. concentration	32.6	7.49	N/R	0.0000781	0.060	0.000433	0.150	0.537	0.00106	0.0141	0.00135	N/R	N/R	0.010
Min. concentration	5.89	1.54	N/R	0.0000215	0.0026	0.0000591	0.0567	0.0440	0.000117	0.00245	0.00031	N/R	N/R	0.0030
90th percentile	21.6	6.06	N/R	0.0000651	0.050	0.000211	0.103	0.263	0.000933	0.00889	0.00092	N/R	N/R	0.0076
95th percentile	26.6	6.85	N/R	0.0000709	0.055	0.000311	0.125	0.387	0.00100	0.0113	0.00111	N/R	N/R	0.0088
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	12	13	12	12	12	12	12	12	12	12	12	12	12	12
No. samples < mdl	2	0	14	2	2	2	2	2	2	2	2	14	14	2
Detection limit (µg)	100	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)	50	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	17	0	117	17	17	17	17	17	17	17	17	117	117	17
% valid data	80	87	80	80	80	80	80	80	80	80	80	80	80	80

Notes:
All non detectable results were reported as 1/2 detection limit and are denoted by italics and underlining
N/R: Statistics not reported due to high % of values <detection limit
N/A: Not applicable
—: Invalid Sample
*Canadian Ambient Air Quality Standard, 24-hour standard

amec foster wheeler

Northeast Gallinger Road Monitoring Results for TSP and Metals (Third Quarter 2016)
(results expressed in μg/m^3)

Date	TSP	PM2.5	As	Cd	Cr	Co	Cu	Fe	Pb	Mn	Ni	Se	V	Zn
July 5, 2016	15.8	4.12	*0.00044*	0.0000557	0.0054	0.000119	0.444	0.102	0.000365	0.00461	0.000848	*0.00044*	*0.00057*	0.0076
July 11, 2016	13.3	4.41	*0.00044*	0.0000653	0.0057	0.0000613	0.361	0.0610	0.000722	0.00289	0.000622	*0.00044*	*0.00056*	0.0068
July 17, 2016	21.9	7.20	*0.00044*	0.0000684	0.024	0.000115	0.460	0.0552	0.000613	0.00336	0.000495	*0.00044*	*0.00056*	0.0074
July 23, 2016	—	5.58	—	—	—	—	—	—	—	—	—	—	—	—
July 29, 2016	—	—	—	—	—	—	—	—	—	—	—	—	—	—
August 5, 2016	8.00	—	*0.00045*	0.0000447	0.048	0.0000691	0.351	0.0672	0.000194	0.00470	0.000486	*0.00045*	*0.00058*	0.0038
August 10, 2016	10.6	2.46	*0.00044*	0.0000500	0.049	0.000104	0.520	0.0895	0.000182	0.00369	0.000813	*0.00044*	*0.00057*	0.0033
August 16, 2016	16.2	4.20	*0.00042*	0.0000460	0.049	0.000100	0.661	0.151	0.000376	0.00655	0.000625	*0.00042*	*0.00054*	0.0051
August 22, 2016	27.4	3.50	*0.00043*	0.0000725	0.058	0.000170	0.645	0.299	0.000775	0.0115	0.000800	*0.00043*	*0.00056*	0.0073
August 28, 2016	10.5	2.70	*0.00038*	0.0000908	0.048	0.0000595	0.377	0.0741	0.00141	0.00521	0.000600	*0.00038*	*0.00049*	0.0066
September 3, 2016	22.2	4.33	*0.00095*	0.0000654	0.045	0.000115	0.124	0.143	0.00109	0.00832	0.000578	*0.00041*	*0.00159*	0.0077
September 9, 2016	12.1	2.16	*0.00094*	0.0000332	0.039	0.0000527	0.232	0.0451	0.000332	0.00412	0.000407	*0.00041*	*0.00157*	0.0037
September 15, 2016	12.8	3.25	*0.00091*	0.0000489	0.0030	0.0000822	0.286	0.106	0.000628	0.00593	0.000580	*0.00039*	*0.00151*	0.0055
September 21, 2016	14.1	11.2	*0.00095*	0.0000620	0.0032	0.0000677	0.476	0.0601	0.000215	0.00291	0.000431	*0.00041*	*0.00158*	0.0052
September 27, 2016	4.96	4.33	*0.00090*	0.0000317	0.0029	0.0000544	0.141	0.0161	0.000150	0.00164	0.000323	*0.00039*	*0.00150*	0.0050

Geometric mean	13.4	4.14	N/R	0.0000542	0.017	0.0000845	0.350	0.0789	0.000430	0.00448	0.000564	N/R	N/R	0.0056
Arithmetic mean	14.6	4.57	N/R	0.0000565	0.029	0.0000900	0.391	0.0977	0.000542	0.00503	0.000585	N/R	N/R	0.0058
Max. concentration	27.4	11.2	N/R	0.0000908	0.058	0.000170	0.661	0.299	0.00141	0.0115	0.000848	N/R	N/R	0.0077
Min. concentration	4.96	2.16	N/R	0.0000317	0.0029	0.0000527	0.124	0.0161	0.000150	0.00164	0.000323	N/R	N/R	0.0033
90th percentile	22.2	6.87	N/R	0.0000717	0.049	0.000118	0.620	0.150	0.00102	0.00796	0.000810	N/R	N/R	0.0076
95th percentile	24.3	8.80	N/R	0.0000798	0.053	0.000139	0.651	0.210	0.00122	0.00958	0.000827	N/R	N/R	0.0077
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	13	13	13	13	13	13	13	13	13	13	13	13	13	13
No. samples < mdl	1	1	14	1	1	1	1	1	1	1	1	14	14	1
Detection limit (μg)	100	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)	50	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	8	8	108	8	8	8	8	8	8	8	8	108	108	8
% valid data	87	87	87	87	87	87	87	87	87	87	87	87	87	87

Notes:
All non detectable results were reported as 1/2 detection limit and are denoted by italics and underlining
N/R: Statistics not reported due to more than 50% of values being less than the detection limit
N/A: Not applicable
—: Invalid Sample
*Canadian Ambient Air Quality Standard, 24-hour standard

APPENDIX B-2

TOTAL DUSTFALL SAMPLING RESULTS

Tait Road Monitoring Results for Dustfall (Third Quarter 2016) (results expressed in g/m^2/30days)

Month	No. Exposure Days	Dustfall (insoluble)	Dustfall (soluble)	Dustfall (total)
July	34	PENDING	PENDING	PENDING
August	28	PENDING	PENDING	PENDING
September	31	PENDING	PENDING	PENDING

Arithmetic mean	PENDING
Max. concentration	PENDING
Min. concentration	PENDING
AAQC	7
No. > AAQC value**	PENDING
No. of valid samples	3
% Valid data	100
No. samples < mdl	1
Detection limit	0.3
Half detection limit	0.15

Gallinger Road Monitoring Results for Dustfall (Third Quarter 2016) (results expressed in g/m^2/30days)

Month	No. Exposure Days	Dustfall (insoluble)	Dustfall (soluble)	Dustfall (total)
July	34	PENDING	PENDING	PENDING
August	28	PENDING	PENDING	PENDING
September	31	PENDING	PENDING	PENDING

Arithmetic mean	PENDING
Max. concentration	PENDING
Min. concentration	PENDING
AAQC	7
No. > AAQC value**	PENDING
No. of valid samples	3
% Valid data	100
No. samples < mdl	0
Detection limit	0.3
Half detection limit	0.15

Notes:
N/R: Statistics not reported due to high % of values <detection 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 (Third Quarter 2016)
(results expressed in µg/m^3)

	Tait Road		Gallinger Road	
Month	**SO_2**	**NO_2**	**SO_2**	**NO_2**
April	0.1	0.4	0.1	0.6
May	0.1	0.8	0.1	0.8
June	0.1	1.1	0.3	0.9
Arithmetic mean	0.1	0.8	0.2	0.8
Max. concentration	0.1	1.1	0.3	0.9
Min. concentration	0.1	0.4	0.1	0.6
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	0
Detection limit	0.26	0.19	0.26	0.19
Half detection limit	0.13	0.09	0.13	0.09

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: Statistics not reported due to high % of values <detection limit

N/A: Not applicable

INV: Invalid Sample

*Ontario Ambient Air Quality Criteria

AIR QUALITY MONITORING PROGRAM
FOURTH QUARTER 2016 REPORT
RAINY RIVER PROJECT

Submitted to:

New Gold Inc.
Rainy River Project
5967 Highway 11/71
P.O. Box 5
Emo, Ontario, Canada P0W IE0

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 2017

Amec Foster Wheeler Project No.: TC111504

February 13, 2017

Amec Foster Wheeler Project No.: TC111504

New Gold Inc.
Rainy River Project
5967 Highway 11/71
P.O. Box 5
Emo, Ontario, Canada P0W IE0
Attention: Darrell Martindale
Environment Manager

Dear Mr. Martindale:

Re: Rainy River Project, Fourth Quarter 2016 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) the attached summary report of the Fourth Quarter 2016 results for the ambient air quality monitoring program at the Rainy River Project.

The monitoring program consists of two air quality sampling stations that 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 are operated and maintained by New Gold staff.

The key findings of the Q4 2016 monitoring are as follow:

- There were no exceedances of the $PM_{2.5}$, TSP, or Metals' AAQC measured in Q4 2016.

The measured TSP and $PM_{2.5}$ concentrations for the Fourth Quarter 2016 are depicted in Figures CL-1 and CL-2.

Amec Foster Wheeler Environment & Infrastructure
160 Traders Blvd. E., Suite 110
Mississauga, Ontario, CANADA L4Z 3K7
Phone 905.568.2929

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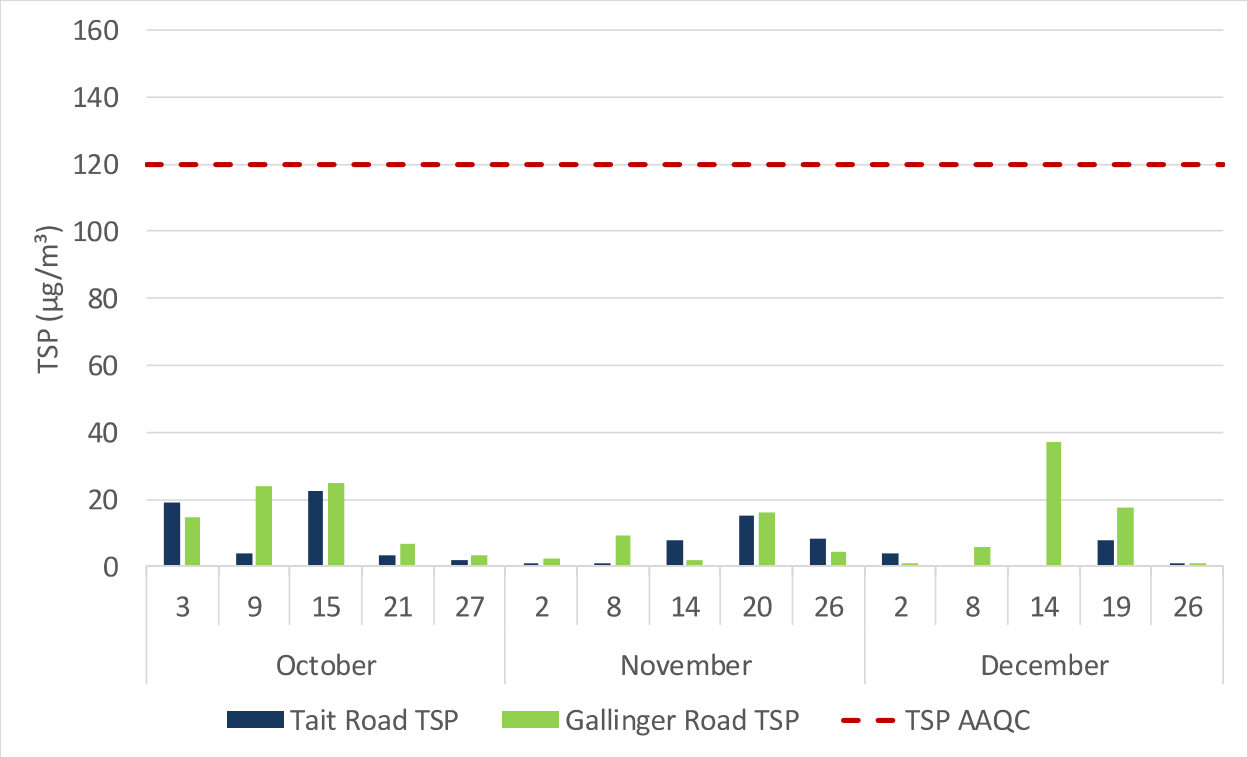

Figure CL-1: TSP Concentrations (2016 – Q4)

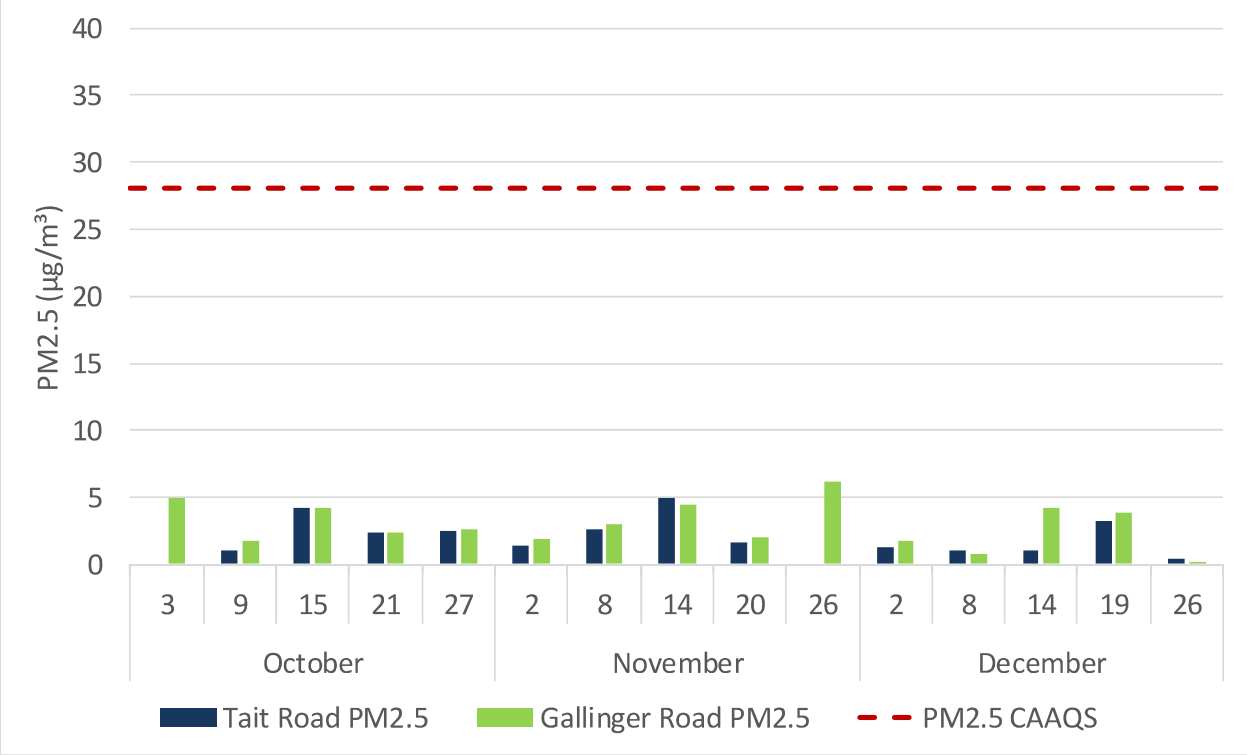

Figure CL-2: $PM_{2.5}$ Concentrations (2016 – Q4)

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

Ryan Fletcher P.Eng
Air Quality Engineer

Tony van der Vooren P.Eng, Ph.D., QEP
Senior Air Quality Consultant

Revision	Date	Revised By	Description
A	February 2, 2017	Ryan Fletcher	Draft Report
B	February 13, 2017	Linda Lattner	Final Report

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ACRONYMS AND ABBREVIATIONS

AAQC	Ambient Air Quality Criteria
AAQO	Alberta Ambient Air Quality Objectives
ACFM	Cubic Feet Per Minute at Actual Conditions
AEP	Alberta Environment and Parks
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
$\mu g/m^3$	Microgram per Cubic Metre

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) 2016 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 staff performed quarterly calibrations, 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 (US EPA) and the Ontario Ministry of the Environment and Climate Change (MOECC) as described in the Operations Manual (MOECC, 2008). Measurements of 24-hour average TSP and metal concentrations were undertaken as this is the averaging time of the relevant Ontario Ambient Air Quality Criteria (AAQC; MOECC, 2012); particulate samples are collected every sixth day on the North American schedule (USEPA, 2017). Sampling was performed with Hi-Vol samplers (brush motor and mass flow controlled). The metals and metalloids analyzed included 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). A metalloid is an element such as arsenic that has both metallic and non-metallic compounds.

The lowest detectable limit is 2.3 milligrams (mg) of total particulate on the filter, resulting in a method detection limit of 1.4 micrograms per cubic metre ($\mu g/m^3$) based on a typical 24-hour sample volume of 1630 m^3.

The metal concentrations were determined with the standard Inductively Coupled Plasma Atomic Emission Spectroscopy (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 US EPA and the MOECC as described in the 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) ; particulate samples are collected every sixth day on the North American schedule (USEPA, 2017). Sampling was performed with PQ200 samplers.

The lowest detectable limit on the Teflon filters is 1 µg of $PM_{2.5}$, resulting in a method detection limit of 0.04 $\mu g/m^3$ (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 (July 4, 2016). Standard dustfall samplers were used to measure total dustfall deposition. 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 is only used for screening purposes. For NO_2, the monthly results were compared to the MOECC 24-hour AAQC converted to an equivalent 30-day average (78 $\mu g/m^3$) 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 Objective of 30 $\mu g/m^3$ (AEP, 2016).

2.5 Field Operations

2.5.1 Hi-Vol Samplers

The two 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.

Two calibrations were performed during this quarter:

- On September 16, 2016, Amec Foster Wheeler staff calibrated the Hi-Vol samplers with a TISCH Environmental flow calibration orifice which was re-certified to National Institute of Standards and Technology (NIST) traceability in July 2016. The coefficient of determination (R^2) for the flow calibration orifice was 0.99999. Temperature and pressure readings were taken from the BGI flow calibrator used for the PQ200s.

- On December 20, 2016, Amec Foster Wheeler staff calibrated the Hi-Vol samplers with a BGI digital flow calibrator which was re-certified to National Institute of Standards and Technology (NIST) traceability in July 2016. The overall uncertainty of the calibrator was

determined to be 0.60% (ambient temperature, barometric pressure and flow) relative to the US EPA standard.

There were no MOECC audits during this quarter.

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.

Two calibrations were performed during this quarter:

- On September 16, 2016, Amec Foster Wheeler staff recalibrated both PQ200 samplers with a BGI flow calibrator which was re-certified to NIST traceability in May 2016. The overall uncertainty of the calibrator was determined to be 0.35% (ambient temperature, barometric pressure and flow) relative to the US EPA standard.

- On December 20, 2016, Amec Foster Wheeler staff recalibrated both PQ200 samplers with a BGI flow calibrator which was re-certified to NIST traceability in May 2016. The overall uncertainty of the calibrator was determined to be 0.35% (ambient temperature, barometric pressure and flow) relative to the US EPA standard.

There were no MOECC audits during this quarter.

2.5.3 Dustfall Samplers

The dustfall samplers containing algaecide were changed every month, as required. Dustfall jars were provided by the laboratory with screw-on lids to prevent sample loss during transport.

2.5.4 Passive Samplers

The permeation filters in the passive samplers were changed every month, as required. Permeation filters were kept in filter cassettes inside a Ziploc bags until deployed to prevent premature exposure. After the sample is collected, the filter is placed back in its cassette inside a Ziploc bag for shipment to the lab.

3.0 RESULTS

The results for the Q4 2016 sampling program are presented in Appendix B-1 for the particulate and metals 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 with MOECC protocol, a value of half the detection limit was substituted for concentrations less than the detection limit.

For comparative purposes, the MOECC AAQC and CAAQS values are presented, where available.

A summary of the statistical analyses for Q4 2016 for the TSP and $PM_{2.5}$ concentrations is presented in Tables 1 and 2 respectively. During the quarter, the 1 in 6 day sampling schedule results in a possible total of fifteen (15) sampling days between October 1 and December 31, 2016.

A summary of the statistical analyses for Q4 2016 for the total dustfall data is presented below in Table 3.

A summary of the statistical analysis for the Q4 2016 passive SO_2 and NO_2 results is presented in Table 4.

The samples scheduled for December 20, 2016 were collected on December 19, 2016 in order that Amec Foster Wheeler field staff could perform equipment calibrations.

3.1 Total Suspended Particulates and Metals

The Tait Road station collected thirteen (13) valid samples and the Gallinger Road station collected fifteen (15) valid samples in Q4 2016, resulting in 87% and 100% valid data respectively. The December 8, 2016 and December 14, 2016 samples at the Tait Road station were invalid due to insufficient sample volume; seasonal temperature changes and slightly low sample times resulted in the volume collected being more than 10% under to desired 1632m^3 target volume

For the quarter, the geometric mean TSP concentrations were 4.19 µg/m^3 for the Tait Road station and 6.32 µg/m^3 for the Gallinger Road station. Values reported by the laboratory as below the detection limit were, by convention, substituted with one-half of the detection limit. The maximum 24-hour concentration for TSP was 22.4 µg/m^3 at the Tait Road station (October 15, 2016), and 37.2 µg/m^3 at the Gallinger Road station (December 14, 2016).

In the quarter, the 24-hour metal concentrations were all below the AAQCs. The arsenic, selenium, and vanadium statistics were not reported as more than 50% of the results were below the method detection limit.

Appendix B-1 presents individual sample data.

The Q4 2016 TSP summary statistics are summarized in Table 1.

There were no exceedances of the MOECC AAQC measured for any of TSP metals, or metalloids in Q4 2016.

Table 1: Summary Statistics for Q4 2016 for TSP Data

Statistic	Q4	
	Tait Road (SW)	Gallinger Road (NE)
Geometric mean (µg/m^3)	4.2	6.3
Arithmetic mean (µg/m^3)	7.4	11.3
October Maximum (µg/m^3)	22.4	25.1
November Maximum (µg/m^3)	15.4	15.9
December Maximum (µg/m^3)	7.7	37.2
Maximum 24 hour (µg/m^3)	22.4 (Oct.15)	37.2 (Dec.14)
90th percentile	18.3	24.7
95th percentile	20.4	28.7
24-hour AAQC	120	120
No. of valid samples	13	15
% valid data	87	100
No. samples > AAQC (particulate)	0	0
No. samples > AAQC (metals)	0	0
No. samples > AAQC (metalloids)	0	0

3.2 $PM_{2.5}$

The Tait Road station collected thirteen (13) valid samples and the Gallinger Road station collected fifteen (15) valid samples in Q4 2016, resulting in 87% and 100% valid data respectively. The Tait Road $PM_{2.5}$ samples on October 3, 2016 and November 26, 2016 were not collected due to a sampler malfunction; brownouts caused by line work on the highway 600 reroute were suspected as the cause and a backup battery supply was installed during the December 2016 calibration

Values reported by the laboratory as below the detection limit were, by convention, substituted with one-half of the detection limit. The maximum 24-hour concentration for $PM_{2.5}$ was 4.95 µg/m^3 at the Tait Road station (November 14, 2016), and 6.12 µg/m^3 at the Gallinger Road station (November 26, 2016). There were no $PM_{2.5}$ exceedances of the AAQC of 30 µg/m^3 or CAAQS (ECCC, 2013) of 28 µg/m^3 measured in Q4 2016. Appendix B-1 presents individual sample data.

The Q4 2016 $PM_{2.5}$ summary statistics are summarized in Table 2.

There were no exceedances of the $PM_{2.5}$ CAAQS in Q4 2016.

Table 2: Summary Statistics for Q4 2016 for $PM_{2.5}$ Data

Statistic	Q4	
	Tait Road (SW)	Gallinger Road (NE)
Arithmetic mean (µg/m^3)	2.13	2.92
October Maximum (µg/m^3)	4.20	4.99
November Maximum (µg/m^3)	4.95	6.12
December Maximum (µg/m^3)	3.29	4.24
Maximum 24 hour (µg/m^3)	4.95 (Nov.14)	6.12 (Nov.26)
90th percentile	4.02	4.79
95th percentile	4.50	5.33
24-hour CAAQS	28	28
No. of valid samples	13	15
% valid data	87	100
No. samples > CAAQS	0	0

3.3 Total Dustfall

In Q4 2016, three (3) valid samples were collected at each station. Each dustfall jar was exposed for approximately 30-days to coincide with each calendar month in the quarter.

A summary of the results are presented in Table 3 and the monthly results are presented in Appendix B-2.

There were no exceedances of the dustfall MOECC AAQC measured in Q4 2016.

Table 3: Summary Statistics for Q4 2016 Total Dustfall Data

Statistic	Tait Road (SW)	Gallinger Road (NE)
Arithmetic mean ($g/m^2/30d$)	0.79	0.90
Maximum ($g/m^2/30d$)	1.3	1.5
30-day AAQC	7	7
No. > AAQC	0	0
No. valid samples*	3	3
% Valid data	100	100

N/A: No applicable criteria
N/R: Not Reportable

3.4 Passive SO_2 and NO_2

In Q4 2016, 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 or NO_2 for a 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 potential comparison with dispersion modelling results. For NO_2, the monthly results were compared to the MOECC 24-hour AAQC converted to an equivalent 30-day average (78 $\mu g/m^3$) 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 Alberta Ambient Air Quality Objective of 30 $\mu g/m^3$ (AEP, 2016).

A summary of the passive results are presented in Table 4 and the monthly results are presented in Appendix B-3.

Table 4: Summary Statistics for Q4 2016 for Passive SO_2 and NO_2 Data

Statistic	Tait Road (SW)		Gallinger Road (NE)	
	SO_2	NO_2	SO_2	NO_2
Mean (µg/m³)	0.5	1.3	0.4	2.1
Maximum (µg/m³)	0.5	1.7	0.5	2.6
AAQC 24-hr converted to 30-day (µg/m³)	N/A	78	N/A	78
Alberta AAQO (µg/m³)	30	N/A	30	N/A
No. valid samples	3	3	3	3
% Valid data	100	100	100	100

N/A: No applicable criterion

4.0 CONCLUSIONS

Two ambient air quality monitoring stations were installed and commissioned in May 2015 at the Rainy River Project.

A summary of the Q4 2016 air quality sampling program is provided below:

- There were 28 valid TSP samples collected (93% sample validity), with metal and metalloid (arsenic) analyses performed on each of the TSP filters. No exceedances of the AAQC were measured for TSP, or for any of the metals and metalloids.
- There were 28 valid $PM_{2.5}$ samples collected (93% sample validity), and no exceedances of the CAAQS were measured.
- Six dustfall samples were collected (100% sample validity), and no exceedances of the AAQC were measured.
- Six valid passive samples for each of SO_2 and NO_2 were collected (100% sample validity). There were no exceedances of AEP Criterion for SO_2 or of the 30-day equivalent AAQC for NO_2.
- There were two calibrations of the TSP Hi-Vols and PQ200s performed in Q4 2016, and no MOECC audits.

5.0 REFERENCES

Alberta Environment and Parks (AEP). 2016. Alberta Ambient Air Quality Objectives and Guidelines Summary.

American Society for Testing and Materials (ASTM). 2004. Standard Test Method for Collection and Measurement of Dustfall (Settleable Particulate Matter).

Environment and Climate Change Canada (ECCC). 2013. Canadian Environmental Protection Act, 1999 S*ections 54 and 55.* Ministry of the Environment and Climate Change (MOECC). 2008. Operations Manual for Air Quality Monitoring in Ontario.

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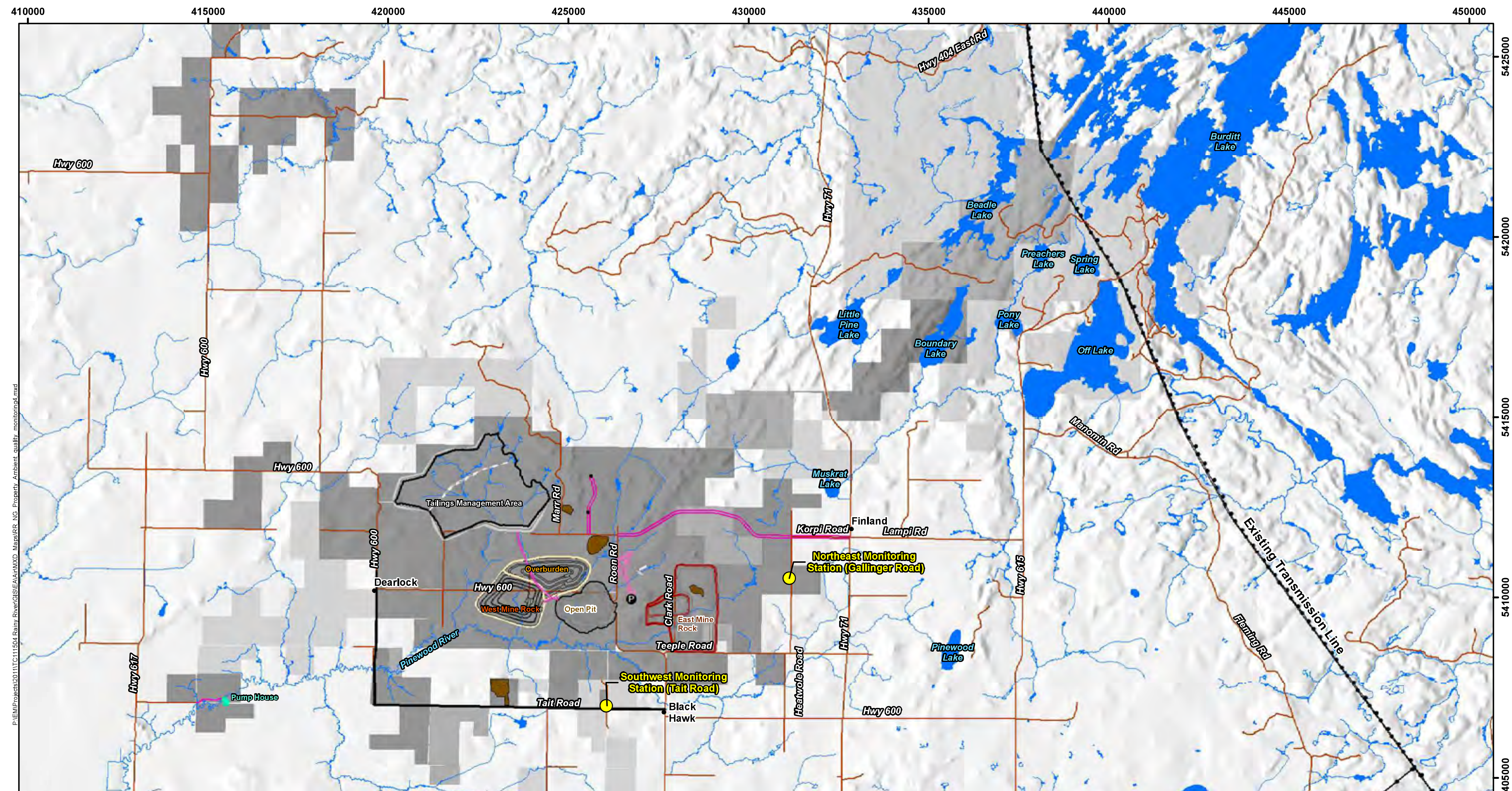
Ministry of the Environment and Climate Change (MOECC). 2012. Ontario's Ambient Air Quality Criteria, PIBS # 6570e01.

Ministry of the Environment and Climate Change (MOECC). 2016. Determination of Total Dustfall in Air Particulate Matter by Gravimetry, E3043.

United States Environmental Protection Agency (USEPA). 2017. Sampling Schedule Calendar, https://www3.epa.gov/ttnamti1/calendar.html (Accessed February 10, 2017).

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

P:\EM\Projects\2011\TC111504 Rainy River\GIS\EA\MXD_Maps\RR_NG_Property_Ambient_quality_monitoring4.mxd

P:\EWProjects\2011\TC111504\Rainy River\GIS\ESA\ArcMXD_Maps\ERA_MS_Ambient_quality_monitoring_station_Tait.mxd

LEGEND

- Southwest Monitoring Station (Tait Road)
- Highway Re-alignment

0 10 20 40 60 80 100 Meters

Notes:
- Aerial imagery provided by RRR Pleades imagery (August 2014).

Datum & Projection: NAD 1983 UTM Zone 15N

N W E S

newgold Rainy River Project

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RAINY RIVER PROJECT

Ambient Air Monitoring
Southwest Monitoring Station

PROJECT N°: TC111504	**FIGURE: 2**
SCALE: 1:700	DATE: August 2015

LEGEND

Northeast Monitoring Station (Gallinger Road)

Gallinger Road

Notes:
- Aerial imagery provided by RRR Plieades imagery (August 2014).

Datum & Projection:
NAD 1983 UTM Zone 15N

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RAINY RIVER PROJECT

Ambient Air Monitoring
Northeast Monitoring Station

PROJECT N°: TC111504	**FIGURE: 3**
SCALE: 1:700	DATE: August 2015

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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 2016)
(results expressed in µg/m³)

Date	TSP	PM2.5	As	Cd	Cr	Co	Cu	Fe	Pb	Mn	Ni	Se	V	Zn
October 3, 2016	19.0	—	*0.00089*	0.0000588	0.0027	0.000176	0.0208	0.212	0.000706	0.00641	0.000617	*0.00039*	*0.0015*	0.00427
October 9, 2016	3.76	1.08	*0.00090*	0.0000245	0.0027	0.000068	0.0331	0.0466	0.000209	0.00174	0.000275	*0.00039*	*0.0015*	*0.0013*
October 15, 2016	22.4	4.20	*0.00096*	0.0000575	0.0030	0.000176	0.0268	0.316	0.00152	0.0185	0.000582	*0.00042*	*0.0016*	0.00646
October 21, 2016	3.35	2.37	*0.00098*	0.0000249	0.0031	0.000059	0.0161	0.0800	0.000269	0.00578	0.000308	*0.00043*	*0.0016*	0.0132
October 27, 2016	2.10	2.46	*0.00096*	0.0000261	0.0029	0.000039	0.0198	0.0363	0.000331	0.00263	0.000344	*0.00041*	*0.0016*	0.00720
November 2, 2016	*0.73*	1.37	*0.00095*	0.0000366	0.0039	0.000141	0.029	0.0473	0.000366	0.00315	0.000404	*0.00041*	*0.0016*	0.00668
November 8, 2016	*0.73*	2.62	*0.00095*	0.0000578	0.0051	0.000091	0.0526	0.0514	0.000229	0.00207	0.000438	*0.00041*	*0.0016*	0.0054
November 14, 2016	*7.60*	4.95	*0.00095*	0.0000561	0.0048	0.000277	0.0293	0.4370	0.000479	0.02106	0.000687	*0.00041*	*0.0016*	0.009522
November 20, 2016	15.4	1.58	*0.00095*	0.0000838	0.0058	0.000269	0.0349	0.415	0.000330	0.01264	0.000876	*0.00041*	*0.0016*	0.0107
November 26, 2016	8.27	—	*0.00095*	0.0000915	0.0052	0.000098	0.0389	0.0372	0.000966	0.00307	0.000827	*0.00041*	*0.0016*	0.0675
December 2, 2016	3.91	1.25	*0.00101*	0.0000479	0.0045	0.000106	0.0437	0.144	0.000560	0.00337	0.000614	*0.00044*	*0.0017*	0.00688
December 8, 2016	—	1.00	—	—	—	—	—	—	—	—	—	—	—	—
December 14, 2016	—	1.08	—	—	—	—	—	—	—	—	—	—	—	—
December 19, 2016	7.68	3.29	*0.00095*	0.000314	0.0051	0.000129	0.0207	0.177	0.00111	0.00588	0.00126	*0.00041*	*0.0016*	0.0142
December 26, 2016	*0.71*	0.42	*0.00092*	0.000496	0.0053	0.000078	0.0404	0.0855	0.000547	0.00239	0.000800	*0.00040*	*0.0015*	0.0127

Geometric mean	4.19													
Arithmetic mean	7.36	2.13	N/R	0.000106	0.0042	0.000131	0.0313	0.160	0.000586	0.00682	0.000618	N/R	N/R	0.0128
Max. concentration	22.4	4.95	N/R	0.000496	0.0058	0.000277	0.053	0.437	0.00152	0.0211	0.00126	N/R	N/R	0.0675
Min. concentration	0.71	0.42	N/R	0.0000245	0.0027	0.0000389	0.0161	0.0363	0.000209	0.00174	0.000275	N/R	N/R	0.0013
90th percentile	18.3	4.02	N/R	0.000270	0.0053	0.000251	0.043	0.395	0.001082	0.0173	0.000866	N/R	N/R	0.0140
95th percentile	20.4	4.50	N/R	0.000387	0.0055	0.000273	0.047	0.424	0.00127	0.0195	0.00103	N/R	N/R	0.0355
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	13	13	13	13	13	13	13	13	13	13	13	13	13	13
No. samples < mdl	4	0	13	0	0	0	0	0	0	0	0	13	13	1
Detection limit (µg)	100	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)	50	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	31	0	100	0	0	0	0	0	0	0	0	100	100	8
% valid data	87	87	87	87	87	87	87	87	87	87	87	87	87	87

Notes:
All non detectable results were reported as 1/2 detection limit and are denoted by italics and underlining
N/R: Statistics not reported due to high % of values <detection limit
N/A: Not applicable
—: Invalid Sample
*Canadian Ambient Air Quality Standard, 24-hour standard

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Northeast Gallinger Road Monitoring Results for TSP and Metals (Fourth Quarter 2016)
(results expressed in µg/m^3)

Date	TSP	PM2.5	As	Cd	Cr	Co	Cu	Fe	Pb	Mn	Ni	Se	V	Zn
October 3, 2016	14.7	4.99	*0.00086*	0.0000529	0.0025	0.000159	0.137	0.140	0.000753	0.00491	0.000511	*0.00037*	*0.0014*	0.00517
October 9, 2016	24.1	1.71	*0.00092*	0.0000324	0.0029	0.000136	0.155	0.185	0.000275	0.00580	0.000428	*0.00040*	*0.0015*	0.00348
October 15, 2016	25.1	4.24	*0.00090*	0.0000660	0.0035	0.0001987	0.097	0.3620	0.001651	0.01939	0.000787	*0.00039*	*0.0015*	0.00805
October 21, 2016	6.55	2.37	*0.00094*	0.0000449	0.0027	0.0000705	0.163	0.0948	0.000262	0.00661	0.000324	*0.00041*	*0.0016*	0.00580
October 27, 2016	3.12	2.62	*0.00094*	0.0000505	0.0032	0.0000493	0.126	0.0374	0.000424	0.00190	0.000330	*0.00041*	*0.0016*	0.00736
November 2, 2016	2.48	1.83	*0.00087*	0.0000473	0.0039	0.000108	0.155	0.0600	0.000358	0.00327	0.000473	*0.00038*	*0.0014*	0.00820
November 8, 2016	9.17	2.95	*0.00094*	0.0000766	0.0043	0.000160	0.171	0.143	0.000245	0.00509	0.000559	*0.00041*	*0.0016*	0.00766
November 14, 2016	1.89	4.50	*0.00092*	0.0000543	0.0040	0.0000714	0.138	0.058	0.000299	0.00354	0.000415	*0.00040*	*0.0015*	0.00415
November 20, 2016	15.9	1.96	*0.00092*	0.0000462	0.0053	0.000203	0.191	0.225	0.000271	0.0059	0.000726	*0.00040*	*0.0015*	0.00474
November 26, 2016	4.51	6.12	*0.00094*	0.0000708	0.0046	0.0000683	0.150	0.0276	0.000770	0.00115	0.000344	*0.00041*	*0.0016*	0.00902
December 2, 2016	*0.73*	1.71	*0.00096*	0.0000434	0.0049	0.000153	0.098	0.0906	0.000428	0.00223	0.000568	*0.00041*	*0.0016*	0.00517
December 8, 2016	5.72	0.83	*0.00096*	0.000112	0.0045	0.000109	0.132	0.115	0.000340	0.00364	0.000629	*0.00042*	*0.0016*	0.0160
December 14, 2016	37.2	4.24	*0.00098*	0.000328	0.0064	0.000348	0.061	0.593	0.001167	0.01541	0.001528	*0.00043*	*0.0016*	0.0222
December 19, 2016	17.8	3.83	*0.00093*	0.000220	0.0050	0.0001569	0.032	0.2289	0.001005	0.00713	0.000930	*0.00040*	*0.0016*	0.0115
December 26, 2016	*0.67*	*0.02*	*0.00087*	0.000162	0.0050	0.0000498	0.093	0.0469	0.000434	0.00133	0.000619	*0.00038*	*0.0014*	0.00932

Geometric mean	6.32	[illegible]												
Arithmetic mean	11.31	2.93	N/R	0.0000938	0.0042	0.000136	0.127	0.160	0.000579	0.00582	0.000612	N/R	N/R	0.00852
Max. concentration	37.2	6.12	N/R	0.000328	0.0064	0.000348	0.191	0.593	0.00165	0.0194	0.00153	N/R	N/R	0.0222
Min. concentration	0.67	0.02	N/R	0.0000324	0.0025	0.0000493	0.032	0.0276	0.000245	0.00115	0.000324	N/R	N/R	0.0035
90th percentile	24.7	4.79	N/R	0.000197	0.0052	0.000201	0.168	0.309	0.001102	0.01210	0.000873	N/R	N/R	0.0142
95th percentile	28.7	5.83	N/R	0.000252	0.0056	0.000246	0.177	0.431	0.001312	0.01660	0.001110	N/R	N/R	0.0179
CAAQS	N/A	[illegible]	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	2	1	15	0	0	0	0	0	0	0	0	15	15	0
Detection limit (µg)	100	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)	50	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	13	7	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:
All non detectable results were reported as 1/2 detection limit and are denoted by italics and underlining
N/R: Statistics not reported due to more than 50% of values being less than the detection limit
N/A: Not applicable
—: Invalid Sample
*Canadian Ambient Air Quality Standard, 24-hour standard

APPENDIX B-2

TOTAL DUSTFALL SAMPLING RESULTS

Tait Road Monitoring Results for Dustfall (Fourth Quarter 2016)
(results expressed in g/m^2/30days)

Month	No. Exposure Days	Dustfall (insoluble)	Dustfall (soluble)	Dustfall (total)
October	31	*0.15*	1.1	1.3
November	29	0.45	0.33	0.78
December	31	0.33	*0.15*	0.33

Arithmetic mean	0.79
Max. concentration	1.3
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 2016)
(results expressed in g/m^2/30days)

Month	No. Exposure Days	Dustfall (insoluble)	Dustfall (soluble)	Dustfall (total)
October	31	0.57	0.9	1.5
November	29	*0.15*	*0.15*	*0.15*
December	31	1.08	*0.15*	1.1

Arithmetic mean	0.90
Max. concentration	1.5
Min. concentration	0.15
AAQC	7
No. > AAQC value**	0
No. of valid samples	3
% Valid data	100
No. samples < mdl	1
Detection limit	0.3
Half detection limit	0.15

Notes:
All non detectable results were reported as 1/2 detection limit and are denoted by italics and underlining
N/R: Statistics not reported due to high % of values <detection limit
N/A: Not applicable
INV: Invalid Sample
**Ontario Ambient Air Quality Criterion (30-day)

APPENDIX B-3

SO_2 AND NO_2 PASSIVE SAMPLING RESULTS

Monitoring Results for Passive SO_2 and NO_2 (Fourth Quarter 2016)
(results expressed in µg/m^3)

	Tait Road		Gallinger Road	
Month	**SO_2**	**NO_2**	**SO_2**	**NO_2**
October	0.5	0.9	0.5	1.7
November	0.5	1.3	*0.1*	2.1
December	0.5	1.7	0.5	2.6

Arithmetic mean	0.5	1.3	0.4	2.1
Max. concentration	0.5	1.7	0.5	2.6
Min. concentration	0.5	0.9	0.1	1.7
AAQC* (24-hr AAQC converted to equivalent 30 day average)	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	1	0
Detection limit	0.3	0.2	0.3	0.2
Half detection limit	0.1	0.1	0.1	0.1

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 25°C
N/R: Statistics not reported due to high % of values <detection limit
N/A: Not applicable
INV: Invalid Sample
*Ontario Ambient Air Quality Criteria

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Northern Region Technical Support Section – Thunder Bay

July 28, 2016

Cailey Anderson
Environmental Specialist

New Gold Inc.
Rainy River Project
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Ontario, Canada, P0W IE0
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Dear Ms. Anderson:

Re: Air Monitoring Station Audit – Non-Continuous Monitors

On July 26th 2016 your company's station [s] were audited. Attached is a copy of the Audit record, below is a summary of the results:

1. Tait Road (Station #62054)

Sampler Type	Sampler S/N	% Error	Criteria Met
PQ200 PM2.5	1752	3.5% High	Yes
TSP Tisch	4118	4.75% High	Yes
Dustfall Jars	N/A	N/A	Yes

2. Galllinger Road (Station #62055)

Sampler Type	Sampler S/N	% Error	Criteria Met
PQ200 PM2.5	1751	1.6% High	Yes
TSP Tisch	4035	5.5% High	Yes
* Dustfall Jars*	N/A	N/A	Yes see note below

*Gallinger Road dustfall has a possible tree problem with one tree located within the 20 mtr allowance [NW side] that can be an issue in about 5 year time frame, please just take note may need trimming.

If you have any questions, do not hesitate to call.
Yours truly,

Jim Stachowich
Senior Environmental Officer
Air, Pesticides and Environmental Planning
Technical Support Section
Northern Region

c: Garnet Cornell Newgold Inc.
c: Ray Boivin Senior Environmental Officer, Kenora District Office, MOE
c: File AQ 06 13 Thunder Bay/NewGold Inc./62054/62055/2016/Qtr#1

Ontario
Ministry of the Environment

Non-Continuous Instrumentation
Dustfall
Site Audit

Dustfall Site Audit				
Site Name/Address:	New Gold Fair Road			
City/Town:	Fmo			
Site ID #: 62054	Operator/Representative: New Gold			
Date (yr/mm/dd): 16/07/26	Auditor: Jim STALHOWSKI			
Criteria	**Requirements**	**Observed**	**Criteria Met?**	
			YES	NO
Sampler height	3 m above ground		✓	○
Distance from Obstructions	270° arc of unrestricted airflow & wind from point source quadrant must be included in arc		✓	○
	No overhead obstructions (hydro telephone wires) to interfere with particle deposition		✓	○
Distance from trees	Should be > 20 m from drip line of trees		✓	○
Distance from road	No nearby unpaved roads & parking lot		✓	○
Rooftop installation	Avoid building wake effect		✓	○
	No nearby chimney or flues that could emit particles (soot/coal)		✓	○
Bracket installation	Should be level & jar must be level in bracket		✓	○
Ground cover	Should have vegetative cover		✓	○
Liner	4 mil liner must be used		✓	○
Comments/observations and overall audit opinion:				
Action Required (Auditor): None		Signature:		
Action Taken (Auditee):		Signature:		

Ontario
Ministry of the Environment

Non-Continuous Instrumentation
Particulate Matter
Atmospheric Analyser Performance Audit

Particulate Matter Performance Audit			
Site Name/Address: NEW GOLD TRAIT ROAD			
City/Town: EMO			
Site ID #: 62054	Operator/Representative:		
Date (yr/mm/dd): 16/07/26	Auditor: JIM STALKWILL		
Calibrator make BGI TRI-CAL	Instrumental serial # 1751	Instrument make PQ200	
Calibrator Serial No. TC-5 64	Pollutant PM 2.5		
Accuracy (GPS)	Zone		
Easting	Northing		
+/- 10% Objective/Criteria Met	Yes ○	No ○	

Results

Calibration Orifice and Equation - Manometer

Calibration orifice number	Manometer type:	Manometer S/N:

	S = slope of the calibration orifice
	I = intercept of the calibration orifice

INST / TRUE

Ambient Temperature 22 / 20.0 Ambient Pressure 732 mmHg / 970 mb

INST / TRUE

Audit Results	Required flow	
Manometer reading (in. of water)	Hi-vol & PM	40 cfm
True flow calculated result: $\sqrt{MR \times S + 1}$	PAH	30 cfm
Percent error = (true flow value – required flow) x 100 / required flow	Dioxins	8 cfm
Leak Test 12.31 − 16.7 / 16.7 x 100 = 73.5%	47 mm	16.7 L/M

Temperature Correction = SQRT [298/(273+/-Ta)] Ta = AMBIENT TEMP °C

Comments/observations (also general station conditions and status of logbooks):

Action Required (Auditor):	Signature:
NONE	
Action Taken (Auditee):	Signature:

00151

Ontario Ministry of the Environment

Atmospheric Analyser Audit Particulate

Site Information

Date YYYY MM DD: 2016 07 26	Company: NEW GOLD		
Station/Site No.: 62054	Location Address: EMO TIBIT ROAD	TE-5007	
Calibrator make	Instrument serial #: 9118	Instrument make: TISCH	
Calibrator Serial No.	Pollutant: TSP		
Accuracy (GPS)	Zone		
Easting	Northing		
+/- 10% Objective/Citeria Met ☑ Yes ☐ No			
Audit performed by (Name and Signature): JIM STALKWILL			

Results

Calibration Orifice and Equation - Manometer

Calibration orifice number:	Manometer type:	Manometer S/N:
41	BIN-ELECTRONICS	1200076

1.60	S = slope of the calibration orifice
0.25	I = intercept of the calibration orifice

Ambient Temperature 27.5°C Ambient Pressure 970 mb

Audit Results		Required flow	
Manometer reading (in.of water)	5.4	Hi-vol & PM	40 cfm
True flow calculated result: $\sqrt{MR \times S+1}$	41.9	PAH	30 cfm
Percent error = (true flow value - required flow) x 100 / required flow	4.75%	Dioxins	8 cfm
Leak Test		47 mm	16.7 L/M

Temperature Correction = SQRT [298/(273+/-Ta)] Ta = AMBIENT TEMP °C

Remarks

Signature (Witness)	Name	Title
	Garnet Cornell	Enviro. Technician

Has the instrument been restored to service? ☐ Yes ☐ No

COPY 3

1999 (12/07)

Ontario
Ministry of the Environment

Non-Continuous Instrumentation
Dustfall
Site Audit

Dustfall Site Audit				
Site Name/Address:	NEW Gold Gallinger Rd			
City/Town:	Emo			
Site ID #:	62055	Operator/Representative:	NEW Gold	
Date (yr/mm/dd):	16/04/26	Auditor:	Jim Stallknecht	

Criteria	**Requirements**	**Observed**	**Criteria Met?**	
			YES	NO
Sampler height	3 m above ground		✓	
	270° arc of unrestricted airflow & wind from point source quadrant must be included in arc		✓	
Distance from Obstructions	No overhead obstructions (hydro telephone wires) to interfere with particle deposition		✓	
Distance from trees	Should be > 20 m from drip line of trees		✓	
Distance from road	No nearby unpaved roads & parking lot		✓	
Rooftop installation	Avoid building wake effect		✓	
	No nearby chimney or flues that could emit particles (soot/coal)		✓	
Bracket installation	Should be level & jar must be level in bracket		✓	
Ground cover	Should have vegetative cover	N/A	✓	
Liner	4 mil liner must be used		✓	

Comments/observations and overall audit opinion:

Action Required (Auditor):	Signature:
Possible Tree Approx 20 mtrs from Dustfall Can be A Issue In 5 Years Time Ok now 5-1	
Action Taken (Auditee):	Signature: 

Ontario
Ministry of the Environment

Non-Continuous Instrumentation
Particulate Matter
Atmospheric Analyser Performance Audit

Particulate Matter Performance Audit			
Site Name/Address: NEW GOLD Gallinger Road			
City/Town: Emo			
Site ID #: 62055	Operator/Representative:		
Date (yr/mm/dd): 16/07/26	Auditor: Jim Stahowick		
Calibrator make BGI TRI-01		Instrumental serial # 1751	Instrument make PQ200 BGI
Calibrator Serial No. TC-5 64		Pollutant PM2.5	
Accuracy (GPS)		Zone	
Easting		Northing	
+/- 10% Objective/Criteria Met		Yes ✓	No O

Results		
Calibration Orifice and Equation - Manometer		
Calibration orifice number	Manometer type:	Manometer S/N:
	S = slope of the calibration orifice	
	I = intercept of the calibration orifice	
Ambient Temperature INST/TRIAL 27.9/32.1	Ambient Pressure INST/TRIAL 737mmHg/0985mb	

Audit Results		Required flow	
Manometer reading (in. of water)	/	Hi-vol & PM	40 cfm
True flow calculated result: $\sqrt{MR \, x \, S + 1}$	/	PAH	30 cfm
Percent error = (true flow value – required flow) x 100 / required flow		Dioxins	8 cfm
Leak Test	(16.97 − 16.7) / 16.7 x 100 = 1.6%	47 mm	16.7 L/M
Temperature Correction = SQRT [298/(273+/-Ta)]		Ta = AMBIENT TEMP °C	

Comments/observations (also general station conditions and status of logbooks):	
Action Required (Auditor): NONE	Signature: [signature]
Action Taken (Auditee):	Signature: [signature]

Ontario Ministry of the Environment

00761

Atmospheric Analyser Audit Particulate

Site Information

Date YYYY MM DD: 2016 07 26	Company: NEW GOLD		
Station/Site No.: 62055	Location Address: KEMO GALLIMAX ROAD TE5007		
Calibrator make		Instrument serial #: 9035	Instrument make: TISCH
Calibrator Serial No.		Pollutant: TSP	
Accuracy (GPS)		Zone	
Easting		Northing	
+/- 10% Objective/Citeria Met	☑ Yes ☐ No		
Audit performed by (Name and Signature): JIM STACHOWICH			

Results

Calibration Orifice and Equation - Manometer

Calibration orifice number: 41	Manometer type: AIR-NEOTRONICS	Manometer S/N: 120076
17.60	S = slope of the calibration orifice	
0.25	I = intercept of the calibration orifice	

Ambient Temperature 25.6°C Ambient Pressure 0968 mb

Audit Results		Required flow	
Manometer reading (in.of water)	5.2	Hi-vol & PM	40 cfm
True flow calculated result: $\sqrt{MR \times S+1}$	47.2	PAH	30 cfm
Percent error = (true flow value - required flow) x 100 / required flow	5.5% ↑	Dioxins	8 cfm
Leak Test		47 mm	16.7 L/M

Temperature Correction = SQRT [298/(273+/-Ta)] Ta = AMBIENT TEMP °C

Remarks

MTC Logs kept on site Lab

Signature (Witness)	Name	Title
	Garnet Connell	Enviro. Technician

Has the instrument been restored to service? ☐ Yes ☐ No

COPY 3

Ontario
Ministry of the Environment

Notification of Exceedence – Regulation 419/05
General Information and Instructions

General Information

Information requested in this notification form is collected under the authority of the *Environmental Protection Act*, R.S.O. 1990 (EPA) and O. Reg. 419/05 and will be used to collect information relating to a measured or modelled air related exceedence as required by s.25(9), s.28(1) and s.30(3) of O. Reg. 419/05. The Ministry of the Environment (MOE) may also request additional information.

1. Questions regarding completion and submission of this notification form should be directed to your local MOE District Office. A list of these District Offices (including fax numbers) is available on the Ministry of the Environment Internet site at http://www.ene.gov.on.ca/envision/org/op.htm#Reg/Dist. A copy of this form may be acquired through the MOE public web site (www.ene.gov.on.ca) or by contacting any MOE office.

2. For notification under s.25(9) or 28(1), the completed notification form should be faxed, as soon as practicable, to the local Ministry of Environment (MOE) District Office which has jurisdiction over the area in which the facility is located.

3. For notification under s. 30, the completed notification form should be immediately faxed to the local Ministry of Environment (MOE) District Office which has jurisdiction over the area which the facility is located. If the exceedance is determined outside of the business hours of the District Office then the completed notification form should be faxed to the Spills Action Center (1-800-268-6061).

4. Information contained in this notification form may not be considered confidential and may be made available to the public upon request. Information may be claimed as confidential but will be subject to the *Freedom of Information and Protection of Privacy Act* (FOIPPA) and the *EBR*. If you do not claim confidentiality at the time of submitting the information, the Ministry of the Environment may make the information available to the public without further notice to you.

Instructions

This form should be used to notify the MOE of a measured or modeled air related exceedence as required under O. Reg. 419/05. Failure to notify the MOE as required by regulation constitutes an offence under the O. Reg. 419/05 and the EPA.

The generic term "limits" in the context of this form means any numerical Point of Impingement Concentration limit set by the MOE including standards in O. Reg. 419/05 and guidelines provided by the MOE (Ministry POI Limits). For a comprehensive list of MOE POI Limits please refer to the publication titled "Summary of O. Reg. 419/05 Standards, Point of Impingement Guidelines, and Ambient Air Quality Criteria (AAQC's)" available on the Ministry of the Environment Internet site at http://www.ene.gov.on.ca/envision/gp/2424e01.htm. Note that contaminants that have guidelines limits or recommended levels for chemicals with no standard or guideline may be considered "contaminants not listed in any of Schedules 1, 2 and 3 and discharges of the contaminant may cause an adverse effect" as this language appears in O. Reg. 419/05.

This form may be used for notification of exceedences of more than one contaminant; Table 1 (or equvalent) should be completed for each contaminant. If this notification is made pursuant to s. 30 in combination with ss. 25(9) or 28(1) then this form must be submitted immediately in accordance with s.30.

Regulatory Authority

28. (1) A person who discharges or causes or permits the discharge of a contaminant shall, as soon as practicable, notify a provincial officer in writing if,

- *(a) the person uses an approved dispersion model to predict concentrations of the contaminant that result from the discharges and,*
  - *(i) the use of the model indicates that discharges of the contaminant may result in a contravention of section 18, 19 or 20, or*
  - *(ii) the contaminant is not listed in any of Schedules 1, 2 and 3 and the use of the model indicates that discharges of the contaminant may cause an adverse effect;*
- *(b) measurements of air samples indicate that discharges of the contaminant may result in a contravention of section 18, 19 or 20; or*
- *(c) the contaminant is not listed in any of Schedules 1, 2 and 3 and measurements of air samples indicate that discharges of the contaminant may cause an adverse effect.*

25. (9) A person who is required under subsection (8) to complete the update of a report not later than March 31 in a year shall, as soon as practicable after that date, notify a provincial officer in writing if the person has started to use an approved dispersion model with respect to a contaminant for the purpose of completing the update but has not yet complied with section 12, and,

- *(a) the use of the model indicates that discharges of the contaminant may result in a contravention of section 18, 19 or 20; or*
- *(b) the contaminant is not listed in any of Schedules 1, 2 and 3 and the use of the model indicates that discharges of the contaminant may cause an adverse effect.*

30. (1) A person who discharges or causes or permits the discharge of a contaminant listed in Schedule 6 into the air shall comply with subsections (3) and (4) if there is reason to believe, based on any relevant information, that discharges of the contaminant may result in the concentration of the contaminant exceeding the half hour upper risk threshold or other time period upper risk threshold set out for that contaminant in Schedule 6 at a point of impingement.

(2) Without limiting the generality of subsection (1), the reference in that subsection to relevant information includes relevant information from predictions of a dispersion model, including,

- *(a) an approved dispersion model or other dispersion model; or*
- *(b) a dispersion model that is not used in accordance with this Regulation.*

(3) If subsection (1) applies to a discharge, the person who discharged or caused or permitted the discharge of the contaminant shall immediately notify the Director in writing.

Ontario
Ministry of the Environment

Notification of Exceedence – Regulation 419/05

1. Ministry of the Environment District Office Information

Date Form Submitted (Faxed)	Date Exceedednce Determined
District Office	**Fax Number**
Thunder Bay District Office	(807) 473-3160

Supporting information attached? ☐ Yes ☒ No

If yes, number of pages: _____

2. Site Information

Name of Person Making the Notification	Business Name
Cailey Anderson	New Gold Inc.
North American Industry Classification System (NAICS) Code	**Business Activity Description** *(a description of the business endeavour, this may include products sold, services provided, equipment used, etc.)*
212220	Gold Ore Mining
Site Name	**MOE District Office**
Rainy River Project	Thunder Bay District Office

Address Information:

Site Address - Street information *(address that has civic numbering and street information includes street number, name, type and direction)*: 24 Marr Road

Unit Identifier *(i.e. suite or apartment number)*:

Survey Address *(used for a rural location specified for a subdivided township, an unsubdivided township or unsurveyed territory)*

Lot and Conc.: used to indicate location within a subdivided township and consists of a lot number and a concession number — Lot: ; Conc.:

Part and Reference: used to indicate location within an unsubdivided township or unsurveyed territory, and consists of a part and a reference plan number indicating the location within that plan. Attach copy of the plan — Part: ; Reference Plan:

Non Address Information *(includes any additional information to clarify applicants' physical location)*:

Municipality/Unorganized Township	County/District	Postal Code
Barwick	Rainy River	P0W 1A0

Geo Reference

Map Datum	Zone	Accuracy Estimate	Geo Referencing Method	UTM Easting	UTM Northing
NAD83	15U	+/-5m	Google Earth	426537	5411220

Certificate of Approval Number (s) – *attach a separate list if more space is required*

3. Type of Notification: Limit Exceedence – *Table 1 or Table 2 should be completed and submitted with this notification of exceedence.*

☒ This is a notification under Section 28(1) – Notice to Provincial Officer as a result of modelling or measurements relating to an exceedence of: (select all that apply)

☐ Schedule 1 ☐ Schedule 2 ☐ Schedule 3 ☐ POI Guideline ☒ Ambient Air Quality Criteria

☐ Other Limit (explain): _____

☐ This is a notification under Section 25 (9) – Notice to Provincial Officer as a result an update of an Emission Summary and Dispersion Modelling Report (select all that apply)

☐ Schedule 1 ☐ Schedule 2 ☐ Schedule 3 ☐ POI Guideline ☐ Ambient Air Quality Criteria

☐ Other Limit (explain): _____

Date that Refinement is anticipated to be complete (dd/mm/yyyy): _____

☐ This is a notification under Section 30 (3) – Notice to the Director as a result of an exceedence of Upper Risk Thresholds (Schedule 6)

☐ Yes ☐ No

4. Follow-Up Action

Section 28 Notifications

Will an Abatement Plan be submitted to the Ministry within 30 days of this notice as per s.29?

☐ Yes
☒ No — If No, please provide the following:

Type of Previously Approved Abatement Plan	Date Approved under s.29 of O. Reg. 419/05 (dd/mm/yyyy)
AAQC exceedance (not standard)	

Section 30 (3) Notifications for URT exceedence

Has an Emission Summary and Dispersion Modelling (ESDM) Report been prepared in accordance with s.30(4) and submitted to the Ministry?

☐ Yes

☐ No If No, what is the anticipated submission date for the ESDM* (dd/mm/yyyy)? _____

** Note: The ESDM must be submitted within three months of the discharge*

5. Model Based Assessment – *please complete this section if notifying of a modelled exceedence (complete Table 1)*

Was an ESDM Report prepared in accordance with s.26 O. Reg. 419/05?

☐ Yes ☐ No

If yes, was the ESDM Report prepared to fulfill *(select all that apply):*

- ☐ s.22 of O. Reg. 419/05 - Application for Certificate of Approval under section 9 of the *Environmental Protection Act*
- ☐ s.23 of O. Reg. 419/05 - Requirement for Schedule 4 or 5 sector facilities
- ☐ s.24 of O. Reg. 419/05 - Notice issued by Director
- ☐ s.25 of O. Reg. 419/05 - Requirement for updating ESDM Report
- ☐ s.30(4) of O. Reg 419/05 – Required as result of URT exceedence
- ☐ s.32(13) of O. Reg. 419/05 – Required as part of a Request for Alternative Standard
- ☐ Other (please specify): _____

Was the approved dispersion model refined as required by s.12 O. Reg. 419/05 (i.e. operating conditions, emission rates)?

☐ Yes ☐ No

Have you modelled for additional receptor locations other than the maximum POI? *(please include figure showing maximum POI location)*

☐ Yes ☐ No

If Yes, specify additional locations (i.e., land use) at which the exceedence may occur (*select all that apply – please include figure showing additional modelled locations*):

☐ Health Care ☐ Seniors Residence / Long Term Care Facility ☐ Child Care Facility ☐ Educational Facility ☐ Dwelling ☐ Unknown

☐ Location Specified by The Director (explain): _____ ☐ Other Location (explain): _____

6. Measurement Based Assessment – *please complete this section if notifying of a measured exceedence (Complete Table 2 or equivalent)*

Type of Monitor / Measurement Type	Date of Exceedence (dd/mm/yyyy)	Duration of Exceedence
TSP High Volume Sampler	30/04/2016	24-hr average

Is the monitoring approved by the Ministry of the Environment?

☒ Yes If yes, please describe the approval: Monitoring Plan was submitted, and plan approval is forthcoming.

☐ No

Monitoring Reference Number: (if available)

Specify the location (i.e., land use) at which the exceedence did occur *(select all that apply)*:

☐ Health Care ☐ Seniors Residence / Long Term Care Facility ☐ Child Care Facility ☐ Educational Facility ☐ Dwelling ☐ Unknown

☐ Location Specified by The Director (explain): _____ ☒ Other Location (explain): Tait Road & McMillan Road

7. Statement of Company Official

I, the undersigned hereby declare that, to the best of my knowledge:

- The information contained herein and the information submitted is complete and accurate in every way and I am aware of the penalties against providing false information as per s.184(2) of the *Environmental Protection Act.*
- I have been authorized to act on behalf of the company identified in this form for the purpose of providing this notification of exceedence under O.Reg 419/05 to the Ministry of the Environment
- I have used the most recent notification form (as obtained from the Ministry of the Environment Internet site at http://www.ene.gov.on.ca/envision/gp/index.htm#PartAir or from my local Ministry District Office and I have included all necessary information required by O. Reg. 419/05 and identified on this form.

Name of Signing Authority *(please print)*	Title
Cailey Anderson	Environmental Specialist

Civic Address *(address that has civic numbering and street information includes street number, name, type and direction)*	Unit Identifier *(i.e. suite or apartment number)*
Rainy River Project, 5967 Highway 11/71, P.O. Box 5	

Delivery Designator:
If signing authority mailing address is a Rural Route, Suburban Service, Mobile Route or General Delivery *(i.e., RR#3)*

Municipality	Postal Station	Province/State	Country	Postal Code
Emo		Ontario	Canada	P0W 1E0

Telephone Number *(including area code & extension)*	Fax Number *(including area code)*	E-mail Address
(807) 707-3058		Cailey.Anderson@newgold.com

Signature	Date *(dd/mm/yyyy)*

Table 1 - Information About Modelled Air Limit Exceedence – Contaminant Information

Location of Maximum POI Concentration (e.g. UTM, street address, etc.)	Land Use at Maximum Point of Impingement (if known)

	Contaminant [a]	CAS [b] Number	Type of Assessment (Air Dispersion Model Used)	Maximum POI [c] Concentration (µg/m³)	Averaging Period (hours)	Current MOE AAQC or POI Limit (µg/m³)	Limiting Effect	Schedule (1, 2 or 3)	Percentage of MOE AAQC or POI Limit
1									
2									
3									
4									
5									
6									
7									
8									
9									
10									
11									
12									
13									
14									
15									
16									
17									
18									
19									
20									
21									
22									

Notes:

(a) Proper Chemical Name should be given (Abbreviations, acronyms, numeric codes, trade names and mixtures NOT ACCEPTABLE).

(b) CAS Number : Chemical Abstracts Services Number (UNIQUE Identifier for a chemical)

(c) POI Concentration : Point of Impingement Concentration

Table 2 - Information About Measured Air Limit Exceedence – Contaminant Information

Location of Monitor (Describe)	Date (dd/mm/yyyy)	Time	Sampling Period	Land Use at Monitor
Intersection of Tait Road and McMillan Road	30/04/2016	0:00	24hr	Mixed Forest/Pasture

	Contaminant [a]	CAS [b] Number	Type of Assessment (Measurement Method)	Maximum POI [c] Concentration (µg/m³)	Averaging Period (hours)	Current MOE AAQC POI Limi (µg/m³)	Limiting Effect	Schedule (1, 2 or 3)	Percentage of MOE AAQC POI Limit
1	Total Suspended Particulate	N/A 1	HiVol	N/A	24	120	Visibility	N/A	130%
2									
3									
4									
5									
6									
7									
8									
9									
10									
11									
12									
13									
14									
15									
16									
17									
18									
19									
20									
21									

For additional measurement locations / sampling times, please included additional tables
****If you are reporting more than one exceedence, include the time of the exceedence in the contaminant column***

Notes:
(a) Proper Chemical Name should be given (Abbreviations, acronyms, numeric codes, trade names and mixtures NOT ACCEPTABLE).

(b) CAS Number : Chemical Abstracts Services Number (UNIQUE Identifier for a chemical)

(c) POI Concentration : Point of Impingement Concentration

Ontario
Ministry of the Environment

Notification of Exceedence – Regulation 419/05
General Information and Instructions

General Information

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2. For notification under s.25(9) or 28(1), the completed notification form should be faxed, as soon as practicable, to the local Ministry of Environment (MOE) District Office which has jurisdiction over the area in which the facility is located.

3. For notification under s. 30, the completed notification form should be immediately faxed to the local Ministry of Environment (MOE) District Office which has jurisdiction over the area which the facility is located. If the exceedance is determined outside of the business hours of the District Office then the completed notification form should be faxed to the Spills Action Center (1-800-268-6061).

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This form may be used for notification of exceedences of more than one contaminant; Table 1 (or equvalent) should be completed for each contaminant. If this notification is made pursuant to s. 30 in combination with ss. 25(9) or 28(1) then this form must be submitted immediately in accordance with s.30.

Regulatory Authority

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(a) the person uses an approved dispersion model to predict concentrations of the contaminant that result from the discharges and,
(i) the use of the model indicates that discharges of the contaminant may result in a contravention of section 18, 19 or 20, or
(ii) the contaminant is not listed in any of Schedules 1, 2 and 3 and the use of the model indicates that discharges of the contaminant may cause an adverse effect;
(b) measurements of air samples indicate that discharges of the contaminant may result in a contravention of section 18, 19 or 20; or
(c) the contaminant is not listed in any of Schedules 1, 2 and 3 and measurements of air samples indicate that discharges of the contaminant may cause an adverse effect.

25. (9) A person who is required under subsection (8) to complete the update of a report not later than March 31 in a year shall, as soon as practicable after that date, notify a provincial officer in writing if the person has started to use an approved dispersion model with respect to a contaminant for the purpose of completing the update but has not yet complied with section 12, and,

(a) the use of the model indicates that discharges of the contaminant may result in a contravention of section 18, 19 or 20; or
(b) the contaminant is not listed in any of Schedules 1, 2 and 3 and the use of the model indicates that discharges of the contaminant may cause an adverse effect.

30. (1) A person who discharges or causes or permits the discharge of a contaminant listed in Schedule 6 into the air shall comply with subsections (3) and (4) if there is reason to believe, based on any relevant information, that discharges of the contaminant may result in the concentration of the contaminant exceeding the half hour upper risk threshold or other time period upper risk threshold set out for that contaminant in Schedule 6 at a point of impingement.

(2) Without limiting the generality of subsection (1), the reference in that subsection to relevant information includes relevant information from predictions of a dispersion model, including,
(a) an approved dispersion model or other dispersion model; or
(b) a dispersion model that is not used in accordance with this Regulation.

(3) If subsection (1) applies to a discharge, the person who discharged or caused or permitted the discharge of the contaminant shall immediately notify the Director in writing.

Ontario
Ministry of the Environment

Notification of Exceedence – Regulation 419/05

1. Ministry of the Environment District Office Information

Date Form Submitted (Faxed)	Date Exceedednce Determined
District Office	**Fax Number**
Thunder Bay District Office	(807) 473-3160

Supporting information attached? ☐ Yes ☒ No

If yes, number of pages: _____

2. Site Information

Name of Person Making the Notification	Business Name
Cailey Anderson	New Gold Inc.
North American Industry Classification System (NAICS) Code	**Business Activity Description** *(a description of the business endeavour, this may include products sold, services provided, equipment used, etc.)*
212220	Gold Ore Mining
Site Name	**MOE District Office**
Rainy River Project	Thunder Bay District Office

Address Information:

Site Address - Street information *(address that has civic numbering and street information includes street number, name, type and direction)*: 24 Marr Road

Unit Identifier *(i.e. suite or apartment number)*:

Survey Address *(used for a rural location specified for a subdivided township, an unsubdivided township or unsurveyed territory)*

Lot and Conc.: used to indicate location within a subdivided township and consists of a lot number and a concession number — Lot: ____ Conc.: ____

Part and Reference: used to indicate location within an unsubdivided township or unsurveyed territory, and consists of a part and a reference plan number indicating the location within that plan. Attach copy of the plan — Part: ____ Reference Plan: ____

Non Address Information *(includes any additional information to clarify applicants' physical location)*:

Municipality/Unorganized Township	County/District	Postal Code
Barwick	Rainy River	P0W 1A0

Geo Reference

Map Datum	Zone	Accuracy Estimate	Geo Referencing Method	UTM Easting	UTM Northing
NAD83	15U	+/-5m	Google Earth	426537	5411220

Certificate of Approval Number (s) – *attach a separate list if more space is required*

3. Type of Notification: Limit Exceedence – *Table 1 or Table 2 should be completed and submitted with this notification of exceedence.*

☒ This is a notification under Section 28(1) – Notice to Provincial Officer as a result of modelling or measurements relating to an exceedence of: (select all that apply)

☐ Schedule 1 ☐ Schedule 2 ☐ Schedule 3 ☐ POI Guideline ☒ Ambient Air Quality Criteria

☐ Other Limit (explain): _____

☐ This is a notification under Section 25 (9) – Notice to Provincial Officer as a result an update of an Emission Summary and Dispersion Modelling Report (select all that apply)

☐ Schedule 1 ☐ Schedule 2 ☐ Schedule 3 ☐ POI Guideline ☐ Ambient Air Quality Criteria

☐ Other Limit (explain): _____

Date that Refinement is anticipated to be complete (dd/mm/yyyy): _____

☐ This is a notification under Section 30 (3) – Notice to the Director as a result of an exceedence of Upper Risk Thresholds (Schedule 6)

☐ Yes ☐ No

4. Follow-Up Action

Section 28 Notifications

Will an Abatement Plan be submitted to the Ministry within 30 days of this notice as per s.29?

☐ Yes
☒ No — If No, please provide the following:

Type of Previously Approved Abatement Plan	Date Approved under s.29 of O. Reg. 419/05 (dd/mm/yyyy)
AAQC exceedance (not standard)	

Section 30 (3) Notifications for URT exceedence

Has an Emission Summary and Dispersion Modelling (ESDM) Report been prepared in accordance with s.30(4) and submitted to the Ministry?

☐ Yes
☒ No — If No, what is the anticipated submission date for the ESDM* (dd/mm/yyyy)? not applicable

** Note: The ESDM must be submitted within three months of the discharge*

5. Model Based Assessment – *please complete this section if notifying of a modelled exceedence (complete Table 1)*

Was an ESDM Report prepared in accordance with s.26 O. Reg. 419/05?

☐ Yes ☐ No

If yes, was the ESDM Report prepared to fulfill *(select all that apply):*

- ☐ s.22 of O. Reg. 419/05 - Application for Certificate of Approval under section 9 of the *Environmental Protection Act*
- ☐ s.23 of O. Reg. 419/05 - Requirement for Schedule 4 or 5 sector facilities
- ☐ s.24 of O. Reg. 419/05 - Notice issued by Director
- ☐ s.25 of O. Reg. 419/05 - Requirement for updating ESDM Report
- ☐ s.30(4) of O. Reg 419/05 – Required as result of URT exceedence
- ☐ s.32(13) of O. Reg. 419/05 – Required as part of a Request for Alternative Standard
- ☐ Other (please specify): _____

Was the approved dispersion model refined as required by s.12 O. Reg. 419/05 (i.e. operating conditions, emission rates)?

☐ Yes ☐ No

Have you modelled for additional receptor locations other than the maximum POI? *(please include figure showing maximum POI location)*

☐ Yes ☐ No

If Yes, specify additional locations (i.e., land use) at which the exceedence may occur (*select all that apply – please include figure showing additional modelled locations*):

☐ Health Care ☐ Seniors Residence / Long Term Care Facility ☐ Child Care Facility ☐ Educational Facility ☐ Dwelling ☐ Unknown

☐ Location Specified by The Director (explain): _____ ☐ Other Location (explain): _____

6. Measurement Based Assessment – *please complete this section if notifying of a measured exceedence (Complete Table 2 or equivalent)*

Type of Monitor / Measurement Type	Date of Exceedence (dd/mm/yyyy)	Duration of Exceedence
TSP High Volume Sampler	30/04/2016	24-hr average

Is the monitoring approved by the Ministry of the Environment?

☒ Yes If yes, please describe the approval: Monitoring Plan was submitted, and plan approval is forthcoming.

☐ No

Monitoring Reference Number: (if available)

Specify the location (i.e., land use) at which the exceedence did occur *(select all that apply)*:

☐ Health Care ☐ Seniors Residence / Long Term Care Facility ☐ Child Care Facility ☐ Educational Facility ☐ Dwelling ☐ Unknown

☐ Location Specified by The Director (explain): _____ ☒ Other Location (explain): Gallinger Road Station

7. Statement of Company Official

I, the undersigned hereby declare that, to the best of my knowledge:

- The information contained herein and the information submitted is complete and accurate in every way and I am aware of the penalties against providing false information as per s.184(2) of the *Environmental Protection Act.*
- I have been authorized to act on behalf of the company identified in this form for the purpose of providing this notification of exceedence under O.Reg 419/05 to the Ministry of the Environment
- I have used the most recent notification form (as obtained from the Ministry of the Environment Internet site at http://www.ene.gov.on.ca/envision/gp/index.htm#PartAir or from my local Ministry District Office and I have included all necessary information required by O. Reg. 419/05 and identified on this form.

Name of Signing Authority *(please print)*	Title
Cailey Anderson	Environmental Specialist

Civic Address *(address that has civic numbering and street information includes street number, name, type and direction)*	Unit Identifier *(i.e. suite or apartment number)*
Rainy River Project, 5967 Highway 11/71, P.O. Box 5	

Delivery Designator:
If signing authority mailing address is a Rural Route, Suburban Service, Mobile Route or General Delivery *(i.e., RR#3)* _____

Municipality	Postal Station	Province/State	Country	Postal Code
Emo		Ontario	Canada	P0W IE0

Telephone Number *(including area code & extension)*	Fax Number *(including area code)*	E-mail Address
(807) 707-3058		Cailey.Anderson@newgold.com

Signature	Date *(dd/mm/yyyy)*

Table 1 - Information About Modelled Air Limit Exceedence – Contaminant Information

Location of Maximum POI Concentration (e.g. UTM, street address, etc.)	Land Use at Maximum Point of Impingement (if known)

	Contaminant [a]	CAS [b] Number	Type of Assessment (Air Dispersion Model Used)	Maximum POI [c] Concentration (µg/m³)	Averaging Period (hours)	Current MOE AAQC or POI Limit (µg/m³)	Limiting Effect	Schedule (1, 2 or 3)	Percentage of MOE AAQC or POI Limit
1									
2									
3									
4									
5									
6									
7									
8									
9									
10									
11									
12									
13									
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15									
16									
17									
18									
19									
20									
21									
22									

Notes:

(a) Proper Chemical Name should be given (Abbreviations, acronyms, numeric codes, trade names and mixtures NOT ACCEPTABLE).

(b) CAS Number : Chemical Abstracts Services Number (UNIQUE Identifier for a chemical)

(c) POI Concentration : Point of Impingement Concentration

Table 2 - Information About Measured Air Limit Exceedence – Contaminant Information

Location of Monitor (Describe)	Date (dd/mm/yyyy)	Time	Sampling Period	Land Use at Monitor
Gallinger Road b/n Korpi Road and Teeple Road	06/05/2016	0:00	24hr	Mixed Forest/Pasture

	Contaminant [a]	CAS [b] Number	Type of Assessment (Measurement Method)	Maximum POI [c] Concentration (µg/m³)	Averaging Period (hours)	Current MOE AAQC POI Limi (µg/m³)	Limiting Effect	Schedule (1, 2 or 3)	Percentage of MOE AAQC POI Limit
1	Fine Particulate Matter (PM2.5)	N/A 1	PQ200	N/A	24	30	Health	N/A (AAQC)	203%
2									
3									
4									
5									
6									
7									
8									
9									
10									
11									
12									
13									
14									
15									
16									
17									
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19									
20									
21									

For additional measurement locations / sampling times, please included additional tables
****If you are reporting more than one exceedence, include the time of the exceedence in the contaminant column***

Notes:
(a) Proper Chemical Name should be given (Abbreviations, acronyms, numeric codes, trade names and mixtures NOT ACCEPTABLE).

(b) CAS Number : Chemical Abstracts Services Number (UNIQUE Identifier for a chemical)

(c) POI Concentration : Point of Impingement Concentration

Ontario
Ministry of the Environment

Notification of Exceedence – Regulation 419/05
General Information and Instructions

General Information

Information requested in this notification form is collected under the authority of the *Environmental Protection Act,* R.S.O. 1990 (EPA) and O. Reg. 419/05 and will be used to collect information relating to a measured or modelled air related exceedence as required by s.25(9), s.28(1) and s.30(3) of O. Reg. 419/05. The Ministry of the Environment (MOE) may also request additional information.

1. Questions regarding completion and submission of this notification form should be directed to your local MOE District Office. A list of these District Offices (including fax numbers) is available on the Ministry of the Environment Internet site at http://www.ene.gov.on.ca/envision/org/op.htm#Reg/Dist. A copy of this form may be acquired through the MOE public web site (www.ene.gov.on.ca) or by contacting any MOE office.

2. For notification under s.25(9) or 28(1), the completed notification form should be faxed, as soon as practicable, to the local Ministry of Environment (MOE) District Office which has jurisdiction over the area in which the facility is located.

3. For notification under s. 30, the completed notification form should be immediately faxed to the local Ministry of Environment (MOE) District Office which has jurisdiction over the area which the facility is located. If the exceedance is determined outside of the business hours of the District Office then the completed notification form should be faxed to the Spills Action Center (1-800-268-6061).

4. Information contained in this notification form may not be considered confidential and may be made available to the public upon request. Information may be claimed as confidential but will be subject to the *Freedom of Information and Protection of Privacy Act* (FOIPPA) and the *EBR*. If you do not claim confidentiality at the time of submitting the information, the Ministry of the Environment may make the information available to the public without further notice to you.

Instructions

This form should be used to notify the MOE of a measured or modeled air related exceedence as required under O. Reg. 419/05. Failure to notify the MOE as required by regulation constitutes an offence under the O. Reg. 419/05 and the EPA.

The generic term "limits" in the context of this form means any numerical Point of Impingement Concentration limit set by the MOE including standards in O. Reg. 419/05 and guidelines provided by the MOE (Ministry POI Limits). For a comprehensive list of MOE POI Limits please refer to the publication titled "Summary of O. Reg. 419/05 Standards, Point of Impingement Guidelines, and Ambient Air Quality Criteria (AAQC's)" available on the Ministry of the Environment Internet site at http://www.ene.gov.on.ca/envision/gp/2424e01.htm. Note that contaminants that have guidelines limits or recommended levels for chemicals with no standard or guideline may be considered "contaminants not listed in any of Schedules 1, 2 and 3 and discharges of the contaminant may cause an adverse effect" as this language appears in O. Reg. 419/05.

This form may be used for notification of exceedences of more than one contaminant; Table 1 (or equvalent) should be completed for each contaminant. If this notification is made pursuant to s. 30 in combination with ss. 25(9) or 28(1) then this form must be submitted immediately in accordance with s.30.

Regulatory Authority

28. (1) A person who discharges or causes or permits the discharge of a contaminant shall, as soon as practicable, notify a provincial officer in writing if,

- *(a) the person uses an approved dispersion model to predict concentrations of the contaminant that result from the discharges and,*
  - *(i) the use of the model indicates that discharges of the contaminant may result in a contravention of section 18, 19 or 20, or*
  - *(ii) the contaminant is not listed in any of Schedules 1, 2 and 3 and the use of the model indicates that discharges of the contaminant may cause an adverse effect;*
- *(b) measurements of air samples indicate that discharges of the contaminant may result in a contravention of section 18, 19 or 20; or*
- *(c) the contaminant is not listed in any of Schedules 1, 2 and 3 and measurements of air samples indicate that discharges of the contaminant may cause an adverse effect.*

25. (9) A person who is required under subsection (8) to complete the update of a report not later than March 31 in a year shall, as soon as practicable after that date, notify a provincial officer in writing if the person has started to use an approved dispersion model with respect to a contaminant for the purpose of completing the update but has not yet complied with section 12, and,

- *(a) the use of the model indicates that discharges of the contaminant may result in a contravention of section 18, 19 or 20; or*
- *(b) the contaminant is not listed in any of Schedules 1, 2 and 3 and the use of the model indicates that discharges of the contaminant may cause an adverse effect.*

30. (1) A person who discharges or causes or permits the discharge of a contaminant listed in Schedule 6 into the air shall comply with subsections (3) and (4) if there is reason to believe, based on any relevant information, that discharges of the contaminant may result in the concentration of the contaminant exceeding the half hour upper risk threshold or other time period upper risk threshold set out for that contaminant in Schedule 6 at a point of impingement.

(2) Without limiting the generality of subsection (1), the reference in that subsection to relevant information includes relevant information from predictions of a dispersion model, including,

- *(a) an approved dispersion model or other dispersion model; or*
- *(b) a dispersion model that is not used in accordance with this Regulation.*

(3) If subsection (1) applies to a discharge, the person who discharged or caused or permitted the discharge of the contaminant shall immediately notify the Director in writing.

Ontario
Ministry of the Environment

Notification of Exceedence – Regulation 419/05

1. Ministry of the Environment District Office Information

Date Form Submitted (Faxed)	Date Exceedednce Determined
District Office: Thunder Bay District Office	Fax Number: (807) 473-3160

Supporting information attached? ☐ Yes ☒ No

If yes, number of pages: _____

2. Site Information

Name of Person Making the Notification	Business Name
Cailey Anderson	New Gold Inc.

North American Industry Classification System (NAICS) Code	Business Activity Description (*a description of the business endeavour, this may include products sold, services provided, equipment used, etc.*)
212220	Gold Ore Mining

Site Name	MOE District Office
Rainy River Project	Thunder Bay District Office

Address Information:

Site Address - Street information (*address that has civic numbering and street information includes street number, name, type and direction*)	Unit Identifier (*i.e. suite or apartment number*)
24 Marr Road	

Survey Address (*used for a rural location specified for a subdivided township, an unsubdivided township or unsurveyed territory*)

Lot and Conc.: used to indicate location within a subdivided township and consists of a lot number and a concession number		Part and Reference: used to indicate location within an unsubdivided township or unsurveyed territory, and consists of a part and a reference plan number indicating the location within that plan. Attach copy of the plan	
Lot	Conc.	Part	Reference Plan

Non Address Information (*includes any additional information to clarify applicants' physical location*)

Municipality/Unorganized Township	County/District	Postal Code
Barwick	Rainy River	P0W 1A0

Geo Reference

Map Datum	Zone	Accuracy Estimate	Geo Referencing Method	UTM Easting	UTM Northing
NAD83	15U	+/-5m	Google Earth	426537	5411220

Certificate of Approval Number (s) – *attach a separate list if more space is required*

3. Type of Notification: Limit Exceedence – *Table 1 or Table 2 should be completed and submitted with this notification of exceedence.*

☒ This is a notification under Section 28(1) – Notice to Provincial Officer as a result of modelling or measurements relating to an exceedence of: (select all that apply)

☐ Schedule 1 ☐ Schedule 2 ☐ Schedule 3 ☐ POI Guideline ☒ Ambient Air Quality Criteria

☐ Other Limit (explain): _____

☐ This is a notification under Section 25 (9) – Notice to Provincial Officer as a result an update of an Emission Summary and Dispersion Modelling Report (select all that apply)

☐ Schedule 1 ☐ Schedule 2 ☐ Schedule 3 ☐ POI Guideline ☐ Ambient Air Quality Criteria

☐ Other Limit (explain): _____

Date that Refinement is anticipated to be complete (dd/mm/yyyy): _____

☐ This is a notification under Section 30 (3) – Notice to the Director as a result of an exceedence of Upper Risk Thresholds (Schedule 6)

☐ Yes ☐ No

4. Follow-Up Action

Section 28 Notifications

Will an Abatement Plan be submitted to the Ministry within 30 days of this notice as per s.29?

☐ Yes
☒ No

If No, please provide the following:	Type of Previously Approved Abatement Plan	Date Approved under s.29 of O. Reg. 419/05 (dd/mm/yyyy)
	AAQC exceedance (not standard)	

Section 30 (3) Notifications for URT exceedence

Has an Emission Summary and Dispersion Modelling (ESDM) Report been prepared in accordance with s.30(4) and submitted to the Ministry?

☐ Yes

☐ No If No, what is the anticipated submission date for the ESDM* (dd/mm/yyyy)? _____

** Note: The ESDM must be submitted within three months of the discharge*

5. Model Based Assessment – *please complete this section if notifying of a modelled exceedence (complete Table 1)*

Was an ESDM Report prepared in accordance with s.26 O. Reg. 419/05?

☐ Yes ☐ No

If yes, was the ESDM Report prepared to fulfill *(select all that apply)*:

- ☐ s.22 of O. Reg. 419/05 - Application for Certificate of Approval under section 9 of the *Environmental Protection Act*
- ☐ s.23 of O. Reg. 419/05 - Requirement for Schedule 4 or 5 sector facilities
- ☐ s.24 of O. Reg. 419/05 - Notice issued by Director
- ☐ s.25 of O. Reg. 419/05 - Requirement for updating ESDM Report
- ☐ s.30(4) of O. Reg 419/05 – Required as result of URT exceedence
- ☐ s.32(13) of O. Reg. 419/05 – Required as part of a Request for Alternative Standard
- ☐ Other (please specify): _____

Was the approved dispersion model refined as required by s.12 O. Reg. 419/05 (i.e. operating conditions, emission rates)?

☐ Yes ☐ No

Have you modelled for additional receptor locations other than the maximum POI? *(please include figure showing maximum POI location)*

☐ Yes ☐ No

If Yes, specify additional locations (i.e., land use) at which the exceedence may occur (*select all that apply – please include figure showing additional modelled locations*):

☐ Health Care ☐ Seniors Residence / Long Term Care Facility ☐ Child Care Facility ☐ Educational Facility ☐ Dwelling ☐ Unknown

☐ Location Specified by The Director (explain): _____ ☐ Other Location (explain): _____

6. Measurement Based Assessment – *please complete this section if notifying of a measured exceedence (Complete Table 2 or equivalent)*

Type of Monitor / Measurement Type	Date of Exceedence (dd/mm/yyyy)	Duration of Exceedence
PQ200 low volume sampler	30/04/2016	24-hr average

Is the monitoring approved by the Ministry of the Environment?

☒ Yes If yes, please describe the approval: Monitoring Plan was submitted, and plan approval is forthcoming.

☐ No

Monitoring Reference Number: (if available)

Specify the location (i.e., land use) at which the exceedence did occur *(select all that apply)*:

☐ Health Care ☐ Seniors Residence / Long Term Care Facility ☐ Child Care Facility ☐ Educational Facility ☐ Dwelling ☐ Unknown

☐ Location Specified by The Director (explain): _____ ☒ Other Location (explain): Tait Road & McMillan Road

7. Statement of Company Official

I, the undersigned hereby declare that, to the best of my knowledge:

- The information contained herein and the information submitted is complete and accurate in every way and I am aware of the penalties against providing false information as per s.184(2) of the *Environmental Protection Act.*
- I have been authorized to act on behalf of the company identified in this form for the purpose of providing this notification of exceedence under O.Reg 419/05 to the Ministry of the Environment
- I have used the most recent notification form (as obtained from the Ministry of the Environment Internet site at http://www.ene.gov.on.ca/envision/gp/index.htm#PartAir or from my local Ministry District Office and I have included all necessary information required by O. Reg. 419/05 and identified on this form.

Name of Signing Authority *(please print)*	Title
Cailey Anderson	Environmental Specialist

Civic Address *(address that has civic numbering and street information includes street number, name, type and direction)*	Unit Identifier *(i.e. suite or apartment number)*
Rainy River Project, 5967 Highway 11/71, P.O. Box 5	

Delivery Designator:
If signing authority mailing address is a Rural Route, Suburban Service, Mobile Route or General Delivery *(i.e., RR#3)* _____

Municipality	Postal Station	Province/State	Country	Postal Code
Emo		Ontario	Canada	P0W IE0

Telephone Number *(including area code & extension)*	Fax Number *(including area code)*	E-mail Address
(807) 707-3058		Cailey.Anderson@newgold.com

Signature	Date *(dd/mm/yyyy)*

Table 1 - Information About Modelled Air Limit Exceedence – Contaminant Information

Location of Maximum POI Concentration (e.g. UTM, street address, etc.)	Land Use at Maximum Point of Impingement (if known)

	Contaminant [a]	CAS [b] Number	Type of Assessment (Air Dispersion Model Used)	Maximum POI [c] Concentration (µg/m³)	Averaging Period (hours)	Current MOE AAQC or POI Limit (µg/m³)	Limiting Effect	Schedule (1, 2 or 3)	Percentage of MOE AAQC or POI Limit
1									
2									
3									
4									
5									
6									
7									
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17									
18									
19									
20									
21									
22									

Notes:

(a) Proper Chemical Name should be given (Abbreviations, acronyms, numeric codes, trade names and mixtures NOT ACCEPTABLE).

(b) CAS Number : Chemical Abstracts Services Number (UNIQUE Identifier for a chemical)

(c) POI Concentration : Point of Impingement Concentration

Table 2 - Information About Measured Air Limit Exceedence – Contaminant Information

Location of Monitor (Describe)	Date (dd/mm/yyyy)	Time	Sampling Period	Land Use at Monitor
Intersection of Tait Road and McMillan Road	06/05/2016	0:00	24hr	Mixed Forest/Pasture

	Contaminant [a]	CAS [b] Number	Type of Assessment (Measurement Method)	Maximum POI [c] Concentration (µg/m³)	Averaging Period (hours)	Current MOE AAQC POI Limi (µg/m³)	Limiting Effect	Schedule (1, 2 or 3)	Percentage of MOE AAQC POI Limit
1	Fine Particulate Matter (PM2.5)	N/A 1	PQ200	N/A	24	30	Health	N/A	185%
2									
3									
4									
5									
6									
7									
8									
9									
10									
11									
12									
13									
14									
15									
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17									
18									
19									
20									
21									

**** For additional measurement locations / sampling times, please included additional tables***
***** If you are reporting more than one exceedence, include the time of the exceedence in the contaminant column***

Notes:
(a) Proper Chemical Name should be given (Abbreviations, acronyms, numeric codes, trade names and mixtures NOT ACCEPTABLE).

(b) CAS Number : Chemical Abstracts Services Number (UNIQUE Identifier for a chemical)

(c) POI Concentration : Point of Impingement Concentration

Rainy River Project
2016 Fish Tissue
Monitoring Program

Prepared For:
New Gold Inc.
Emo, ON

Prepared By:
Minnow Environmental Inc.
Georgetown, ON

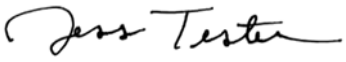
March 2017

Rainy River Project
2016 Fish Tissue Monitoring Program

Report Prepared for:

New Gold Inc.
Rainy River Project

Report Prepared by:
Minnow Environmental Inc.



Jess Tester, B.Sc.
Project Manager

Pierre Stecko, M.Sc., EP, RPBio
Project Principal

February 2017

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1.0 INTRODUCTION

1.1 Site Description

New Gold Inc. owns the Rainy River Project (RRP), located in northwestern Ontario in the Township of Chapple and District of Rainy River, approximately 65 km northwest of Fort Frances, and approximately 420 km west of Thunder Bay (Figure 1.1). The RRP is located within the Pinewood River watershed. The Pinewood River flows past the site and drains into the Rainy River approximately 37 km downstream.

Earliest exploration of the RRP began in 1967. Rainy River Resources Ltd. acquired the project in 2005 and began conducting baseline studies in 2008. The RRP 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. Upon completion, the RRP site construction will include:

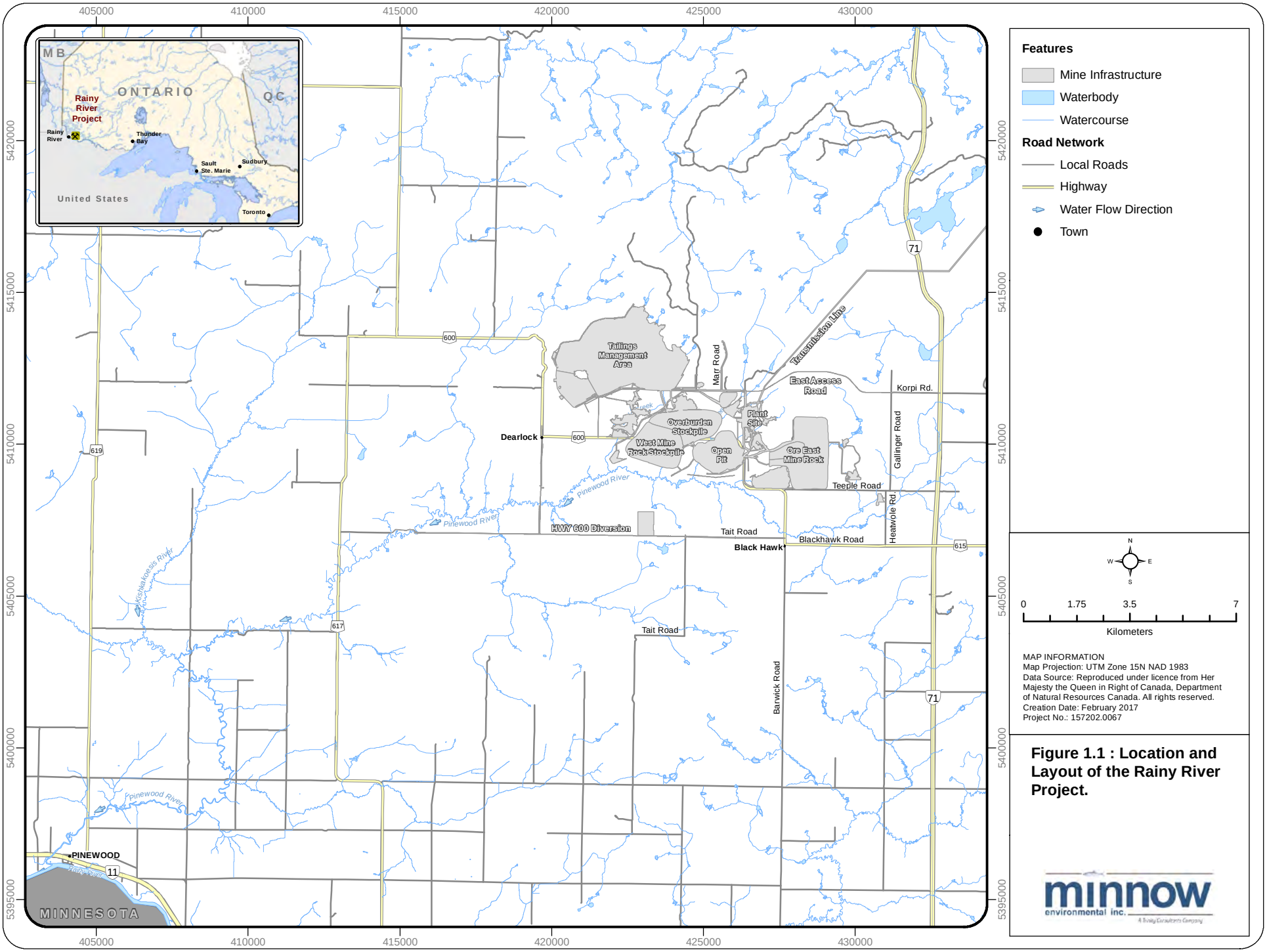
- an open pit mine,
- an underground mine,
- ore storage facilities,
- a process plant,
- a Tailings Management Facility (TMF) including a water management pond (WMP) and Tailings Management Area (TMA),
- water management infrastructure including, watercourse diversions, site drainage works,
- a fuel tank farm, and
- explosives mixing and storage facilities.

Mill commissioning and production start 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 both the Federal EA Approval and provincial Environmental Compliance Approval (ECA). The ECA, Number 5178-9TUPD9, was issued by the Ministry of the Environment and Climate Change (MOECC) on September 1, 2015.

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



MAP INFORMATION
Map Projection: UTM Zone 15N NAD 1983

Creation Date: February 2017
Project No.: 157202.0067

Figure 1.1 : Location and Layout of the Rainy River Project.

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has affected these concentrations, and, if it has, to communicate any potential risk to human health from the consumption of the sentinel sport fish.

1.3 Study Design

The 2016 study included fish assessment in the Pinewood River downstream of the RRP extending to approximately 100 m upstream of the confluence with the Rainy River. 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, liver, and ovary. Muscle and liver samples were collected to meet regulatory requirements, while ovaries were sampled (as available), based on discussion with local First Nations community members who expressed interest in having the roe sampled.

Fifteen individuals of each species (i.e., northern pike and walleye) were targeted. Data were compared to provincial, federal and international criteria for the protection of human health (Health Canada 2007, Health Canada 2010, MOECC 2015, IRIS 2017) as well as baseline concentrations (AMEC 2013).

2.0 METHODS

The RRP Fish Tissue Monitoring Program was conducted from September 19th to 24th, 2016. 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 a handheld GPS and maps, and were chosen based on habitat characteristics preferred by the target species.

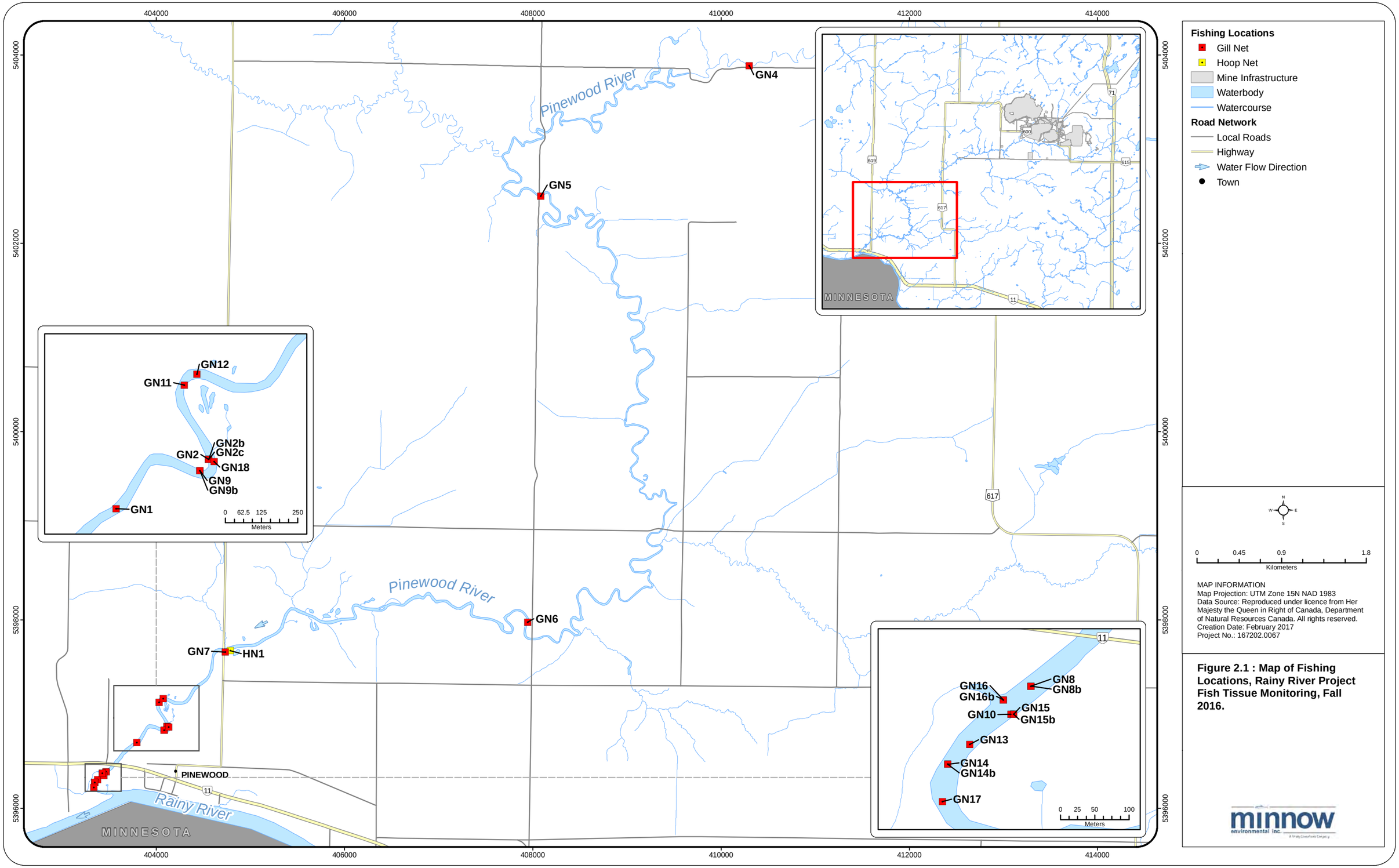
2.1 Field Data Collection

Fish sampling was performed under an Ontario Ministry of Natural Resources Licence to Collect Fish for Scientific Purposes (Licence No. 1084026; Appendix B). Fishing was conducted in the Pinewood River downstream of the RRP using gill nets and hoop nets (Figure 2.1). Gill nets were standard 100-ft lengths with mesh sizes of 3" and 4". Medium hoop nets (0.75 m diameter hoops, 2.5 cm stretched mesh) were used. Time of deployment and retrieval were recorded for every net set. 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 MOECC recommendations for the Rainy River; MOECC 2015). A total of fifteen northern pike and fifteen walleye were retained for detailed assessment. Any live bycatch[1] 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. 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 sampling of field duplicates (duplicate fillets, split liver, and split ovary samples) for 10% of tissue samples (i.e., a total of seven field duplicate 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

[1] Unwanted fish species caught while conducting targeted sampling for a different species (i.e., in this study, any fish species other than northern pike and walleye).



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 2017
Project No.: 167202.0067

Figure 2.1 : Map of Fishing Locations, Rainy River Project Fish Tissue Monitoring, Fall 2016.

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QA/QC requirements (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 and hoop net set 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 (e.g., field duplicates, laboratory duplicates, and certified reference materials). The DQA indicated excellent data quality (Appendix A). After DQA, summary statistics were calculated for each analyte (i.e., mean, standard deviation, minimum, and maximum).

Mercury is the only metal[2] 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). In addition to evaluating mercury concentrations relative to health guidelines, 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 2017) 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 = TDI mg/kg x 70 kg / consumption rate (kg).

[2] 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	0.0175 [6]	188.5	56.2	11.0
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 (2016) 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). Further discussion with local First Nations community members in August 2016 confirmed that the Pinewood River does not support a significant traditional fishery, and that it is only occasionally used for recreational fishing, with most fishing located near the mouth (Appendix D). In light of this, the consumption rate category of 21.8 g/d was used in deriving the benchmarks, representing the upper limit consumption rate for Canadian population based on high caloric intake (Table 2.2; OHM 1990, Richardson 1997).

In the previous fish tissue study (Minnow 2016a), the consumption rate used for determining benchmarks exceeded the average value for subsistence populations (70 g/day; USEPA 1997) and is considered excessive relative to the actual fishing activity occurring within the Pinewood River. The consumption rate of 21.8 g/d still results in the derivation of conservative benchmarks, as it is more than double the mean consumption rate for anglers within a general population (8.0 g/d; USEPA 1997). Additionally, 21.8 g/d is the highest consumption level considered in development of fish advisories in Ontario. Benchmarks were derived for COPC where health criteria or TDI values were available (Table 2.2):

- 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 seven fish species were captured in the Pinewood River using gill nets and hoop nets (Table 3.1). Northern pike were the most abundant fish, followed by black crappie and walleye (Table 3.1).

3.2 Fish Tissue Quality

3.2.1 Muscle Tissue Chemistry

Northern pike and walleye muscle tissue samples contained metal concentrations that were well below human consumption benchmarks (established in Section 2.3), except for mercury in two northern pike muscle samples (Tables 3.2 and C.5). Despite these two exceptions, the average muscle tissue mercury concentrations were still below the benchmark in both species (Table 3.2). 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).

RRP effluent has had no detectable mercury concentrations (Minnow 2016b), suggesting that effluent does not contribute to mercury accumulation in Pinewood River fish. Naturally elevated mercury concentrations are often observed in predatory fish species in northern lakes and depositional rivers due to naturally elevated 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 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). Walleye tissue typically exhibits the same relationship between muscle tissue and fish size, however this relationship may be obscured in the 2016 data set, as most walleye fork lengths are within a narrow range (i.e., 30.5 to 37 cm), with only two much larger (female) fish (Figure 3.1, Table B.4).

Combined (2012, 2015 and 2016) northern pike fork length and muscle mercury concentration data indicated that mercury in Pinewood River northern pike muscle tissue generally occurs at concentrations above the benchmark in fish that are greater than roughly 60.5 cm in fork length

Table 3.1: Summary of fishing effort in the Pinewood River, Rainy River Project Fish Monitoring, 2016.

a) Fish catch numbers by sampling method.

Species	Gill Nets	Medium Hoop Nets	Total Catch
Northern pike	76	0	76
Walleye	17	0	17
Black crappie	30	1	31
Rock bass	3	0	3
Shorthead redhorse	3	0	3
White sucker	3	0	3
Yellow perch	1	0	1

b) Catch-per-unit-effort (CPUE) by sampling method.

Species	Gill Nets (fish per 100 m*hr)	Medium Hoop Nets (fish per trap*day)
Northern pike	0.46	0.00
Walleye	0.1	0.00
Black crappie	0.18	1.08
Rock bass	0.02	0.00
Shorthead redhorse	0.02	0.00
White sucker	0.02	0.00
Yellow perch	0.01	0.00
Total CPUE	0.81	1.08

Table 3.2: Metal concentrations in fish tissue, Rainy River Project Fish Tissue Monitoring, 2016.

Parameter		Lowest Detection Limit	Units	Benchmark[1,2]	Northern Pike											
					Muscle				Liver				Ovary			
					Average (n=15)	SD	Minimum	Maximum	Average (n=15)	SD	Minimum	Maximum	Average (n=7)	SD	Minimum	Maximum
% Moisture		0.25	%	-	78.6	1.2	76.7	81.2	74.1	4.7	66.0	79.9	81.5	1.0	80.3	82.9
Total Metals	Aluminum (Al)	2.0	mg/kg w.w.	-	0.5	0.1	<0.4	0.7	1.0	0.5	<0.4	1.7	0.4	0.1	<0.4	0.5
	Antimony (Sb)	0.010	mg/kg w.w.	0.3	<0.002	0.0001	<0.002	<0.002	0.003	0.001	<0.002	0.004	<0.002	0.0001	<0.002	<0.002
	Arsenic (As)	0.020	mg/kg w.w.	0.2	0.086	0.037	0.022	0.143	0.040	0.012	0.010	0.056	0.022	0.011	0.005	0.043
	Barium (Ba)	0.050	mg/kg w.w.	126	0.027	0.018	0.011	0.070	0.013	0.002	<0.010	0.017	0.024	0.016	0.011	0.051
	Beryllium (Be)	0.010	mg/kg w.w.	1.3	<0.002	0.0001	<0.002	<0.002	<0.003	0.0005	<0.002	<0.003	<0.002	0.0001	<0.002	<0.002
	Bismuth (Bi)	0.010	mg/kg w.w.	-	0.003	0.0006	<0.002	0.004	0.004	0.001	<0.002	0.008	<0.002	0.0001	<0.002	<0.002
	Boron (B)	1.0	mg/kg w.w.	63.1	<0.2	0.01	<0.2	<0.2	<0.3	0.05	<0.2	<0.3	<0.2	0.01	<0.2	<0.2
	Cadmium (Cd)	0.0050	mg/kg w.w.	0.6	0.0013	0.0008	<0.0009	0.0040	0.073	0.048	0.0149	0.182	0.0060	0.0025	0.0021	0.0097
	Calcium (Ca)	20	mg/kg w.w.	-	284	147	118	641	45	14	30	71	123	9	106	137
	Cesium (Cs)	0.0050	mg/kg w.w.	-	0.0071	0.0028	0.0039	0.0128	0.0036	0.0019	0.00170	0.0091	0.0055	0.0015	0.0035	0.0081
	Chromium (Cr)	0.050	mg/kg w.w.	0.6	0.022	0.023	<0.010	0.075	0.02	0.02	<0.010	0.07	0.018	0.012	<0.009	0.039
	Cobalt (Co)	0.020	mg/kg w.w.	-	0.004	0.0003	<0.004	0.005	0.050	0.0169	0.0252	0.075	0.057	0.0191	0.030	0.080
	Copper (Cu)	0.10	mg/kg w.w.	57.4	0.15	0.03	0.11	0.22	24.5	10.5	8.0	46	1.26	0.137	0.97	1.38
	Iron (Fe)	3.0	mg/kg w.w.	-	1.7	0.38	1.2	2.5	203	169	37	498	52	8.3	40	61
	Lead (Pb)	0.020	mg/kg w.w.	2.3	<0.004	0.0002	<0.004	<0.005	0.01	0.004	<0.004	0.02	<0.004	0.0002	0.003	0.00
	Lithium (Li)	0.50	mg/kg w.w.	-	<0.11	0.006	<0.09	<0.12	<0.13	0.02	<0.10	<0.17	<0.09	0.005	<0.09	<0.10
	Magnesium (Mg)	2.0	mg/kg w.w.	-	329	15	297	346	158	24	119	213	244	16	221	263
	Manganese (Mn)	0.050	mg/kg w.w.	76.9	0.36	0.22	0.152	1.02	1.14	0.35	0.52	1.7	34	6.8	23	44
	Mercury (Hg)	0.0050	mg/kg w.w.	0.5	0.36	0.127	0.160	0.61	0.125	0.071	0.059	0.33	0.029	0.013	0.0169	0.052
	Molybdenum (Mo)	0.020	mg/kg w.w.	3.2	<0.004	0.0002	<0.004	<0.005	0.179	0.051	0.097	0.279	0.053	0.0101	0.037	0.062
	Nickel (Ni)	0.20	mg/kg w.w.	0.7	<0.04	0.002	<0.04	<0.05	0.053	0.01	<0.04	0.07	0.04	0.007	<0.03	0.05
	Phosphorus (P)	10	mg/kg w.w.	-	2,335	208	1,974	2,685	2,774	485	1,822	3,689	3,054	127	2,822	3,193
	Potassium (K)	20	mg/kg w.w.	-	4,317	229	3,837	4,618	2,764	294	2,271	3,225	3,840	156	3,675	4,099
	Rubidium (Rb)	0.050	mg/kg w.w.	-	5.7	1.11	4.5	8.6	5.5	1.34	3.6	8.5	5.7	0.79	4.6	6.8
	Selenium (Se)	0.050	mg/kg w.w.	3.2	0.18	0.023	0.14	0.22	1.75	0.42	1.01	2.5	0.97	0.35	0.73	1.74
	Sodium (Na)	20	mg/kg w.w.	-	292	109	123	601	843	130	626	1,027	870	94	721	1,034
	Strontium (Sr)	0.050	mg/kg w.w.	378	0.131	0.085	0.039	0.32	0.037	0.011	0.021	0.061	0.074	0.021	0.056	0.108
	Tellurium (Te)	0.020	mg/kg w.w.	-	<0.004	0.0002	<0.004	<0.005	<0.005	0.0009	<0.004	<0.007	0.004	0.0002	<0.003	0.004
	Thallium (Tl)	0.0020	mg/kg w.w.	-	0.0029	0.0015	0.0018	0.0076	0.0030	0.0021	0.00119	0.0089	0.0038	0.0011	0.0027	0.0058
	Tin (Sn)	0.10	mg/kg w.w.	-	0.06	0.02	0.03	0.10	0.07	0.02	0.03	0.1	0.02	0.005	<0.02	0.03
	Uranium (U)	0.0020	mg/kg w.w.	0.4	0.0004	0.00003	<0.0004	0.0005	0.0005	0.0001	<0.0004	0.0008	<0.0004	0.00002	<0.0003	<0.0004
	Vanadium (V)	0.10	mg/kg w.w.	-	<0.02	0.001	<0.02	<0.02	0.18	0.11	0.06	0.40	0.03	0.01	<0.02	0.04
	Zinc (Zn)	0.50	mg/kg w.w.	189	4.1	1.0	3.0	6.7	38	9.2	18	53	70	12.5	50	85
	Zirconium (Zr)	0.20	mg/kg w.w.	-	<0.04	0.002	<0.04	<0.05	<0.05	0.009	<0.04	<0.07	<0.04	0.002	<0.03	<0.04

SD - Standard Deviation.

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 3.2: Metal concentrations in fish tissue, Rainy River Project Fish Tissue Monitoring, 2016.

Parameter		Lowest Detection Limit	Units	Benchmark[1,2]	Walleye											
					Muscle				Liver				Ovary			
					Average (n=15)	SD	Minimum	Maximum	Average (n=15)	SD	Minimum	Maximum	Average (n=8)	SD	Minimum	Maximum
% Moisture		0.25	%	-	78.8	0.9	77.5	80.2	75.8	2.6	69.7	80.6	70.2	2.2	67.7	73.1
Total Metals	Aluminum (Al)	2.0	mg/kg w.w.	-	0.5	0.2	<0.4	1.1	0.8	0.5	<0.4	1.5	<0.6	0.04	<0.5	<0.6
	Antimony (Sb)	0.010	mg/kg w.w.	0.3	<0.002	0.0001	<0.002	<0.002	<0.002	0.0003	<0.002	<0.003	<0.003	0.0002	<0.003	<0.003
	Arsenic (As)	0.020	mg/kg w.w.	0.2	0.037	0.012	0.024	0.070	0.069	0.020	0.036	0.117	0.043	0.008	0.032	0.055
	Barium (Ba)	0.050	mg/kg w.w.	126	0.011	0.001	<0.010	0.012	0.017	0.020	<0.010	0.088	0.021	0.006	<0.014	0.035
	Beryllium (Be)	0.010	mg/kg w.w.	1.3	<0.002	0.00009	<0.002	<0.002	<0.002	0.0003	<0.002	<0.003	<0.003	0.0002	<0.003	<0.003
	Bismuth (Bi)	0.010	mg/kg w.w.	-	0.003	0.0007	<0.002	0.004	0.003	0.0004	<0.002	0.0035	<0.003	0.0002	<0.003	<0.003
	Boron (B)	1.0	mg/kg w.w.	63.1	<0.2	0.009	<0.2	<0.2	<0.2	0.03	<0.2	<0.3	<0.3	0.02	<0.3	<0.3
	Cadmium (Cd)	0.0050	mg/kg w.w.	0.6	<0.0011	0.0003	<0.0010	<0.0023	0.103	0.104	0.043	0.439	0.0020	0.0011	<0.0014	0.0045
	Calcium (Ca)	20	mg/kg w.w.	-	118	35	95	216	180	338	55	1,389	213	46	149	294
	Cesium (Cs)	0.0050	mg/kg w.w.	-	0.0118	0.0024	0.0094	0.0181	0.0079	0.0020	0.0060	0.013	0.0099	0.0011	0.0086	0.0113
	Chromium (Cr)	0.050	mg/kg w.w.	0.6	0.01	0.010	<0.010	0.045	<0.027	0.020	<0.010	<0.06	<0.015	0.001	<0.013	<0.016
	Cobalt (Co)	0.020	mg/kg w.w.	-	<0.004	0.0002	<0.004	<0.005	0.128	0.094	0.038	0.34	0.060	0.013	0.037	0.075
	Copper (Cu)	0.10	mg/kg w.w.	57.4	0.134	0.019	0.08712	0.16	1.98	1.69	1.01	7.97	0.72	0.054	0.66	0.83
	Iron (Fe)	3.0	mg/kg w.w.	-	1.0	0.3	0.6699	1.9	70	31	33	137	24.5	4.2	17.4	31
	Lead (Pb)	0.020	mg/kg w.w.	2.3	<0.005	0.002	<0.004	<0.011	<0.008	0.004	<0.004	<0.015	<0.006	0.0004	<0.005	<0.006
	Lithium (Li)	0.50	mg/kg w.w.	-	<0.11	0.005	<0.10	<0.11	<0.12	0.013	<0.10	<0.15	<0.15	0.01	<0.13	<0.16
	Magnesium (Mg)	2.0	mg/kg w.w.	-	324	19	294	360	178	46	122	301	332	51	271	419
	Manganese (Mn)	0.050	mg/kg w.w.	76.9	0.09	0.02	0.06	0.11	1.49	0.59	0.80	2.8	4	2.1	1	7
	Mercury (Hg)	0.0050	mg/kg w.w.	0.5	0.35	0.099	0.187	0.484	0.091	0.034	0.049	0.163	0.0250	0.006	0.0149	0.031
	Molybdenum (Mo)	0.020	mg/kg w.w.	3.2	<0.005	0.001	<0.004	<0.009	0.121	0.039	0.055	0.178	0.012	0.003	0.006	0.016
	Nickel (Ni)	0.20	mg/kg w.w.	0.7	0.05	0.01	0.04	0.07	0.05	0.006	<0.04	0.0606	<0.06	0.004	<0.05	<0.06
	Phosphorus (P)	10	mg/kg w.w.	-	2,295	173	1,856	2,588	2,769	671	1,838	4,313	2,719	194	2,439	2,946
	Potassium (K)	20	mg/kg w.w.	-	4,401	220	4,005	4,815	2,680	289	2,034	3,003	3,118	277	2,582	3,504
	Rubidium (Rb)	0.050	mg/kg w.w.	-	12.7	2.97	8.81	21.32	8.5	2.1	5.0	12.238	9.2	1.57	7.2	11.5
	Selenium (Se)	0.050	mg/kg w.w.	3.2	0.21	0.02	0.18	0.27	0.68	0.11	0.47	0.87	0.83	0.15	0.52	0.96
	Sodium (Na)	20	mg/kg w.w.	-	264	61	120	369	1,076	185	780	1,517	786	201	441	1,095
	Strontium (Sr)	0.050	mg/kg w.w.	378	0.019	0.010	<0.010	0.046	0.11	0.20	0.038	0.81765	0.061	0.019	0.035	0.097
	Tellurium (Te)	0.020	mg/kg w.w.	-	<0.004	0.0002	<0.004	<0.005	<0.005	0.0005	<0.004	<0.006	<0.006	0.0004	<0.005	<0.006
	Thallium (Tl)	0.0020	mg/kg w.w.	-	0.0033	0.00076	0.0023	0.0045	0.0093	0.0032	0.0057	0.0166474	0.0072	0.0017	0.0044	0.0095
	Tin (Sn)	0.10	mg/kg w.w.	-	0.02	0.003	<0.02	0.03	0.10	0.06	<0.02	0.25863	0.04	0.01	<0.03	0.06
	Uranium (U)	0.0020	mg/kg w.w.	0.4	<0.0004	0.00002	<0.0004	<0.0005	0.0005	0.0001	<0.0004	0.000946	<0.0006	0.00004	<0.0005	<0.0006
	Vanadium (V)	0.10	mg/kg w.w.	-	<0.02	0.001	<0.02	<0.02	0.03	0.03	<0.02	0.1419	<0.03	0.002	<0.03	<0.03
	Zinc (Zn)	0.50	mg/kg w.w.	189	2.8	0.3	2.4	3.4	15.9	2.2	12.9563	18.9981	31	4.4	22	35
	Zirconium (Zr)	0.20	mg/kg w.w.	-	<0.04	0.002	<0.04	<0.05	<0.05	0.005	<0.04	<0.06	<0.06	0.004	<0.05	<0.06

SD - Standard Deviation.

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.

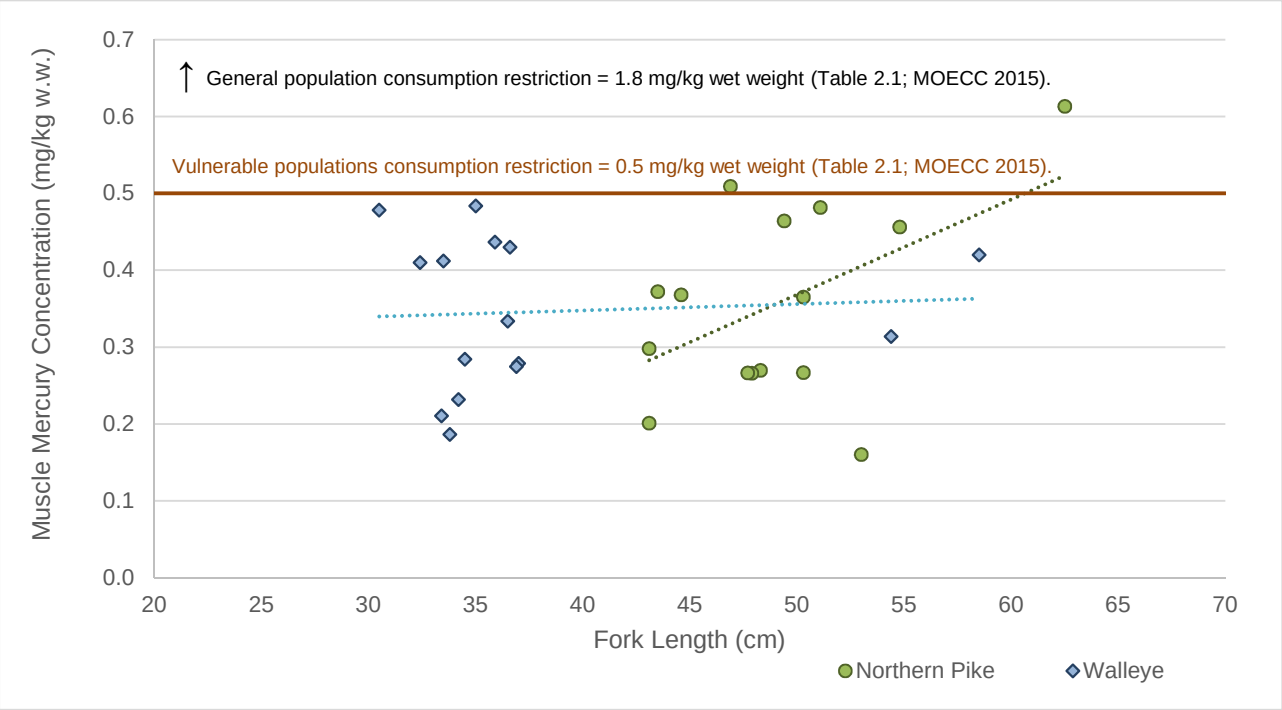

Figure 3.1: Muscle mercury concentration and fork length of fish from the Pinewood River, Rainy River Project Fish Tissue Monitoring, 2016.

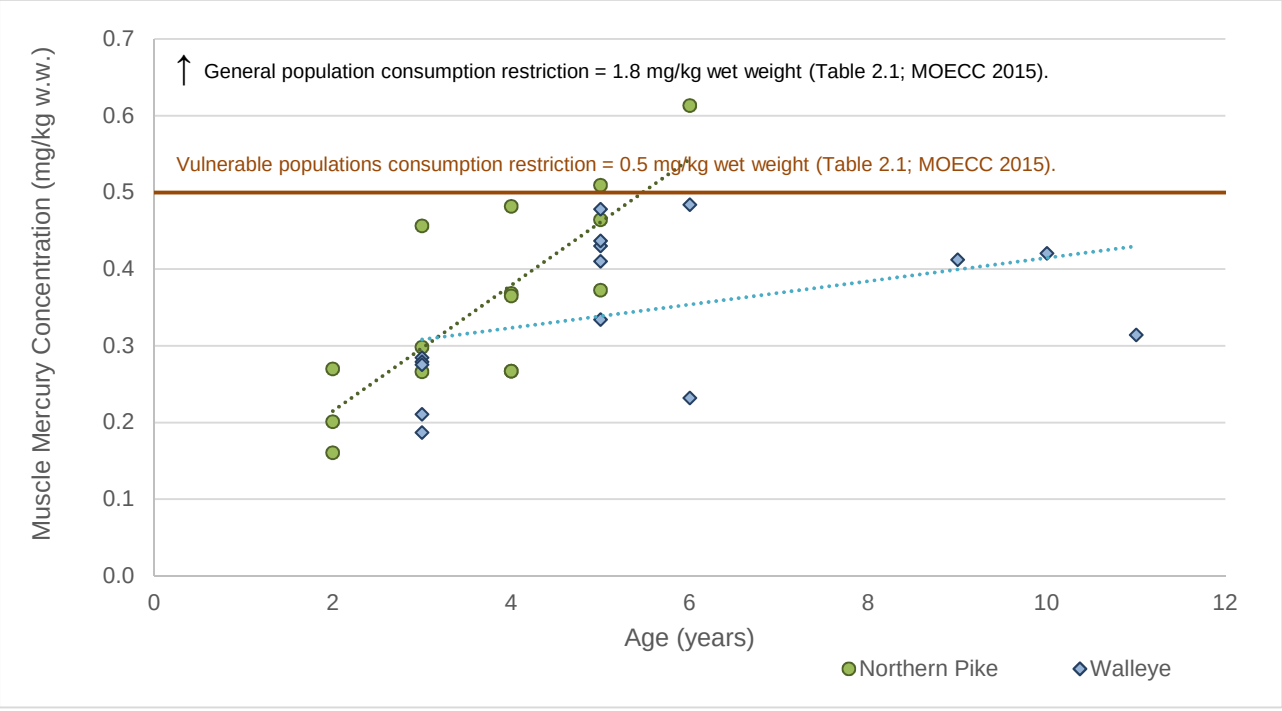

Figure 3.2: Muscle mercury concentration and age of fish from the Pinewood River, Rainy River Project Fish Tissue Monitoring, 2016.

(Figure 3.3). For Pinewood River walleye, the combined data suggest that fish with fork lengths greater than 38.8 cm will have mercury concentrations greater than this benchmark (Figure 3.4).

The 2016 muscle mercury concentrations were compared to 2015 data and 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 or lower, despite notably different maximum sizes/ages for both species (Figure 3.3 and 3.4; AMEC 2013). The longest/oldest northern pike captured in the 2016 was bigger than the largest/oldest captured in the baseline. For walleye, the opposite was true. Generally, average metal concentrations in northern pike and walleye muscle tissue were within the range of baseline (2012) data for all metals (Table 3.3; AMEC 2013). Average metal concentrations in muscle tissue of fish collected in 2016 were also within range of fish collected in 2015 for all metals (Table 3.3).

Overall, the majority of metal concentrations in fish muscle were below human consumption benchmarks. Mercury concentrations in two northern pike muscle samples were marginally above the benchmark (i.e., the guideline for commercially sold fish and the consumption restriction guideline for vulnerable populations; Health Canada 2007, MOECC 2015). However, mercury concentrations were below the consumption restriction guideline for the general population (Table 2.1, MOECC 2015). Based comparison to human consumption benchmarks and baseline data, it appears that the RRP has not influenced metal concentrations in tissues of exposed northern pike or walleye.

3.2.2 Liver Tissue Chemistry

Fish liver tissue is not recommended for human consumption (MOECC 2015). Discussion with local First Nations community members in August 2016 indicated that organs of fish caught in the Pinewood River are not regularly eaten by community members (Appendix D). It is unclear whether livers are included with canned northern pike, a process which includes 80% of the fish (Appendix D). However, since RRP has regulatory requirements to monitor for key contaminants in northern pike and walleye livers, concentrations of metals in livers have been screened against benchmarks for context. 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 TDI values or a commercial guideline (Tables 3.2 and

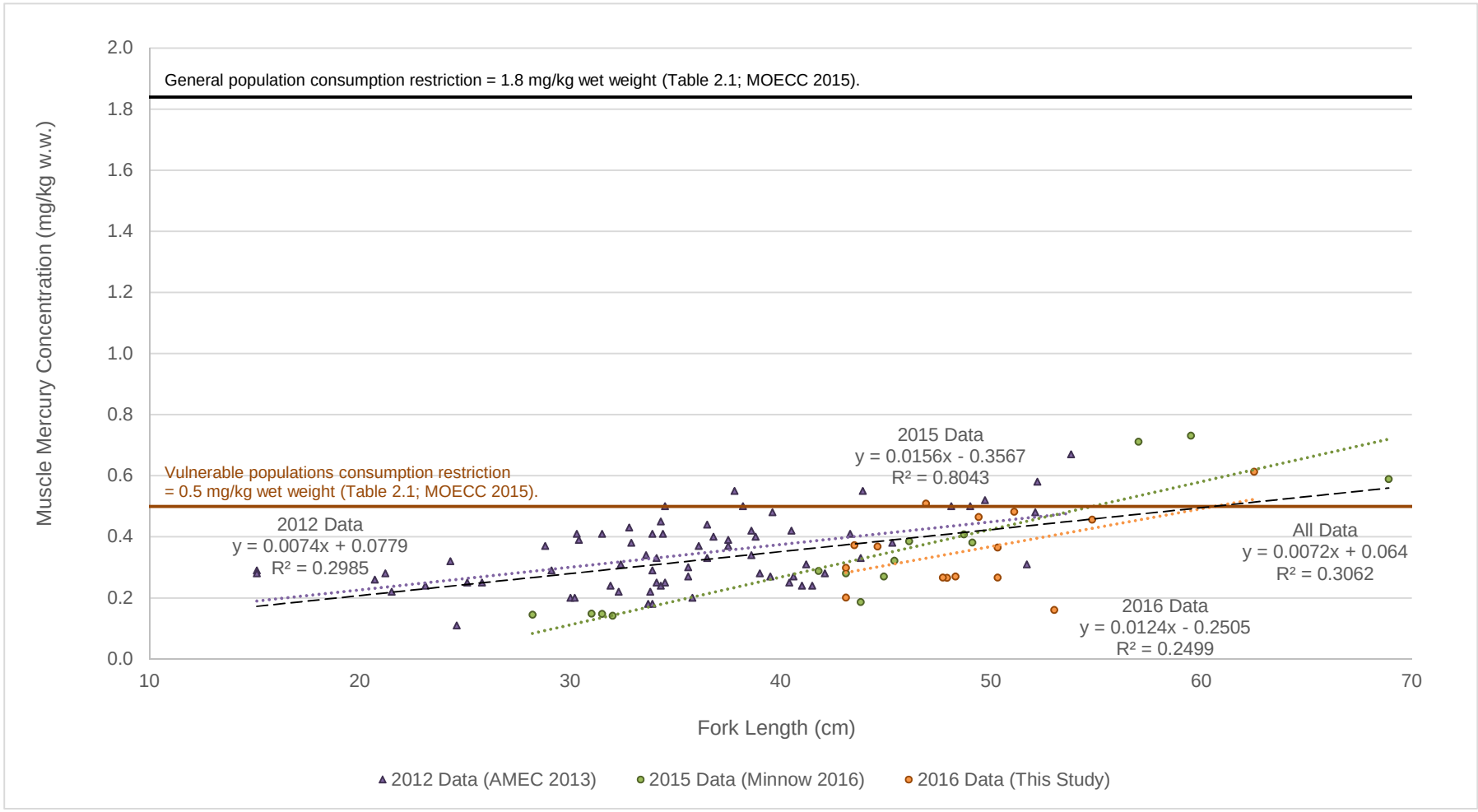

Figure 3.3: Muscle mercury concentration and fork length of northern pike from the Pinewood River, comparing fish caught during the baseline (2012; n = 70) and construction (2015 [n = 15] and 2016 [n = 15]) periods, Rainy River Project Fish Tissue Monitoring, 2016.

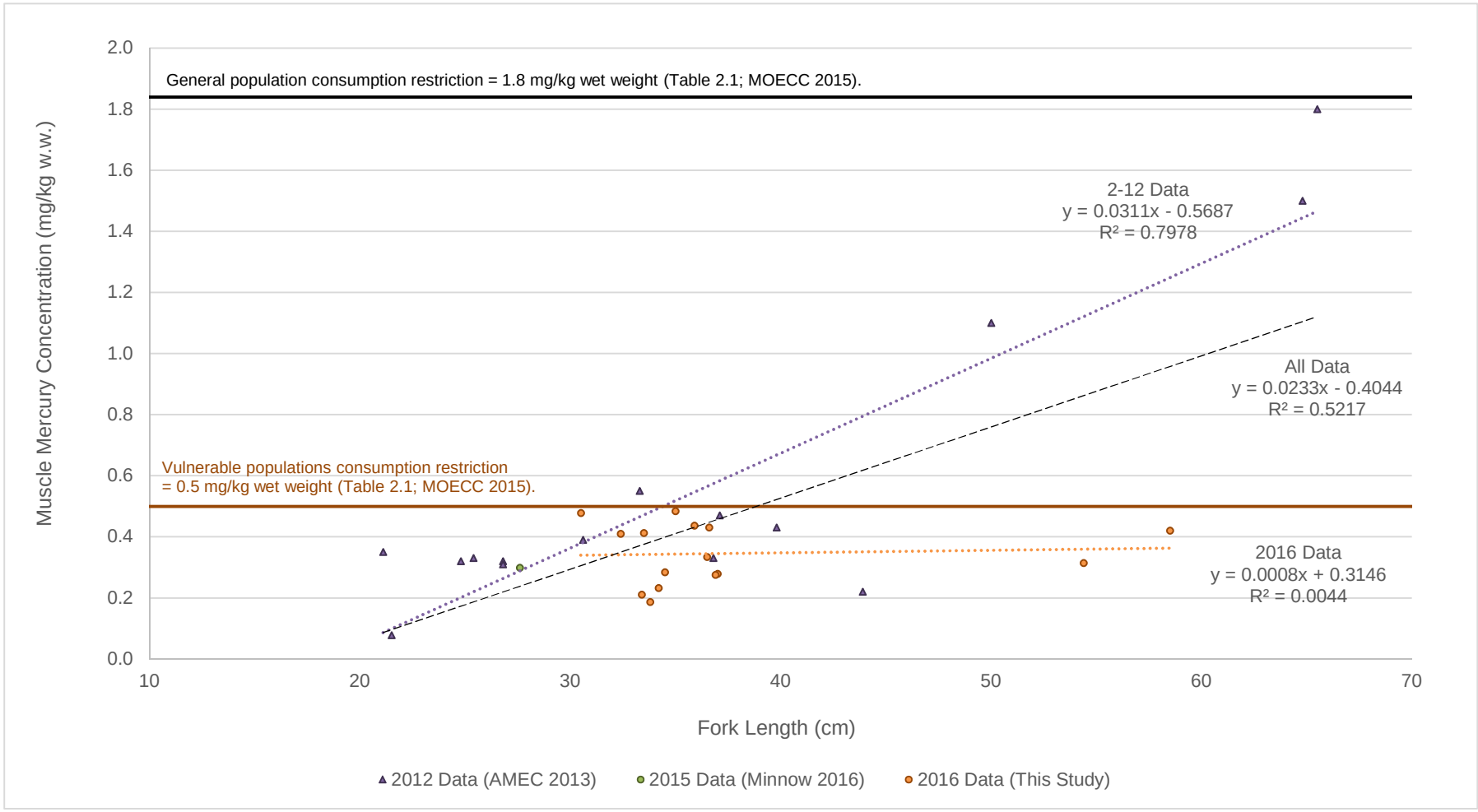

Figure 3.4: Muscle mercury concentration and fork length of walleye from the Pinewood River, comparing fish caught during the baseline (2012; n = 15) and construction (2015 [n = 15] and 2016 [n = 15]) periods, Rainy River Project Fish Tissue Monitoring, 2016.

Table 3.3: Concentrations (mean ± standard deviation) of contaminants of potential concern (COPC) in northern pike and walleye muscle tissue, comparing baseline (2012) and construction (2015, 2016) data, Rainy River Project Fish Tissue Monitoring.

COPC	Units	Benchmark[1,2]	Northern Pike Muscle Tissue Average ± SD			Walleye Muscle Tissue Average ± SD		
			Baseline 2012 Data (n = 70; AMEC 2013)	2015 Data (n = 15; Minnow 2016)	2016 Data (n = 15; This Study)	Baseline 2012 Data (n = 15; AMEC 2013)	2015 Data (n = 1; Minnow 2016)	2016 Data (n = 15; This Study)
Arsenic (As)	mg/kg w.w.	1.0	0.10 ± 0	0.093 ± 0.021	0.086 ± 0.037	0.1 ± 0	0.10	0.04 ± 0.01
Boron (B)	mg/kg w.w.	56.2	<0.50 ± 0	<0.22 ± 0.011	<0.21 ± 0.012	<0.5 ± 0	<0.21	<0.2 ± 0.009
Cadmium (Cd)	mg/kg w.w.	3.2	<0.01 ± 0	0.0018 ± 0.0016	0.0013 ± 0.00077	<0.01 ± 0	<0.0010	<0.0011 ± 0.0003
Chromium (Cr)	mg/kg w.w.	3.2	<0.30 ± 0	0.024 ± 0.023	0.022 ± 0.023	<0.3 ± 0	<0.010	0.01 ± 0.010
Cobalt (Co)	mg/kg w.w.	-	0.01 ± 0.00051	0.0045 ± 0.00024	0.0044 ± 0.00034	<0.005 ± 0	<0.0042	<0.004 ± 0.0002
Copper (Cu)	mg/kg w.w.	292.2	0.51 ± 0.048	0.18 ± 0.041	0.15 ± 0.030	0.54 ± 0.15	0.15	0.13 ± 0.02
Iron (Fe)	mg/kg w.w.	-	3.23 ± 0.52	2.76 ± 0.88	1.69 ± 0.38	3.2 ± 0.56	2.2	1.0 ± 0.3
Lead (Pb)	mg/kg w.w.	11.6	0.03 ± 0	0.012 ± 0.018	<0.0043 ± 0.00024	<0.03 ± 0	0.007	<0.005 ± 0.002
Manganese (Mn)	mg/kg w.w.	391.7	0.78 ± 0.73	0.44 ± 0.25	0.36 ± 0.22	0.31 ± 0.03	0.16	0.09 ± 0.02
Mercury (Hg)	mg/kg w.w.	0.5	0.34 ± 0.11	0.34 ± 0.20	0.36 ± 0.13	0.57 ± 0.50	0.30	0.35 ± 0.099
Molybdenum (Mo)	mg/kg w.w.	16.1	0.05 ± 0.012	0.0056 ± 0.0020	<0.0043 ± 0.00024	<0.05 ± 0	<0.0042	<0.005 ± 0.001
Nickel (Ni)	mg/kg w.w.	3.5	0.10 ± 0.44	<0.044 ± 0.0021	<0.043 ± 0.0024	<0.05 ± 0	<0.042	0.05 ± 0.01
Selenium (Se)	mg/kg w.w.	16.1	0.20 ± 0.017	0.21 ± 0.031	0.18 ± 0.023	0.21 ± 0.04	0.29	0.21 ± 0.02
Zinc (Zn)	mg/kg w.w.	963	5.0 ± 1.8	4.6 ± 2.6	4.1 ± 1.0	3.5 ± 0.6	3.2	2.8 ± 0.3

w.w. - wet weight.

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.

C.6). Generally, average liver concentrations were within the range of 2015 and baseline (2012) data for all metals (Table 3.4; AMEC 2013).

3.2.3 Ovary Tissue Chemistry

Discussion with local First Nations community members in August 2016 indicated that roe of fish caught in the Pinewood River is not regularly eaten by community members (Appendix D). Despite this, concentrations of metals in ovaries have been screened against benchmarks as a precaution. Some metals are known to accumulate to higher concentrations in ovary tissue than in muscle tissue (e.g., selenium).

Screening of 2016 ovary tissue samples showed that ovaries contained metal concentrations that were below human consumption benchmarks for metals with established TDI values or a commercial guideline (Tables 3.2 and C.7). Average ovary concentrations of northern pike collected in 2016 were within range of fish collected in 2015 for all metals (Table 3.5). No female walleye were sampled in 2015. Ovaries could not be compared to baseline, as they were not sampled during the project baseline.

Table 3.4: Concentrations (mean ± standard deviation) of contaminants of potential concern (COPC) in northern pike and walleye liver tissue, comparing baseline (2012) and construction (2015, 2016) data, Rainy River Project Fish Tissue Monitoring.

COPC	Units	Benchmark[1,2]	Northern Pike Liver Tissue Average ± SD			Walleye Liver Tissue Average ± SD		
			Baseline 2012 Data (n = 70; AMEC 2013)	2015 Data (n = 15; Minnow 2016)	2016 Data (n = 15; This Study)	Baseline 2012 Data (n = 13; AMEC 2013)	2015 Data (n = 1; Minnow 2016)	2016 Data (n = 15; This Study)
Arsenic (As)	mg/kg w.w.	1.0	0.10 ± 0.013	0.044 ± 0.020	0.040 ± 0.012	<0.10 ± 0	0.020	0.012 ± 0.020
Boron (B)	mg/kg w.w.	56.2	<0.50 ± 0	<0.28 ± 0.058	<0.26 ± 0.047	<0.05 ± 0	<0.06	<0.05 ± 0.026
Cadmium (Cd)	mg/kg w.w.	3.2	0.051 ± 0.050	0.054 ± 0.038	0.073 ± 0.048	0.112 ± 0.055	0.038	0.048 ± 0.104
Chromium (Cr)	mg/kg w.w.	3.2	<0.30 ± 0	0.039 ± 0.039	0.023 ± 0.020	<0.30 ± 0	0.039	0.020 ± 0.020
Cobalt (Co)	mg/kg w.w.	-	0.056 ± 0.057	0.043 ± 0.017	0.050 ± 0.017	0.13 ± 0.088	0.017	0.017 ± 0.094
Copper (Cu)	mg/kg w.w.	292.2	13 ± 9.3	25 ± 12	24 ± 11	2.0 ± 0.5	12	11 ± 2
Iron (Fe)	mg/kg w.w.	-	112 ± 73	122 ± 112	203 ± 169	84 ± 24	112	169 ± 31
Lead (Pb)	mg/kg w.w.	11.6	0.031 ± 0.0075	0.044 ± 0.13	0.0071 ± 0.0044	0.030 ± 0	0.127	0.0044 ± 0.0042
Manganese (Mn)	mg/kg w.w.	391.7	1.5 ± 0.49	1.4 ± 0.58	1.1 ± 0.35	1.9 ± 0.45	0.6	0.3 ± 0.59
Mercury (Hg)	mg/kg w.w.	0.5	0.18 ± 0.16	0.14 ± 0.10	0.13 ± 0.071	0.33 ± 0.32	0.10	0.07 ± 0.034
Molybdenum (Mo)	mg/kg w.w.	16.1	0.17 ± 0.046	0.15 ± 0.042	0.18 ± 0.051	0.14 ± 0.046	0.04	0.05 ± 0.039
Nickel (Ni)	mg/kg w.w.	3.5	0.05 ± 0	<0.057 ± 0.012	0.053 ± 0.011	<0.05 ± 0	<0.012	0.011 ± 0.006
Selenium (Se)	mg/kg w.w.	16.1	1.3 ± 0.39	1.5 ± 0.38	1.8 ± 0.42	0.79 ± 0.16	0.4	0.4 ± 0.11
Zinc (Zn)	mg/kg w.w.	963	34 ± 13	47 ± 16	38 ± 9.2	19 ± 2	16	9 ± 2.2

w.w. - wet weight.

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 3.5: Concentrations (mean ± standard deviation) of contaminants of potential concern (COPC) in northern pike and walleye ovary tissue, comparing 2015 and 2016 (construction period) data, Rainy River Project Fish Tissue Monitoring.

COPC	Units	Benchmark[1,2]	Northern Pike Ovary Tissue Average ± SD		Walleye Ovary Tissue Average ± SD
			2015 Data (n = 9; Minnow 2016)	2016 Data (n = 7; This Study)	2016 Data (n = 8; This Study)
Arsenic (As)	mg/kg w.w.	1.0	0.025 ± 0.0056	0.022 ± 0.011	0.043 ± 0.008
Boron (B)	mg/kg w.w.	56.2	<0.22 ± 0.026	<0.2 ± 0.01	<0.3 ± 0.02
Cadmium (Cd)	mg/kg w.w.	3.2	0.0076 ± 0.0026	0.0060 ± 0.0025	0.0020 ± 0.0011
Chromium (Cr)	mg/kg w.w.	3.2	0.017 ± 0.012	0.018 ± 0.012	<0.015 ± 0.001
Cobalt (Co)	mg/kg w.w.	-	0.067 ± 0.015	0.057 ± 0.0191	0.060 ± 0.013
Copper (Cu)	mg/kg w.w.	292.2	1.18 ± 0.160	1.26 ± 0.137	0.72 ± 0.054
Iron (Fe)	mg/kg w.w.	-	54.9 ± 11.1	52 ± 8.3	24.5 ± 4.2
Lead (Pb)	mg/kg w.w.	11.6	0.0076 ± 0.0071	<0.004 ± 0.0002	<0.006 ± 0.0004
Manganese (Mn)	mg/kg w.w.	391.7	35.4 ± 11.8	34 ± 6.8	4 ± 2.1
Mercury (Hg)	mg/kg w.w.	0.5	0.0310 ± 0.0176	0.029 ± 0.013	0.0250 ± 0.006
Molybdenum (Mo)	mg/kg w.w.	16.1	0.042 ± 0.0073	0.053 ± 0.0101	0.012 ± 0.003
Nickel (Ni)	mg/kg w.w.	3.5	<0.044 ± 0.0053	0.04 ± 0.007	<0.06 ± 0.004
Selenium (Se)	mg/kg w.w.	16.1	1.17 ± 0.287	0.97 ± 0.35	0.83 ± 0.15
Zinc (Zn)	mg/kg w.w.	963	80.0 ± 19.8	70 ± 12.5	31 ± 4.4

w.w. - wet weight.

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.

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 2016 are listed below.

1. Fish communities and catchability (CPUE) were generally consistent with the results of previous sampling efforts, with higher CPUE for northern pike relative to walleye. CPUE for walleye was higher in 2016 than in 2015 and in baseline studies.

2. New benchmarks were used in 2016 based on discussions regarding local fishing and consumption rates. The benchmarks were calculated based on the upper limit consumption rate for the Canadian population. Despite this change, even comparison to benchmarks derived from the much higher subsistence consumption rates (i.e., benchmarks used in 2015) would not change the conclusions of this report.

3. Northern pike and walleye muscle, liver, and ovary tissue samples contained metal concentrations that were below human consumption benchmarks for metals with established TDI values, except for mercury in two northern pike muscle samples. Mean concentrations of mercury in both species were below the benchmark for all tissue sample types and within the range of baseline for muscle and liver samples.

4. Screening of metal concentrations in northern pike and walleye muscle tissue indicated that mercury in northern pike occurs at concentrations above some consumption benchmarks in larger fish (greater than approximately 60.5 cm in length). 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 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 2016 fish tissue monitoring study, recommendations for future monitoring include:

1. Utilize local fisherpersons for targeted angling of northern pike and walleye (particularly focused on the latter). In addition to providing opportunity for First Nations involvement,

local knowledge of the habitat may result in efficient capture of walleye by angling while reducing the bycatch and the stress to fish associated with gillnetting. An angling event with local support could occur during one or two evenings, with subsequent supplementary gill and hoop netting by Minnow to ensure the capture of 15 individuals.

2. Discontinue monitoring of ovaries, as the roe of northern pike and walleye caught in the Pinewood River are not regularly eaten by community members (Appendix D) and there is no apparent benefit of analyzing ovaries in addition to fish muscle tissue.

5.0 REFERENCES

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APPENDIX A

Data Quality Assessment

APPENDIX A: DATA QUALITY ASSESSMENT

LIST OF TABLES

After Page…

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 L1845628; 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). Twenty 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 but one of the 335 reported method blank results were non-detectable (Appendix C). In one method blank, manganese was slightly above the MDL; however, all samples had detectable concentrations of manganese that were at least 5-times greater than the method detection limit (Table C.5 to C.7), indicating that this one detectable result did not affect data interpretability. The method blank results for this study suggest no inadvertent sample contamination within the laboratory.

A2.4 Data Precision

Laboratory Duplicate Samples

Six laboratory duplicate samples were evaluated for moisture and another seven or eight laboratory duplicate samples were evaluated for each of the metals (Appendix C). All laboratory duplicate results (271 in total) met ALS Environmental's applicable DQOs. Overall, laboratory precision achieved in this study is considered good.

Field Duplicate Samples

Seven field duplicate samples (three muscle tissue, two liver, and one ovary) were collected for quality assurance (Table A.2). Most of duplicate samples had excellent agreement. In four of the ten samples only one analyte (chromium, copper, strontium, or tin) exceeded the DQO of ≤40% RPD (Table A.2). Although these results did not always

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	0.4
	Antimony (Sb)	0.3	0.010	0.002
	Barium (Ba)	10.1	0.050	0.010
	Beryllium (Be)	1.3	0.010	0.002
	Bismuth (Bi)	-	0.010	0.002
	Boron (B)	11	1.0	0.2
	Cadmium (Cd)	0.5	0.0050	0.0009
	Cesium (Cs)	-	0.0050	0.0017
	Chromium (Cr)	0.6	0.050	0.009
	Cobalt (Co)	-	0.020	0.004
	Lead (Pb)	2.3	0.020	0.003
	Lithium (Li)	-	0.50	0.09
	Molybdenum (Mo)	3.2	0.020	0.004
	Nickel (Ni)	0.8	0.20	0.20
	Strontium (Sr)	378.4	0.050	0.010
	Tellurium (Te)	-	0.020	0.003
	Tin (Sn)	-	0.10	0.02
	Uranium (U)	0.4	0.0020	0.0003
	Vanadium (V)	-	0.10	0.02
	Zirconium (Zr)	-	0.20	0.03

[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.

Table A.2: Field duplicate results. Highlighted values did not meet the data quality objective of≤ 40% Relative Percent Difference (RPD).

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Client Sample ID:			PINR-NP01-M	PINR-NPX-M	RPD (%)	PINR-NP06-M	PINR-NPZ-M	RPD (%)	PINR-WA01-M	PINR-WAX-M	RPD (%)	PINR-WA06-M	PINR-WAZ-M	RPD (%)	PINR-NP01-L	PINR-NPX-L	RPD (%)	PINR-WA01-L	PINR-WAX-L	RPD (%)	PINR-NP01-O	PINR-NPX-O	RPD (%)
Date Sampled:			21-Sep-2016	21-Sep-2016		21-Sep-2016	21-Sep-2016		21-Sep-2016	21-Sep-2016		23-Sep-2016	23-Sep-2016		21-Sep-2016	21-Sep-2016		21-Sep-2016	21-Sep-2016		21-Sep-2016	21-Sep-2016	
ALS Sample ID:			L1845628-1	L1845628-16		L1845628-6	L1845628-17		L1845628-42	L1845628-57		L1845628-47	L1845628-58		L1845628-18	L1845628-33		L1845628-59	L1845628-74		L1845628-34	L1845628-41	
Analytes	**Units**	**Lowest MDL**																					
% Moisture	%	0.25	77.2	77.3	0.1	78.6	78.1	0.6	79.0	78.1	1	77.5	77.5	0	79.6	78.3	2	73.9	76.0	3	80.5	80.8	0.4
Aluminum (Al)	mg/kg d.w.	2.0	2.3	2.7	16	<2.0	<5.0	0	<2.0	<2.0	0	<5.0	<5.0	0	2.6	2.7	4	<5.0	<5.0	0	<2.0	<2.0	0
Antimony (Sb)	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	<0.010	<0.010	0	<0.010	<0.010	0	<0.010	<0.010	0
Arsenic (As)	mg/kg d.w.	0.020	0.090	0.107	17	0.470	0.394	18	0.174	0.141	21	0.166	0.188	12	0.040	0.055	32	0.259	0.280	8	0.025	0.026	4
Barium (Ba)	mg/kg d.w.	0.050	0.291	0.266	9	0.168	0.480	96	<0.050	<0.050	0	0.054	<0.050	8	<0.050	<0.050	0	<0.050	<0.050	0	0.295	0.231	24
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	<0.010	<0.010	0	<0.010	<0.010	0	<0.010	<0.010	0
Bismuth (Bi)	mg/kg d.w.	0.010	<0.010	<0.010	0	<0.010	<0.010	0	0.011	0.012	9	0.019	0.018	5	<0.010	0.011	10	<0.010	<0.010	0	<0.010	<0.010	0
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	<1.0	<1.0	0	<1.0	<1.0	0	<1.0	<1.0	0
Cadmium (Cd)	mg/kg d.w.	0.0050	<0.0050	<0.0050	0	<0.0050	<0.010	0	<0.0050	<0.0050	0	<0.010	<0.010	0	0.0706	0.0711	0.7	0.187	0.203	8	0.0099	0.0120	19
Calcium (Ca)	mg/kg d.w.	20	2,520	2,280	10	1,810	4,110	78	793	531	40	489	446	9	150	157	5	377	275	31	660	601	9
Cesium (Cs)	mg/kg d.w.	0.0050	0.0524	0.0500	5	0.0224	0.0381	52	0.0499	0.0441	12	0.0483	0.0441	9	0.0123	0.0125	2	0.0283	0.0322	13	0.0348	0.0350	0.6
Chromium (Cr)	mg/kg d.w.	0.050	0.082	0.056	38	<0.050	<0.20	0	<0.050	<0.050	0	<0.20	<0.20	0	<0.050	<0.050	0	<0.20	<0.20	0	0.096	0.311	106
Cobalt (Co)	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	0.130	0.109	18	0.273	0.351	25	0.154	0.159	3
Copper (Cu)	mg/kg d.w.	0.10	0.86	0.86	0	0.78	0.62	23	0.77	0.74	4	0.77	0.41	61	55.7	63.3	13	4.84	4.96	2	6.64	6.77	2
Iron (Fe)	mg/kg d.w.	3.0	9.0	7.9	13	8.1	8.1	0	3.8	3.4	11	7.5	5.1	38	548	455	19	184	172	7	211	217	3
Lead (Pb)	mg/kg d.w.	0.020	<0.020	0.028	33	<0.020	<0.050	0	<0.020	<0.020	0	<0.050	<0.050	0	<0.020	<0.020	0	<0.050	<0.050	0	<0.020	<0.020	0
Lithium (Li)	mg/kg d.w.	0.50	<0.50	<0.50	0	<0.50	<0.50	0	<0.50	<0.50	0	<0.50	<0.50	0	<0.50	<0.50	0	<0.50	<0.50	0	<0.50	<0.50	0
Magnesium (Mg)	mg/kg d.w.	2.0	1,540	1,480	4	1,600	1,440	11	1,580	1,450	9	1,390	1,220	13	754	742	2	707	777	9	1,290	1,320	2
Manganese (Mn)	mg/kg d.w.	0.050	2.54	2.31	9	2.81	6.64	81	0.494	0.370	29	0.530	0.424	22	2.79	2.98	7	7.09	7.74	9	117	119	2
Mercury (Hg)	mg/kg d.w.	0.0050	2.01	2.00	0.5	1.80	1.64	9	2.04	1.97	3	2.17	2.08	4	0.630	0.688	9	0.301	0.305	1	0.188	0.210	11
Molybdenum (Mo)	mg/kg d.w.	0.020	<0.020	<0.020	0	<0.020	<0.040	0	<0.020	<0.020	0	<0.040	<0.040	0	0.521	0.480	8	0.406	0.493	19	0.276	0.308	11
Nickel (Ni)	mg/kg d.w.	0.20	<0.20	<0.20	0	<0.20	<0.20	0	0.21	0.28	29	<0.20	<0.20	0	<0.20	0.20	0	<0.20	<0.20	0	0.22	<0.20	10
Phosphorus (P)	mg/kg d.w.	10	12,100	11,500	5	11,900	11,100	7	11,500	9,710	17	8,410	8,090	4	13,800	13,700	0.7	10,300	11,200	8	16,400	16,600	1
Potassium (K)	mg/kg d.w.	20	19,200	18,600	3	20,400	17,800	14	21,400	18,600	14	17,600	18,000	2	14,900	13,700	8	8,940	10,500	16	19,000	19,800	4
Rubidium (Rb)	mg/kg d.w.	0.050	20.5	20.0	2	21.4	20.1	6	53.3	48.3	10	40.1	38.2	5	18.5	17.4	6	29.1	32.6	11	22.9	24.3	6
Selenium (Se)	mg/kg d.w.	0.050	0.666	0.642	4	1.08	0.94	14	1.07	1.04	3	0.93	0.90	3	4.58	5.02	9	2.23	2.19	2	4.35	4.20	4
Sodium (Na)	mg/kg d.w.	20	1,170	1,180	0.9	1,930	1,280	40	1,660	1,780	7	901	769	16	3,980	3,510	13	3,690	4,080	10	4,570	4,460	2
Strontium (Sr)	mg/kg d.w.	0.050	1.51	1.34	12	0.775	1.97	87	0.181	0.080	77	<0.10	<0.10	0	0.167	0.130	25	0.24	0.18	29	0.603	0.509	17
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	<0.020	<0.020	0	<0.020	<0.020	0	<0.020	<0.020	0
Thallium (Tl)	mg/kg d.w.	0.0020	0.0127	0.0110	14	0.0120	0.0123	2	0.0153	0.0136	12	0.0193	0.0192	0.5	0.0093	0.0069	30	0.0244	0.0278	13	0.0224	0.0241	7
Tin (Sn)	mg/kg d.w.	0.10	0.40	0.40	0	0.54	0.34	45	<0.10	<0.10	0	0.13	0.16	21	0.43	0.28	42	0.37	0.45	20	0.16	0.17	6
Uranium (U)	mg/kg d.w.	0.0020	<0.0020	0.0024	18	<0.0020	<0.0020	0	<0.0020	<0.0020	0	<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	<0.10	<0.10	0	<0.10	<0.10	0	<0.10	<0.10	0	0.28	0.25	11	<0.10	<0.10	0	<0.10	<0.10	0
Zinc (Zn)	mg/kg d.w.	0.50	17.9	17.6	2	20.0	21.9	9	13.7	12.0	13	10.8	10.2	6	111	111	0	50.4	55.9	10	367	373	2
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	<0.20	<0.20	0	<0.20	<0.20	0	<0.20	<0.20	0

d.w. - dry weight.
MDL - Method Detection Limit.

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). One muscle tissue sample (PINR-NP06-M) had concentrations that exceeded the DQO for barium, calcium, cesium, manganese, sodium, strontium, and tin (Table A.2). For some of these analytes (barium, cesium, and tin), absolute differences were relatively small and approaching the MDL. Concentrations of calcium, manganese, sodium, and strontium were well above the MDLs (Table A.2; Appendix C). Of these, only manganese is a contaminant of potential concern, but had excellent agreement in the other six 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 may also result from the 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.

A2.5 Data Accuracy

Data accuracy was evaluated based on results of certified reference materials (CRM), and laboratory control samples (LCS; Appendix C). All CRM and LCS results (536 in total) met ALS Environmental's data quality objectives for accuracy (Appendix C). Laboratory accuracy achieved in this study is considered excellent.

A3.0 DATA QUALITY STATEMENT

Data collected for the 2016 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, 2016.

Net Set ID	Mesh Size (in)	Length (m)	UTM (NAD83, 15N)		Set Date	Lift Date	Set Time	Lift Time	Time (hrs)	Effort (m*hrs/ 100 m)	Northern Pike		Walleye		Black Crappie		Rock Bass		Shorthead Redhorse		White Sucker		Yellow Perch	
			Easting	Northing							Catch	CPUE	Catch	CPUE	Catch	CPUE	Catch	CPUE	Catch	CPUE	Catch	CPUE	Catch	CPUE
GN1	4	45.72	403797	5396699	20-Sep-16	21-Sep-16	18:00	13:35	19.58	8.95	0	0	0	0	0	0	0	0	0	0	0	0	0	0
GN2	3	45.72	404116	5396869	20-Sep-16	21-Sep-16	18:15	13:20	19.08	8.72	3	0.34	2	0.23	2	0.23	0	0	1	0.11	0	0	0	0
GN2b	3	45.72	404116	5396869	21-Sep-16	22-Sep-16	13:25	13:50	24.42	11.16	2	0.18	0	0	2	0.18	0	0	0	0	1	0.09	0	0
GN2c	3	45.72	404116	5396869	22-Sep-16	22-Sep-16	13:57	18:00	4.05	1.85	1	0.54	0	0	0	0	1	0.54	0	0	0	0	0	0
GN3	3	45.72	412958	5405686	21-Sep-16	21-Sep-16	9:41	18:53	9.20	4.21	0	0	0	0	0	0	0	0	0	0	0	0	0	0
GN4	3	45.72	410302	5403889	21-Sep-16	21-Sep-16	10:06	18:34	8.47	3.87	1	0.26	0	0	0	0	0	0	0	0	0	0	0	0
GN5	3	45.72	408086	5402502	21-Sep-16	21-Sep-16	10:40	18:05	7.42	3.39	0	0	0	0	0	0	0	0	0	0	0	0	0	0
GN6	3	45.72	407948	5397979	21-Sep-16	21-Sep-16	11:10	17:30	6.33	2.90	3	1.04	0	0	0	0	0	0	0	0	0	0	0	0
GN7	3	45.72	404735	5397659	21-Sep-16	21-Sep-16	11:36	14:06	2.50	1.14	2	1.75	0	0	0	0	0	0	0	0	0	0	0	0
GN8	4	45.72	403469	5396389	21-Sep-16	22-Sep-16	13:39	12:45	23.10	10.56	0	0	0	0	0	0	0	0	0	0	1	0.09	0	0
GN8b	3	45.72	403469	5396389	22-Sep-16	23-Sep-16	13:00	11:17	22.28	10.19	4	0.39	0	0	1	0.10	0	0	0	0	0	0	1	0.10
GN9	3	45.72	404086	5396830	21-Sep-16	22-Sep-16	14:49	13:34	22.75	10.40	4	0.38	2	0.19	0	0	0	0	1	0.10	0	0	0	0
GN9b	3	45.72	404086	5396830	22-Sep-16	23-Sep-16	13:39	11:32	21.88	10.01	4	0.40	0	0	2	0.20	0	0	0	0	0	0	0	0
GN10	3	45.72	403440	5396348	22-Sep-16	23-Sep-16	15:05	9:26	18.35	8.39	8	0.95	3	0.36	4	0.48	2	0.24	0	0	0	0	0	0
GN11	3	45.72	404032	5397125	22-Sep-16	23-Sep-16	15:16	10:47	19.52	8.92	2	0.22	0	0	2	0.22	0	0	0	0	0	0	0	0
GN12	3	45.72	404076	5397163	22-Sep-16	23-Sep-16	15:34	10:19	18.75	8.57	4	0.47	1	0.12	3	0.35	0	0	0	0	1	0.12	0	0
GN13	3	45.72	403380	5396304	22-Sep-16	23-Sep-16	15:20	8:50	17.50	8.00	6	0.75	2	0.25	1	0.12	0	0	1	0.12	0	0	0	0
GN14	3	45.72	403348	5396275	23-Sep-16	23-Sep-16	11:47	16:00	4.22	1.93	6	3.11	1	0.52	0	0	0	0	0	0	0	0	0	0
GN14b	3	45.72	403348	5396275	23-Sep-16	24-Sep-16	16:05	8:23	16.30	7.45	0	0	0	0	0	0	0	0	0	0	0	0	0	0
GN15	3	45.72	403444	5396348	23-Sep-16	23-Sep-16	11:52	16:13	4.35	1.99	3	1.51	0	0	0	0	0	0	0	0	0	0	0	0
GN15b	3	45.72	403444	5396348	23-Sep-16	24-Sep-16	16:18	8:40	16.37	7.48	5	0.67	2	0.27	4	0.53	0	0	0	0	0	0	0	0
GN16	3	45.72	403429	5396369	23-Sep-16	24-Sep-16	16:20	18:40	26.33	12.04	5	0.42	2	0.17	0	0	0	0	0	0	0	0	0	0
GN16b	3	45.72	403429	5396369	23-Sep-16	24-Sep-16	18:45	8:29	13.73	6.28	6	0.96	0	0	7	1.11	0	0	0	0	0	0	0	0
GN17	3	45.72	403340	5396221	23-Sep-16	24-Sep-16	16:39	8:09	15.50	7.09	7	0.99	2	0.28	2	0.28	0	0	0	0	0	0	0	0
GN18	3	45.72	404136	5396861	23-Sep-16	23-Sep-16	16:50	18:10	1.33	0.61	0	0	0	0	0	0	0	0	0	0	0	0	0	0
									Total	**166.1**	**76**	**0.46**	**17**	**0.10**	**30**	**0.18**	**3**	**0.02**	**3**	**0.02**	**3**	**0.02**	**1**	**0.01**

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, 2016.

Net Set ID	Net Size	UTM (NAD83, 15U)		Set Date	Lift Date	Set Time	Lift Time	Time (hrs)	Effort (trap*days)	Black Crappie	
		Easting	Northing							Catch	CPUE
HN1	m	404788	5397675	21-Sep-16	22-Sep-16	16:00	14:17	22.28	0.93	1	1.08
								Total	**0.93**	**1**	**1.08**

CPUE = catch-per-unit-effort, expressed as the number of fish per trap*day.
m = medium sized hoop nets (2.5' [0.75 m] diameter hoops, 1” [2.5 cm] stretched mesh).

Table B.3: Northern pike data for fish caught in the Pinewood River, Rainy River Project Fish Monitoring, 2016.

Date	Fish ID	Sex	Fork Length (cm)	Total Length (cm)	Body Weight (g)	Organ Weight (g)		Mercury Concentration (mg/kg w.w.)			Age	Abnormalities
						Gonad	Liver	Muscle	Liver	Ovary		
21-Sep-16	PINR-NP01	F	54.8	58.8	1,170	24.033	20.133	0.456	0.139	0.039	3	-
21-Sep-16	PINR-NP02	F	48.3	51.4	800	10.777	7.503	0.270	0.088	0.017	2	-
21-Sep-16	PINR-NP03	F	51.1	55.2	930	15.605	11.628	0.482	0.131	0.030	4	-
21-Sep-16	PINR-NP04	M	47.9	51.1	815	12.022	5.780	0.266	0.109	-	3	-
21-Sep-16	PINR-NP05	M	44.6	47.4	720	19.804	11.807	0.368	0.072	-	4	-
21-Sep-16	PINR-NP06	M	43.5	46.6	605	11.104	5.952	0.372	0.109	-	5	-
21-Sep-16	PINR-NP08	F	43.1	47.5	700	10.640	6.886	0.201	0.082	0.018	2	-
21-Sep-16	PINR-NP09	M	53.0	45.9	630	7.163	7.646	0.160	0.059	-	2	-
22-Sep-16	PINR-NP10	M	43.1	46.1	620	16.562	8.503	0.298	0.087	-	3	-
22-Sep-16	PINR-NP11	M	46.9	49.8	720	10.562	7.815	0.509	0.203	-	5	-
22-Sep-16	PINR-NP12	F	50.3	53.7	1,020	19.377	14.061	0.267	0.076	0.018	4	-
22-Sep-16	PINR-NP13	M	49.4	52.7	790	9.731	5.766	0.464	0.325	-	5	-
22-Sep-16	PINR-NP14	F	50.3	53.5	880	14.931	12.305	0.365	0.128	0.031	4	-
22-Sep-16	PINR-NP15	M	47.7	50.6	750	13.344	4.977	0.267	0.067	-	4	-
22-Sep-16	PINR-NP16	F	62.5	65.7	1,640	20.357	17.235	0.613	0.203	0.052	6	-
Mean			**49.1**	**51.7**	**853**	**14.40**	**9.866**	**0.357**	**0.125**	**0.0293**	**4**	**-**
Minimum			**43.1**	**45.9**	**605**	**7.163**	**4.977**	**0.160**	**0.0589**	**0.0169**	**2**	**-**
Maximum			**62.5**	**65.7**	**1,640**	**24.03**	**20.13**	**0.613**	**0.325**	**0.0523**	**6**	**-**
Standard Deviation			**5.1**	**5.3**	**267**	**4.799**	**4.538**	**0.127**	**0.071**	**0.0131**	**1**	**-**

w.w. - wet weight.

Table B.4: Walleye data for fish caught in the Pinewood River, Rainy River Project Fish Monitoring, 2016.

Date	Fish ID	Sex	Fork Length (cm)	Total Length (cm)	Body Weight (g)	Organ Weight (g)		Mercury Concentration (mg/kg w.w.)			Age	Abnormalities
						Gonad	Liver	Muscle	Liver	Ovary		
21-Sep-16	PINR-WA01	F	36.6	38.9	500	12.598	9.784	0.430	0.079	0.031	5	-
21-Sep-16	PINR-WA02	F	34.2	36.1	420	8.002	7.371	0.232	0.068	0.023	6	-
22-Sep-16	PINR-WA03	I	34.5	36.9	500	1.218	7.194	0.284	0.082	-	3	-
22-Sep-16	PINR-WA04	F	36.5	38.4	490	10.121	7.087	0.334	0.092	0.028	5	-
22-Sep-16	PINR-WA05	F	32.4	34.3	400	12.007	5.603	0.410	0.120	0.030	5	-
23-Sep-16	PINR-WA06	M	30.5	32.5	300	6.043	3.278	0.478	0.163	-	5	-
23-Sep-16	PINR-WA07	I	33.8	35.9	490	1.309	4.347	0.187	0.071	-	3	-
23-Sep-16	PINR-WA08	F	35.0	37.3	460	11.488	11.776	0.484	0.101	0.029	6	-
23-Sep-16	PINR-WA09	F	35.9	37.5	430	14.685	5.232	0.437	0.154	0.026	5	-
23-Sep-16	PINR-WA11	I	37.0	39.3	600	1.721	9.168	0.279	0.058	-	3	-
24-Sep-16	PINR-WA12	F	58.5	62.3	2,550	59.180	54.401	0.420	0.083	0.018	10	-
24-Sep-16	PINR-WA13	F	54.4	57.8	1,920	51.577	33.021	0.314	0.078	0.015	11	-
24-Sep-16	PINR-WA14	I	36.9	38.2	560	1.422	11.279	0.275	0.049	-	3	-
24-Sep-16	PINR-WA15	M	33.5	36.1	410	8.454	3.904	0.412	0.113	-	9	tumour on side
24-Sep-16	PINR-WA16	I	33.4	35.6	470	1.328	7.569	0.211	0.054	-	3	-
Mean			**37.5**	**39.8**	**700**	**13.41**	**12.068**	**0.346**	**0.091**	**0.0250**	**5**	**-**
Minimum			**30.5**	**32.5**	**300**	**1.218**	**3.278**	**0.187**	**0.0493**	**0.0149**	**3**	**-**
Maximum			**58.5**	**62.3**	**2,550**	**59.18**	**54.40**	**0.484**	**0.163**	**0.0313**	**11**	**-**
Standard Deviation			**7.9**	**8.4**	**638**	**17.728**	**13.702**	**0.099**	**0.034**	**0.0060**	**3**	**-**

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	1084026
Local Reference No. / N° de référence local	FF2016-1618
Issuer Account No. / N° de compte du délivreur de permis	10003073

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:

Name of Licencee / Nom du titulaire du permis	Last Name / Nom de famille	First Name / Prénom	Middle Name / Second Prénom
	Ms. Tester	Jess	

Name of Business/Organization/Affiliation (if applicable) / Nom de l'entreprise/de l'organisme/de l'affiliation (le cas échéant)

Minnow Environment Inc.

Mailing address of Licencee / *Adresse postale du titulaire du permis*	Street Name & No./PO Box/RR#/Gen. Del./ N° rue/C.P./R.R./poste restante		
	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 X	Juvenile / Fretin X	Adults / Adulte X	Numbers / Nombre	Name of Waterbody / Nom de l'étendue d'eau
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)
	2016-09-15	2016-10-31

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		2016-07-13

Signature of Licencee / Signature du titulaire du permis	Date (YYYY-MM-DD)
Jess Tester	2016-07-13

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, identification, 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.1084026
Local Reference No. 2016-1618
Issuer Account No. 10003073

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 (2" and 3" diameter), Gill net (3", 4", 5" mesh size), Angling gear

16. **Persons authorized under this licence include the following:**

    Jess Tester, Mike White, Tyrell Worrall, Olivia Butty

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

X Jess Tester

Date

20 - July - 2016

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, 2016.

Parameter		Lowest Detection Limit	Units	Northern Pike											
				Muscle				Liver				Ovary			
				Average (n=15)	SD	Minimum	Maximum	Average (n=15)	SD	Minimum	Maximum	Average (n=7)	SD	Minimum	Maximum
% Moisture		0.25	%	78.6	1.2	76.7	81.2	74.1	4.7	66.0	79.9	81.5	1.0	80.3	82.9
Total Metals	Aluminum (Al)	2.0	mg/kg d.w.	2.1	0.4	<2.0	3.4	3.9	1.8	<2.0	6.9	2.6	0.7	<2.0	3.1
	Antimony (Sb)	0.010	mg/kg d.w.	<0.010	0	<0.010	<0.010	0.010	0.001	<0.010	0.014	<0.010	0	<0.010	<0.010
	Arsenic (As)	0.020	mg/kg d.w.	0.405	0.176	0.099	0.683	0.158	0.047	0.048	0.207	0.122	0.065	0.026	0.244
	Barium (Ba)	0.050	mg/kg d.w.	0.128	0.080	0.050	0.324	0.050	0.002	<0.050	0.056	0.127	0.078	0.059	0.263
	Beryllium (Be)	0.010	mg/kg d.w.	<0.010	0	<0.010	<0.010	<0.010	0	<0.010	<0.010	<0.010	0	<0.010	<0.010
	Bismuth (Bi)	0.010	mg/kg d.w.	0.012	0.0029	<0.010	0.018	0.015	0.006	<0.010	0.030	<0.010	0	<0.010	<0.010
	Boron (B)	1.0	mg/kg d.w.	<1.0	0	<1.0	<1.0	<1.0	0	<1.0	<1.0	<1.0	0	<1.0	<1.0
	Cadmium (Cd)	0.0050	mg/kg d.w.	0.0060	0.0037	<0.0050	0.0195	0.286	0.185	0.0709	0.677	0.0329	0.0148	0.0110	0.0553
	Calcium (Ca)	20	mg/kg d.w.	1,322	665	564	2,960	182	68	87	304	666	48	620	748
	Cesium (Cs)	0.0050	mg/kg d.w.	0.0335	0.0140	0.0186	0.0682	0.0145	0.00796	0.00500	0.0351	0.0298	0.0077	0.0177	0.0413
	Chromium (Cr)	0.050	mg/kg d.w.	0.105	0.112	<0.050	0.363	0.082	0.062	<0.050	0.200	0.129	0.074	<0.050	0.204
	Cobalt (Co)	0.020	mg/kg d.w.	0.020	0.001	<0.020	0.024	0.201	0.0747	0.0780	0.326	0.309	0.1118	0.157	0.469
	Copper (Cu)	0.10	mg/kg d.w.	0.72	0.13	0.53	1.08	96.5	42.8	33.9	178	6.79	0.681	5.55	7.54
	Iron (Fe)	3.0	mg/kg d.w.	8.0	2.0	5.6	12.3	793	643	108	1,960	280	50.8	214	358
	Lead (Pb)	0.020	mg/kg d.w.	<0.020	0	<0.020	<0.020	0.026	0.012	<0.020	0.050	<0.020	0	<0.020	<0.020
	Lithium (Li)	0.50	mg/kg d.w.	<0.50	0	<0.50	<0.50	<0.50	0	<0.50	<0.50	<0.50	0	<0.50	<0.50
	Magnesium (Mg)	2.0	mg/kg d.w.	1,541	47	1,450	1,600	640	182	349	981	1,321	42	1,280	1,400
	Manganese (Mn)	0.050	mg/kg d.w.	1.70	0.99	0.666	4.73	4.63	1.89	1.54	8.2	183	42.6	118	260
	Mercury (Hg)	0.0050	mg/kg d.w.	1.68	0.628	0.767	2.92	0.508	0.308	0.199	1.26	0.159	0.074	0.093	0.299
	Molybdenum (Mo)	0.020	mg/kg d.w.	<0.020	0	<0.020	<0.020	0.702	0.188	0.284	1.100	0.286	0.0611	0.211	0.352
	Nickel (Ni)	0.20	mg/kg d.w.	<0.20	0	<0.20	<0.20	0.21	0.02	<0.20	0.29	0.24	0.035	<0.20	0.27
	Phosphorus (P)	10	mg/kg d.w.	10,900	501	10,200	11,800	11,283	3,540	5,360	17,000	16,529	464	15,900	17,200
	Potassium (K)	20	mg/kg d.w.	20,207	991	18,900	22,200	11,117	2,776	7,220	14,800	20,829	1,537	19,200	22,400
	Rubidium (Rb)	0.050	mg/kg d.w.	26.7	6.57	20.3	45.8	22.5	8.14	10.6	42.1	30.8	4.76	23.6	36.6
	Selenium (Se)	0.050	mg/kg d.w.	0.847	0.111	0.630	1.01	6.88	1.62	3.70	9.7	5.23	1.93	4.17	9.49
	Sodium (Na)	20	mg/kg d.w.	1,370	543	653	2,960	3,421	1,025	1,840	5,110	4,724	665	3,940	5,910
	Strontium (Sr)	0.050	mg/kg d.w.	0.610	0.380	0.183	1.43	0.149	0.052	0.063	0.240	0.398	0.094	0.306	0.556
	Tellurium (Te)	0.020	mg/kg d.w.	<0.020	0	<0.020	<0.020	<0.020	0.0000	<0.020	<0.020	0.020	0	<0.020	0.020
	Thallium (Tl)	0.0020	mg/kg d.w.	0.0134	0.0063	0.0083	0.0338	0.0117	0.0068	0.00350	0.0264	0.0203	0.0052	0.0148	0.0295
	Tin (Sn)	0.10	mg/kg d.w.	0.27	0.10	0.12	0.44	0.27	0.09	0.15	0.39	0.14	0.03	<0.10	0.17
	Uranium (U)	0.0020	mg/kg d.w.	0.0020	0	<0.0020	0.0022	0.0021	0.00054	<0.0020	0.0041	<0.0020	0	<0.0020	<0.0020
	Vanadium (V)	0.10	mg/kg d.w.	<0.10	0	<0.10	<0.10	0.70	0.39	0.18	1.56	0.20	0.04	<0.10	0.24
	Zinc (Zn)	0.50	mg/kg d.w.	19.3	5.0	14.3	32.6	151	43.8	52	242	379	63.2	285	467
	Zirconium (Zr)	0.20	mg/kg d.w.	<0.20	0	<0.20	<0.20	<0.20	0	<0.20	<0.20	<0.20	0	<0.20	<0.20

SD - Standard Deviation.

Table C.1: Average dry weight (d.w.) metal concentrations in fish tissue, Rainy River Project Fish Monitoring, 2016.

Parameter		Lowest Detection Limit	Units	Walleye											
				Muscle				Liver				Ovary			
				Average (n=15)	SD	Minimum	Maximum	Average (n=15)	SD	Minimum	Maximum	Average (n=8)	SD	Minimum	Maximum
% Moisture		0.25	%	78.8	0.9	77.5	80.2	75.8	2.6	69.7	80.6	70.2	2.2	67.7	73.1
Total Metals	Aluminum (Al)	2.0	mg/kg d.w.	2.3	0.8	<2.0	5.0	3.3	1.7	<2.0	7.0	<2.0	0	<2.0	<2.0
	Antimony (Sb)	0.010	mg/kg d.w.	<0.010	0.0000	<0.010	<0.010	<0.010	0	<0.010	<0.010	<0.010	0	<0.010	<0.010
	Arsenic (As)	0.020	mg/kg d.w.	0.176	0.051	0.115	0.318	0.286	0.072	0.150	0.438	0.145	0.025	0.112	0.193
	Barium (Ba)	0.050	mg/kg d.w.	0.050	0.001	<0.050	0.052	0.071	0.083	<0.050	0.371	0.076	0.025	<0.050	0.129
	Beryllium (Be)	0.010	mg/kg d.w.	<0.010	0	<0.010	<0.010	<0.010	0	<0.010	<0.010	<0.010	0	<0.010	<0.010
	Bismuth (Bi)	0.010	mg/kg d.w.	0.013	0.0033	<0.010	0.019	0.011	0.002	<0.010	0.015	<0.010	0	<0.010	<0.010
	Boron (B)	1.0	mg/kg d.w.	<1.0	0	<1.0	<1.0	<1.0	0	<1.0	<1.0	<1.0	0	<1.0	<1.0
	Cadmium (Cd)	0.0050	mg/kg d.w.	<0.0050	0	<0.0050	<0.0050	0.445	0.495	0.170	2.04	0.0127	0.0047	<0.0050	0.0160
	Calcium (Ca)	20	mg/kg d.w.	555	161	434	1,030	759	1,427	212	5,860	724	185	463	1,040
	Cesium (Cs)	0.0050	mg/kg d.w.	0.0558	0.0114	0.0456	0.0876	0.0331	0.0093	0.0223	0.0545	0.0335	0.0058	0.0268	0.0415
	Chromium (Cr)	0.050	mg/kg d.w.	0.067	0.046	<0.050	0.200	<0.110	0.076	<0.050	<0.20	<0.050	0	<0.050	<0.050
	Cobalt (Co)	0.020	mg/kg d.w.	<0.020	0	<0.020	<0.020	0.517	0.350	0.160	1.28	0.200	0.041	0.138	0.256
	Copper (Cu)	0.10	mg/kg d.w.	0.629	0.090	0.440	0.780	8.21	7.06	3.96	33.2	2.42	0.263	2.10	2.94
	Iron (Fe)	3.0	mg/kg d.w.	4.8	1.4	3.3	8.5	293	136	139	635	82.4	14.6	64.5	110
	Lead (Pb)	0.020	mg/kg d.w.	<0.020	0	<0.020	<0.020	<0.032	0.015	<0.020	<0.050	<0.020	0	<0.020	<0.020
	Lithium (Li)	0.50	mg/kg d.w.	<0.50	0	<0.50	<0.50	<0.50	0	<0.50	<0.50	<0.50	0	<0.50	<0.50
	Magnesium (Mg)	2.0	mg/kg d.w.	1,527	86	1,305	1,650	737	180	549	1,270	1,113	117	962	1,300
	Manganese (Mn)	0.050	mg/kg d.w.	0.42	0.07	0.27	0.50	6.15	2.26	3.59	11.7	14	6.4	4	22
	Mercury (Hg)	0.0050	mg/kg d.w.	1.63	0.455	0.902	2.15	0.374	0.125	0.221	0.610	0.083	0.018	0.053	0.101
	Molybdenum (Mo)	0.020	mg/kg d.w.	<0.020	0	<0.020	<0.020	0.500	0.154	0.230	0.725	0.042	0.011	0.021	0.054
	Nickel (Ni)	0.20	mg/kg d.w.	0.24	0.03	0.20	0.29	0.20	0.01	<0.20	0.22	<0.20	0	<0.20	<0.20
	Phosphorus (P)	10	mg/kg d.w.	10,817	788	8,250	11,500	11,443	2,532	8,130	18,200	9,139	509	8,490	10,100
	Potassium (K)	20	mg/kg d.w.	20,747	1,073	17,800	22,400	11,152	1,512	8,790	14,000	10,541	1,419	8,020	12,100
	Rubidium (Rb)	0.050	mg/kg d.w.	60.0	14.2	39.2	103.0	35.7	10.5	22.4	58	31.2	6.71	22.4	40.7
	Selenium (Se)	0.050	mg/kg d.w.	0.970	0.101	0.863	1.220	2.84	0.522	1.96	4.03	2.78	0.483	1.92	3.39
	Sodium (Na)	20	mg/kg d.w.	1,246	299	608	1,720	4,506	995	3,070	6,400	2,680	825	1,370	3,870
	Strontium (Sr)	0.050	mg/kg d.w.	0.089	0.048	<0.050	0.217	0.454	0.837	0.130	3.45	0.207	0.070	0.108	0.332
	Tellurium (Te)	0.020	mg/kg d.w.	<0.020	0	<0.020	<0.020	<0.020	0	<0.020	<0.020	<0.020	0	<0.020	<0.020
	Thallium (Tl)	0.0020	mg/kg d.w.	0.0157	0.0036	0.0108	0.0206	0.0384	0.0127	0.0237	0.0658	0.0242	0.0058	0.0164	0.0337
	Tin (Sn)	0.10	mg/kg d.w.	0.11	0.01	<0.10	0.15	0.40	0.25	<0.10	1.11	0.16	0.04	<0.10	0.19
	Uranium (U)	0.0020	mg/kg d.w.	<0.0020	0	<0.0020	<0.0020	0.0023	0.0007	<0.0020	0.0044	<0.0020	0	<0.0020	<0.0020
	Vanadium (V)	0.10	mg/kg d.w.	<0.10	0	<0.10	<0.10	0.14	0.14	<0.10	0.66	<0.10	0	<0.10	<0.10
	Zinc (Zn)	0.50	mg/kg d.w.	13.2	1.3	10.5	16.0	66.4	11.0	50.8	84.1	103	14.1	77	121
	Zirconium (Zr)	0.20	mg/kg d.w.	<0.20	0	<0.20	<0.20	<0.20	0	<0.20	<0.20	<0.20	0	<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, 2016.

Parameter		Lowest Detection Limit	Units	Northern Pike														
				PINR-NP01-M	PINR-NP02-M	PINR-NP03-M	PINR-NP04-M	PINR-NP05-M	PINR-NP06-M	PINR-NP16-M	PINR-NP08-M	PINR-NP09-M	PINR-NP10-M	PINR-NP11-M	PINR-NP12-M	PINR-NP13-M	PINR-NP14-M	PINR-NP15-M
				21-Sep-2016	21-Sep-2016	21-Sep-2016	21-Sep-2016	21-Sep-2016	21-Sep-2016	22-Sep-2016	21-Sep-2016	21-Sep-2016	22-Sep-2016	22-Sep-2016	22-Sep-2016	22-Sep-2016	22-Sep-2016	22-Sep-2016
% Moisture		0.25	%	77.3	77.9	78.1	79.7	76.7	78.4	79.0	79.2	79.1	79.3	79.8	77.2	81.2	78.9	77.4
Total Metals	Aluminum (Al)	2.0	mg/kg d.w.	2.5	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	3.4	<2.0	<2.0	<2.0	<2.0	<2.0
	Antimony (Sb)	0.010	mg/kg 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
	Arsenic (As)	0.020	mg/kg d.w.	0.099	0.362	0.380	0.666	0.277	0.432	0.683	0.269	0.274	0.359	0.666	0.392	0.239	0.371	0.603
	Barium (Ba)	0.050	mg/kg d.w.	0.279	0.117	0.080	0.201	0.053	0.324	0.120	0.084	0.106	0.106	0.118	<0.050	0.069	0.075	0.131
	Beryllium (Be)	0.010	mg/kg 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
	Bismuth (Bi)	0.010	mg/kg d.w.	<0.010	0.013	0.015	<0.010	<0.010	<0.010	0.012	0.014	<0.010	0.011	0.018	<0.010	0.011	0.018	<0.010
	Boron (B)	1.0	mg/kg 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
	Cadmium (Cd)	0.0050	mg/kg d.w.	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.0195	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
	Calcium (Ca)	20	mg/kg d.w.	2,400	1,270	1,130	1,680	880	2,960	1,010	1,350	1,790	639	1,230	564	628	959	1,340
	Cesium (Cs)	0.0050	mg/kg d.w.	0.0512	0.0295	0.0218	0.0292	0.0218	0.0303	0.0448	0.0186	0.0203	0.0311	0.0341	0.0498	0.0682	0.0273	0.0248
	Chromium (Cr)	0.050	mg/kg d.w.	0.069	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	0.363	<0.050	<0.050	0.258	0.333	<0.050
	Cobalt (Co)	0.020	mg/kg d.w.	<0.020	<0.020	0.022	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	0.024	<0.020
	Copper (Cu)	0.10	mg/kg d.w.	0.86	0.61	0.67	0.73	0.73	0.70	0.53	0.67	0.84	1.08	0.55	0.69	0.66	0.71	0.74
	Iron (Fe)	3.0	mg/kg d.w.	8.5	5.6	5.7	8.8	7.7	8.1	7.9	6.2	6.2	12.3	7.9	6.0	11.8	9.0	7.9
	Lead (Pb)	0.020	mg/kg 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
	Lithium (Li)	0.50	mg/kg 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
	Magnesium (Mg)	2.0	mg/kg d.w.	1,510	1,550	1,580	1,570	1,460	1,520	1,540	1,570	1,450	1,580	1,590	1,490	1,580	1,600	1,520
	Manganese (Mn)	0.050	mg/kg d.w.	2.43	1.81	1.16	2.20	0.902	4.73	1.24	1.58	1.82	1.02	1.33	0.666	1.11	1.13	2.32
	Mercury (Hg)	0.0050	mg/kg d.w.	2.01	1.22	2.20	1.31	1.58	1.72	2.92	0.966	0.767	1.44	2.52	1.17	2.47	1.73	1.18
	Molybdenum (Mo)	0.020	mg/kg 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
	Nickel (Ni)	0.20	mg/kg 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
	Phosphorus (P)	10	mg/kg d.w.	11,800	11,100	10,500	10,600	10,800	11,500	10,700	11,600	11,000	10,200	10,300	11,200	10,500	10,400	11,300
	Potassium (K)	20	mg/kg d.w.	18,900	20,400	20,400	18,900	19,800	19,100	20,300	22,200	19,500	21,000	20,200	20,000	22,000	20,700	19,700
	Rubidium (Rb)	0.050	mg/kg d.w.	20.3	24.1	22.8	26.4	22.2	20.8	31.3	27.3	32.0	29.4	25.9	29.7	45.8	22.5	20.7
	Selenium (Se)	0.050	mg/kg d.w.	0.654	0.804	0.949	0.906	0.878	1.01	0.869	0.922	0.919	0.810	0.987	0.630	0.767	0.768	0.839
	Sodium (Na)	20	mg/kg d.w.	1,175	1,220	1,290	2,960	1,090	1,605	1,380	1,000	2,120	1,060	1,310	1,230	653	1,350	1,110
	Strontium (Sr)	0.050	mg/kg d.w.	1.43	0.577	0.478	0.923	0.312	1.373	0.559	0.568	0.727	0.205	0.538	0.183	0.205	0.416	0.661
	Tellurium (Te)	0.020	mg/kg 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
	Thallium (Tl)	0.0020	mg/kg d.w.	0.0127	0.0116	0.0086	0.0184	0.0108	0.0122	0.0100	0.0132	0.0121	0.0099	0.0103	0.0178	0.0118	0.0083	0.0338
	Tin (Sn)	0.10	mg/kg d.w.	0.40	0.12	0.16	0.19	0.38	0.44	0.28	0.22	0.24	0.25	0.22	0.21	0.38	0.21	0.39
	Uranium (U)	0.0020	mg/kg d.w.	0.0022	<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
	Vanadium (V)	0.10	mg/kg 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
	Zinc (Zn)	0.50	mg/kg d.w.	17.8	17.4	22.9	15.4	14.6	21.0	14.3	25.9	19.8	32.6	22.1	14.6	16.4	17.6	17.6
	Zirconium (Zr)	0.20	mg/kg 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

Table C.2: Dry weight (d.w.) metal concentrations in fish muscle tissue, Rainy River Project Fish Monitoring, 2016.

Parameter		Lowest Detection Limit	Units	Walleye														
				PINR-WA01-M	PINR-WA02-M	PINR-WA03-M	PINR-WA04-M	PINR-WA05-M	PINR-WA06-M	PINR-WA07-M	PINR-WA08-M	PINR-WA09-M	PINR-WA16-M	PINR-WA11-M	PINR-WA12-M	PINR-WA13-M	PINR-WA14-M	PINR-WA15-M
				21-Sep-2016	21-Sep-2016	22-Sep-2016	22-Sep-2016	22-Sep-2016	23-Sep-2016	23-Sep-2016	23-Sep-2016	23-Sep-2016	24-Sep-2016	23-Sep-2016	24-Sep-2016	24-Sep-2016	24-Sep-2016	24-Sep-2016
% Moisture		0.25	%	78.6	80.0	79.7	79.0	80.2	77.5	79.3	77.5	79.4	78.3	78.2	78.0	77.9	78.0	79.9
Total Metals	Aluminum (Al)	2.0	mg/kg d.w.	<2.0	<2.0	<2.0	<2.0	<2.0	<5.0	2.7	2.1	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
	Antimony (Sb)	0.010	mg/kg 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
	Arsenic (As)	0.020	mg/kg d.w.	0.158	0.178	0.147	0.124	0.168	0.177	0.115	0.240	0.190	0.158	0.136	0.318	0.206	0.142	0.178
	Barium (Ba)	0.050	mg/kg d.w.	<0.050	<0.050	<0.050	<0.050	<0.050	0.052	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
	Beryllium (Be)	0.010	mg/kg 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
	Bismuth (Bi)	0.010	mg/kg d.w.	0.012	0.015	<0.010	0.018	0.013	0.019	<0.010	0.011	0.015	<0.010	<0.010	0.018	<0.010	<0.010	<0.010
	Boron (B)	1.0	mg/kg 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
	Cadmium (Cd)	0.0050	mg/kg d.w.	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.010	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
	Calcium (Ca)	20	mg/kg d.w.	662	499	499	1,030	483	468	539	794	533	462	493	450	434	508	471
	Cesium (Cs)	0.0050	mg/kg d.w.	0.0470	0.0470	0.0517	0.0600	0.0530	0.0462	0.0876	0.0489	0.0556	0.0512	0.0486	0.0696	0.0659	0.0456	0.0591
	Chromium (Cr)	0.050	mg/kg d.w.	<0.050	<0.050	<0.050	<0.050	<0.050	<0.20	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	0.155	<0.050
	Cobalt (Co)	0.020	mg/kg 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
	Copper (Cu)	0.10	mg/kg d.w.	0.76	0.64	0.74	0.62	0.44	0.59	0.69	0.63	0.78	0.63	0.59	0.67	0.57	0.53	0.56
	Iron (Fe)	3.0	mg/kg d.w.	3.6	3.6	3.3	4.7	4.1	6.3	6.6	8.5	5.2	4.1	4.1	3.7	5.0	3.6	5.3
	Lead (Pb)	0.020	mg/kg d.w.	<0.020	<0.020	<0.020	<0.020	<0.020	<0.050	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
	Lithium (Li)	0.50	mg/kg 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
	Magnesium (Mg)	2.0	mg/kg d.w.	1,515	1,530	1,540	1,580	1,520	1,305	1,610	1,600	1,650	1,510	1,600	1,550	1,430	1,440	1,520
	Manganese (Mn)	0.050	mg/kg d.w.	0.432	0.474	0.404	0.384	0.426	0.477	0.495	0.498	0.403	0.470	0.480	0.270	0.280	0.414	0.407
	Mercury (Hg)	0.0050	mg/kg d.w.	2.01	1.16	1.40	1.59	2.07	2.13	0.902	2.15	2.12	0.971	1.28	1.91	1.42	1.25	2.05
	Molybdenum (Mo)	0.020	mg/kg d.w.	<0.020	<0.020	<0.020	<0.020	<0.020	<0.040	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
	Nickel (Ni)	0.20	mg/kg d.w.	0.25	0.23	0.22	0.22	0.26	<0.20	0.26	0.29	0.27	0.24	0.20	0.24	0.22	0.24	0.26
	Phosphorus (P)	10	mg/kg d.w.	10,605	10,800	11,200	10,700	10,800	8,250	11,500	11,500	11,400	10,700	11,500	11,100	10,600	10,700	10,900
	Potassium (K)	20	mg/kg d.w.	20,000	20,900	20,900	20,700	21,200	17,800	22,400	21,400	21,800	20,600	21,600	20,600	19,600	20,500	21,200
	Rubidium (Rb)	0.050	mg/kg d.w.	50.8	56.8	59.6	63.6	53.2	39.2	103	48.3	54.6	62.1	61.1	65.9	71.3	58.2	52.6
	Selenium (Se)	0.050	mg/kg d.w.	1.06	1.07	0.927	0.964	0.987	0.915	0.870	1.22	1.11	0.901	0.938	0.911	0.863	0.905	0.911
	Sodium (Na)	20	mg/kg d.w.	1,720	1,660	1,360	1,530	608	835	1,060	1,120	1,480	1,060	1,190	1,130	1,210	1,360	1,360
	Strontium (Sr)	0.050	mg/kg d.w.	0.131	0.056	0.065	0.217	<0.050	<0.10	0.098	0.162	0.073	<0.050	0.053	0.072	0.068	0.088	0.051
	Tellurium (Te)	0.020	mg/kg 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
	Thallium (Tl)	0.0020	mg/kg d.w.	0.0145	0.0180	0.0115	0.0206	0.0182	0.0193	0.0186	0.0164	0.0181	0.0111	0.0108	0.0141	0.0202	0.0118	0.0123
	Tin (Sn)	0.10	mg/kg d.w.	<0.10	<0.10	<0.10	<0.10	0.14	0.15	<0.10	<0.10	0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
	Uranium (U)	0.0020	mg/kg 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
	Vanadium (V)	0.10	mg/kg 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
	Zinc (Zn)	0.50	mg/kg d.w.	12.9	13.6	13.2	16.0	12.4	10.5	14.0	13.8	13.2	12.1	12.5	14.8	12.0	13.1	14.3
	Zirconium (Zr)	0.20	mg/kg 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

Table C.3: Dry weight (d.w.) metal concentrations in fish liver tissue, Rainy River Project Fish Monitoring, 2016.

Parameter		Lowest Detection Limit	Units	Northern Pike														
				PINR-NP01-L	PINR-NP02-L	PINR-NP03-L	PINR-NP04-L	PINR-NP05-L	PINR-NP06-L	PINR-NP16-L	PINR-NP08-L	PINR-NP09-L	PINR-NP10-L	PINR-NP11-L	PINR-NP12-L	PINR-NP13-L	PINR-NP14-L	PINR-NP15-L
				21-Sep-2016	21-Sep-2016	21-Sep-2016	21-Sep-2016	21-Sep-2016	21-Sep-2016	22-Sep-2016	21-Sep-2016	21-Sep-2016	22-Sep-2016	22-Sep-2016	22-Sep-2016	22-Sep-2016	22-Sep-2016	22-Sep-2016
% Moisture		0.25	%	79.0	76.9	72.9	74.6	66.0	67.5	79.9	78.3	73.7	71.5	74.0	78.4	74.2	79.1	66.1
Total Metals	Aluminum (Al)	2.0	mg/kg d.w.	2.7	2.7	<2.0	6.7	<2.0	<5.0	6.9	<2.0	4.7	<2.0	6.0	3.7	4.5	3.0	<5.0
	Antimony (Sb)	0.010	mg/kg d.w.	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.014	<0.010	<0.010	<0.010	<0.010
	Arsenic (As)	0.020	mg/kg d.w.	0.048	0.190	0.113	0.204	0.095	0.138	0.159	0.169	0.207	0.195	0.173	0.185	0.191	0.189	0.107
	Barium (Ba)	0.050	mg/kg d.w.	<0.050	<0.050	<0.050	0.051	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	0.056	<0.050	<0.050
	Beryllium (Be)	0.010	mg/kg 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
	Bismuth (Bi)	0.010	mg/kg d.w.	<0.010	0.019	0.014	0.019	<0.010	0.011	0.018	0.015	<0.010	0.011	0.020	<0.010	0.030	0.021	0.011
	Boron (B)	1.0	mg/kg 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
	Cadmium (Cd)	0.0050	mg/kg d.w.	0.071	0.178	0.169	0.503	0.128	0.560	0.677	0.193	0.102	0.118	0.368	0.182	0.356	0.408	0.280
	Calcium (Ca)	20	mg/kg d.w.	154	184	129	279	87	97	237	304	151	113	164	191	269	222	144
	Cesium (Cs)	0.0050	mg/kg d.w.	0.0124	0.0097	0.0068	0.0215	<0.0050	0.0097	0.0167	0.0217	0.0141	0.0113	0.0097	0.0222	0.0351	0.0153	0.0065
	Chromium (Cr)	0.050	mg/kg d.w.	<0.050	<0.050	<0.050	<0.200	<0.050	<0.200	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	0.082	<0.050	<0.200
	Cobalt (Co)	0.020	mg/kg d.w.	0.120	0.239	0.228	0.290	0.078	0.151	0.250	0.173	0.142	0.126	0.288	0.170	0.275	0.326	0.159
	Copper (Cu)	0.10	mg/kg d.w.	59.5	148	103	130	33.9	72.9	39.6	97.0	66.1	80.1	151	87.6	178	131	69.7
	Iron (Fe)	3.0	mg/kg d.w.	502	1,090	287	1,960	108	452	335	624	160	350	1,840	392	1,920	886	987
	Lead (Pb)	0.020	mg/kg d.w.	<0.020	<0.020	<0.020	<0.050	<0.020	<0.050	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	0.024	<0.020	<0.050
	Lithium (Li)	0.50	mg/kg 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
	Magnesium (Mg)	2.0	mg/kg d.w.	748	716	620	663	349	454	828	981	563	458	503	799	697	813	404
	Manganese (Mn)	0.050	mg/kg d.w.	2.89	4.34	4.15	5.54	1.54	3.03	8.24	7.62	4.75	3.27	3.49	7.38	4.90	4.63	3.64
	Mercury (Hg)	0.0050	mg/kg d.w.	0.659	0.381	0.484	0.430	0.211	0.334	1.01	0.379	0.224	0.307	0.782	0.351	1.26	0.612	0.199
	Molybdenum (Mo)	0.020	mg/kg d.w.	0.501	0.828	0.585	1.10	0.284	0.706	0.713	0.737	0.629	0.611	0.782	0.621	0.931	0.814	0.690
	Nickel (Ni)	0.20	mg/kg 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	0.29	<0.20	<0.20
	Phosphorus (P)	10	mg/kg d.w.	13,750	13,600	11,600	10,400	5,360	7,350	15,200	17,000	9,610	8,200	8,910	14,800	11,500	15,100	6,860
	Potassium (K)	20	mg/kg d.w.	14,300	11,800	11,900	9,550	8,100	7,910	14,800	14,600	10,000	7,970	9,900	14,200	10,100	14,400	7,220
	Rubidium (Rb)	0.050	mg/kg d.w.	18.0	23.2	22.0	21.4	10.6	13.0	42.1	30.9	23.8	15.3	21.5	31.9	26.3	22.4	14.7
	Selenium (Se)	0.050	mg/kg d.w.	4.80	8.10	7.88	8.02	3.70	7.03	6.65	8.43	6.04	5.37	9.73	6.68	8.10	7.55	5.13
	Sodium (Na)	20	mg/kg d.w.	3,745	3,840	2,630	3,670	1,840	2,060	5,110	4,720	3,480	2,730	3,420	4,040	3,140	4,840	2,050
	Strontium (Sr)	0.050	mg/kg d.w.	0.149	0.172	0.101	0.240	0.063	<0.100	0.188	0.200	0.128	0.086	0.129	0.139	0.230	0.173	0.130
	Tellurium (Te)	0.020	mg/kg 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
	Thallium (Tl)	0.0020	mg/kg d.w.	0.0081	0.0109	0.0065	0.0237	0.0035	0.0090	0.0085	0.0140	0.0091	0.0059	0.0094	0.0195	0.0151	0.0060	0.0264
	Tin (Sn)	0.10	mg/kg d.w.	0.36	0.37	0.33	0.39	0.20	0.29	0.21	0.39	0.20	0.18	0.21	0.15	0.32	0.26	0.16
	Uranium (U)	0.0020	mg/kg d.w.	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	0.0041	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020
	Vanadium (V)	0.10	mg/kg d.w.	0.27	0.92	0.58	1.56	0.18	0.45	0.85	0.44	0.22	0.57	0.93	0.44	1.02	0.93	1.16
	Zinc (Zn)	0.50	mg/kg d.w.	111	181	147	168	51.5	116	135	242	160	132	160	174	195	170	118
	Zirconium (Zr)	0.20	mg/kg 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

Table C.3: Dry weight (d.w.) metal concentrations in fish liver tissue, Rainy River Project Fish Monitoring, 2016.

Parameter		Lowest Detection Limit	Units	Walleye														
				PINR-WA01-L	PINR-WA02-L	PINR-WA03-L	PINR-WA04-L	PINR-WA05-L	PINR-WA06-L	PINR-WA07-L	PINR-WA08-L	PINR-WA09-L	PINR-WA16-L	PINR-WA11-L	PINR-WA12-L	PINR-WA13-L	PINR-WA14-L	PINR-WA15-L
				21-Sep-2016	21-Sep-2016	22-Sep-2016	22-Sep-2016	22-Sep-2016	23-Sep-2016	23-Sep-2016	23-Sep-2016	23-Sep-2016	24-Sep-2016	23-Sep-2016	24-Sep-2016	24-Sep-2016	24-Sep-2016	24-Sep-2016
% Moisture		0.25	%	73.9	74.4	76.3	80.6	76.3	73.3	74.7	74.6	69.7	76.7	74.9	76.0	78.9	77.7	78.5
Total Metals	Aluminum (Al)	2.0	mg/kg d.w.	<5.0	<2.0	<2.0	2.0	<5.0	<5.0	<5.0	<2.0	<5.0	<2.0	<2.0	<2.0	2.2	<2.0	7.0
	Antimony (Sb)	0.010	mg/kg 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
	Arsenic (As)	0.020	mg/kg d.w.	0.270	0.236	0.356	0.267	0.269	0.438	0.234	0.267	0.279	0.388	0.311	0.150	0.340	0.223	0.256
	Barium (Ba)	0.050	mg/kg d.w.	<0.050	<0.050	<0.050	<0.050	0.371	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
	Beryllium (Be)	0.010	mg/kg 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
	Bismuth (Bi)	0.010	mg/kg d.w.	<0.010	<0.010	<0.010	0.015	0.013	0.013	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
	Boron (B)	1.0	mg/kg 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
	Cadmium (Cd)	0.0050	mg/kg d.w.	0.195	0.170	0.273	0.292	0.182	0.525	0.269	0.216	0.332	0.313	0.267	0.253	1.08	0.273	2.04
	Calcium (Ca)	20	mg/kg d.w.	326	350	360	626	5,860	285	1050	217	212	494	219	231	380	329	442
	Cesium (Cs)	0.0050	mg/kg d.w.	0.0303	0.0248	0.0285	0.0470	0.0545	0.0223	0.0464	0.0348	0.0235	0.0310	0.0287	0.0266	0.0357	0.0316	0.0301
	Chromium (Cr)	0.050	mg/kg d.w.	<0.200	<0.050	<0.050	<0.050	<0.200	<0.200	<0.200	<0.050	<0.200	<0.050	<0.050	<0.050	<0.050	<0.050	<0.200
	Cobalt (Co)	0.020	mg/kg d.w.	0.312	0.273	0.432	0.443	0.196	1.28	0.676	0.213	0.925	0.265	0.701	0.160	0.223	0.570	1.08
	Copper (Cu)	0.10	mg/kg d.w.	4.90	5.51	7.17	7.69	6.83	6.20	8.05	3.96	6.68	9.33	5.22	33.2	6.15	4.55	7.66
	Iron (Fe)	3.0	mg/kg d.w.	178	202	376	254	198	245	450	154	218	268	457	139	286	330	635
	Lead (Pb)	0.020	mg/kg d.w.	<0.050	<0.020	<0.020	<0.020	<0.050	<0.050	<0.050	<0.020	<0.050	<0.020	<0.020	<0.020	<0.020	<0.020	<0.050
	Lithium (Li)	0.50	mg/kg 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
	Magnesium (Mg)	2.0	mg/kg d.w.	742	700	741	884	1270	584	658	656	844	631	550	760	833	549	654
	Manganese (Mn)	0.050	mg/kg d.w.	7.42	5.37	5.30	9.16	11.7	5.19	6.09	5.51	8.92	4.38	3.98	3.97	6.16	3.59	5.56
	Mercury (Hg)	0.0050	mg/kg d.w.	0.303	0.264	0.346	0.473	0.507	0.610	0.279	0.396	0.508	0.231	0.230	0.347	0.369	0.221	0.527
	Molybdenum (Mo)	0.020	mg/kg d.w.	0.450	0.463	0.590	0.665	0.725	0.598	0.673	0.360	0.588	0.441	0.335	0.230	0.409	0.311	0.667
	Nickel (Ni)	0.20	mg/kg d.w.	<0.20	0.22	<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	mg/kg d.w.	10,750	12,300	12,200	13,900	18,200	9,710	10,600	10,000	13,500	9,620	8,130	11,300	12,500	8,240	10,700
	Potassium (K)	20	mg/kg d.w.	9,720	11,500	12,500	14,000	12,400	8,790	10,500	11,400	9,910	10,600	10,200	12,300	13,400	10,600	9,460
	Rubidium (Rb)	0.050	mg/kg d.w.	30.9	34.8	28.2	51.2	37.1	22.4	46.2	42.1	25.3	30.5	30.6	43.6	58.0	30.6	23.3
	Selenium (Se)	0.050	mg/kg d.w.	2.21	2.35	3.21	4.03	3.13	3.06	2.99	2.38	2.87	2.96	2.62	1.96	3.31	2.46	3.07
	Sodium (Na)	20	mg/kg d.w.	3,885	3,980	6,400	4,950	3,470	3,820	4,310	3,070	3,070	5,310	4,310	5,010	5,920	5,360	4,720
	Strontium (Sr)	0.050	mg/kg d.w.	0.210	0.194	0.221	0.382	3.45	0.180	0.600	0.151	0.130	0.292	0.153	0.174	0.240	0.214	0.220
	Tellurium (Te)	0.020	mg/kg 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
	Thallium (Tl)	0.0020	mg/kg d.w.	0.0261	0.0387	0.0335	0.0576	0.0371	0.0387	0.0658	0.0338	0.0485	0.0296	0.0286	0.0237	0.0552	0.0266	0.0318
	Tin (Sn)	0.10	mg/kg d.w.	0.41	0.41	0.36	0.67	0.49	0.49	0.45	0.33	0.25	1.11	0.27	<0.10	0.13	0.21	0.26
	Uranium (U)	0.0020	mg/kg d.w.	<0.0020	<0.0020	<0.0020	<0.0020	0.0033	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	0.0021	<0.0020	0.0044
	Vanadium (V)	0.10	mg/kg d.w.	<0.10	<0.10	<0.10	0.14	<0.10	0.12	<0.10	<0.10	0.15	<0.10	<0.10	<0.10	<0.10	<0.10	0.66
	Zinc (Zn)	0.50	mg/kg d.w.	53.2	58.6	76.5	80.3	78.2	50.8	68.9	52.6	62.7	70.4	61.4	77.6	84.1	58.1	62.0
	Zirconium (Zr)	0.20	mg/kg 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

Table C.4: Dry weight (d.w.) metal concentrations in fish ovaries, Rainy River Project Fish Monitoring, 2016.

Parameter		Lowest Detection Limit	Units	Northern Pike							Walleye							
				PINR-NP01-O	PINR-NP02-O	PINR-NP03-O	PINR-NP08-O	PINR-NP12-O	PINR-NP14-O	PINR-NP16-O	PINR-WA01-O	PINR-WA02-O	PINR-WA04-O	PINR-WA05-O	PINR-WA08-O	PINR-WA09-O	PINR-WA12-O	PINR-WA13-O
				21-Sep-2016	21-Sep-2016	21-Sep-2016	21-Sep-2016	22-Sep-2016	22-Sep-2016	22-Sep-2016	21-Sep-2016	21-Sep-2016	22-Sep-2016	22-Sep-2016	23-Sep-2016	23-Sep-2016	24-Sep-2016	24-Sep-2016
	% Moisture	0.25	%	80.7	82.9	80.3	81.7	80.5	82.0	82.5	67.7	70.8	71.8	67.8	71.1	67.7	73.1	71.7
Total Metals	Aluminum (Al)	2.0	mg/kg d.w.	<2.0	3.1	<2.0	2.1	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
	Antimony (Sb)	0.010	mg/kg 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
	Arsenic (As)	0.020	mg/kg d.w.	0.026	0.125	0.096	0.103	0.120	0.143	0.244	0.145	0.147	0.112	0.126	0.150	0.158	0.128	0.193
	Barium (Ba)	0.050	mg/kg d.w.	0.263	0.068	0.142	0.059	0.195	0.061	0.099	0.051	0.076	<0.050	0.062	0.071	0.062	0.129	0.081
	Beryllium (Be)	0.010	mg/kg 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
	Bismuth (Bi)	0.010	mg/kg 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
	Boron (B)	1.0	mg/kg 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
	Cadmium (Cd)	0.0050	mg/kg d.w.	0.0110	0.0292	0.0252	0.0349	0.0270	0.0478	0.0553	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.0093	0.0160
	Calcium (Ca)	20	mg/kg d.w.	631	620	631	748	642	708	680	564	886	767	463	759	594	717	1,040
	Cesium (Cs)	0.0050	mg/kg d.w.	0.0349	0.0296	0.0177	0.0233	0.0413	0.0299	0.0320	0.0285	0.0320	0.0394	0.0268	0.0297	0.0301	0.0415	0.0400
	Chromium (Cr)	0.050	mg/kg d.w.	0.204	0.183	0.058	0.073	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
	Cobalt (Co)	0.020	mg/kg d.w.	0.157	0.469	0.346	0.255	0.278	0.428	0.227	0.188	0.256	0.256	0.194	0.210	0.198	0.138	0.160
	Copper (Cu)	0.10	mg/kg d.w.	6.71	7.08	6.41	7.54	6.81	7.46	5.55	2.17	2.50	2.33	2.29	2.50	2.10	2.53	2.94
	Iron (Fe)	3.0	mg/kg d.w.	214	358	262	324	286	285	228	84.8	90.2	110	66.2	75.5	80.3	64.5	87.8
	Lead (Pb)	0.020	mg/kg 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
	Lithium (Li)	0.50	mg/kg 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
	Magnesium (Mg)	2.0	mg/kg d.w.	1,305	1,290	1,280	1,400	1,350	1,300	1,320	1,160	1,080	962	1,300	1,260	1,040	1,060	1,040
	Manganese (Mn)	0.050	mg/kg d.w.	118	260	193	163	185	172	193	14.1	16.8	17.7	21.9	11.9	18.9	5.23	3.98
	Mercury (Hg)	0.0050	mg/kg d.w.	0.199	0.0991	0.153	0.0981	0.0929	0.173	0.299	0.0968	0.0780	0.101	0.0922	0.101	0.0798	0.0660	0.0528
	Molybdenum (Mo)	0.020	mg/kg d.w.	0.292	0.352	0.213	0.337	0.255	0.345	0.211	0.0460	0.0540	0.0520	0.0390	0.0370	0.0480	0.0360	0.0210
	Nickel (Ni)	0.20	mg/kg d.w.	0.21	<0.20	<0.20	<0.20	0.27	0.27	0.21	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
	Phosphorus (P)	10	mg/kg d.w.	16,500	16,500	16,000	16,700	15,900	17,200	16,900	9,120	9,460	9,280	8,870	10,100	8,490	9,170	8,620
	Potassium (K)	20	mg/kg d.w.	19,400	22,300	19,200	22,400	19,200	22,300	21,000	9,670	12,000	12,100	8,020	10,500	9,540	11,700	10,800
	Rubidium (Rb)	0.050	mg/kg d.w.	23.6	31.5	25.8	33.5	34.9	29.9	36.6	26.1	35.2	39.3	22.4	26.9	26.7	32.4	40.7
	Selenium (Se)	0.050	mg/kg d.w.	4.28	4.29	4.86	9.49	4.20	5.30	4.17	2.92	3.07	3.39	2.61	3.28	2.64	1.92	2.43
	Sodium (Na)	20	mg/kg d.w.	4,515	5,210	4,530	3,940	4,170	4,790	5,910	2,130	2,540	2,840	1,370	2,510	2,410	3,770	3,870
	Strontium (Sr)	0.050	mg/kg d.w.	0.556	0.328	0.392	0.306	0.500	0.355	0.349	0.160	0.332	0.193	0.108	0.223	0.160	0.206	0.274
	Tellurium (Te)	0.020	mg/kg d.w.	0.02	<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	mg/kg d.w.	0.0233	0.0216	0.0155	0.0205	0.0295	0.0148	0.0167	0.0221	0.0306	0.0337	0.0193	0.0212	0.0268	0.0164	0.0231
	Tin (Sn)	0.10	mg/kg d.w.	0.17	0.17	0.11	0.13	<0.10	0.12	0.12	0.16	0.19	0.11	<0.10	0.19	<0.10	<0.10	<0.10
	Uranium (U)	0.0020	mg/kg 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
	Vanadium (V)	0.10	mg/kg d.w.	<0.10	0.24	0.21	<0.10	<0.10	0.14	0.20	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
	Zinc (Zn)	0.50	mg/kg d.w.	370	422	348	467	427	332	285	99.3	121	119	99.8	110	96.4	97.7	77.2
	Zirconium (Zr)	0.20	mg/kg 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

Table C.5: Wet weight (w.w.) metal concentrations in fish muscle tissue, Rainy River Project Fish Tissue Monitoring, 2016.

Parameter		Lowest Detection Limit	Units	Benchmark[1,2]	Northern Pike														
					PINR-NP01-M	PINR-NP02-M	PINR-NP03-M	PINR-NP04-M	PINR-NP05-M	PINR-NP06-M	PINR-NP16-M	PINR-NP08-M	PINR-NP09-M	PINR-NP10-M	PINR-NP11-M	PINR-NP12-M	PINR-NP13-M	PINR-NP14-M	PINR-NP15-M
					21-Sep-2016	21-Sep-2016	21-Sep-2016	21-Sep-2016	21-Sep-2016	21-Sep-2016	22-Sep-2016	21-Sep-2016	21-Sep-2016	22-Sep-2016	22-Sep-2016	22-Sep-2016	22-Sep-2016	22-Sep-2016	22-Sep-2016
% Moisture		0.25	%	-	77.3	77.9	78.1	79.7	76.7	78.4	79.0	79.2	79.1	79.3	79.8	77.2	81.2	78.9	77.4
Total Metals	Aluminum (Al)	2.0	mg/kg w.w.	-	0.6	<0.4	<0.4	<0.4	<0.5	<0.4	<0.4	<0.4	<0.4	0.7	<0.4	<0.5	<0.4	<0.4	<0.5
	Antimony (Sb)	0.010	mg/kg w.w.	0.3	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
	Arsenic (As)	0.020	mg/kg w.w.	0.2	0.022	0.080	0.083	0.135	0.065	0.094	0.143	0.056	0.057	0.074	0.135	0.089	0.045	0.078	0.136
	Barium (Ba)	0.050	mg/kg w.w.	126	0.063	0.026	0.018	0.041	0.012	0.070	0.025	0.017	0.022	0.022	0.024	<0.011	0.013	0.016	0.030
	Beryllium (Be)	0.010	mg/kg w.w.	1.3	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
	Bismuth (Bi)	0.010	mg/kg w.w.	-	<0.002	0.003	0.003	<0.002	<0.002	<0.002	0.003	0.003	<0.002	0.002	0.004	<0.002	0.002	0.004	<0.002
	Boron (B)	1.0	mg/kg w.w.	63.1	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
	Cadmium (Cd)	0.0050	mg/kg w.w.	0.6	<0.0011	<0.0011	<0.0011	<0.0010	<0.0012	<0.0011	<0.0011	<0.0010	<0.0010	0.0040	<0.0010	<0.0011	<0.0009	<0.0011	<0.0011
	Calcium (Ca)	20	mg/kg w.w.	-	546	281	247	341	205	641	212	281	374	132	248	129	118	202	303
	Cesium (Cs)	0.0050	mg/kg w.w.	-	0.0116	0.0065	0.0048	0.0059	0.0051	0.0065	0.0094	0.0039	0.0042	0.0064	0.0069	0.0114	0.0128	0.0058	0.0056
	Chromium (Cr)	0.050	mg/kg w.w.	0.6	0.016	<0.011	<0.011	<0.010	<0.012	<0.011	<0.011	<0.010	<0.010	0.075	<0.010	<0.011	0.049	0.070	<0.011
	Cobalt (Co)	0.020	mg/kg w.w.	-	<0.005	<0.004	0.005	<0.004	<0.005	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.005	<0.004	0.005	<0.005
	Copper (Cu)	0.10	mg/kg w.w.	57.4	0.20	0.13	0.15	0.15	0.17	0.15	0.11	0.14	0.18	0.22	0.11	0.16	0.12	0.15	0.17
	Iron (Fe)	3.0	mg/kg w.w.	-	1.9	1.2	1.2	1.8	1.8	1.8	1.7	1.3	1.3	2.5	1.6	1.4	2.2	1.9	1.8
	Lead (Pb)	0.020	mg/kg w.w.	2.3	<0.005	<0.004	<0.004	<0.004	<0.005	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.005	<0.004	<0.004	<0.005
	Lithium (Li)	0.50	mg/kg w.w.	-	<0.11	<0.11	<0.11	<0.10	<0.12	<0.11	<0.11	<0.10	<0.10	<0.10	<0.10	<0.11	<0.09	<0.11	<0.11
	Magnesium (Mg)	2.0	mg/kg w.w.	-	344	343	346	319	340	329	323	327	303	327	321	340	297	338	344
	Manganese (Mn)	0.050	mg/kg w.w.	76.9	0.55	0.40	0.25	0.45	0.21	1.02	0.26	0.33	0.38	0.21	0.27	0.152	0.21	0.24	0.52
	Mercury (Hg)	0.0050	mg/kg w.w.	0.5	0.456	0.270	0.482	0.266	0.368	0.372	0.613	0.201	0.160	0.298	0.509	0.267	0.464	0.365	0.267
	Molybdenum (Mo)	0.020	mg/kg w.w.	3.2	<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
	Nickel (Ni)	0.20	mg/kg w.w.	0.7	<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	mg/kg w.w.	-	2,685	2,453	2,300	2,152	2,516	2,490	2,247	2,413	2,299	2,111	2,081	2,554	1,974	2,194	2,554
	Potassium (K)	20	mg/kg w.w.	-	4,300	4,508	4,468	3,837	4,613	4,135	4,263	4,618	4,076	4,347	4,080	4,560	4,136	4,368	4,452
	Rubidium (Rb)	0.050	mg/kg w.w.	-	4.6	5.3	5.0	5.4	5.2	4.5	6.6	5.7	6.7	6.1	5.2	6.8	8.6	4.7	4.7
	Selenium (Se)	0.050	mg/kg w.w.	3.2	0.149	0.178	0.208	0.184	0.205	0.22	0.182	0.192	0.192	0.168	0.199	0.144	0.144	0.162	0.190
	Sodium (Na)	20	mg/kg w.w.	-	267	270	283	601	254	347	290	208	443	219	265	280	123	285	251
	Strontium (Sr)	0.050	mg/kg w.w.	378	0.32	0.13	0.10	0.19	0.073	0.30	0.12	0.12	0.15	0.042	0.11	0.042	0.039	0.088	0.149
	Tellurium (Te)	0.020	mg/kg w.w.	-	<0.005	<0.004	<0.004	<0.004	<0.005	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.005	<0.004	<0.004	<0.005
	Thallium (Tl)	0.0020	mg/kg w.w.	-	0.0029	0.0026	0.0019	0.0037	0.0025	0.0026	0.0021	0.0027	0.0025	0.0020	0.0021	0.0041	0.0022	0.0018	0.0076
	Tin (Sn)	0.10	mg/kg w.w.	-	0.09	0.03	0.04	0.04	0.09	0.10	0.06	0.05	0.05	0.05	0.04	0.05	0.07	0.04	0.09
	Uranium (U)	0.0020	mg/kg w.w.	0.4	0.0005	<0.0004	<0.0004	<0.0004	<0.0005	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0005	<0.0004	<0.0004	<0.0005
	Vanadium (V)	0.10	mg/kg w.w.	-	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
	Zinc (Zn)	0.50	mg/kg w.w.	189	4.0	3.8	5.0	3.1	3.4	4.5	3.0	5.4	4.1	6.7	4.5	3.3	3.1	3.7	4.0
	Zirconium (Zr)	0.20	mg/kg w.w.	-	<0.05	<0.04	<0.04	<0.04	<0.05	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.05	<0.04	<0.04	<0.05

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.5: Wet weight (w.w.) metal concentrations in fish muscle tissue, Rainy River Project Fish Tissue Monitoring, 2016.

Parameter		Lowest Detection Limit	Units	Benchmark[1,2]	Walleye														
					PINR-WA01-M	PINR-WA02-M	PINR-WA03-M	PINR-WA04-M	PINR-WA05-M	PINR-WA06-M	PINR-WA07-M	PINR-WA08-M	PINR-WA09-M	PINR-WA16-M	PINR-WA11-M	PINR-WA12-M	PINR-WA13-M	PINR-WA14-M	PINR-WA15-M
					21-Sep-2016	21-Sep-2016	22-Sep-2016	22-Sep-2016	22-Sep-2016	23-Sep-2016	23-Sep-2016	23-Sep-2016	23-Sep-2016	24-Sep-2016	23-Sep-2016	24-Sep-2016	24-Sep-2016	24-Sep-2016	24-Sep-2016
	% Moisture	0.25	%	-	78.6	80.0	79.7	79.0	80.2	77.5	79.3	77.5	79.4	78.3	78.2	78.0	77.9	78.0	79.9
Total Metals	Aluminum (Al)	2.0	mg/kg w.w.	-	<0.4	<0.4	<0.4	<0.4	<0.4	<1.1	0.6	0.5	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4
	Antimony (Sb)	0.010	mg/kg w.w.	0.3	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
	Arsenic (As)	0.020	mg/kg w.w.	0.2	0.034	0.036	0.030	0.026	0.033	0.040	0.024	0.054	0.039	0.034	0.030	0.070	0.046	0.031	0.036
	Barium (Ba)	0.050	mg/kg w.w.	126	<0.011	<0.010	<0.010	<0.011	<0.010	0.012	<0.010	<0.011	<0.010	<0.011	<0.011	<0.011	<0.011	<0.011	<0.010
	Beryllium (Be)	0.010	mg/kg w.w.	1.3	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
	Bismuth (Bi)	0.010	mg/kg w.w.	-	0.002	0.003	<0.002	0.004	0.003	0.004	<0.002	0.002	0.003	<0.002	<0.002	0.004	<0.002	<0.002	<0.002
	Boron (B)	1.0	mg/kg w.w.	63.1	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
	Cadmium (Cd)	0.0050	mg/kg w.w.	0.6	<0.0011	<0.0010	<0.0010	<0.0011	<0.0010	<0.0023	<0.0010	<0.0011	<0.0010	<0.0011	<0.0011	<0.0011	<0.0011	<0.0011	<0.0010
	Calcium (Ca)	20	mg/kg w.w.	-	142	100	101	216	96	105	112	179	110	100	107	99	96	112	95
	Cesium (Cs)	0.0050	mg/kg w.w.	-	0.0101	0.0094	0.0105	0.0126	0.0105	0.0104	0.0181	0.0110	0.0115	0.0111	0.0106	0.0153	0.0146	0.0100	0.0119
	Chromium (Cr)	0.050	mg/kg w.w.	0.6	<0.011	<0.010	<0.010	<0.011	<0.010	<0.045	<0.010	<0.011	<0.010	<0.011	<0.011	<0.011	<0.011	0.034	<0.010
	Cobalt (Co)	0.020	mg/kg w.w.	-	<0.004	<0.004	<0.004	<0.004	<0.004	<0.005	<0.004	<0.005	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004
	Copper (Cu)	0.10	mg/kg w.w.	57.4	0.16	0.13	0.15	0.13	0.09	0.13	0.14	0.14	0.16	0.14	0.13	0.15	0.13	0.12	0.11
	Iron (Fe)	3.0	mg/kg w.w.	-	0.8	0.7	0.7	1.0	0.8	1.4	1.4	1.9	1.1	0.9	0.9	0.8	1.1	0.8	1.1
	Lead (Pb)	0.020	mg/kg w.w.	2.3	<0.004	<0.004	<0.004	<0.004	<0.004	<0.011	<0.004	<0.005	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004
	Lithium (Li)	0.50	mg/kg w.w.	-	<0.11	<0.10	<0.10	<0.11	<0.10	<0.11	<0.10	<0.11	<0.10	<0.11	<0.11	<0.11	<0.11	<0.11	<0.10
	Magnesium (Mg)	2.0	mg/kg w.w.	-	325	306	313	332	301	294	333	360	340	328	349	341	316	317	306
	Manganese (Mn)	0.050	mg/kg w.w.	76.9	0.093	0.095	0.082	0.081	0.084	0.107	0.102	0.112	0.083	0.102	0.105	0.059	0.062	0.091	0.082
	Mercury (Hg)	0.0050	mg/kg w.w.	0.5	0.430	0.232	0.284	0.334	0.410	0.478	0.187	0.484	0.437	0.211	0.279	0.420	0.314	0.275	0.412
	Molybdenum (Mo)	0.020	mg/kg w.w.	3.2	<0.020	<0.020	<0.020	<0.020	<0.020	<0.021	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
	Nickel (Ni)	0.20	mg/kg w.w.	0.7	0.05	0.05	0.04	0.05	0.05	<0.20	0.05	0.07	0.06	0.05	0.04	0.05	0.05	0.05	0.05
	Phosphorus (P)	10	mg/kg w.w.	-	2,275	2,160	2,274	2,247	2,138	1,856	2,381	2,588	2,348	2,322	2,507	2,442	2,343	2,354	2,191
	Potassium (K)	20	mg/kg w.w.	-	4,290	4,180	4,243	4,347	4,198	4,005	4,637	4,815	4,491	4,470	4,709	4,532	4,332	4,510	4,261
	Rubidium (Rb)	0.050	mg/kg w.w.	-	11	11	12	13	11	8.8	21	11	11	13	13	14	16	13	11
	Selenium (Se)	0.050	mg/kg w.w.	3.2	0.226	0.214	0.188	0.202	0.195	0.206	0.180	0.275	0.229	0.196	0.204	0.200	0.191	0.199	0.183
	Sodium (Na)	20	mg/kg w.w.	-	369	332	276	321	120	188	219	252	305	230	259	249	267	299	273
	Strontium (Sr)	0.050	mg/kg w.w.	378	0.028	0.011	0.013	0.046	<0.010	<0.023	0.020	0.036	0.015	<0.011	0.012	0.016	0.015	0.019	0.010
	Tellurium (Te)	0.020	mg/kg w.w.	-	<0.004	<0.004	<0.004	<0.004	<0.004	<0.005	<0.004	<0.005	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004
	Thallium (Tl)	0.0020	mg/kg w.w.	-	0.0031	0.0036	0.0023	0.0043	0.0036	0.0043	0.0039	0.0037	0.0037	0.0024	0.0024	0.0031	0.0045	0.0026	0.0025
	Tin (Sn)	0.10	mg/kg w.w.	-	<0.02	<0.02	<0.02	<0.02	0.03	0.03	<0.02	<0.02	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
	Uranium (U)	0.0020	mg/kg w.w.	0.4	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0005	<0.0004	<0.0005	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004
	Vanadium (V)	0.10	mg/kg w.w.	-	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
	Zinc (Zn)	0.50	mg/kg w.w.	189	2.8	2.7	2.7	3.4	2.5	2.4	2.9	3.1	2.7	2.6	2.7	3.3	2.7	2.9	2.9
	Zirconium (Zr)	0.20	mg/kg w.w.	-	<0.04	<0.04	<0.04	<0.04	<0.04	<0.05	<0.04	<0.05	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04

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, 2016.

Parameter		Lowest Detection Limit	Units	Benchmark[1,2]	Northern Pike														
					PINR-NP01-L	PINR-NP02-L	PINR-NP03-L	PINR-NP04-L	PINR-NP05-L	PINR-NP06-L	PINR-NP16-L	PINR-NP08-L	PINR-NP09-L	PINR-NP10-L	PINR-NP11-L	PINR-NP12-L	PINR-NP13-L	PINR-NP14-L	PINR-NP15-L
					21-Sep-2016	21-Sep-2016	21-Sep-2016	21-Sep-2016	21-Sep-2016	21-Sep-2016	22-Sep-2016	21-Sep-2016	21-Sep-2016	22-Sep-2016	22-Sep-2016	22-Sep-2016	22-Sep-2016	22-Sep-2016	22-Sep-2016
	% Moisture	0.25	%	-	79.0	76.9	72.9	74.6	66.0	67.5	79.9	78.3	73.7	71.5	74.0	78.4	74.2	79.1	66.1
Total Metals	Aluminum (Al)	2.0	mg/kg w.w.	-	0.6	0.6	<0.5	1.7	<0.7	<1.6	1.4	<0.4	1.2	<0.6	1.6	0.8	1.2	0.6	<1.7
	Antimony (Sb)	0.010	mg/kg w.w.	0.3	<0.002	<0.002	<0.003	<0.003	<0.003	<0.003	<0.002	<0.002	<0.003	<0.003	0.004	<0.002	<0.003	<0.002	<0.003
	Arsenic (As)	0.020	mg/kg w.w.	0.2	0.010	0.044	0.031	0.052	0.032	0.045	0.032	0.037	0.054	0.056	0.045	0.040	0.049	0.040	0.036
	Barium (Ba)	0.050	mg/kg w.w.	126	<0.011	<0.012	<0.014	0.013	<0.017	<0.016	<0.010	<0.011	<0.013	<0.014	<0.013	<0.011	0.014	<0.010	<0.017
	Beryllium (Be)	0.010	mg/kg w.w.	1.3	<0.002	<0.002	<0.003	<0.003	<0.003	<0.003	<0.002	<0.002	<0.003	<0.003	<0.003	<0.002	<0.003	<0.002	<0.003
	Bismuth (Bi)	0.010	mg/kg w.w.	-	<0.002	0.004	0.004	0.005	<0.003	0.004	0.004	0.003	<0.003	0.003	0.005	<0.002	0.008	0.004	0.004
	Boron (B)	1.0	mg/kg w.w.	63.1	<0.2	<0.2	<0.3	<0.3	<0.3	<0.3	<0.2	<0.2	<0.3	<0.3	<0.3	<0.2	<0.3	<0.2	<0.3
	Cadmium (Cd)	0.0050	mg/kg w.w.	0.6	0.0149	0.041	0.046	0.128	0.044	0.182	0.136	0.042	0.027	0.034	0.096	0.039	0.092	0.085	0.095
	Calcium (Ca)	20	mg/kg w.w.	-	32	43	35	71	30	32	48	66	40	32	43	41	69	46	49
	Cesium (Cs)	0.0050	mg/kg w.w.	-	0.0026	0.0022	0.0018	0.0055	<0.0017	0.0032	0.0034	0.0047	0.0037	0.0032	0.0025	0.0048	0.0091	0.0032	0.0022
	Chromium (Cr)	0.050	mg/kg w.w.	0.6	<0.011	<0.012	<0.014	<0.051	<0.017	<0.065	<0.010	<0.011	<0.013	<0.014	<0.013	<0.011	0.021	<0.010	<0.068
	Cobalt (Co)	0.020	mg/kg w.w.	-	0.025	0.055	0.062	0.074	0.027	0.049	0.050	0.038	0.037	0.036	0.075	0.037	0.071	0.068	0.054
	Copper (Cu)	0.10	mg/kg w.w.	57.4	12.5	34	28	33	11.5	23.7	8.0	21.0	17.4	22.8	39	18.9	46	27	23.6
	Iron (Fe)	3.0	mg/kg w.w.	-	106	252	78	498	37	147	67	135	42	100	478	85	495	185	335
	Lead (Pb)	0.020	mg/kg w.w.	2.3	<0.004	<0.005	<0.005	<0.013	<0.007	<0.016	<0.004	<0.004	<0.005	<0.006	<0.005	<0.004	0.006	<0.004	<0.017
	Lithium (Li)	0.50	mg/kg w.w.	-	<0.11	<0.12	<0.14	<0.13	<0.17	<0.16	<0.10	<0.11	<0.13	<0.14	<0.13	<0.11	<0.13	<0.10	<0.17
	Magnesium (Mg)	2.0	mg/kg w.w.	-	157	165	168	168	119	148	166	213	148	131	131	173	180	170	137
	Manganese (Mn)	0.050	mg/kg w.w.	76.9	0.61	1.00	1.12	1.41	0.52	0.98	1.66	1.65	1.25	0.93	0.91	1.59	1.26	0.97	1.23
	Mercury (Hg)	0.0050	mg/kg w.w.	0.5	0.139	0.088	0.131	0.109	0.072	0.109	0.203	0.082	0.059	0.087	0.203	0.076	0.325	0.128	0.067
	Molybdenum (Mo)	0.020	mg/kg w.w.	3.2	0.105	0.191	0.159	0.28	0.097	0.229	0.143	0.160	0.165	0.174	0.203	0.134	0.240	0.170	0.234
	Nickel (Ni)	0.20	mg/kg w.w.	0.7	0.04	<0.20	<0.21	<0.21	<0.21	<0.21	<0.20	<0.20	<0.21	<0.21	<0.21	<0.20	0.07	<0.20	<0.21
	Phosphorus (P)	10	mg/kg w.w.	-	2,894	3,142	3,144	2,642	1,822	2,389	3,055	3,689	2,527	2,337	2,317	3,197	2,967	3,156	2,326
	Potassium (K)	20	mg/kg w.w.	-	3,010	2,726	3,225	2,426	2,754	2,571	2,975	3,168	2,630	2,271	2,574	3,067	2,606	3,010	2,448
	Rubidium (Rb)	0.050	mg/kg w.w.	-	3.8	5.4	6.0	5.4	3.6	4.2	8.5	6.7	6.3	4.4	5.6	6.9	6.8	4.7	5.0
	Selenium (Se)	0.050	mg/kg w.w.	3.2	1.01	1.87	2.14	2.04	1.26	2.28	1.34	1.83	1.59	1.53	2.53	1.44	2.09	1.58	1.74
	Sodium (Na)	20	mg/kg w.w.	-	788	887	713	932	626	670	1,027	1,024	915	778	889	873	810	1,012	695
	Strontium (Sr)	0.050	mg/kg w.w.	378	0.031	0.040	0.027	0.06	0.021	<0.033	0.038	0.043	0.034	0.025	0.034	0.030	0.059	0.036	0.04
	Tellurium (Te)	0.020	mg/kg w.w.	-	<0.004	<0.005	<0.005	<0.005	<0.007	<0.007	<0.004	<0.004	<0.005	<0.006	<0.005	<0.004	<0.005	<0.004	<0.007
	Thallium (Tl)	0.0020	mg/kg w.w.	-	0.0017	0.0025	0.0018	0.0060	0.0012	0.0029	0.0017	0.0030	0.0024	0.0017	0.0024	0.0042	0.0039	0.0013	0.0089
	Tin (Sn)	0.10	mg/kg w.w.	-	0.07	0.09	0.09	0.10	0.07	0.09	0.04	0.08	0.05	0.05	0.05	0.03	0.08	0.05	0.05
	Uranium (U)	0.0020	mg/kg w.w.	0.4	<0.0004	<0.0005	<0.0005	<0.0005	<0.0007	<0.0007	0.0008	<0.0004	<0.0005	<0.0006	<0.0005	<0.0004	<0.0005	<0.0004	<0.0007
	Vanadium (V)	0.10	mg/kg w.w.	-	0.06	0.21	0.16	0.40	0.06	0.15	0.17	0.10	0.06	0.16	0.24	0.10	0.26	0.19	0.39
	Zinc (Zn)	0.50	mg/kg w.w.	189	23	42	40	43	17.5	38	27	53	42	38	42	38	50	36	40
	Zirconium (Zr)	0.20	mg/kg w.w.	-	<0.04	<0.05	<0.05	<0.05	<0.07	<0.07	<0.04	<0.04	<0.05	<0.06	<0.05	<0.04	<0.05	<0.04	<0.07

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, 2016.

Parameter		Lowest Detection Limit	Units	Benchmark[1,2]	Walleye														
					PINR-WA01-L	PINR-WA02-L	PINR-WA03-L	PINR-WA04-L	PINR-WA05-L	PINR-WA06-L	PINR-WA07-L	PINR-WA08-L	PINR-WA09-L	PINR-WA16-L	PINR-WA11-L	PINR-WA12-L	PINR-WA13-L	PINR-WA14-L	PINR-WA15-L
					21-Sep-2016	21-Sep-2016	22-Sep-2016	22-Sep-2016	22-Sep-2016	23-Sep-2016	23-Sep-2016	23-Sep-2016	23-Sep-2016	24-Sep-2016	23-Sep-2016	24-Sep-2016	24-Sep-2016	24-Sep-2016	24-Sep-2016
% Moisture		0.25	%	-	73.9	74.4	76.3	80.6	76.3	73.3	74.7	74.6	69.7	76.7	74.9	76.0	78.9	77.7	78.5
Total Metals	Aluminum (Al)	2.0	mg/kg w.w.	-	<1.3	<0.5	<0.5	0.4	<1.2	<1.3	<1.3	<0.5	<1.5	<0.5	<0.5	<0.5	0.5	<0.4	1.5
	Antimony (Sb)	0.010	mg/kg w.w.	0.3	<0.003	<0.003	<0.002	<0.002	<0.002	<0.003	<0.003	<0.003	<0.003	<0.002	<0.003	<0.002	<0.002	<0.002	<0.002
	Arsenic (As)	0.020	mg/kg w.w.	0.2	0.070	0.060	0.084	0.052	0.064	0.117	0.059	0.068	0.085	0.090	0.078	0.036	0.072	0.050	0.055
	Barium (Ba)	0.050	mg/kg w.w.	126	<0.013	<0.013	<0.012	<0.010	0.088	<0.013	<0.013	<0.013	<0.015	<0.012	<0.013	<0.012	<0.011	<0.011	<0.011
	Beryllium (Be)	0.010	mg/kg w.w.	1.3	<0.003	<0.003	<0.002	<0.002	<0.002	<0.003	<0.003	<0.003	<0.003	<0.002	<0.003	<0.002	<0.002	<0.002	<0.002
	Bismuth (Bi)	0.010	mg/kg w.w.	-	<0.003	<0.003	<0.002	0.003	0.003	0.003	<0.003	<0.003	<0.003	<0.002	<0.003	<0.002	<0.002	<0.002	<0.002
	Boron (B)	1.0	mg/kg w.w.	63.1	<0.3	<0.3	<0.2	<0.2	<0.2	<0.3	<0.3	<0.3	<0.3	<0.2	<0.3	<0.2	<0.2	<0.2	<0.2
	Cadmium (Cd)	0.0050	mg/kg w.w.	0.6	0.051	0.044	0.065	0.057	0.043	0.140	0.068	0.055	0.101	0.073	0.067	0.061	0.23	0.061	0.44
	Calcium (Ca)	20	mg/kg w.w.	-	85	90	85	121	1389	76	266	55	64	115	55	55	80	73	95
	Cesium (Cs)	0.0050	mg/kg w.w.	-	0.0079	0.0063	0.0068	0.0091	0.0129	0.0060	0.0117	0.0088	0.0071	0.0072	0.0072	0.0064	0.0075	0.0070	0.0065
	Chromium (Cr)	0.050	mg/kg w.w.	0.6	<0.052	<0.013	<0.012	<0.010	<0.047	<0.053	<0.051	<0.013	<0.061	<0.012	<0.013	<0.012	<0.011	<0.011	<0.043
	Cobalt (Co)	0.020	mg/kg w.w.	-	0.081	0.070	0.102	0.086	0.046	0.34	0.171	0.054	0.280	0.062	0.176	0.038	0.047	0.127	0.23
	Copper (Cu)	0.10	mg/kg w.w.	57.4	1.28	1.41	1.70	1.49	1.62	1.66	2.04	1.01	2.02	2.17	1.31	8.0	1.30	1.01	1.65
	Iron (Fe)	3.0	mg/kg w.w.	-	46	52	89	49	47	65	114	39	66	62	115	33	60	74	137
	Lead (Pb)	0.020	mg/kg w.w.	2.3	<0.013	<0.005	<0.005	<0.004	<0.012	<0.013	<0.013	<0.005	<0.015	<0.005	<0.005	<0.005	<0.004	<0.004	<0.011
	Lithium (Li)	0.50	mg/kg w.w.	-	<0.13	<0.13	<0.12	<0.10	<0.12	<0.13	<0.13	<0.13	<0.15	<0.12	<0.13	<0.12	<0.11	<0.11	<0.11
	Magnesium (Mg)	2.0	mg/kg w.w.	-	194	179	176	171	301	156	166	167	256	147	138	182	176	122	141
	Manganese (Mn)	0.050	mg/kg w.w.	76.9	1.94	1.37	1.26	1.78	2.8	1.39	1.54	1.40	2.70	1.02	1.00	0.95	1.30	0.80	1.20
	Mercury (Hg)	0.0050	mg/kg w.w.	0.5	0.079	0.068	0.082	0.092	0.120	0.163	0.071	0.101	0.154	0.054	0.058	0.083	0.078	0.049	0.113
	Molybdenum (Mo)	0.020	mg/kg w.w.	3.2	0.117	0.119	0.140	0.129	0.172	0.160	0.170	0.091	0.178	0.103	0.084	0.055	0.086	0.069	0.143
	Nickel (Ni)	0.20	mg/kg w.w.	0.7	<0.21	0.06	<0.20	<0.20	<0.20	<0.21	<0.21	<0.21	<0.21	<0.20	<0.21	<0.20	<0.20	<0.20	<0.20
	Phosphorus (P)	10	mg/kg w.w.	-	2,806	3,149	2,891	2,697	4,313	2,593	2,682	2,540	4,091	2,241	2,041	2,712	2,638	1,838	2,301
	Potassium (K)	20	mg/kg w.w.	-	2,537	2,944	2,963	2,716	2,939	2,347	2,657	2,896	3,003	2,470	2,560	2,952	2,827	2,364	2,034
	Rubidium (Rb)	0.050	mg/kg w.w.	-	8.1	8.9	6.7	9.9	8.8	6.0	11.7	10.7	7.7	7.1	7.7	10.5	12.2	6.8	5.0
	Selenium (Se)	0.050	mg/kg w.w.	3.2	0.58	0.60	0.76	0.78	0.74	0.82	0.76	0.60	0.87	0.69	0.66	0.47	0.70	0.55	0.66
	Sodium (Na)	20	mg/kg w.w.	-	1,014	1,019	1,517	960	822	1,020	1,090	780	930	1,237	1,082	1,202	1,249	1,195	1,015
	Strontium (Sr)	0.050	mg/kg w.w.	378	0.055	0.050	0.052	0.074	0.82	0.048	0.15	0.038	0.039	0.068	0.038	0.042	0.051	0.048	0.047
	Tellurium (Te)	0.020	mg/kg w.w.	-	<0.005	<0.005	<0.005	<0.004	<0.005	<0.005	<0.005	<0.005	<0.006	<0.005	<0.005	<0.005	<0.004	<0.004	<0.004
	Thallium (Tl)	0.0020	mg/kg w.w.	-	0.0068	0.0099	0.0079	0.0112	0.0088	0.0103	0.0166	0.0086	0.0147	0.0069	0.0072	0.0057	0.0116	0.0059	0.0068
	Tin (Sn)	0.10	mg/kg w.w.	-	0.11	0.10	0.09	0.13	0.12	0.13	0.11	0.08	0.08	0.26	0.07	<0.02	0.03	0.05	0.06
	Uranium (U)	0.0020	mg/kg w.w.	0.4	<0.0005	<0.0005	<0.0005	<0.0004	0.0008	<0.0005	<0.0005	<0.0005	<0.0006	<0.0005	<0.0005	<0.0005	0.0004	<0.0004	0.0009
	Vanadium (V)	0.10	mg/kg w.w.	-	<0.03	<0.03	<0.02	0.03	<0.02	0.03	<0.03	<0.03	0.05	<0.02	<0.03	<0.02	<0.02	<0.02	0.14
	Zinc (Zn)	0.50	mg/kg w.w.	189	13.9	15.0	18.1	15.6	18.5	13.6	17.4	13.4	19.0	16.4	15.4	18.6	17.7	13.0	13.3
	Zirconium (Zr)	0.20	mg/kg w.w.	-	<0.05	<0.05	<0.05	<0.04	<0.05	<0.05	<0.05	<0.05	<0.06	<0.05	<0.05	<0.05	<0.04	<0.04	<0.04

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, 2016.

Parameter		Lowest Detection Limit	Units	Benchmark[1,2]	Northern Pike							Walleye							
					PINR-NP01-O	PINR-NP02-O	PINR-NP03-O	PINR-NP08-O	PINR-NP12-O	PINR-NP14-O	PINR-NP16-O	PINR-WA01-O	PINR-WA02-O	PINR-WA04-O	PINR-WA05-O	PINR-WA08-O	PINR-WA09-O	PINR-WA12-O	PINR-WA13-O
					21-Sep-2016	21-Sep-2016	21-Sep-2016	21-Sep-2016	22-Sep-2016	22-Sep-2016	22-Sep-2016	21-Sep-2016	21-Sep-2016	22-Sep-2016	22-Sep-2016	23-Sep-2016	23-Sep-2016	24-Sep-2016	24-Sep-2016
	% Moisture	0.25	%	-	80.7	82.9	80.3	81.7	80.5	82.0	82.5	67.7	70.8	71.8	67.8	71.1	67.7	73.1	71.7
Total Metals	Aluminum (Al)	2.0	mg/kg w.w.	-	<0.4	0.5	<0.4	0.4	<0.4	<0.4	<0.4	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6	<0.5	<0.6
	Antimony (Sb)	0.010	mg/kg w.w.	0.3	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003
	Arsenic (As)	0.020	mg/kg w.w.	0.2	0.005	0.021	0.019	0.019	0.023	0.026	0.043	0.047	0.043	0.032	0.041	0.043	0.051	0.034	0.055
	Barium (Ba)	0.050	mg/kg w.w.	126	0.051	0.012	0.028	0.011	0.038	0.011	0.017	0.016	0.022	<0.014	0.020	0.021	0.020	0.035	0.023
	Beryllium (Be)	0.010	mg/kg w.w.	1.3	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003
	Bismuth (Bi)	0.010	mg/kg w.w.	-	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003
	Boron (B)	1.0	mg/kg w.w.	63.1	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3
	Cadmium (Cd)	0.0050	mg/kg w.w.	0.6	0.0021	0.0050	0.0050	0.0064	0.0053	0.0086	0.0097	<0.0016	<0.0015	<0.0014	<0.0016	<0.0014	<0.0016	0.0025	0.0045
	Calcium (Ca)	20	mg/kg w.w.	-	122	106	124	137	125	127	119	182	259	216	149	219	192	193	294
	Cesium (Cs)	0.0050	mg/kg w.w.	-	0.0068	0.0051	0.0035	0.0043	0.0081	0.0054	0.0056	0.0092	0.0093	0.0111	0.0086	0.0086	0.0097	0.0112	0.0113
	Chromium (Cr)	0.050	mg/kg w.w.	0.6	0.039	0.031	0.011	0.013	<0.010	<0.009	<0.009	<0.016	<0.015	<0.014	<0.016	<0.014	<0.016	<0.013	<0.014
	Cobalt (Co)	0.020	mg/kg w.w.	-	0.030	0.080	0.068	0.047	0.054	0.077	0.040	0.061	0.075	0.072	0.062	0.061	0.064	0.037	0.045
	Copper (Cu)	0.10	mg/kg w.w.	57.4	1.30	1.21	1.26	1.38	1.33	1.34	0.97	0.70	0.73	0.66	0.74	0.72	0.68	0.68	0.83
	Iron (Fe)	3.0	mg/kg w.w.	-	41	61	52	59	56	51	40	27	26	31	21	22	26	17	25
	Lead (Pb)	0.020	mg/kg w.w.	2.3	<0.004	<0.003	<0.004	<0.004	<0.004	<0.004	<0.004	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.005	<0.006
	Lithium (Li)	0.50	mg/kg w.w.	-	<0.10	<0.09	<0.10	<0.09	<0.10	<0.09	<0.09	<0.16	<0.15	<0.14	<0.16	<0.14	<0.16	<0.13	<0.14
	Magnesium (Mg)	2.0	mg/kg w.w.	-	253	221	252	256	263	234	231	375	315	271	419	364	336	285	294
	Manganese (Mn)	0.050	mg/kg w.w.	76.9	23	44	38	30	36	31	34	4.6	4.9	5.0	7.1	3.4	6.1	1.4	1.1
	Mercury (Hg)	0.0050	mg/kg w.w.	0.5	0.039	0.017	0.030	0.018	0.018	0.031	0.052	0.031	0.023	0.028	0.030	0.029	0.026	0.018	0.015
	Molybdenum (Mo)	0.020	mg/kg w.w.	3.2	0.057	0.060	0.042	0.062	0.050	0.062	0.037	0.015	0.016	0.015	0.013	0.011	0.016	0.010	0.006
	Nickel (Ni)	0.20	mg/kg w.w.	0.7	0.04	<0.20	<0.20	<0.20	0.05	0.05	0.04	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21
	Phosphorus (P)	10	mg/kg w.w.	-	3,193	2,822	3,152	3,056	3,101	3,096	2,958	2,946	2,762	2,617	2,856	2,919	2,742	2,467	2,439
	Potassium (K)	20	mg/kg w.w.	-	3,754	3,813	3,782	4,099	3,744	4,014	3,675	3,123	3,504	3,412	2,582	3,035	3,081	3,147	3,056
	Rubidium (Rb)	0.050	mg/kg w.w.	-	4.6	5.4	5.1	6.1	6.8	5.4	6.4	8.4	10.3	11.1	7.2	7.8	8.6	8.7	11.5
	Selenium (Se)	0.050	mg/kg w.w.	3.2	0.83	0.73	0.96	1.74	0.82	0.95	0.73	0.94	0.90	0.96	0.84	0.95	0.85	0.52	0.69
	Sodium (Na)	20	mg/kg w.w.	-	874	891	892	721	813	862	1,034	688	742	801	441	725	778	1,014	1,095
	Strontium (Sr)	0.050	mg/kg w.w.	378	0.108	0.056	0.077	0.056	0.098	0.064	0.061	0.052	0.097	0.054	0.035	0.064	0.052	0.055	0.078
	Tellurium (Te)	0.020	mg/kg w.w.	-	0.00387	<0.003	<0.004	<0.004	<0.004	<0.004	<0.004	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.005	<0.006
	Thallium (Tl)	0.0020	mg/kg w.w.	-	0.0045	0.0037	0.0031	0.0038	0.0058	0.0027	0.0029	0.0071	0.0089	0.0095	0.0062	0.0061	0.0087	0.0044	0.0065
	Tin (Sn)	0.10	mg/kg w.w.	-	0.03	0.03	0.02	0.02	<0.02	0.02	0.02	0.05	0.06	0.03	<0.03	0.05	<0.03	<0.03	<0.03
	Uranium (U)	0.0020	mg/kg w.w.	0.4	<0.0004	<0.0003	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0006	<0.0006	<0.0006	<0.0006	<0.0006	<0.0006	<0.0005	<0.0006
	Vanadium (V)	0.10	mg/kg w.w.	-	<0.02	0.04	0.04	<0.02	<0.02	0.03	0.04	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03
	Zinc (Zn)	0.50	mg/kg w.w.	189	72	72	69	85	83	60	50	32.1	35	34	32.1	32	31.1	26.3	21.8
	Zirconium (Zr)	0.20	mg/kg w.w.	-	<0.04	<0.03	<0.04	<0.04	<0.04	<0.04	<0.04	<0.06	<0.06	<0.06	<0.06	<0.06	<0.06	<0.05	<0.06

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
101 - 1025 Hillside Ave.
Victoria BC V8T 2A2

Date Received: 19-OCT-16
Report Date: 13-DEC-16 15:12 (MT)
Version: FINAL

Client Phone: 250-595-1627

Certificate of Analysis

Lab Work Order #: L1845628

Project P.O. #: NOT SUBMITTED
Job Reference: 167202.0067
C of C Numbers:
Legal Site Desc:

Selam Worku
Account Manager

ALS ENVIRONMENTAL ANALYTICAL REPORT

Grouping	Analyte	L1845628-1 Tissue 21-SEP-16 PINR-NP01-M	L1845628-2 Tissue 21-SEP-16 PINR-NP02-M	L1845628-3 Tissue 21-SEP-16 PINR-NP03-M	L1845628-4 Tissue 21-SEP-16 PINR-NP04-M	L1845628-5 Tissue 21-SEP-16 PINR-NP05-M
TISSUE						
Physical Tests	% Moisture (%)	77.2	77.9	78.1	79.7	76.7
Metals	Aluminum (Al)-Total (mg/kg)	2.3	<2.0	<2.0	<2.0	<2.0
	Antimony (Sb)-Total (mg/kg)	<0.010	<0.010	<0.010	<0.010	<0.010
	Arsenic (As)-Total (mg/kg)	0.090	0.362	0.380	0.666	0.277
	Barium (Ba)-Total (mg/kg)	0.291	0.117	0.080	0.201	0.053
	Beryllium (Be)-Total (mg/kg)	<0.010	<0.010	<0.010	<0.010	<0.010
	Bismuth (Bi)-Total (mg/kg)	<0.010	0.013	0.015	<0.010	<0.010
	Boron (B)-Total (mg/kg)	<1.0	<1.0	<1.0	<1.0	<1.0
	Cadmium (Cd)-Total (mg/kg)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
	Calcium (Ca)-Total (mg/kg)	2520	1270	1130	1680	880
	Cesium (Cs)-Total (mg/kg)	0.0524	0.0295	0.0218	0.0292	0.0218
	Chromium (Cr)-Total (mg/kg)	0.082	<0.050	<0.050	<0.050	<0.050
	Cobalt (Co)-Total (mg/kg)	<0.020	<0.020	0.022	<0.020	<0.020
	Copper (Cu)-Total (mg/kg)	0.86	0.61	0.67	0.73	0.73
	Iron (Fe)-Total (mg/kg)	9.0	5.6	5.7	8.8	7.7
	Lead (Pb)-Total (mg/kg)	<0.020	<0.020	<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)	1540	1550	1580	1570	1460
	Manganese (Mn)-Total (mg/kg)	2.54	1.81	1.16	2.20	0.902
	Mercury (Hg)-Total (mg/kg)	2.01	1.22	2.20	1.31	1.58
	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)	12100	11100	10500	10600	10800
	Potassium (K)-Total (mg/kg)	19200	20400	20400	18900	19800
	Rubidium (Rb)-Total (mg/kg)	20.5	24.1	22.8	26.4	22.2
	Selenium (Se)-Total (mg/kg)	0.666	0.804	0.949	0.906	0.878
	Sodium (Na)-Total (mg/kg)	1170	1220	1290	2960	1090
	Strontium (Sr)-Total (mg/kg)	1.51	0.577	0.478	0.923	0.312
	Tellurium (Te)-Total (mg/kg)	<0.020	<0.020	<0.020	<0.020	<0.020
	Thallium (Tl)-Total (mg/kg)	0.0127	0.0116	0.0086	0.0184	0.0108
	Tin (Sn)-Total (mg/kg)	0.40	0.12	0.16	0.19	0.38
	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)	17.9	17.4	22.9	15.4	14.6
	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	L1845628-6 Tissue 21-SEP-16 PINR-NP06-M	L1845628-7 Tissue 22-SEP-16 PINR-NP16-M	L1845628-8 Tissue 21-SEP-16 PINR-NP08-M	L1845628-9 Tissue 21-SEP-16 PINR-NP09-M	L1845628-10 Tissue 22-SEP-16 PINR-NP10-M
TISSUE						
Physical Tests	% Moisture (%)	78.6	79.0	79.2	79.1	79.3
Metals	Aluminum (Al)-Total (mg/kg)	<2.0	<2.0	<2.0	<2.0	3.4
	Antimony (Sb)-Total (mg/kg)	<0.010	<0.010	<0.010	<0.010	<0.010
	Arsenic (As)-Total (mg/kg)	0.470	0.683	0.269	0.274	0.359
	Barium (Ba)-Total (mg/kg)	0.168	0.120	0.084	0.106	0.106
	Beryllium (Be)-Total (mg/kg)	<0.010	<0.010	<0.010	<0.010	<0.010
	Bismuth (Bi)-Total (mg/kg)	<0.010	0.012	0.014	<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	<0.0050	<0.0050	0.0195
	Calcium (Ca)-Total (mg/kg)	1810	1010	1350	1790	639
	Cesium (Cs)-Total (mg/kg)	0.0224	0.0448	0.0186	0.0203	0.0311
	Chromium (Cr)-Total (mg/kg)	<0.050	<0.050	<0.050	<0.050	0.363
	Cobalt (Co)-Total (mg/kg)	<0.020	<0.020	<0.020	<0.020	<0.020
	Copper (Cu)-Total (mg/kg)	0.78	0.53	0.67	0.84	1.08
	Iron (Fe)-Total (mg/kg)	8.1	7.9	6.2	6.2	12.3
	Lead (Pb)-Total (mg/kg)	<0.020	<0.020	<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)	1600	1540	1570	1450	1580
	Manganese (Mn)-Total (mg/kg)	2.81	1.24	1.58	1.82	1.02
	Mercury (Hg)-Total (mg/kg)	1.80	2.92	0.966	0.767	1.44
	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)	11900	10700	11600	11000	10200
	Potassium (K)-Total (mg/kg)	20400	20300	22200	19500	21000
	Rubidium (Rb)-Total (mg/kg)	21.4	31.3	27.3	32.0	29.4
	Selenium (Se)-Total (mg/kg)	1.08	0.869	0.922	0.919	0.810
	Sodium (Na)-Total (mg/kg)	1930	1380	1000	2120	1060
	Strontium (Sr)-Total (mg/kg)	0.775	0.559	0.568	0.727	0.205
	Tellurium (Te)-Total (mg/kg)	<0.020	<0.020	<0.020	<0.020	<0.020
	Thallium (Tl)-Total (mg/kg)	0.0120	0.0100	0.0132	0.0121	0.0099
	Tin (Sn)-Total (mg/kg)	0.54	0.28	0.22	0.24	0.25
	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)	20.0	14.3	25.9	19.8	32.6
	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	L1845628-11 Tissue 22-SEP-16 PINR-NP11-M	L1845628-12 Tissue 22-SEP-16 PINR-NP12-M	L1845628-13 Tissue 22-SEP-16 PINR-NP13-M	L1845628-14 Tissue 22-SEP-16 PINR-NP14-M	L1845628-15 Tissue 22-SEP-16 PINR-NP15-M
TISSUE						
Physical Tests	% Moisture (%)	79.8	77.2	81.2	78.9	77.4
Metals	Aluminum (Al)-Total (mg/kg)	<2.0	<2.0	<2.0	<2.0	<2.0
	Antimony (Sb)-Total (mg/kg)	<0.010	<0.010	<0.010	<0.010	<0.010
	Arsenic (As)-Total (mg/kg)	0.666	0.392	0.239	0.371	0.603
	Barium (Ba)-Total (mg/kg)	0.118	<0.050	0.069	0.075	0.131
	Beryllium (Be)-Total (mg/kg)	<0.010	<0.010	<0.010	<0.010	<0.010
	Bismuth (Bi)-Total (mg/kg)	0.018	<0.010	0.011	0.018	<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)	1230	564	628	959	1340
	Cesium (Cs)-Total (mg/kg)	0.0341	0.0498	0.0682	0.0273	0.0248
	Chromium (Cr)-Total (mg/kg)	<0.050	<0.050	0.258	0.333	<0.050
	Cobalt (Co)-Total (mg/kg)	<0.020	<0.020	<0.020	0.024	<0.020
	Copper (Cu)-Total (mg/kg)	0.55	0.69	0.66	0.71	0.74
	Iron (Fe)-Total (mg/kg)	7.9	6.0	11.8	9.0	7.9
	Lead (Pb)-Total (mg/kg)	<0.020	<0.020	<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)	1590	1490	1580	1600	1520
	Manganese (Mn)-Total (mg/kg)	1.33	0.666	1.11	1.13	2.32
	Mercury (Hg)-Total (mg/kg)	2.52	1.17	2.47	1.73	1.18
	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)	10300	11200	10500	10400	11300
	Potassium (K)-Total (mg/kg)	20200	20000	22000	20700	19700
	Rubidium (Rb)-Total (mg/kg)	25.9	29.7	45.8	22.5	20.7
	Selenium (Se)-Total (mg/kg)	0.987	0.630	0.767	0.768	0.839
	Sodium (Na)-Total (mg/kg)	1310	1230	653	1350	1110
	Strontium (Sr)-Total (mg/kg)	0.538	0.183	0.205	0.416	0.661
	Tellurium (Te)-Total (mg/kg)	<0.020	<0.020	<0.020	<0.020	<0.020
	Thallium (Tl)-Total (mg/kg)	0.0103	0.0178	0.0118	0.0083	0.0338
	Tin (Sn)-Total (mg/kg)	0.22	0.21	0.38	0.21	0.39
	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)	22.1	14.6	16.4	17.6	17.6
	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	L1845628-16 Tissue 21-SEP-16 PINR-NPX-M	L1845628-17 Tissue 21-SEP-16 PINR-NPZ-M	L1845628-18 Tissue 21-SEP-16 PINR-NP01-L	L1845628-19 Tissue 21-SEP-16 PINR-NP02-L	L1845628-20 Tissue 21-SEP-16 PINR-NP03-L
TISSUE						
Physical Tests	% Moisture (%)	77.3	78.1	79.6	76.9	72.9
Metals	Aluminum (Al)-Total (mg/kg)	2.7	<5.0	2.6	2.7	<2.0
	Antimony (Sb)-Total (mg/kg)	<0.010	<0.010	<0.010	<0.010	<0.010
	Arsenic (As)-Total (mg/kg)	0.107	0.394	0.040	0.190	0.113
	Barium (Ba)-Total (mg/kg)	0.266	0.480	<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)	<0.010	<0.010	<0.010	0.019	0.014
	Boron (B)-Total (mg/kg)	<1.0	<1.0	<1.0	<1.0	<1.0
	Cadmium (Cd)-Total (mg/kg)	<0.0050	<0.010	0.0706	0.178	0.169
	Calcium (Ca)-Total (mg/kg)	2280	4110	150	184	129
	Cesium (Cs)-Total (mg/kg)	0.0500	0.0381	0.0123	0.0097	0.0068
	Chromium (Cr)-Total (mg/kg)	0.056	<0.20	<0.050	<0.050	<0.050
	Cobalt (Co)-Total (mg/kg)	<0.020	<0.020	0.130	0.239	0.228
	Copper (Cu)-Total (mg/kg)	0.86	0.62	55.7	148	103
	Iron (Fe)-Total (mg/kg)	7.9	8.1	548	1090	287
	Lead (Pb)-Total (mg/kg)	0.028	<0.050	<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)	1480	1440	754	716	620
	Manganese (Mn)-Total (mg/kg)	2.31	6.64	2.79	4.34	4.15
	Mercury (Hg)-Total (mg/kg)	2.00	1.64	0.630	0.381	0.484
	Molybdenum (Mo)-Total (mg/kg)	<0.020	<0.040	0.521	0.828	0.585
	Nickel (Ni)-Total (mg/kg)	<0.20	<0.20	<0.20	<0.20	<0.20
	Phosphorus (P)-Total (mg/kg)	11500	11100	13800	13600	11600
	Potassium (K)-Total (mg/kg)	18600	17800	14900	11800	11900
	Rubidium (Rb)-Total (mg/kg)	20.0	20.1	18.5	23.2	22.0
	Selenium (Se)-Total (mg/kg)	0.642	0.94	4.58	8.10	7.88
	Sodium (Na)-Total (mg/kg)	1180	1280	3980	3840	2630
	Strontium (Sr)-Total (mg/kg)	1.34	1.97	0.167	0.172	0.101
	Tellurium (Te)-Total (mg/kg)	<0.020	<0.020	<0.020	<0.020	<0.020
	Thallium (Tl)-Total (mg/kg)	0.0110	0.0123	0.0093	0.0109	0.0065
	Tin (Sn)-Total (mg/kg)	0.40	0.34	0.43	0.37	0.33
	Uranium (U)-Total (mg/kg)	0.0024	<0.0020	<0.0020	<0.0020	<0.0020
	Vanadium (V)-Total (mg/kg)	<0.10	<0.10	0.28	0.92	0.58
	Zinc (Zn)-Total (mg/kg)	17.6	21.9	111	181	147
	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	L1845628-21	L1845628-22	L1845628-23	L1845628-24	L1845628-25
Description	Tissue	Tissue	Tissue	Tissue	Tissue
Sampled Date	21-SEP-16	21-SEP-16	21-SEP-16	22-SEP-16	21-SEP-16
Sampled Time					
Client ID	PINR-NP04-L	PINR-NP05-L	PINR-NP06-L	PINR-NP16-L	PINR-NP08-L
Grouping **Analyte**					
TISSUE					
Physical Tests % Moisture (%)	74.6	66.0	67.5	79.9	78.3
Metals Aluminum (Al)-Total (mg/kg)	6.7	<2.0	<5.0	6.9	<2.0
Antimony (Sb)-Total (mg/kg)	<0.010	<0.010	<0.010	<0.010	<0.010
Arsenic (As)-Total (mg/kg)	0.204	0.095	0.138	0.159	0.169
Barium (Ba)-Total (mg/kg)	0.051	<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)	0.019	<0.010	0.011	0.018	0.015
Boron (B)-Total (mg/kg)	<1.0	<1.0	<1.0	<1.0	<1.0
Cadmium (Cd)-Total (mg/kg)	0.503	0.128	0.560	0.677	0.193
Calcium (Ca)-Total (mg/kg)	279	87	97	237	304
Cesium (Cs)-Total (mg/kg)	0.0215	<0.0050	0.0097	0.0167	0.0217
Chromium (Cr)-Total (mg/kg)	<0.20	<0.050	<0.20	<0.050	<0.050
Cobalt (Co)-Total (mg/kg)	0.290	0.078	0.151	0.250	0.173
Copper (Cu)-Total (mg/kg)	130	33.9	72.9	39.6	97.0
Iron (Fe)-Total (mg/kg)	1960	108	452	335	624
Lead (Pb)-Total (mg/kg)	<0.050	<0.020	<0.050	<0.020	<0.020
Lithium (Li)-Total (mg/kg)	<0.50	<0.50	<0.50	<0.50	<0.50
Magnesium (Mg)-Total (mg/kg)	663	349	454	828	981
Manganese (Mn)-Total (mg/kg)	5.54	1.54	3.03	8.24	7.62
Mercury (Hg)-Total (mg/kg)	0.430	0.211	0.334	1.01	0.379
Molybdenum (Mo)-Total (mg/kg)	1.10	0.284	0.706	0.713	0.737
Nickel (Ni)-Total (mg/kg)	<0.20	<0.20	<0.20	<0.20	<0.20
Phosphorus (P)-Total (mg/kg)	10400	5360	7350	15200	17000
Potassium (K)-Total (mg/kg)	9550	8100	7910	14800	14600
Rubidium (Rb)-Total (mg/kg)	21.4	10.6	13.0	42.1	30.9
Selenium (Se)-Total (mg/kg)	8.02	3.70	7.03	6.65	8.43
Sodium (Na)-Total (mg/kg)	3670	1840	2060	5110	4720
Strontium (Sr)-Total (mg/kg)	0.24	0.063	<0.10	0.188	0.200
Tellurium (Te)-Total (mg/kg)	<0.020	<0.020	<0.020	<0.020	<0.020
Thallium (Tl)-Total (mg/kg)	0.0237	0.0035	0.0090	0.0085	0.0140
Tin (Sn)-Total (mg/kg)	0.39	0.20	0.29	0.21	0.39
Uranium (U)-Total (mg/kg)	<0.0020	<0.0020	<0.0020	0.0041	<0.0020
Vanadium (V)-Total (mg/kg)	1.56	0.18	0.45	0.85	0.44
Zinc (Zn)-Total (mg/kg)	168	51.5	116	135	242
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	L1845628-26 Tissue 21-SEP-16 PINR-NP09-L	L1845628-27 Tissue 22-SEP-16 PINR-NP10-L	L1845628-28 Tissue 22-SEP-16 PINR-NP11-L	L1845628-29 Tissue 22-SEP-16 PINR-NP12-L	L1845628-30 Tissue 22-SEP-16 PINR-NP13-L
TISSUE						
Physical Tests	% Moisture (%)	73.7	71.5	74.0	78.4	74.2
Metals	Aluminum (Al)-Total (mg/kg)	4.7	<2.0	6.0	3.7	4.5
	Antimony (Sb)-Total (mg/kg)	<0.010	<0.010	0.014	<0.010	<0.010
	Arsenic (As)-Total (mg/kg)	0.207	0.195	0.173	0.185	0.191
	Barium (Ba)-Total (mg/kg)	<0.050	<0.050	<0.050	<0.050	0.056
	Beryllium (Be)-Total (mg/kg)	<0.010	<0.010	<0.010	<0.010	<0.010
	Bismuth (Bi)-Total (mg/kg)	<0.010	0.011	0.020	<0.010	0.030
	Boron (B)-Total (mg/kg)	<1.0	<1.0	<1.0	<1.0	<1.0
	Cadmium (Cd)-Total (mg/kg)	0.102	0.118	0.368	0.182	0.356
	Calcium (Ca)-Total (mg/kg)	151	113	164	191	269
	Cesium (Cs)-Total (mg/kg)	0.0141	0.0113	0.0097	0.0222	0.0351
	Chromium (Cr)-Total (mg/kg)	<0.050	<0.050	<0.050	<0.050	0.082
	Cobalt (Co)-Total (mg/kg)	0.142	0.126	0.288	0.170	0.275
	Copper (Cu)-Total (mg/kg)	66.1	80.1	151	87.6	178
	Iron (Fe)-Total (mg/kg)	160	350	1840	392	1920
	Lead (Pb)-Total (mg/kg)	<0.020	<0.020	<0.020	<0.020	0.024
	Lithium (Li)-Total (mg/kg)	<0.50	<0.50	<0.50	<0.50	<0.50
	Magnesium (Mg)-Total (mg/kg)	563	458	503	799	697
	Manganese (Mn)-Total (mg/kg)	4.75	3.27	3.49	7.38	4.90
	Mercury (Hg)-Total (mg/kg)	0.224	0.307	0.782	0.351	1.26
	Molybdenum (Mo)-Total (mg/kg)	0.629	0.611	0.782	0.621	0.931
	Nickel (Ni)-Total (mg/kg)	<0.20	<0.20	<0.20	<0.20	0.29
	Phosphorus (P)-Total (mg/kg)	9610	8200	8910	14800	11500
	Potassium (K)-Total (mg/kg)	10000	7970	9900	14200	10100
	Rubidium (Rb)-Total (mg/kg)	23.8	15.3	21.5	31.9	26.3
	Selenium (Se)-Total (mg/kg)	6.04	5.37	9.73	6.68	8.10
	Sodium (Na)-Total (mg/kg)	3480	2730	3420	4040	3140
	Strontium (Sr)-Total (mg/kg)	0.128	0.086	0.129	0.139	0.230
	Tellurium (Te)-Total (mg/kg)	<0.020	<0.020	<0.020	<0.020	<0.020
	Thallium (Tl)-Total (mg/kg)	0.0091	0.0059	0.0094	0.0195	0.0151
	Tin (Sn)-Total (mg/kg)	0.20	0.18	0.21	0.15	0.32
	Uranium (U)-Total (mg/kg)	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020
	Vanadium (V)-Total (mg/kg)	0.22	0.57	0.93	0.44	1.02
	Zinc (Zn)-Total (mg/kg)	160	132	160	174	195
	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	L1845628-31 Tissue 22-SEP-16 PINR-NP14-L	L1845628-32 Tissue 22-SEP-16 PINR-NP15-L	L1845628-33 Tissue 21-SEP-16 PINR-NPX-L	L1845628-34 Tissue 21-SEP-16 PINR-NP01-O	L1845628-35 Tissue 21-SEP-16 PINR-NP02-O
TISSUE						
Physical Tests	% Moisture (%)	79.1	66.1	78.3	80.5	82.9
Metals	Aluminum (Al)-Total (mg/kg)	3.0	<5.0	2.7	<2.0	3.1
	Antimony (Sb)-Total (mg/kg)	<0.010	<0.010	<0.010	<0.010	<0.010
	Arsenic (As)-Total (mg/kg)	0.189	0.107	0.055	0.025	0.125
	Barium (Ba)-Total (mg/kg)	<0.050	<0.050	<0.050	0.295	0.068
	Beryllium (Be)-Total (mg/kg)	<0.010	<0.010	<0.010	<0.010	<0.010
	Bismuth (Bi)-Total (mg/kg)	0.021	0.011	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)	0.408	0.280	0.0711	0.0099	0.0292
	Calcium (Ca)-Total (mg/kg)	222	144	157	660	620
	Cesium (Cs)-Total (mg/kg)	0.0153	0.0065	0.0125	0.0348	0.0296
	Chromium (Cr)-Total (mg/kg)	<0.050	<0.20	<0.050	0.096	0.183
	Cobalt (Co)-Total (mg/kg)	0.326	0.159	0.109	0.154	0.469
	Copper (Cu)-Total (mg/kg)	131	69.7	63.3	6.64	7.08
	Iron (Fe)-Total (mg/kg)	886	987	455	211	358
	Lead (Pb)-Total (mg/kg)	<0.020	<0.050	<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)	813	404	742	1290	1290
	Manganese (Mn)-Total (mg/kg)	4.63	3.64	2.98	117	260
	Mercury (Hg)-Total (mg/kg)	0.612	0.199	0.688	0.188	0.0991
	Molybdenum (Mo)-Total (mg/kg)	0.814	0.690	0.480	0.276	0.352
	Nickel (Ni)-Total (mg/kg)	<0.20	<0.20	0.20	0.22	<0.20
	Phosphorus (P)-Total (mg/kg)	15100	6860	13700	16400	16500
	Potassium (K)-Total (mg/kg)	14400	7220	13700	19000	22300
	Rubidium (Rb)-Total (mg/kg)	22.4	14.7	17.4	22.9	31.5
	Selenium (Se)-Total (mg/kg)	7.55	5.13	5.02	4.35	4.29
	Sodium (Na)-Total (mg/kg)	4840	2050	3510	4570	5210
	Strontium (Sr)-Total (mg/kg)	0.173	0.13	0.130	0.603	0.328
	Tellurium (Te)-Total (mg/kg)	<0.020	<0.020	<0.020	<0.020	<0.020
	Thallium (Tl)-Total (mg/kg)	0.0060	0.0264	0.0069	0.0224	0.0216
	Tin (Sn)-Total (mg/kg)	0.26	0.16	0.28	0.16	0.17
	Uranium (U)-Total (mg/kg)	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020
	Vanadium (V)-Total (mg/kg)	0.93	1.16	0.25	<0.10	0.24
	Zinc (Zn)-Total (mg/kg)	170	118	111	367	422
	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	L1845628-36	L1845628-37	L1845628-38	L1845628-39	L1845628-40
Description	Tissue	Tissue	Tissue	Tissue	Tissue
Sampled Date	21-SEP-16	21-SEP-16	22-SEP-16	22-SEP-16	22-SEP-16
Sampled Time					
Client ID	PINR-NP03-O	PINR-NP08-O	PINR-NP12-O	PINR-NP14-O	PINR-NP16-O
Grouping / **Analyte**					
TISSUE					
Physical Tests % Moisture (%)	80.3	81.7	80.5	82.0	82.5
Metals Aluminum (Al)-Total (mg/kg)	<2.0	2.1	<2.0	<2.0	<2.0
Antimony (Sb)-Total (mg/kg)	<0.010	<0.010	<0.010	<0.010	<0.010
Arsenic (As)-Total (mg/kg)	0.096	0.103	0.120	0.143	0.244
Barium (Ba)-Total (mg/kg)	0.142	0.059	0.195	0.061	0.099
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	<0.010
Boron (B)-Total (mg/kg)	<1.0	<1.0	<1.0	<1.0	<1.0
Cadmium (Cd)-Total (mg/kg)	0.0252	0.0349	0.0270	0.0478	0.0553
Calcium (Ca)-Total (mg/kg)	631	748	642	708	680
Cesium (Cs)-Total (mg/kg)	0.0177	0.0233	0.0413	0.0299	0.0320
Chromium (Cr)-Total (mg/kg)	0.058	0.073	<0.050	<0.050	<0.050
Cobalt (Co)-Total (mg/kg)	0.346	0.255	0.278	0.428	0.227
Copper (Cu)-Total (mg/kg)	6.41	7.54	6.81	7.46	5.55
Iron (Fe)-Total (mg/kg)	262	324	286	285	228
Lead (Pb)-Total (mg/kg)	<0.020	<0.020	<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)	1280	1400	1350	1300	1320
Manganese (Mn)-Total (mg/kg)	193	163	185	172	193
Mercury (Hg)-Total (mg/kg)	0.153	0.0981	0.0929	0.173	0.299
Molybdenum (Mo)-Total (mg/kg)	0.213	0.337	0.255	0.345	0.211
Nickel (Ni)-Total (mg/kg)	<0.20	<0.20	0.27	0.27	0.21
Phosphorus (P)-Total (mg/kg)	16000	16700	15900	17200	16900
Potassium (K)-Total (mg/kg)	19200	22400	19200	22300	21000
Rubidium (Rb)-Total (mg/kg)	25.8	33.5	34.9	29.9	36.6
Selenium (Se)-Total (mg/kg)	4.86	9.49	4.20	5.30	4.17
Sodium (Na)-Total (mg/kg)	4530	3940	4170	4790	5910
Strontium (Sr)-Total (mg/kg)	0.392	0.306	0.500	0.355	0.349
Tellurium (Te)-Total (mg/kg)	<0.020	<0.020	<0.020	<0.020	<0.020
Thallium (Tl)-Total (mg/kg)	0.0155	0.0205	0.0295	0.0148	0.0167
Tin (Sn)-Total (mg/kg)	0.11	0.13	<0.10	0.12	0.12
Uranium (U)-Total (mg/kg)	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020
Vanadium (V)-Total (mg/kg)	0.21	<0.10	<0.10	0.14	0.20
Zinc (Zn)-Total (mg/kg)	348	467	427	332	285
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	L1845628-41 Tissue 21-SEP-16 PINR-NPX-O	L1845628-42 Tissue 21-SEP-16 PINR-WA01-M	L1845628-43 Tissue 21-SEP-16 PINR-WA02-M	L1845628-44 Tissue 22-SEP-16 PINR-WA03-M	L1845628-45 Tissue 22-SEP-16 PINR-WA04-M
TISSUE						
Physical Tests	% Moisture (%)	80.8	79.0	80.0	79.7	79.0
Metals	Aluminum (Al)-Total (mg/kg)	<2.0	<2.0	<2.0	<2.0	<2.0
	Antimony (Sb)-Total (mg/kg)	<0.010	<0.010	<0.010	<0.010	<0.010
	Arsenic (As)-Total (mg/kg)	0.026	0.174	0.178	0.147	0.124
	Barium (Ba)-Total (mg/kg)	0.231	<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)	<0.010	0.011	0.015	<0.010	0.018
	Boron (B)-Total (mg/kg)	<1.0	<1.0	<1.0	<1.0	<1.0
	Cadmium (Cd)-Total (mg/kg)	0.0120	<0.0050	<0.0050	<0.0050	<0.0050
	Calcium (Ca)-Total (mg/kg)	601	793	499	499	1030
	Cesium (Cs)-Total (mg/kg)	0.0350	0.0499	0.0470	0.0517	0.0600
	Chromium (Cr)-Total (mg/kg)	0.311	<0.050	<0.050	<0.050	<0.050
	Cobalt (Co)-Total (mg/kg)	0.159	<0.020	<0.020	<0.020	<0.020
	Copper (Cu)-Total (mg/kg)	6.77	0.77	0.64	0.74	0.62
	Iron (Fe)-Total (mg/kg)	217	3.8	3.6	3.3	4.7
	Lead (Pb)-Total (mg/kg)	<0.020	<0.020	<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)	1320	1580	1530	1540	1580
	Manganese (Mn)-Total (mg/kg)	119	0.494	0.474	0.404	0.384
	Mercury (Hg)-Total (mg/kg)	0.210	2.04	1.16	1.40	1.59
	Molybdenum (Mo)-Total (mg/kg)	0.308	<0.020	<0.020	<0.020	<0.020
	Nickel (Ni)-Total (mg/kg)	<0.20	0.21	0.23	0.22	0.22
	Phosphorus (P)-Total (mg/kg)	16600	11500	10800	11200	10700
	Potassium (K)-Total (mg/kg)	19800	21400	20900	20900	20700
	Rubidium (Rb)-Total (mg/kg)	24.3	53.3	56.8	59.6	63.6
	Selenium (Se)-Total (mg/kg)	4.20	1.07	1.07	0.927	0.964
	Sodium (Na)-Total (mg/kg)	4460	1660	1660	1360	1530
	Strontium (Sr)-Total (mg/kg)	0.509	0.181	0.056	0.065	0.217
	Tellurium (Te)-Total (mg/kg)	<0.020	<0.020	<0.020	<0.020	<0.020
	Thallium (Tl)-Total (mg/kg)	0.0241	0.0153	0.0180	0.0115	0.0206
	Tin (Sn)-Total (mg/kg)	0.17	<0.10	<0.10	<0.10	<0.10
	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)	373	13.7	13.6	13.2	16.0
	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	L1845628-46 Tissue 22-SEP-16 PINR-WA05-M	L1845628-47 Tissue 23-SEP-16 PINR-WA06-M	L1845628-48 Tissue 23-SEP-16 PINR-WA07-M	L1845628-49 Tissue 23-SEP-16 PINR-WA08-M	L1845628-50 Tissue 23-SEP-16 PINR-WA09-M
TISSUE						
Physical Tests	% Moisture (%)	80.2	77.5	79.3	77.5	79.4
Metals	Aluminum (Al)-Total (mg/kg)	<2.0	<5.0	2.7	2.1	<2.0
	Antimony (Sb)-Total (mg/kg)	<0.010	<0.010	<0.010	<0.010	<0.010
	Arsenic (As)-Total (mg/kg)	0.168	0.166	0.115	0.240	0.190
	Barium (Ba)-Total (mg/kg)	<0.050	0.054	<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)	0.013	0.019	<0.010	0.011	0.015
	Boron (B)-Total (mg/kg)	<1.0	<1.0	<1.0	<1.0	<1.0
	Cadmium (Cd)-Total (mg/kg)	<0.0050	<0.010	<0.0050	<0.0050	<0.0050
	Calcium (Ca)-Total (mg/kg)	483	489	539	794	533
	Cesium (Cs)-Total (mg/kg)	0.0530	0.0483	0.0876	0.0489	0.0556
	Chromium (Cr)-Total (mg/kg)	<0.050	<0.20	<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)	0.44	0.77	0.69	0.63	0.78
	Iron (Fe)-Total (mg/kg)	4.1	7.5	6.6	8.5	5.2
	Lead (Pb)-Total (mg/kg)	<0.020	<0.050	<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)	1520	1390	1610	1600	1650
	Manganese (Mn)-Total (mg/kg)	0.426	0.530	0.495	0.498	0.403
	Mercury (Hg)-Total (mg/kg)	2.07	2.17	0.902	2.15	2.12
	Molybdenum (Mo)-Total (mg/kg)	<0.020	<0.040	<0.020	<0.020	<0.020
	Nickel (Ni)-Total (mg/kg)	0.26	<0.20	0.26	0.29	0.27
	Phosphorus (P)-Total (mg/kg)	10800	8410	11500	11500	11400
	Potassium (K)-Total (mg/kg)	21200	17600	22400	21400	21800
	Rubidium (Rb)-Total (mg/kg)	53.2	40.1	103	48.3	54.6
	Selenium (Se)-Total (mg/kg)	0.987	0.93	0.870	1.22	1.11
	Sodium (Na)-Total (mg/kg)	608	901	1060	1120	1480
	Strontium (Sr)-Total (mg/kg)	<0.050	<0.10	0.098	0.162	0.073
	Tellurium (Te)-Total (mg/kg)	<0.020	<0.020	<0.020	<0.020	<0.020
	Thallium (Tl)-Total (mg/kg)	0.0182	0.0193	0.0186	0.0164	0.0181
	Tin (Sn)-Total (mg/kg)	0.14	0.13	<0.10	<0.10	0.10
	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)	12.4	10.8	14.0	13.8	13.2
	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	L1845628-51	L1845628-52	L1845628-53	L1845628-54	L1845628-55
Description	Tissue	Tissue	Tissue	Tissue	Tissue
Sampled Date	24-SEP-16	23-SEP-16	24-SEP-16	24-SEP-16	24-SEP-16
Sampled Time					
Client ID	PINR-WA16-M	PINR-WA11-M	PINR-WA12-M	PINR-WA13-M	PINR-WA14-M
Grouping / **Analyte**					
TISSUE					
Physical Tests % Moisture (%)	78.3	78.2	78.0	77.9	78.0
Metals Aluminum (Al)-Total (mg/kg)	<2.0	<2.0	<2.0	<2.0	<2.0
Antimony (Sb)-Total (mg/kg)	<0.010	<0.010	<0.010	<0.010	<0.010
Arsenic (As)-Total (mg/kg)	0.158	0.136	0.318	0.206	0.142
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)	<0.010	<0.010	0.018	<0.010	<0.010
Boron (B)-Total (mg/kg)	<1.0	<1.0	<1.0	<1.0	<1.0
Cadmium (Cd)-Total (mg/kg)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Calcium (Ca)-Total (mg/kg)	462	493	450	434	508
Cesium (Cs)-Total (mg/kg)	0.0512	0.0486	0.0696	0.0659	0.0456
Chromium (Cr)-Total (mg/kg)	<0.050	<0.050	<0.050	<0.050	0.155
Cobalt (Co)-Total (mg/kg)	<0.020	<0.020	<0.020	<0.020	<0.020
Copper (Cu)-Total (mg/kg)	0.63	0.59	0.67	0.57	0.53
Iron (Fe)-Total (mg/kg)	4.1	4.1	3.7	5.0	3.6
Lead (Pb)-Total (mg/kg)	<0.020	<0.020	<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)	1510	1600	1550	1430	1440
Manganese (Mn)-Total (mg/kg)	0.470	0.480	0.270	0.280	0.414
Mercury (Hg)-Total (mg/kg)	0.971	1.28	1.91	1.42	1.25
Molybdenum (Mo)-Total (mg/kg)	<0.020	<0.020	<0.020	<0.020	<0.020
Nickel (Ni)-Total (mg/kg)	0.24	0.20	0.24	0.22	0.24
Phosphorus (P)-Total (mg/kg)	10700	11500	11100	10600	10700
Potassium (K)-Total (mg/kg)	20600	21600	20600	19600	20500
Rubidium (Rb)-Total (mg/kg)	62.1	61.1	65.9	71.3	58.2
Selenium (Se)-Total (mg/kg)	0.901	0.938	0.911	0.863	0.905
Sodium (Na)-Total (mg/kg)	1060	1190	1130	1210	1360
Strontium (Sr)-Total (mg/kg)	<0.050	0.053	0.072	0.068	0.088
Tellurium (Te)-Total (mg/kg)	<0.020	<0.020	<0.020	<0.020	<0.020
Thallium (Tl)-Total (mg/kg)	0.0111	0.0108	0.0141	0.0202	0.0118
Tin (Sn)-Total (mg/kg)	<0.10	<0.10	<0.10	<0.10	<0.10
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)	12.1	12.5	14.8	12.0	13.1
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	L1845628-56 Tissue 24-SEP-16 PINR-WA15-M	L1845628-57 Tissue 21-SEP-16 PINR-WAX-M	L1845628-58 Tissue 23-SEP-16 PINR-WAZ-M	L1845628-59 Tissue 21-SEP-16 PINR-WA01-L	L1845628-60 Tissue 21-SEP-16 PINR-WA02-L
TISSUE						
Physical Tests	% Moisture (%)	79.9	78.1	77.5	73.9	74.4
Metals	Aluminum (Al)-Total (mg/kg)	<2.0	<2.0	<5.0	<5.0	<2.0
	Antimony (Sb)-Total (mg/kg)	<0.010	<0.010	<0.010	<0.010	<0.010
	Arsenic (As)-Total (mg/kg)	0.178	0.141	0.188	0.259	0.236
	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)	<0.010	0.012	0.018	<0.010	<0.010
	Boron (B)-Total (mg/kg)	<1.0	<1.0	<1.0	<1.0	<1.0
	Cadmium (Cd)-Total (mg/kg)	<0.0050	<0.0050	<0.010	0.187	0.170
	Calcium (Ca)-Total (mg/kg)	471	531	446	377	350
	Cesium (Cs)-Total (mg/kg)	0.0591	0.0441	0.0441	0.0283	0.0248
	Chromium (Cr)-Total (mg/kg)	<0.050	<0.050	<0.20	<0.20	<0.050
	Cobalt (Co)-Total (mg/kg)	<0.020	<0.020	<0.020	0.273	0.273
	Copper (Cu)-Total (mg/kg)	0.56	0.74	0.41	4.84	5.51
	Iron (Fe)-Total (mg/kg)	5.3	3.4	5.1	184	202
	Lead (Pb)-Total (mg/kg)	<0.020	<0.020	<0.050	<0.050	<0.020
	Lithium (Li)-Total (mg/kg)	<0.50	<0.50	<0.50	<0.50	<0.50
	Magnesium (Mg)-Total (mg/kg)	1520	1450	1220	707	700
	Manganese (Mn)-Total (mg/kg)	0.407	0.370	0.424	7.09	5.37
	Mercury (Hg)-Total (mg/kg)	2.05	1.97	2.08	0.301	0.264
	Molybdenum (Mo)-Total (mg/kg)	<0.020	<0.020	<0.040	0.406	0.463
	Nickel (Ni)-Total (mg/kg)	0.26	0.28	<0.20	<0.20	0.22
	Phosphorus (P)-Total (mg/kg)	10900	9710	8090	10300	12300
	Potassium (K)-Total (mg/kg)	21200	18600	18000	8940	11500
	Rubidium (Rb)-Total (mg/kg)	52.6	48.3	38.2	29.1	34.8
	Selenium (Se)-Total (mg/kg)	0.911	1.04	0.90	2.23	2.35
	Sodium (Na)-Total (mg/kg)	1360	1780	769	3690	3980
	Strontium (Sr)-Total (mg/kg)	0.051	0.080	<0.10	0.24	0.194
	Tellurium (Te)-Total (mg/kg)	<0.020	<0.020	<0.020	<0.020	<0.020
	Thallium (Tl)-Total (mg/kg)	0.0123	0.0136	0.0192	0.0244	0.0387
	Tin (Sn)-Total (mg/kg)	<0.10	<0.10	0.16	0.37	0.41
	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)	14.3	12.0	10.2	50.4	58.6
	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	L1845628-61	L1845628-62	L1845628-63	L1845628-64	L1845628-65
Description	Tissue	Tissue	Tissue	Tissue	Tissue
Sampled Date	22-SEP-16	22-SEP-16	22-SEP-16	23-SEP-16	23-SEP-16
Sampled Time					
Client ID	PINR-WA03-L	PINR-WA04-L	PINR-WA05-L	PINR-WA06-L	PINR-WA07-L
Grouping **Analyte**					
TISSUE					
Physical Tests % Moisture (%)	76.3	80.6	76.3	73.3	74.7
Metals Aluminum (Al)-Total (mg/kg)	<2.0	2.0	<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)	0.356	0.267	0.269	0.438	0.234
Barium (Ba)-Total (mg/kg)	<0.050	<0.050	0.371	<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	0.015	0.013	0.013	<0.010
Boron (B)-Total (mg/kg)	<1.0	<1.0	<1.0	<1.0	<1.0
Cadmium (Cd)-Total (mg/kg)	0.273	0.292	0.182	0.525	0.269
Calcium (Ca)-Total (mg/kg)	360	626	5860	285	1050
Cesium (Cs)-Total (mg/kg)	0.0285	0.0470	0.0545	0.0223	0.0464
Chromium (Cr)-Total (mg/kg)	<0.050	<0.050	<0.20	<0.20	<0.20
Cobalt (Co)-Total (mg/kg)	0.432	0.443	0.196	1.28	0.676
Copper (Cu)-Total (mg/kg)	7.17	7.69	6.83	6.20	8.05
Iron (Fe)-Total (mg/kg)	376	254	198	245	450
Lead (Pb)-Total (mg/kg)	<0.020	<0.020	<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)	741	884	1270	584	658
Manganese (Mn)-Total (mg/kg)	5.30	9.16	11.7	5.19	6.09
Mercury (Hg)-Total (mg/kg)	0.346	0.473	0.507	0.610	0.279
Molybdenum (Mo)-Total (mg/kg)	0.590	0.665	0.725	0.598	0.673
Nickel (Ni)-Total (mg/kg)	<0.20	<0.20	<0.20	<0.20	<0.20
Phosphorus (P)-Total (mg/kg)	12200	13900	18200	9710	10600
Potassium (K)-Total (mg/kg)	12500	14000	12400	8790	10500
Rubidium (Rb)-Total (mg/kg)	28.2	51.2	37.1	22.4	46.2
Selenium (Se)-Total (mg/kg)	3.21	4.03	3.13	3.06	2.99
Sodium (Na)-Total (mg/kg)	6400	4950	3470	3820	4310
Strontium (Sr)-Total (mg/kg)	0.221	0.382	3.45	0.18	0.60
Tellurium (Te)-Total (mg/kg)	<0.020	<0.020	<0.020	<0.020	<0.020
Thallium (Tl)-Total (mg/kg)	0.0335	0.0576	0.0371	0.0387	0.0658
Tin (Sn)-Total (mg/kg)	0.36	0.67	0.49	0.49	0.45
Uranium (U)-Total (mg/kg)	<0.0020	<0.0020	0.0033	<0.0020	<0.0020
Vanadium (V)-Total (mg/kg)	<0.10	0.14	<0.10	0.12	<0.10
Zinc (Zn)-Total (mg/kg)	76.5	80.3	78.2	50.8	68.9
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	L1845628-66 Tissue 23-SEP-16 PINR-WA08-L	L1845628-67 Tissue 23-SEP-16 PINR-WA09-L	L1845628-68 Tissue 24-SEP-16 PINR-WA16-L	L1845628-69 Tissue 23-SEP-16 PINR-WA11-L	L1845628-70 Tissue 24-SEP-16 PINR-WA12-L
TISSUE						
Physical Tests	% Moisture (%)	74.6	69.7	76.7	74.9	76.0
Metals	Aluminum (Al)-Total (mg/kg)	<2.0	<5.0	<2.0	<2.0	<2.0
	Antimony (Sb)-Total (mg/kg)	<0.010	<0.010	<0.010	<0.010	<0.010
	Arsenic (As)-Total (mg/kg)	0.267	0.279	0.388	0.311	0.150
	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)	<0.010	<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)	0.216	0.332	0.313	0.267	0.253
	Calcium (Ca)-Total (mg/kg)	217	212	494	219	231
	Cesium (Cs)-Total (mg/kg)	0.0348	0.0235	0.0310	0.0287	0.0266
	Chromium (Cr)-Total (mg/kg)	<0.050	<0.20	<0.050	<0.050	<0.050
	Cobalt (Co)-Total (mg/kg)	0.213	0.925	0.265	0.701	0.160
	Copper (Cu)-Total (mg/kg)	3.96	6.68	9.33	5.22	33.2
	Iron (Fe)-Total (mg/kg)	154	218	268	457	139
	Lead (Pb)-Total (mg/kg)	<0.020	<0.050	<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)	656	844	631	550	760
	Manganese (Mn)-Total (mg/kg)	5.51	8.92	4.38	3.98	3.97
	Mercury (Hg)-Total (mg/kg)	0.396	0.508	0.231	0.230	0.347
	Molybdenum (Mo)-Total (mg/kg)	0.360	0.588	0.441	0.335	0.230
	Nickel (Ni)-Total (mg/kg)	<0.20	<0.20	<0.20	<0.20	<0.20
	Phosphorus (P)-Total (mg/kg)	10000	13500	9620	8130	11300
	Potassium (K)-Total (mg/kg)	11400	9910	10600	10200	12300
	Rubidium (Rb)-Total (mg/kg)	42.1	25.3	30.5	30.6	43.6
	Selenium (Se)-Total (mg/kg)	2.38	2.87	2.96	2.62	1.96
	Sodium (Na)-Total (mg/kg)	3070	3070	5310	4310	5010
	Strontium (Sr)-Total (mg/kg)	0.151	0.13	0.292	0.153	0.174
	Tellurium (Te)-Total (mg/kg)	<0.020	<0.020	<0.020	<0.020	<0.020
	Thallium (Tl)-Total (mg/kg)	0.0338	0.0485	0.0296	0.0286	0.0237
	Tin (Sn)-Total (mg/kg)	0.33	0.25	1.11	0.27	<0.10
	Uranium (U)-Total (mg/kg)	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020
	Vanadium (V)-Total (mg/kg)	<0.10	0.15	<0.10	<0.10	<0.10
	Zinc (Zn)-Total (mg/kg)	52.6	62.7	70.4	61.4	77.6
	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	L1845628-71	L1845628-72	L1845628-73	L1845628-74	L1845628-75
Description	Tissue	Tissue	Tissue	Tissue	Tissue
Sampled Date	24-SEP-16	24-SEP-16	24-SEP-16	21-SEP-16	21-SEP-16
Sampled Time					
Client ID	PINR-WA13-L	PINR-WA14-L	PINR-WA15-L	PINR-WAX-L	PINR-WA01-O
Grouping **Analyte**					
TISSUE					
Physical Tests % Moisture (%)	78.9	77.7	78.5	76.0	67.7
Metals Aluminum (Al)-Total (mg/kg)	2.2	<2.0	7.0	<5.0	<2.0
Antimony (Sb)-Total (mg/kg)	<0.010	<0.010	<0.010	<0.010	<0.010
Arsenic (As)-Total (mg/kg)	0.340	0.223	0.256	0.280	0.145
Barium (Ba)-Total (mg/kg)	<0.050	<0.050	<0.050	<0.050	0.051
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	<0.010
Boron (B)-Total (mg/kg)	<1.0	<1.0	<1.0	<1.0	<1.0
Cadmium (Cd)-Total (mg/kg)	1.08	0.273	2.04	0.203	<0.0050
Calcium (Ca)-Total (mg/kg)	380	329	442	275	564
Cesium (Cs)-Total (mg/kg)	0.0357	0.0316	0.0301	0.0322	0.0285
Chromium (Cr)-Total (mg/kg)	<0.050	<0.050	<0.20	<0.20	<0.050
Cobalt (Co)-Total (mg/kg)	0.223	0.570	1.08	0.351	0.188
Copper (Cu)-Total (mg/kg)	6.15	4.55	7.66	4.96	2.17
Iron (Fe)-Total (mg/kg)	286	330	635	172	84.8
Lead (Pb)-Total (mg/kg)	<0.020	<0.020	<0.050	<0.050	<0.020
Lithium (Li)-Total (mg/kg)	<0.50	<0.50	<0.50	<0.50	<0.50
Magnesium (Mg)-Total (mg/kg)	833	549	654	777	1160
Manganese (Mn)-Total (mg/kg)	6.16	3.59	5.56	7.74	14.1
Mercury (Hg)-Total (mg/kg)	0.369	0.221	0.527	0.305	0.0968
Molybdenum (Mo)-Total (mg/kg)	0.409	0.311	0.667	0.493	0.046
Nickel (Ni)-Total (mg/kg)	<0.20	<0.20	<0.20	<0.20	<0.20
Phosphorus (P)-Total (mg/kg)	12500	8240	10700	11200	9120
Potassium (K)-Total (mg/kg)	13400	10600	9460	10500	9670
Rubidium (Rb)-Total (mg/kg)	58.0	30.6	23.3	32.6	26.1
Selenium (Se)-Total (mg/kg)	3.31	2.46	3.07	2.19	2.92
Sodium (Na)-Total (mg/kg)	5920	5360	4720	4080	2130
Strontium (Sr)-Total (mg/kg)	0.240	0.214	0.22	0.18	0.160
Tellurium (Te)-Total (mg/kg)	<0.020	<0.020	<0.020	<0.020	<0.020
Thallium (Tl)-Total (mg/kg)	0.0552	0.0266	0.0318	0.0278	0.0221
Tin (Sn)-Total (mg/kg)	0.13	0.21	0.26	0.45	0.16
Uranium (U)-Total (mg/kg)	0.0021	<0.0020	0.0044	<0.0020	<0.0020
Vanadium (V)-Total (mg/kg)	<0.10	<0.10	0.66	<0.10	<0.10
Zinc (Zn)-Total (mg/kg)	84.1	58.1	62.0	55.9	99.3
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	L1845628-76 Tissue 21-SEP-16 PINR-WA02-O	L1845628-77 Tissue 22-SEP-16 PINR-WA04-O	L1845628-78 Tissue 22-SEP-16 PINR-WA05-O	L1845628-79 Tissue 23-SEP-16 PINR-WA08-O	L1845628-80 Tissue 23-SEP-16 PINR-WA09-O
TISSUE						
Physical Tests	% Moisture (%)	70.8	71.8	67.8	71.1	67.7
Metals	Aluminum (Al)-Total (mg/kg)	<2.0	<2.0	<2.0	<2.0	<2.0
	Antimony (Sb)-Total (mg/kg)	<0.010	<0.010	<0.010	<0.010	<0.010
	Arsenic (As)-Total (mg/kg)	0.147	0.112	0.126	0.150	0.158
	Barium (Ba)-Total (mg/kg)	0.076	<0.050	0.062	0.071	0.062
	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	<0.010
	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)	886	767	463	759	594
	Cesium (Cs)-Total (mg/kg)	0.0320	0.0394	0.0268	0.0297	0.0301
	Chromium (Cr)-Total (mg/kg)	<0.050	<0.050	<0.050	<0.050	<0.050
	Cobalt (Co)-Total (mg/kg)	0.256	0.256	0.194	0.210	0.198
	Copper (Cu)-Total (mg/kg)	2.50	2.33	2.29	2.50	2.10
	Iron (Fe)-Total (mg/kg)	90.2	110	66.2	75.5	80.3
	Lead (Pb)-Total (mg/kg)	<0.020	<0.020	<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)	1080	962	1300	1260	1040
	Manganese (Mn)-Total (mg/kg)	16.8	17.7	21.9	11.9	18.9
	Mercury (Hg)-Total (mg/kg)	0.0780	0.101	0.0922	0.101	0.0798
	Molybdenum (Mo)-Total (mg/kg)	0.054	0.052	0.039	0.037	0.048
	Nickel (Ni)-Total (mg/kg)	<0.20	<0.20	<0.20	<0.20	<0.20
	Phosphorus (P)-Total (mg/kg)	9460	9280	8870	10100	8490
	Potassium (K)-Total (mg/kg)	12000	12100	8020	10500	9540
	Rubidium (Rb)-Total (mg/kg)	35.2	39.3	22.4	26.9	26.7
	Selenium (Se)-Total (mg/kg)	3.07	3.39	2.61	3.28	2.64
	Sodium (Na)-Total (mg/kg)	2540	2840	1370	2510	2410
	Strontium (Sr)-Total (mg/kg)	0.332	0.193	0.108	0.223	0.160
	Tellurium (Te)-Total (mg/kg)	<0.020	<0.020	<0.020	<0.020	<0.020
	Thallium (Tl)-Total (mg/kg)	0.0306	0.0337	0.0193	0.0212	0.0268
	Tin (Sn)-Total (mg/kg)	0.19	0.11	<0.10	0.19	<0.10
	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)	121	119	99.8	110	96.4
	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

	Sample ID	L1845628-81	L1845628-82			
	Description	Tissue	Tissue			
	Sampled Date	24-SEP-16	24-SEP-16			
	Sampled Time					
	Client ID	PINR-WA12-O	PINR-WA13-O			
Grouping	**Analyte**					
TISSUE						
Physical Tests	% Moisture (%)	73.1	71.7			
Metals	Aluminum (Al)-Total (mg/kg)	<2.0	<2.0			
	Antimony (Sb)-Total (mg/kg)	<0.010	<0.010			
	Arsenic (As)-Total (mg/kg)	0.128	0.193			
	Barium (Ba)-Total (mg/kg)	0.129	0.081			
	Beryllium (Be)-Total (mg/kg)	<0.010	<0.010			
	Bismuth (Bi)-Total (mg/kg)	<0.010	<0.010			
	Boron (B)-Total (mg/kg)	<1.0	<1.0			
	Cadmium (Cd)-Total (mg/kg)	0.0093	0.0160			
	Calcium (Ca)-Total (mg/kg)	717	1040			
	Cesium (Cs)-Total (mg/kg)	0.0415	0.0400			
	Chromium (Cr)-Total (mg/kg)	<0.050	<0.050			
	Cobalt (Co)-Total (mg/kg)	0.138	0.160			
	Copper (Cu)-Total (mg/kg)	2.53	2.94			
	Iron (Fe)-Total (mg/kg)	64.5	87.8			
	Lead (Pb)-Total (mg/kg)	<0.020	<0.020			
	Lithium (Li)-Total (mg/kg)	<0.50	<0.50			
	Magnesium (Mg)-Total (mg/kg)	1060	1040			
	Manganese (Mn)-Total (mg/kg)	5.23	3.98			
	Mercury (Hg)-Total (mg/kg)	0.0660	0.0528			
	Molybdenum (Mo)-Total (mg/kg)	0.036	0.021			
	Nickel (Ni)-Total (mg/kg)	<0.20	<0.20			
	Phosphorus (P)-Total (mg/kg)	9170	8620			
	Potassium (K)-Total (mg/kg)	11700	10800			
	Rubidium (Rb)-Total (mg/kg)	32.4	40.7			
	Selenium (Se)-Total (mg/kg)	1.92	2.43			
	Sodium (Na)-Total (mg/kg)	3770	3870			
	Strontium (Sr)-Total (mg/kg)	0.206	0.274			
	Tellurium (Te)-Total (mg/kg)	<0.020	<0.020			
	Thallium (Tl)-Total (mg/kg)	0.0164	0.0231			
	Tin (Sn)-Total (mg/kg)	<0.10	<0.10			
	Uranium (U)-Total (mg/kg)	<0.0020	<0.0020			
	Vanadium (V)-Total (mg/kg)	<0.10	<0.10			
	Zinc (Zn)-Total (mg/kg)	97.7	77.2			
	Zirconium (Zr)-Total (mg/kg)	<0.20	<0.20			

* 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)
Method Blank	Manganese (Mn)-Total	MB-LOR	L1845628-1, -10, -11, -12, -13, -14, -15, -16, -18, -19, -2, -20, -22, -3, -4, -5, -7, -8, -9

Qualifiers for Individual Parameters Listed:

Qualifier	Description
MB-LOR	Method Blank exceeds ALS DQO. Limits of Reporting have been adjusted for samples with positive hits below 5x blank level.

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
VA	ALS ENVIRONMENTAL - VANCOUVER, BRITISH COLUMBIA, CANADA

Chain of Custody Numbers:

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.

Chain of Custody (COC) / Analytical Request Form

ALS Environmental
www.alsglobal.com

Canada Toll Free: 1 800 668 9878

L1845628-COFC

COC Number:

Page 1 of 8

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	E ☐Emergency (1-2 bus. days if received by 3pm) 100% surcharge - contact ALS to confirm TAT
		Select Distribution: ☑EMAIL ☐MAIL ☐FAX	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		Invoice Distribution
	Same as Report To ☐ Yes ☑ No	Select Invoice Distribution: ☑EMAIL ☐MAIL ☐FAX
	Copy of Invoice with Report ☐ Yes ☑ No	
Company:	New Gold, Robyn Gaebel, (807) 482-0900 ext 8239	Email 1 or Fax Robyn.Gaebel@newgold.com
Contact:	5967 Highway 11/71, P.O. Box 5, Emo, Ontario, P0W IE0	Email 2

Project Information		Oil and Gas Required Fields (client use)	
ALS Quote #:	Q56734	Approver ID:	Cost Center:
Job #:	167202.0067	GL Account:	Routing Code:
PO / AFE:		Activity Code:	
LSD:		Location:	

ALS Lab Work Order # (lab use only):

ALS Contact: Selam Worku | Sampler: JT/KMc

Analysis Request — Indicate Filtered (F), Preserved (P) or Filtered and Preserved (F/P) below

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-NP01-M ✓	21-Sep-16	-	Tissue	R	R	R	1
	PINR-NP02-M ✓	21-Sep-16	-	Tissue	R	R	R	1
	PINR-NP03-M ✓	21-Sep-16	-	Tissue	R	R	R	1
	PINR-NP04-M ✓	21-Sep-16	-	Tissue	R	R	R	1
	PINR-NP05-M ✓	21-Sep-16	-	Tissue	R	R	R	1
	PINR-NP06-M ✓	21-Sep-16	-	Tissue	R	R	R	1
	PINR-NP16-M ✓	22-Sep-16	-	Tissue	R	R	R	1
	PINR-NP08-M ✓	21-Sep-16	-	Tissue	R	R	R	1
	PINR-NP09-M ✓	21-Sep-16	-	Tissue	R	R	R	1
	PINR-NP10-M ✓	22-Sep-16	-	Tissue	R	R	R	1
	PINR-NP11-M ✓	22-Sep-16	-	Tissue	R	R	R	1
	PINR-NP12-M ✓	22-Sep-16	-	Tissue	R	R	R	1

Short Holding Time

Rush Processing

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		
			5.6		

SHIPMENT RELEASE (client use)			INITIAL SHIPMENT RECEPTION (lab use only)			FINAL SHIPMENT RECEPTION (lab use only)		
Released by:	Date: Oct 18, 2016	Time:	Received by: Shaylon	Date: Oct 19	Time: 920	Received by:	Date:	Time:

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION

WHITE - LABORATORY COPY YELLOW - CLIENT COPY

NA-FM-0206a 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

L1845628-COFC

COC Number:

Report To		Report Format / Distribution		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		
	Copy of Invoice with Report ☐ Yes ☑ No	Select Invoice Distribution:	☐EMAIL ☐MAIL ☐FAX	
Company:	New Gold, Robyn Gaebel, (807) 482-0900 ext 8239	Email 1 or Fax	Robyn.Gaebel@newgold.com	
Contact:	5967 Highway 11/71, P.O. Box 5, Emo, Ontario, P0W IE0	Email 2		

Project Information		Oil and Gas Required Fields (client use)	
ALS Quote #:	Q56734	Approver ID:	Cost Center:
Job #:	167202.0067	GL Account:	Routing Code:
PO / AFE:		Activity Code:	
LSD:		Location:	

ALS Lab Work Order # (lab use only) | **ALS Contact:** Selam Worku | **Sampler:** JT/KMc

Analysis Request

Indicate Filtered (F), Preserved (P) or Filtered and Preserved (F/P) below

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-NP13-M ✓	22-Sep-16	-	Tissue	R	R	R	1
	PINR-NP14-M ✓	22-Sep-16	-	Tissue	R	R	R	1
	PINR-NP15-M ✓	22-Sep-16	-	Tissue	R	R	R	1
	PINR-NPX-M ✓	21-Sep-16	-	Tissue	R	R	R	1
	PINR-NPZ-M ✓	21-Sep-16	-	Tissue	R	R	R	1
	PINR-NP01-L ✓	21-Sep-16	-	Tissue	R	R	R	1
	PINR-NP02-L ✓	21-Sep-16	-	Tissue	R	R	R	1
	PINR-NP03-L ✓	21-Sep-16	-	Tissue	R	R	R	1
	PINR-NP04-L ✓	21-Sep-16	-	Tissue	R	R	R	1
	PINR-NP05-L ✓	21-Sep-16	-	Tissue	R	R	R	1
	PINR-NP06-L ✓	21-Sep-16	-	Tissue	R	R	R	1
	PINR-NP16-L ✓	22-Sep-16	-	Tissue	R	R	R	1

Short Holding Time

Rush Processing

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		
			5.6		

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:	Date:	Time:
	18-Oct-16		Shayan	Oct 19	920			

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION

WHITE - LABORATORY COPY YELLOW - CLIENT COPY

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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

L1845628-COFC

COC Number:

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	E ☐Emergency (1-2 bus. days if received by 3pm) 100% surcharge - contact ALS to confirm TAT
		Select Distribution: ☑EMAIL ☐MAIL ☐FAX	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:	New Gold, Robyn Gaebel, (807) 482-0900 ext 8239	Email 1 or Fax Robyn.Gaebel@newgold.com	
Contact:	5967 Highway 11/71, P.O. Box 5, Emo, Ontario, P0W IE0	Email 2	

Project Information		Oil and Gas Required Fields (client use)	
ALS Quote #:	Q56734	Approver ID:	Cost Center:
Job #:	167202.0067	GL Account:	Routing Code:
PO / AFE:		Activity Code:	
LSD:		Location:	

ALS Lab Work Order # (lab use only)	ALS Contact: Selam Worku	Sampler: JT/KMc

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-NP08-L ✓	21-Sep-16	-	Tissue	R	R	R	1
	PINR-NP09-L ✓	21-Sep-16	-	Tissue	R	R	R	1
	PINR-NP10-L ✓	22-Sep-16	-	Tissue	R	R	R	1
	PINR-NP11-L ✓	22-Sep-16	-	Tissue	R	R	R	1
	PINR-NP12-L ✓	22-Sep-16	-	Tissue	R	R	R	1
	PINR-NP13-L ✓	22-Sep-16	-	Tissue	R	R	R	1
	PINR-NP14-L ✓	22-Sep-16	-	Tissue	R	R	R	1
	PINR-NP15-L ✓	22-Sep-16	-	Tissue	R	R	R	1
	PINR-NPX-L ✓	21-Sep-16	-	Tissue	R	R	R	1
	PINR-NP01-O ✓	21-Sep-16	-	Tissue	R	R	R	1
	PINR-NP02-O ✓	21-Sep-16	-	Tissue	R	R	R	1
	PINR-NP03-O ✓	21-Sep-16	-	Tissue	R	R	R	1

Short Holding Time

Rush Processing

Drinking Water (DW) Samples[1] (client use)	Special Instructions / Specify Criteria to add on report (client Use)	SAMPLE CONDITION AS RECEIVED (lab use only)
Are samples taken from a Regulated DW System? ☐ Yes ☐ No		Frozen ☐ SIF Observations Yes ☐ No ☐
Are samples for human drinking water use? ☐ Yes ☐ No		Ice packs Yes ☐ No ☐ Custody seal intact Yes ☐ No ☐
		Cooling Initiated ☐

INITIAL COOLER TEMPERATURES °C			FINAL COOLER TEMPERATURES °C		
			5.6		

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:	Date:	Time:
	18-Oct-16			Oct.19	920			

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION WHITE - LABORATORY COPY YELLOW - CLIENT COPY

ALS FM-0325e v09 Front/04 January 2014

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1. If any water samples are taken from a **Regulated Drinking Water (DW) System**, please submit using an **Authorized DW COC form**.

Chain of Custody (COC) / Analytical Request Form

ALS Environmental
www.alsglobal.com

Canada Toll Free: 1 800 668 9878

L1845628-COFC

COC Number:

Page 4 of 8

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	E ☐Emergency (1-2 bus. days if received by 3pm) 100% surcharge - contact ALS to confirm TAT
		Select Distribution: ☑EMAIL ☐MAIL ☐FAX	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		Invoice Distribution	Analysis Request
	Same as Report To ☐ Yes ☑ No	Select Invoice Distribution: ☐EMAIL ☐MAIL ☐FAX	Indicate Filtered (F), Preserved (P) or Filtered and Preserved (F/P) below
	Copy of Invoice with Report ☐ Yes ☑ No		
Company:	New Gold, Robyn Gaebel, (807) 482-0900 ext 8239	Email 1 or Fax Robyn.Gaebel@newgold.com	
Contact:	5967 Highway 11/71, P.O. Box 5, Emo, Ontario, P0W IE0	Email 2	

Project Information		Oil and Gas Required Fields (client use)	
ALS Quote #:	Q56734	Approver ID:	Cost Center:
Job #:	167202.0067	GL Account:	Routing Code:
PO / AFE:		Activity Code:	
LSD:		Location:	

ALS Lab Work Order # (lab use only)	ALS Contact: Selam Worku	Sampler: JT/KMc

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-NP08-O ✓	21-Sep-16	-	Tissue	R	R	R	1
	PINR-NP12-O ✓	22-Sep-16	-	Tissue	R	R	R	1
	PINR-NP14-O ✓	22-Sep-16	-	Tissue	R	R	R	1
	PINR-NP16-O ✓	22-Sep-16	-	Tissue	R	R	R	1
	PINR-NPX-O ✓	21-Sep-16	-	Tissue	R	R	R	1

Short Holding Time
Rush Processing

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		
			5.6		

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:	Date:	Time:
	Oct 18, 2016		Shayan	Oct 19	920			

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION WHITE - LABORATORY COPY YELLOW - CLIENT COPY

NA-FM-03206 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

L1845628-COFC

COC Number:

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		E ☐Emergency (1-2 bus. days if received by 3pm) 100% surcharge - contact ALS to confirm TAT
		Select Distribution:	☑EMAIL ☐MAIL ☐FAX	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		Invoice Distribution	
	Same as Report To ☐ Yes ☑ No	Select Invoice Distribution:	☐EMAIL ☐MAIL ☐FAX
	Copy of Invoice with Report ☐ Yes ☑ No	Email 1 or Fax	Robyn.Gaebel@newgold.com
Company:	New Gold, Robyn Gaebel, (807) 482-0900 ext 8239	Email 2	
Contact:	5967 Highway 11/71, P.O. Box 5, Emo, Ontario, P0W IE0		

Project Information		Oil and Gas Required Fields (client use)	
ALS Quote #:	Q56734	Approver ID:	Cost Center:
Job #:	167202.0067	GL Account:	Routing Code:
PO / AFE:		Activity Code:	
LSD:		Location:	

ALS Lab Work Order # (lab use only):

ALS Contact: Selam Worku | Sampler: JT/KMc

Analysis Request

Indicate Filtered (F), Preserved (P) or Filtered and Preserved (F/P) below

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
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	PINR-Wa07-M ✓	23-Sep-16	-	Tissue	R	R	R	1
	PINR-Wa08-M ✓	23-Sep-16	-	Tissue	R	R	R	1
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	PINR-Wa11-M ✓	23-Sep-16	-	Tissue	R	R	R	1
	PINR-Wa12-M ✓	24-Sep-16	-	Tissue	R	R	R	1

Short Holding Time

Rush Processing

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		
			5.6		

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:	Date:	Time:
	Oct 18, 2016		Shayan	Oct.19	920			

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Chain of Custody (COC) / Analytical Request Form

Canada Toll Free: 1 800 668 9878

L1845628-COFC

COC Number:

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Report To		Report Format / Distribution	Select Service Level Below (Rush Turnaround Time (TAT) is not available for all tests)
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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
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Contact:	5967 Highway 11/71, P.O. Box 5, Emo, Ontario, P0W IE0	Email 2	

Project Information		Oil and Gas Required Fields (client use)	
ALS Quote #:	Q56734	Approver ID:	Cost Center:
Job #:	167202.0067	GL Account:	Routing Code:
PO / AFE:		Activity Code:	
LSD:		Location:	

ALS Lab Work Order # (lab use only)

ALS Contact: Selam Worku **Sampler:** JT/KMc

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	PINR-Wa15-M ✓	24-Sep-16	-	Tissue	R	R	R	1
	PINR-WaX-M ✓	21-Sep-16	-	Tissue	R	R	R	1
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	PINR-Wa07-L ✓	23-Sep-16	-	Tissue	R	R	R	1

Short Holding Time

Rush Processing

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		
			5.6		

SHIPMENT RELEASE (client use)			INITIAL SHIPMENT RECEPTION (lab use only)			FINAL SHIPMENT RECEPTION (lab use only)		
Released by:	Date: Oct 18, 2016	Time:	Received by: Shayan	Date: Oct 19	Time: 920	Received by:	Date:	Time:

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION

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Chain of Custody (COC) / Analytical Request Form

Canada Toll Free: 1 800 668 9878

L1845628-COFC

OC Number:

Report To		Report Format / Distribution	Select Service Level Below (Rush Turnaround Time (TAT) is not available for all tests)
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		Email 1 or Fax jtester@minnow.ca	Specify Date Required for E2,E or P:
		Email 2	

Invoice To		Invoice Distribution
	Same as Report To ☐ Yes ☑ No	Select Invoice Distribution: ☐EMAIL ☐MAIL ☐FAX
	Copy of Invoice with Report ☐ Yes ☑ No	
Company:	New Gold, Robyn Gaebel, (807) 482-0900 ext 8239	Email 1 or Fax Robyn.Gaebel@newgold.com
Contact:	5967 Highway 11/71, P.O. Box 5, Emo, Ontario, P0W IE0	Email 2

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ALS Quote #:	Q56734	Approver ID:	Cost Center:
Job #:	167202.0067	GL Account:	Routing Code:
PO / AFE:		Activity Code:	
LSD:		Location:	

ALS Lab Work Order # (lab use only):

ALS Contact: Selam Worku | Sampler: JT/KMc

Analysis Request — Indicate Filtered (F), Preserved (P) or Filtered and Preserved (F/P) below

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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	
		5.6	

SHIPMENT RELEASE (client use)			INITIAL SHIPMENT RECEPTION (lab use only)		
Released by:	Date: Oct 6, 2016	Time:	Received by: Shayan	Date: Oct 7	Time: 920

FINAL SHIPMENT RECEPTION (lab use only)		
Received by:	Date:	Time:

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NA-FM-0328e v09 Front/04 January 2014

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COC Number:

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		Select Distribution: ☑EMAIL ☐MAIL ☐FAX	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		Invoice Distribution
	Same as Report To ☐ Yes ☑ No	Select Invoice Distribution: ☐EMAIL ☐MAIL ☐FAX
	Copy of Invoice with Report ☐ Yes ☑ No	
Company:	New Gold, Robyn Gaebel, (807) 482-0900 ext 8239	Email 1 or Fax Robyn.Gaebel@newgold.com
Contact:	5967 Highway 11/71, P.O. Box 5, Emo, Ontario, P0W IE0	Email 2

Project Information		Oil and Gas Required Fields (client use)	
ALS Quote #:	Q56734	Approver ID:	Cost Center:
Job #:	167202.0067	GL Account:	Routing Code:
PO / AFE:		Activity Code:	
LSD:		Location:	

ALS Lab Work Order # (lab use only)

ALS Contact: Selam Worku **Sampler:** JT/KMc

Analysis Request

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	PINR-Wa12-O ✓	24-Sep-16	-	Tissue	R	R	R	1
	PINR-Wa13-O ✓	24-Sep-16	-	Tissue	R	R	R	1

Short Holding Time

Rush Processing

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		
			5.6		

SHIPMENT RELEASE (client use)			INITIAL SHIPMENT RECEPTION (lab use only)			FINAL SHIPMENT RECEPTION (lab use only)		
Released by:	Date: Sep 16,16	Time:	Received by: Shayan	Date: Oct.19	Time: 920	Received by:	Date:	Time:

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NA-FM-0328e v08 Front/04 January 2014

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APPENDIX D

Communications

Provided by Shannon King
Pwi-Di-Goo-Zing Ne-Yaa-Zhing Advisory Services – First Nations Coordinator

Thursday, August 25th,. 2016 Vaughan Wilson & Stan Vlotaros Barrwick and Emo Residents

1. **Is the Pinewood river routinely used for the collection of fish for consumption?**
   Mostly only at the mouth and a km upstream, no known fishers of the river so far.

2. **Is use limited to the area near the mouth of the Pinewood (at the Rainy River) or are upstream areas used also?**
   The mouth.

3. **How does such use compare to use of Rainy River downstream of the Pinewood?**
   (Got 2 different answers for this one)
   A More fishing in the mouth of the Pinewood in the spring than downstream.
   B Pinewood has maybe 1/10th of the fishing than Sleeman river.

4. **To what extent does fishing frequency vary with season?**
   Spring is the main fishing season for the Pinewood (sparse through other seasons).

5. **Which fish species are caught and consumed?**
   Northern, walleye, sturgeon, sucker, bass, shiners.

6. **What is considered to be an edible size?**
   12-14 inches for walleye/northern and typically 48-60 inches for sturgeon.

7. **What is the typical consumption rate of the Pinewood River fish?**
   Maybe %5 compared to the Rainy.

8. **Which fish tissue are consumed?**
   Fillet, side flanks, 2 dorsal fins on a walleye. For canned northern can use %80 of the fish, and %80 of the sturgeon.

Suggestions for things to look at for our baseline study:

-average growth rate
-arsynic levels
-color of fillets
-tissue and fillet (based on same sizes and species of fish)
-grinding entire fish when testing
-slot sized fish testing
-resident vs non-resident walleye

Tuesday, August 30th, 2016 Jeff Brown Rainy River First Nations

1. **Is the Pinewood river routinely used for the collection of fish for consumption?**
   Mr. Brown doesn't fish for consumption in the Pinewood but knows of locals (non-first Nation) who do

2. **Is use limited to the area near the mouth of the Pinewood (at the Rainy River) or are upstream areas used also?**
   Mr. Brown fishes mostly at the mouth

3. **How does such use compare to use of Rainy River downstream of the Pinewood?**

4. **To what extent does fishing frequency vary with season?**
   Spring time is the best for catching walleye. They head to the Pinewood to spawn.

5. **Which fish species are caught and consumed?**
   Northern, walleye, croppies

6. **What is considered to be an edible size?**
   13-18 inches (walleye)

7. **What is the typical consumption rate of the Pinewood River fish?**

8. **Which fish tissue are consumed?**
   Fillets and cheeks

Mr. Brown expressed concern about the questions only being directed to the Pinewood.

Tuesday, August 30th, 2016 Trisha Bombay - Rainy River First Nations

1. **Is the Pinewood river routinely used for the collection of fish for consumption?**
   Yes

2. **Is use limited to the area near the mouth of the Pinewood (at the Rainy River) or are upstream areas used also?**
   Fishes in both upstream and the mouth, favours the mouth.

3. **How does such use compare to use of Rainy River downstream of the Pinewood?**
   There is a lot of fishing downstream of the pinewood. Mostly locals fish in the Pinewood

4. **To what extent does fishing frequency vary with season?**
   Spring is most popular for fishing for walleye

5. **Which fish species are caught and consumed?**
   Northern, walleye

6. **What is considered to be an edible size?**
   Under slot 14-16 inches (walleye)

7. **What is the typical consumption rate of the Pinewood River fish?**
   Depends on the season, walleye has been increasing in the river, also muskies are coming back and they haven't been around in a long time.

8. **Which fish tissue are consumed?**
   Fillets and cheeks

Trish expressed that she wasn't aware of too many people from her community that fish in the Pinewood. Mostly the locals (non-native) fish in the Pinewood.

Tuesday August 30th, 2016 Karen Bombay Rainy River First Nations

1. **Is the Pinewood river routinely used for the collection of fish for consumption?**
   Yes

2. **Is use limited to the area near the mouth of the Pinewood (at the Rainy River) or are upstream areas used also?**
   Both are used

3. **How does such use compare to use of Rainy River downstream of the Pinewood?**
   Depends on the person. The mouth is popular at spring but all the river is used.

4. **To what extent does fishing frequency vary with season?**
   Spring time is most popular at the mouth. The fish from the lake come into the river to spawn.

5. **Which fish species are caught and consumed?**
   It depends of the water levels

6. **What is considered to be an edible size?**
   12-16 inches

7. **What is the typical consumption rate of the Pinewood River fish?**

8. **Which fish tissue are consumed?**
   Fillets and cheeks. Traditional the community members used to smoke the sturgeons from the pinewood and the eggs.

Tuesday, August 30th, 2016 Rick Christianson

1. **Is the Pinewood river routinely used for the collection of fish for consumption?**
   He only knows of people recreational fishing in the Pinewood.

2. **Is use limited to the area near the mouth of the Pinewood (at the Rainy River) or are upstream areas used also?**
   Both upstream and the mouth are used.

3. **How does such use compare to use of Rainy River downstream of the Pinewood?**
   Mostly the mouth and in the Rainy River are used.

4. **To what extent does fishing frequency vary with season?**
   Everyone knows it's better in the spring. He has never fished in the winter but knows of people who have.

5. **Which fish species are caught and consumed?**
   Northern Pike, Walleye and sogeye

6. **What is considered to be an edible size?**
   Walleye 14-17
   Northern Pike 25 inches

7. **What is the typical consumption rate of the Pinewood River fish?**

8. **Which fish tissue are consumed?**
   Filets and cheeks of a walleye
   Filets and the backs of Northern Pike

Wednesday, August 31st, 2016 Brian Major – Big Grassy First Nation

1. **Is the Pinewood river routinely used for the collection of fish for consumption?**
   Not to his knowledge

2. **Is use limited to the area near the mouth of the Pinewood (at the Rainy River) or are upstream areas used also?**
   Mouth is the main area. Heard of locals fishing upstream.

3. **How does such use compare to use of Rainy River downstream of the Pinewood?**
   The mouth of the Pinewood is where a lot of fish are caught.

4. **To what extent does fishing frequency vary with season?**
   Fishing is best in the spring and fall. Has seen the odd ice shack in the winter.

5. **Which fish species are caught and consumed?**
   Walleye, Northern, Sturgeon, Suckers

6. **What is considered to be an edible size?**
   14”-17” Walleye, 36”-40” Northern, 48”-56” Sturgeon, 24”-30” sucker

7. **What is the typical consumption rate of the Pinewood River fish?**
   Spring & Fall

8. **Which fish tissue are consumed?**
   Filets and cheeks mostly. Remembers when all of the fish was used, including the guts.

Brian expressed concern for the Grassy Rivers. He said Grassy Rivers have, Bass, Walleye, Muskie, Northern, Tulibi, Suckers, Ling, Perch, Crapi. He feels that testing all sizes and the complete fish would give better results. The big one are the biggest reproducers, its part of why they toss them back. Testing the ROE will give a better understanding too.