Keeyask Generation Project

Terrestrial Effects Monitoring Plan

Mercury In Plants Monitoring Report

TEMP-2018-06

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KEEYASK GENERATION PROJECT

TERRESTRIAL EFFECTS MONITORING PLAN

REPORT #TEMP-2018-06

MERCURY IN PLANTS MONITORING

Prepared for

Manitoba Hydro

By

ECOSTEM Ltd.

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SUMMARY

Background

Construction of the Keeyask Generation Project (the Project) at Gull Rapids began in July 2014. The Keeyask Hydropower Limited Partnership (KHLP) was required to prepare a plan to monitor the effects of construction and operation of the generating station on the terrestrial environment. Monitoring results will help the KHLP, government regulators, members of local First Nation communities, and the general public understand how construction and operation of the generating station will affect the environment, and whether or not more needs to be done to reduce harmful effects.

This report describes the results of mercury in plants monitoring conducted during the fourth summer of Project construction.

Why is the study being done?

Members of partner First Nations are concerned about Project-related changes in mercury levels in terrestrial plants that are eaten or have traditional uses. During the Project's environmental assessment, members of the Keeyask Mercury and Human Health Technical Working Group decided that mercury levels should be monitored in Labrador tea, northern Labrador tea, blueberries, and sweet flag (Wihkis in Cree).

This study is being conducted to evaluate whether the creation of the Project reservoir increases mercury content in several kinds of traditionally used plants.

What was done?

Mercury levels in plants are being monitored as a component of the technical science monitoring, including voluntary submission of plant samples by members of partner First Nations. To evaluate if there are changes in mercury levels, mercury levels in the selected terrestrial plants after the reservoir impoundment will be compared with those found in plants that were collected prior to reservoir impoundment.

Plant tissue collecting to record mercury levels prior to impoundment began in 2017. For blueberry plants, berries were collected at 27 locations from August 26 to 30. Labrador tea leaves were collected at 26 locations on September 18 and 19. Northern Labrador tea and sweet flag/Wihkis, the other two species of interest, were not found in the searched areas. More than the minimum amount of tissue was collected at each location.

What was found?

Analysis of the berries collected from blueberry bushes found that mercury content was below the smallest amount that the laboratory could measure (5.0 ng/g) in all of the samples.

Mercury content in the Labrador tea leaves was below the smallest amount that could be measured in four of the 26 samples. Assuming total mercury content is 75% of the detection limit for those samples, average mercury content for the Labrador tea leaves was 5.7 ng/g, and the highest content was 8.5 ng/g. There was no difference in total mercury content between samples collected in locations near the Project site compared with the reference locations away from the Project site.

What does it mean?

Mercury occurs naturally in the environment. There are no established guidelines for safe levels of consumption of country food plants in local diets.

In the meantime, other studies provide an idea of what can be expected for mercury in boreal plants in Canada. Results from such studies found mean total mercury concentration values for 17 different plant species ranged from 4.9 ng/g up to 39.3 ng/g, with most being higher than 10.0 ng/g. For the 2017 samples, all of the blueberry concentrations were below the bottom end of this range and all of the Labrador tea leaf concentrations were either below or near the bottom end or the range.

What will be done next?

Monitoring of mercury in plants will continue in 2018. The minimum amount of plant tissue to be collected will be increased to safeguard against any material loss during storage or lab analysis and to ensure that enough tissue continues to be available to provide a low laboratory detection limit. No other major changes to field methods are anticipated.

ACKNOWLEDGEMENTS

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STUDY TEAM

Dr. James Ehnes was the project manager and study designer.

Fieldwork was conducted by Brock Epp, Nathan Ricard and Alanna Sutton.

Data analysis and report writing were completed by Brock Epp and James Ehnes. Cartography was completed by Nathan Ricard.

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1.0 INTRODUCTION

Construction of the Keeyask Generation Project (the Project), a 695 megawatt hydroelectric generating station (GS) and associated facilities, began in July 2014. The Project is located at Gull Rapids on the lower Nelson River in northern Manitoba where Gull Lake flows into Stephens Lake, 35 km upstream of the existing Kettle GS.

The *Keeyask Generation Project Response to EIS Guidelines* (the EIS; KHLP 2012a), completed in June 2012, provides a summary of predicted effects and planned mitigation for the Project. Technical supporting information for the terrestrial environment, including a description of the environmental setting, effects and mitigation, and a summary of proposed monitoring and follow-up programs is provided in the *Keeyask Generation Project Environmental Impact Statement Terrestrial Supporting Volume* (TE SV; KHLP 2012b). The *Keeyask Generation Project Terrestrial Effects Monitoring Plan* (TEMP; KHLP 2015) was developed as part of the licensing process for the Project. Monitoring activities for various components of the terrestrial environment were described, including the focus of this report, mercury in plants, during the construction and operation phases.

This study addresses concerns that members of the partner First Nations have expressed about mercury levels in traditionally used terrestrial plant species. Mercury levels in these plants species will be monitored via tissue collected as a component of the TEMP, including any plant samples collected and submitted by partner First Nations community members. During Project operation, mercury levels in selected terrestrial plant species will be compared with those in plants that were collected prior to reservoir impoundment. During the Project's environmental assessment, the four plant species/groups selected by members of the Keeyask Mercury and Human Health Technical Working Group for monitoring were Labrador tea (*Rhododendron groenlandicum*), northern Labrador tea (*Rhododendron tomentosum*), blueberries (*Vaccinium* spp.) and sweet flag (*Acorus americanus*), which is called Wihkis in Cree.

The objectives of this study are to:

- Evaluate pre-impoundment mercury levels in the selected terrestrial plant species; and,
- Evaluate if there are changes in mercury levels in the selected terrestrial plant species during Project operation.

Monitoring during the construction period, prior to impoundment was conducted for the first time in 2017. This report presents the results from this monitoring.

2.0 LITERATURE OVERVIEW

Mercury is a naturally occurring metal that exists in elemental, inorganic and organic forms in the environment (Research Triangle Institute 1999). Mercury is naturally introduced into the environment through the weathering of minerals in rocks and soils and through volcanic activity. Human activities, such as mining and fossil fuel burning have increased the amounts of mercury in the global environment (Fitzgerald et al. 1998). There is some evidence that suggests that hydroelectric reservoirs may increase mercury concentrations in land plants that are very close to the reservoir (Zhang et al. 1995). While the potential pathways for mercury being transferred from the reservoir to the plants were not tested, the authors speculated the difference could be due to the absorption of gaseous mercury emitted from water or soil surfaces. Another possibility was that mercury was being taken up by plant roots from groundwater that was hydrologically connected to the reservoir.

Vascular and non-vascular plants have a large capacity to take up and store mercury in their tissues (e.g. Siegel et al. 1987, Will-Wolf et al. 2005). As such, they may be an important sink for atmospheric or soil mercury. It has been suggested that the mercury concentration in foliage largely represents the accumulation of atmospheric mercury through the growing season, while mercury taken up from the soil is largely stored in roots (Rea et al. 2002, Ericksen et al. 2003).

Studies identifying safe levels for consumption of country food plants in local diets were not found. Plant mercury concentrations from this study will be provided to the toxicologist undertaking the Project’s Human Health Risk Assessment (HHRA) for further analysis.

For general context, Table 2-1 provides literature-reported mean total mercury concentration values for plant species from studies conducted in Canada. Four of these studies are from the Experimental Lakes Area in northwestern Ontario (St. Louis et al. 2001, Hall and St. Louis 2004, Hall et al. 2005, Mailman and Bodaly 2005), one is from southern Ontario (Rasmussen et al. 1991), one is from Quebec (Zhang et al. 1995) and one is from the Southern Indian Lake area in Manitoba (Bodaly et al. 1987).

These studies found that mean total mercury concentration values for various plant species range from 4.9 ng/g up to 39.3 ng/g, with mercury concentrations being higher than 10.0 ng/g for most species (Table 2-1). Total mercury concentration values measured in species from the Southern Indian Lake area, which is the closest to the Keeyask region, are similar to values recorded in other studies.

Mercury concentrations in plants growing in the Keeyask region are likely different from those reported in Table 2-1 for a variety of reasons. The most important of these are species differences, plant parts sampled, site conditions, proximity to human emission sources, time sampled in the growing season and time in the life of the individual plant.

Plant species differ in their capacity to bioaccumulate mercury. Plants at one mining site accumulated from 100 to 1,000 ng/g of total mercury, depending on the species (Bailey and Gray 1997). Within a particular plant, total mercury concentrations are different in the fruit, leaf, stem and root of the same species (Schwesig and Krebs 2003). Site conditions can have an important influence through factors such as local bedrock geology (AMAP 1998) or groundwater (Zhang et al. 1995). The natural accumulation of mercury in plant parts is a function of time, occurring over the growing season and the life of the individual plant. Mercury concentrations in leaves tend to be highest near the end of the growing season (Rasmussen 1995; Schwesig and Krebs 2003).

Table 2-1: Mean total mercury values for plant species found in Keeyask region as reported by studies conducted in various provinces

Plant Species Name		Tissue Tested	Total Mercury (ng/g)1	Source
Scientific	**Common**			
Alnus viridis	Green alder	Foliage, small branches	8.2	Hall and St Louis 2004, Mailman and Bodaly 2005
Alnus incana	Speckled alder	Foliage	34.0	St Louis et al. 2001
Alnus spp.	Alder	Foliage, bark, wood, small branches	11.8	Bodaly et al. 1987
Betula papyrifera	White birch	Foliage, bark, wood, small branches	12.5	Bodaly et al. 1987, Hall and St Louis 2004, Hall et al. 2005, Mailman and Bodaly 2005
Chamaedaphne calyculata	Leather-leaf	Foliage, small branches	20.4	Mailman and Bodaly 2005, St Louis et al. 2001
Cornus canadensis	Bunchberry	Foliage and stem	9.8	Hall and St Louis 2004
Kalmia polifolia	Bog-laurel	Foliage, small branches	10.5	Mailman and Bodaly 2005
Larix laricina	Tamarack	Foliage, small branches	19.7	Mailman and Bodaly 2005, Rasmussen et al. 1991
Ledum groenlandicum	Labrador-tea	Foliage, small branches	18.1	Bodaly et al. 1987, Hall and St Louis 2004, Mailman and Bodaly 2005
Picea glauca	White spruce	Foliage	13.9	Rasmussen et al. 1991
Picea mariana	Black spruce	Foliage, wood, small branches	39.32	Bodaly et al. 1987, Mailman and Bodaly 2005, Zhang et al. 1995
Pinus banksiana	Jack pine	Foliage, wood, small branches	20.4	Bodaly et al. 1987, Friedli et al. 2007, Hall and St. Louis 2004, Hall et al. 2004
Populus balsamifera	Balsam-poplar	Foliage, bark, wood, small branches	13.5	Bodaly et al. 1987
Populus tremuloides	Trembling aspen	Foliage, bark, wood, small branches	10.3	Bodaly et al. 1987, Friedli et al. 2007,
Prunus pensylvanica	Pin-cherry	Foliage, small branches	4.9	Mailman and Bodaly 2005
Salix spp.*	Willows	Foliage, bark, wood, small branches	10.4	Bodaly et al. 1987, Mailman and Bodaly 2005
Vaccinium spp.	Blueberry	Foliage, small branches	8.4	Hall and St Louis 2004, Mailman and Bodaly 2005

Notes: [1] Mean values are the average across the studies listed in the Source column. For those publications where it is stated, these are all dry weight concentrations. [2] Includes samples growing near a reservoir.

3.0 METHODS

Section 7.2.3 of the TEMP details the methods for this study. The following section summarizes the monitoring activities conducted during 2017.

3.1 SAMPLE COLLECTION

Suitable permanent collection sites for the selected plant species were identified within two different zones. The first was the “Project Effects” zone, which was a 50 m wide band adjacent to the future reservoir shoreline, and the “Reference” zone, which provided data from unaffected areas for comparison with samples from the Project Effects zone. The Reference zone included locations that were at least 1 km away from the future reservoir shoreline or other human features that might influence mercury levels in plant tissue (Map 3-1).

Preliminary aerial surveys were conducted to identify the portions of the Project Effects zone that would be suitable for plant tissue collection. These surveys determined that there were no suitable collection areas in the Project Effects zone north of the Nelson River because the area had burned in 2013. A recent burn would introduce confounding factors for evaluating reservoir effects on mercury. Mercury is readily volatilized from organic matter consumed during burning, with the amounts being highly influenced by the amount of peat and other organic material present in the surface soil layer (Turetsky et al. 2006). The amount of mercury released can vary greatly with fire parameters such as burn intensity and severity. Additionally, the regenerating burned plants may have varied uptake rates while maturing.

Most of the Project Effects zone south of the Nelson River fell within areas that had burned in 2005. In these areas, sufficient time had passed for the large pulse of released mercury to work its way through the local ecosystems and for the burned plants of interest to fully regenerate. The potential reference areas were selected from those that burned in 2005.

General areas meeting the selection criteria described above were surveyed by helicopter for potential sample locations. Potential sample locations included a habitat patch of a type that often supports one or more of the target plant species. When potentially suitable locations were found, they were marked from the air with a GPS unit (Garmin Map78 or Map62). Each location was then visited on the ground to confirm that suitable collection locations existed. A location was suitable for mercury collection if there appeared to be a sufficient number of plants to conduct mercury analysis over six sample collection years. Effort was also made to find a location such that as many of the target species as possible was within walking distance of each other, to minimize helicopter use.

Plant tissue was first collected by ECOSTEM staff in 2017. The volunteer collection program for members of the partner First Nations also began in 2017, with a detailed sampling protocol developed to help achieve consistency across sampling by different individuals.

To maximize seasonal mercury accumulation, the timing for when tissue was collected varied by species group. Blueberry collection was conducted when the berries were ripe. Labrador tea leaf collection was done later in the growing season. To date, sweet flag/Wihkis has not been found during EIS or monitoring studies.

In 2017, tissue collection was carried out from August 26 to 30 for blueberry, and on September 18 and 19 for Labrador tea.

Once a suitable collection site (i.e., the specific place within a location where tissue was collected) for a particular species was found, the position was marked with a GPS unit, and the area was marked with a pin flag and flagging tape. Information about the collection location and sampled plants was recorded, including:

- Species sampled
- Habitat type, including dominant tree species, shrub species and ground cover
- Soil type (organic or mineral) and soil moisture regime (water, very wet, moist, dry)
- Plant condition, including health and size
- Growing conditions (full sun, partial shade, shade)
- Approximate age of collected tissue
- Photos of plant and location

A sufficient amount of tissue to conduct mercury analysis in the lab was obtained. A minimum of 1/5th of a cup of berries, and 1/3rd of a cup of leaves or roots was gathered. After approximately every tenth sample, a second sample was obtained from the same location for quality control purposes.

Tissue samples were collected and handled in a manner that minimized potential contamination. This included wearing a new pair of sterile vinyl gloves, using clean tools, placing the tissue in a new sealable freezer bag, sealing it, and then placing the first sealed bag into a second labelled and sealed bag. The samples were kept in a cooler with ice packs, until they could be transferred into a freezer for storage at the end of each day. Plant tissue samples were kept frozen until they were analyzed.

3.2 LABORATORY ANALYSIS

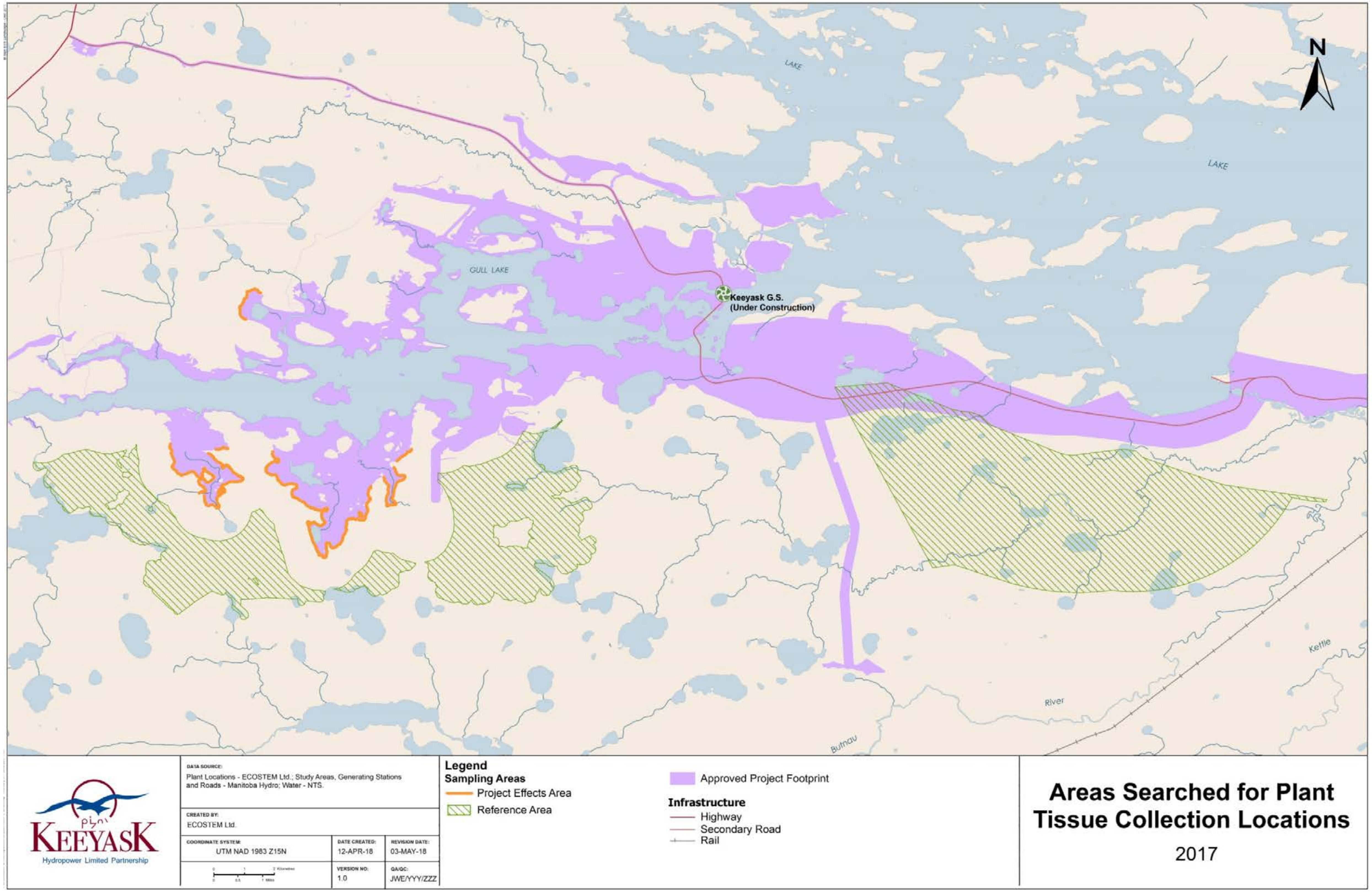
Plant tissue samples collected in 2017 were submitted for mercury analysis to ALS Environmental in Winnipeg, Manitoba on December 21, 2017. Total mercury content was measured on January 25, 2018.

ALS Environmental measured total mercury content in dry tissue using cold-vapor atomic fluorescence spectrometry (CVAFS; method reference: EPA 200.3/EPA 1631E (modified)). Prior to CVAFS analysis, tissue samples underwent hotblock digestion with nitric and hydrochloric acids, in combination with repeated additions of hydrogen peroxide, followed by cold-oxidation using bromine monochloride prior to reduction with stannous chloride. The detection limit for mercury by this method was 5 ng/g.

Percent moisture was also measured in the event there was a desire to convert the results to wet weights. More than the minimum amount of tissue had been collected for each sample. The quantity of tissue submitted was adequate to measure total mercury in all of the samples.

The quantity of tissue submitted was not sufficient to also obtain a percent moisture level using accredited ALS Environmental methods. To accurately test for mercury content, the sample must be dehydrated at a maximum temperature of 60°C, which is too low to follow an accredited method for determining moisture content. To complete the accredited method, enough material would be needed to undertake mercury and percent moisture on different samples. Therefore, the lab measured percent moisture results will overstate the moisture content. This was not considered to be a concern as literature reported values for terrestrial plants are usually provided on a dry weight basis (Section 2.0).

Appendix 1 presents the full methodology and analysis results provided by ALS Environmental.



Map 3-1: **Areas within the Project zones (Project Effects and Reference) that were searched for suitable plant tissue collection areas in 2017**

4.0 RESULTS

Ground searches found three of the five target species for tissue sampling (Photo 4-1 to Photo 4-3): Labrador tea, velvet-leaf blueberry (*Vaccinium myrtilloides*) and bog-bilberry (*Vaccinium uliginosum*). The other two target species, northern Labrador tea and sweet flag/Wihkis were not found in the search areas. Sweet flag/Wihkis has not been found during any of the technical science studies conducted for the TEMP to date or for the EIS.

Photo 4-1: Labrador tea

Photo 4-2: Velvet-leaf blueberry

Photo 4-3: Bog bilberry

Plant tissue was sampled at 53 locations across both of the Project zones, including 22 in the Project Effects zone and 31 in the Reference zone (Table 4-1; Map 4-1, Map 4-2). Labrador tea collection sites were found more often than either of the blueberry species.

Table 4-1: Number of locations sampled for each species found in the sample zones

Species	Project Effects Zone	Reference Zone	Both
Labrador tea	11	15	26
Velvet-leaf blueberry	5	6	11
Bog-bilberry	6	10	16
Total locations	22	31	53

The laboratory analysis determined that the total mercury content of every velvet-leaf blueberry and bog-bilberry tissue sample was below the detection limit (<5 ng/g).

Twenty-two of the 26 Labrador tea tissue samples had total mercury content that was slightly above the detection limit. These included 10 of the 11 samples in the Project Effects zone, and 12 of the 15 samples in the Reference zone (Table 4-2). Figure 4-1 provides a boxplot of these concentrations.

Table 4-2: Mercury analysis results for Labrador tea tissue samples with mercury above the detection limit

Values	Project Effects Zone	Reference Zone	Both
Number of samples	11	15	26
Number of samples with mercury above detection limit	10	12	22
Average mercury (ng/g)1	6.2	5.4	5.7
Standard deviation (ng/g)1	1.3	1.0	1.2
Maximum mercury (ng/g)	8.5	7.5	8.5

[1] Based on total number of samples, with samples below detection limit set to 75% of the detection limit.

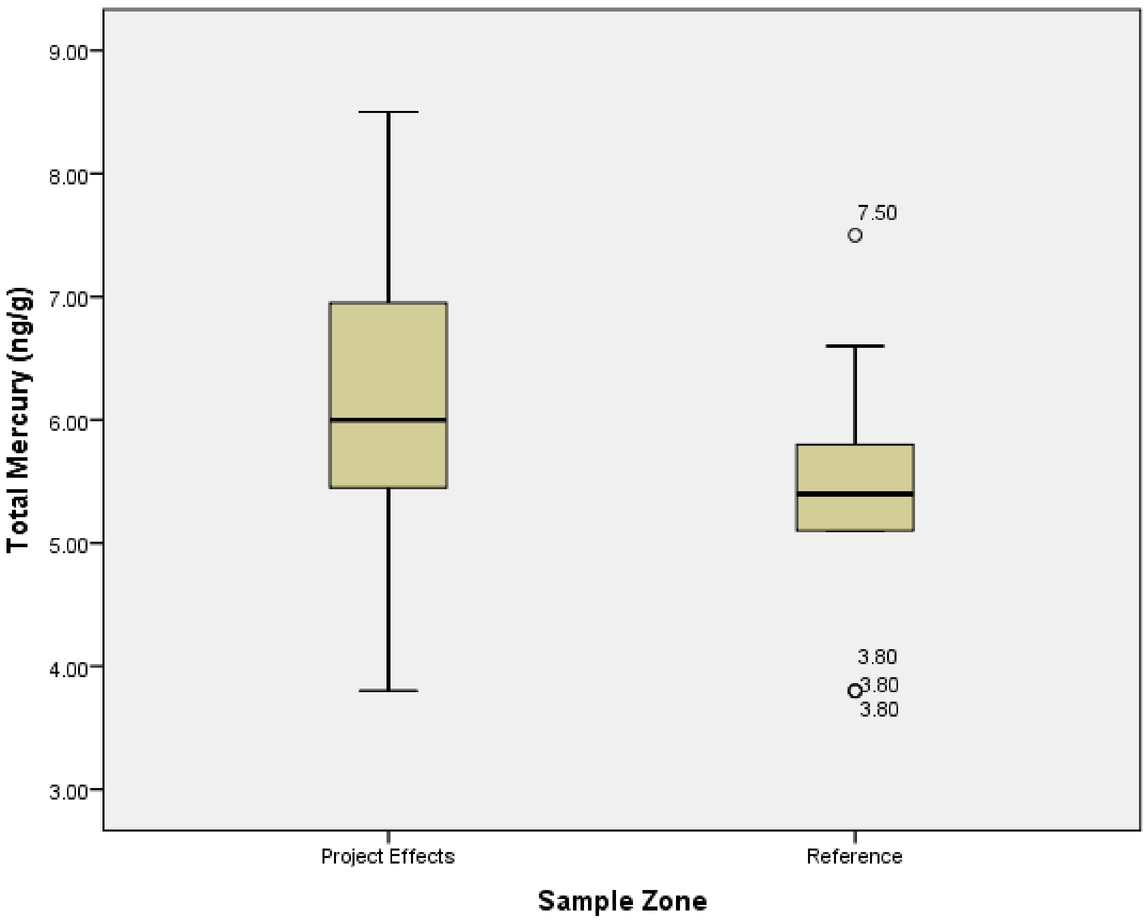


Figure 4-1: Boxplot of total mercury concentration in Labrador tea leaves, by Project zone

Among the Labrador tea tissue samples with mercury content above the detection limit, average mercury was 6.2 ng/g in the Project Effects zone compared with 5.4 ng/g in those from the Reference zone. However, this difference was not statistically significant based on an independent samples t-test (a=5%; Table 4-3).

Additional samples to be gathered in 2018 and 2019, prior to impoundment, will capture year-to-year variability in mean mercury concentration. Even if it turns out that the mean mercury concentration in one zone is slightly higher than the other, this would not be a major concern for the analysis since it is designed to compare changes after the reservoir versus before it rather than reservoir versus reference area for all periods. Having similar concentrations in both zones prior to the reservoir increases the confidence that any post-reservoir differences are not due to other differences between the sites from each zone.

Table 4-3: Independent samples t-test comparison between samples from Project Effects and Reference zones

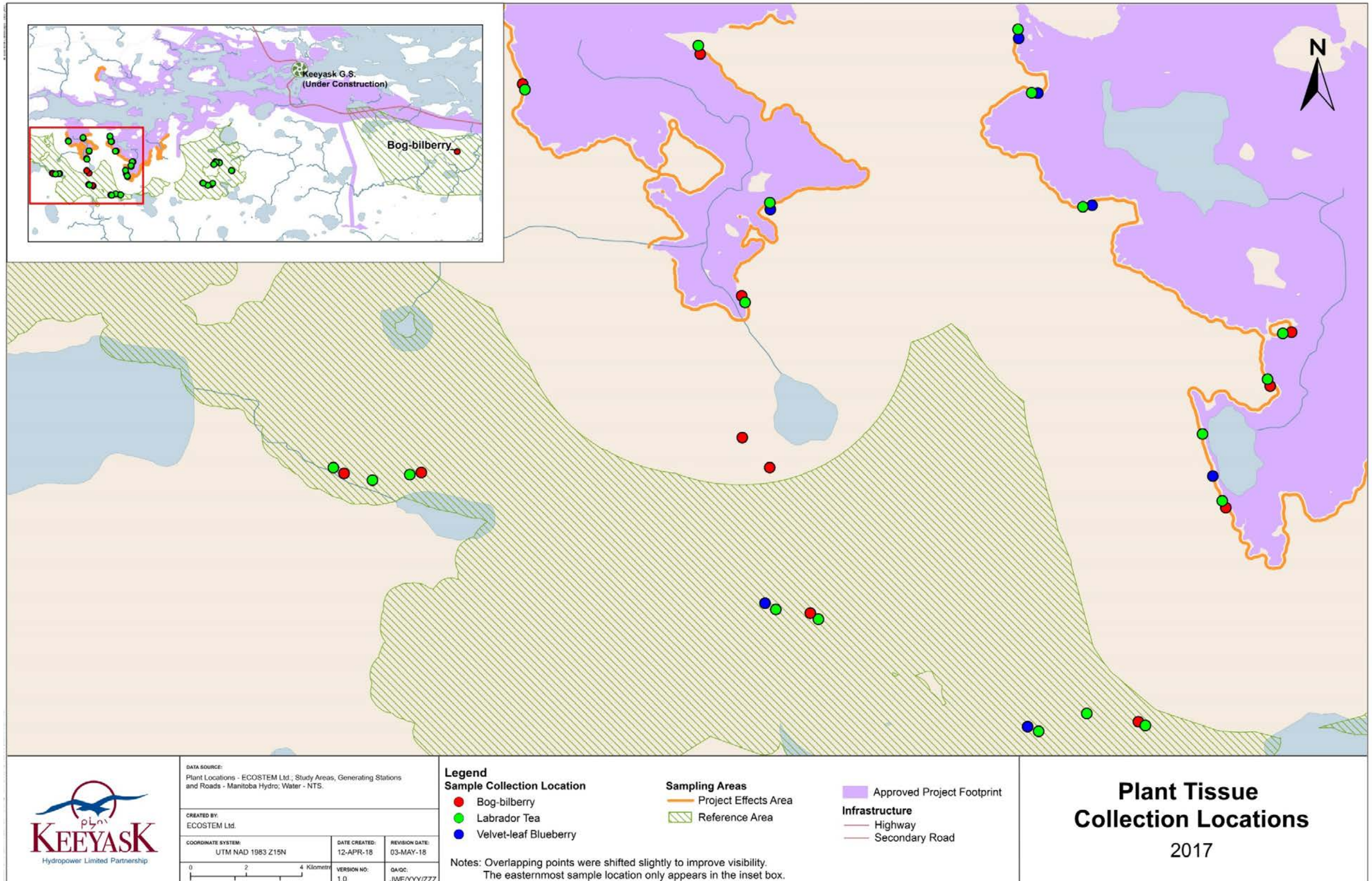
Metric	Equal Variances Assumed[1]	Equal Variances Not Assumed
T	1.725	1.669
Df	24	18.9
P (2-tailed)	**0.097**	0.112
Mean Difference	0.777	0.777
Standard Error of Difference	0.450	0.465

[1] Based on Levene's test for equality of variances (F=0.732, P=0.401), equal variances are assumed.

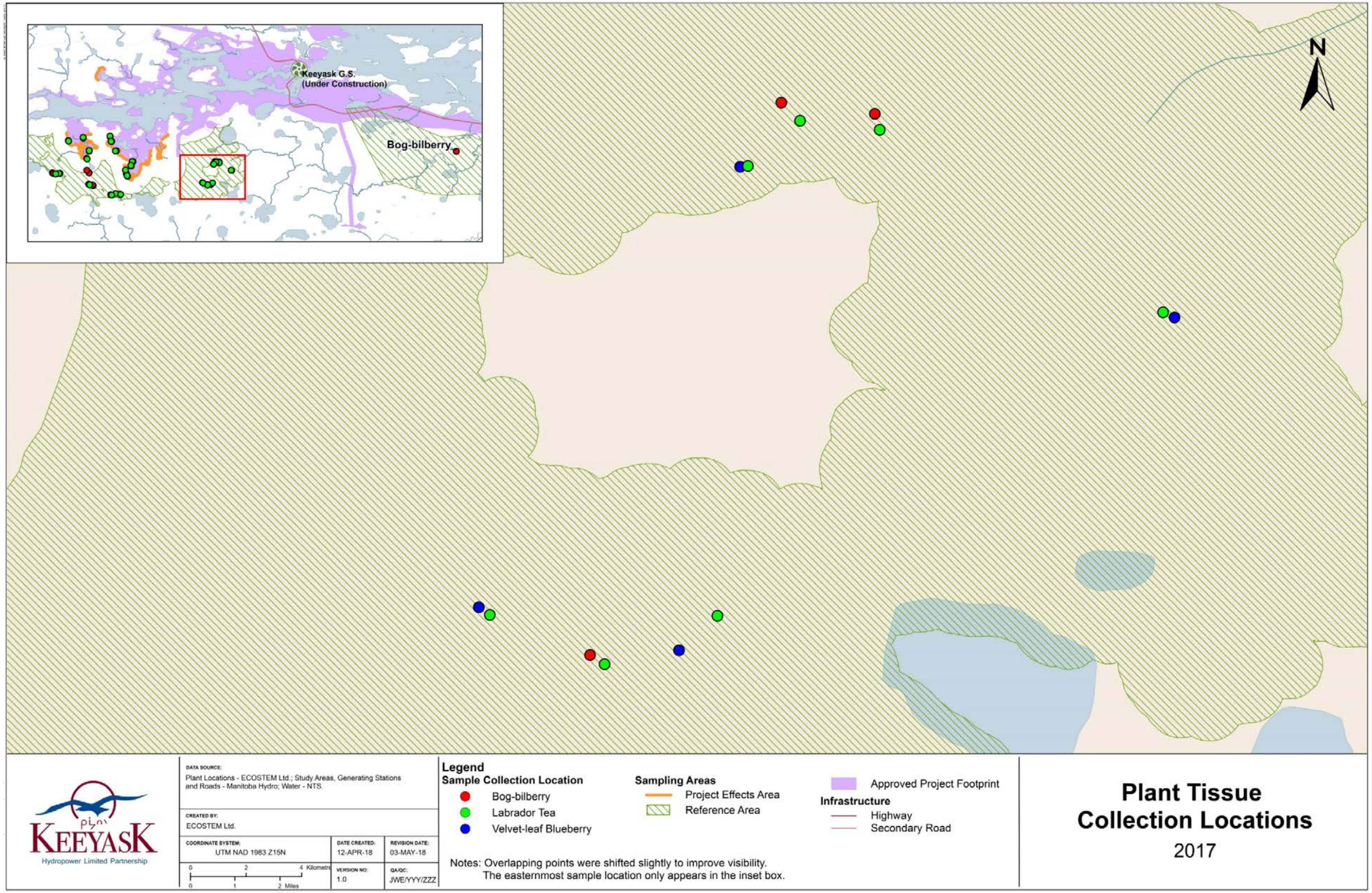
At two of the Labrador tea collection locations, a second sample was collected for quality control purposes, (the volume of blueberry berries at each location was insufficient to collect a second sample). Mercury content in the first and second samples at each location were similar. Differences were 0.4 ng/g and 0.6 ng/g between the first sample and the quality control sample at the two locations, or 6.2% and 11.5% of the first sample, respectively (Table 4-4).

Table 4-4: Comparison of original sample and quality control sample for mercury at two Labrador tea collection locations

Collection Location	Sample	Mercury (ng/g)	Difference	
			Absolute (ng/g)	Percent of First Sample
LTPE1710	First	6.5	0.4	6.2
	Quality Control	6.1		
LTRE1723	First	5.2	0.6	11.5
	Quality Control	5.8		



Map 4-1: **Plant tissue collection locations in western portions of the search areas, 2017**



Map 4-2: **Plant tissue collection locations in eastern portions of the search areas, 2017**

5.0 SUMMARY AND CONCLUSIONS

In 2017, plant tissue was collected for mercury analysis at 22 locations within the Project Effects zone and at 31 locations in the Reference zone. Blueberry berries were collected from August 26 to 30, and Labrador tea leaves on September 18 and 19. Samples from the community voluntary collection program were not received in 2017. All samples were kept frozen until they were analyzed by the ALS Environmental laboratory.

The laboratory determined that the total mercury content of every blueberry sample was below the detection limit (i.e., <5 ng/g).

Twenty-two of the 26 Labrador tea tissue samples had total mercury content that was slightly above the detection limit. Average mercury content in the leaf samples was 5.7 ng/g (assuming a value of 75% of the detection limit for the four samples below the detection limit), and the highest content was 8.5 ng/g. Average total mercury concentrations from the Project Effects and Reference zones were not significantly different from each other.

No guidelines for safe levels of consumption of country food plants in local diets could be found during a literature search. The toxicologist undertaking the Project's Human Health Risk Assessment will evaluate the plant mercury concentrations from this study after several years of data are available.

Other studies provide an indication of what can be expected for mercury in boreal plants in Canada. Results from such studies found mean total mercury concentration values for 17 different native boreal species ranged from 4.9 ng/g up to 39.3 ng/g, with most being higher than 10.0 ng/g. For the 2017 TEMP samples, all of the blueberry concentrations were below the bottom end of this range and all of the Labrador tea leaf concentrations were either below or near the bottom end of the range.

While more than the minimum amount of tissue was collected for each sample in 2017, it is recommended that more be collected in future years. This would safeguard against any material damage or loss during storage or lab analysis and ensure that enough tissue continues to be available to get a low laboratory detection limit. The minimum amount of tissue collected would be doubled. The extent to which this can be accomplished will be limited by the need to collect berries late in the season. By that time, many of the plants have been browsed by animals. Other factors will be year-to-year differences in plant productivity and seasonal variation in timing of ripening.

5.1 NEXT STEPS

Monitoring fieldwork for the mercury in plants study will continue in 2018. If possible, more tissue collected (the minimum amount of will be doubled) to ensure that considerably more tissue than needed for mercury testing is available. No other major changes to field methods are anticipated.

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APPENDIX 1:
ALS ENVIRONMENTAL RESULTS

Table 6-1: ALS Environmental methodology for total mercury and percent moisture

Date Received	21-Dec-2017 11:35				
Report Date	25-Jan-2018 7:38				
ALS Test Code	**ALS Test Description**	**Lab Location**	**Matrix**	**Method Reference**	**Methodology Description**
Total Mercury					
HG-DRY-CVAF-WP	Mercury in Tissue by CVAFS, Dry Weight	Winnipeg	Tissue	EPA 200.3/EPA 1631E (mod)	Tissue samples undergo hotblock digestion with nitric and hydrochloric acids, in combination with repeated additions of hydrogen peroxide, followed by cold-oxidation using bromine monochloride prior to reduction with stannous chloride, and analyzed by CVAFS. 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.
Percent Moisture					
SPECIAL REQ-61-WP	Special Request Inorganics Winnipeg	Winnipeg	Misc.	SPECIAL REQUEST	

Table 6-2: ALS Environmental test results for individual samples

Sample Location	Project Zone	Species	Total Mercury (mg/kg)	Detection Limit (mg/kg)	Percent Moisture
LTPE1701	Project Effects	Labrador tea	0.0085	0.005	42
LTPE1702	Project Effects	Labrador tea	0.0073	0.005	36
LTPE1703	Project Effects	Labrador tea	0.007	0.005	40.3
LTPE1704	Project Effects	Labrador tea	0.006	0.005	41.4
LTPE1705	Project Effects	Labrador tea	0.0069	0.005	44.1
LTPE1706	Project Effects	Labrador tea	0.0058	0.005	41.6
LTPE1707	Project Effects	Labrador tea	0.0056	0.005	40.8
LTPE1708	Project Effects	Labrador tea	<0.0050	0.005	39.6
LTPE1709	Project Effects	Labrador tea	0.0053	0.005	35.6
LTPE1710A	Project Effects	Labrador tea	0.0065	0.005	73
LTPE1710B	Project Effects	Labrador tea	0.0061	0.005	33.3
LTPE1711	Project Effects	Labrador tea	0.0051	0.005	34.3
LTRE1712	Reference	Labrador tea	0.0051	0.005	46.1
LTRE1713	Reference	Labrador tea	0.0054	0.005	41.2
LTRE1714	Reference	Labrador tea	0.0075	0.005	41.5
LTRE1715	Reference	Labrador tea	0.0056	0.005	41.5
LTRE1716	Reference	Labrador tea	0.0066	0.005	37.3
LTRE1717	Reference	Labrador tea	0.0062	0.005	37.7
LTRE1718	Reference	Labrador tea	0.0059	0.005	38.8
LTRE1719	Reference	Labrador tea	<0.0050	0.005	40
LTRE1720	Reference	Labrador tea	0.0057	0.005	39.7
LTRE1721	Reference	Labrador tea	0.0054	0.005	40.6
LTRE1722	Reference	Labrador tea	0.0051	0.005	40.5
LTRE1723A	Reference	Labrador tea	0.0052	0.005	46.3
LTRE1723B	Reference	Labrador tea	0.0058	0.005	45.6
LTRE1724	Reference	Labrador tea	0.0057	0.005	45.2
LTRE1725	Reference	Labrador tea	<0.0050	0.005	45.6
LTRE1726	Reference	Labrador tea	<0.0050	0.005	46.5
VUR1001	Reference	Bog bilberry	<0.0050	0.005	79.7
VUPE1701	Project Effects	Bog bilberry	<0.0050	0.005	79.9
VUPE1702	Project Effects	Bog bilberry	<0.0050	0.005	97.4
VMPE1703	Project Effects	Velvet-leaf blueberry	<0.0050	0.005	82.5
VUPE1704	Project Effects	Bog bilberry	<0.0050	0.005	85.6
VMPE1705	Project Effects	Velvet-leaf blueberry	<0.0050	0.005	88.4
VMPE1706	Project Effects	Velvet-leaf blueberry	<0.0050	0.005	90.4
VUPE1707	Project Effects	Bog bilberry	<0.0050	0.005	81.8
VMPE1708	Project Effects	Velvet-leaf blueberry	<0.0050	0.005	76.2
VUPE1709	Project Effects	Bog bilberry	<0.0050	0.005	81.4
VMPE1710	Project Effects	Velvet-leaf blueberry	<0.0050	0.005	73.6
VUPE1711	Project Effects	Bog bilberry	<0.0050	0.005	82.8

Sample Location	Project Zone	Species	Total Mercury (mg/kg)	Detection Limit (mg/kg)	Percent Moisture
VURE1712	Reference	Bog bilberry	<0.0050	0.005	79.1
VURE1713	Reference	Bog bilberry	<0.0050	0.005	81.6
VMRE1714	Reference	Velvet-leaf blueberry	<0.0050	0.005	75.8
VMRE1715	Reference	Velvet-leaf blueberry	<0.0050	0.005	77.8
VURE1716	Reference	Bog bilberry	<0.0050	0.005	78.3
VMRE1717	Reference	Velvet-leaf blueberry	<0.0050	0.005	76.2
VMRE1718	Reference	Velvet-leaf blueberry	<0.0050	0.005	76.4
VURE1719	Reference	Bog bilberry	<0.0050	0.005	80.3
VURE1720	Reference	Bog bilberry	<0.0050	0.005	81.9
VURE1721	Reference	Bog bilberry	<0.0050	0.005	80.4
VMRE1722	Reference	Velvet-leaf blueberry	<0.0050	0.005	74.5
VURE1723	Reference	Bog bilberry	<0.0050	0.005	75.9
VURE1724	Reference	Bog bilberry	<0.0050	0.005	82.4
VMRE1725	Reference	Velvet-leaf blueberry	<0.0050	0.005	78.5
VURE1726	Reference	Bog bilberry	<0.0050	0.005	77.4