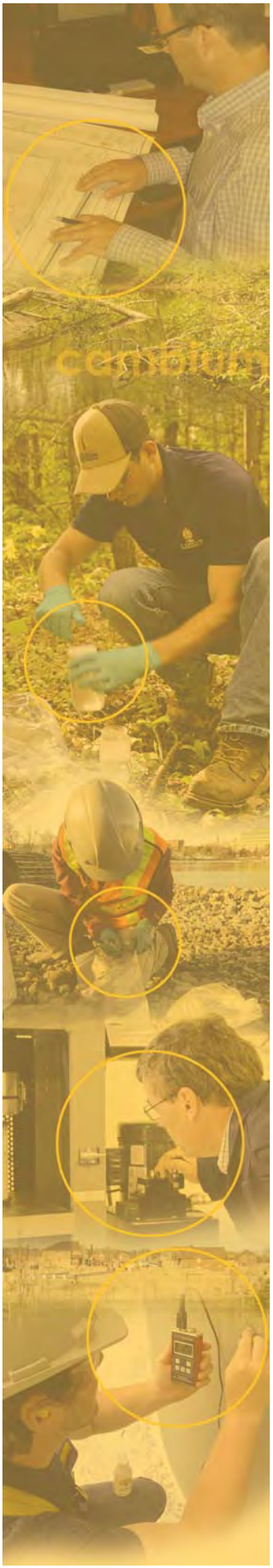

2012/2013 Biennial Monitoring Report Bissett Creek Waste Disposal Site

Cambium Reference No.: 2923-003

2014-05-27

Prepared for: The United Townships of Head, Clara & Maria

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EXECUTIVE SUMMARY

Cambium Inc. was retained by the United Townships of Head, Clara & Maria to complete the 2012/2013 Biennial Monitoring Report for the Bissett Creek Waste Disposal Site. The 2012 and 2013 monitoring programs were completed by Jp2g Consultants Inc. and AECOM.

The Bissett Creek Waste Disposal Site operates under Ontario Minstry of the Enivronment Environmental Compliance Approval No. A412406 as a natural attenuation landfill consisting of an approved fill area of 0.6 hectares within a total site area of 2.881 hectares and a contaminant attenuation zone area, which was acquired in 2011, of 19.337 hectares.

Groundwater and surface water samples were collected on June 21, 2012 and July 8, 2013 from existing groundwater and surface water sampling locations.

A local groundwater divide runs in a roughly northeast to southwest direction across the Site. This feature is created by the hill to the northeast of the Site, and likely extends southwest to the confluence of the intermittent tributary with Bissett Creek. The groundwater elevation data from 2001 to 2013 show that this groundwater divide drifts in a north-south direction across the Site from year to year and season to season.

To ensure appropriate actions are in place to respond to any potential degradation in groundwater quality beyond an acceptable level, site specific trigger levels have been developed for the Site. These are based on the Ministry of the Environment's Reasonable Use Concept values for groundwater. The only excedance of the Reasonable Use Concept in 2012 and 2013 was nitrate at BH1-I, which is completed in the bedrock aquifer, which is consistent with historical results. The nitrate concentrations in BH1-I have decresed in recent years; the 2012 and 2013 concentrations are the lowest since 2003, indicating a recent decreasing trend. Since this is the only exceedance of the Reasonable Use Concept, it is not considered a concern at this time. Given the distance between the downgradient monitoring well BH1-I and the contaminant attenuation zone boundary, and the minor nature of the landfill effects at this location, the Site is interpreted as being in compliance with Reasonable Use Concept at the contaminant attenuation zone boundary.

Based on the weak strength of the leachate produced, in addition to the distances of the wetland depression (SW1) and the intermittent tributary (SW2) to the fill area, the landfill is not expected to have adverse effects on the surface water quality at either location and no mitigative measures are recommended at this time.

Using the average annual fill rate of the Site determined of 405 cubic metres, it is estimated that a total of 810 cubic metres was placed at the site between the November 2011 topographic survey and the autumn of 2013.

Subtracting the volume filled in 2012 and 2013 from the remaining capacity in 2011 of 8,970 cubic metres, resulted in a remaining capacity of approximately 8,160 cubic metres as of autumn 2013. Based on the calculated remaining volume and the calculated average annual fill rate, the remaining Site life of the Bissett

Creek Site is approximately 20 years from the autumn of 2013. Actual Site life is dependent on the annual fill rate and cover and compaction methods.

Cambium does not recommend any changes to the 2014/2015 monitoring program. An updated topographic survey should be completed during the 2014/2015 monitoring program to provide an update on volume placed at the Site and the remaining capacity and Site life.

Respectfully submitted,

Cambium Inc.

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1.0 INTRODUCTION

Cambium Inc. (Cambium) was retained by the United Townships of Head, Clara & Maria (Township) to complete the 2012/2013 Biennial Monitoring Report (BMR) for the Bissett Creek Waste Disposal Site (Site). The Site operates under the Ontario Minstry of the Enivronment (MOE) Environmental Compliance Approval (ECA) No. A412406 (Appendix A). The purpose of this report is to satisfy Condition 20 of the ECA (last amended April 4, 2013) and includes an evaluation of the overall adequacy of the monitoring program, an assessment of the current impact of the Site on the natural environment, and a review (if required) of any remedial action. Cambium has provided recommendations for the 2014/2015 monitoring program based on the results of the 2012/2013 monitoring program.

1.1 SITE LOCATION

The Site is located on Lots 12 and 13, Concession 13, in the geographic Township of Maria, in the United Townships of Head, Clara & Maria. The Site is accessed from Bissett Creek Road and is located in zone 17 at Universal Transverse Mercator (UTM) coordinates zone 17 728025 5122057, North American Datum 83 (Figure 1).

1.2 SITE DESCRIPTION

The Site is owned and operated by the United Townships of Head, Clara & Maria and operates under ECA No. A412406. The Site is a natural attenuation landfill consisting of an approved fill area of 0.6 hectares (ha) within a total site area of 2.881 ha and a contaminant attenuation zone (CAZ) area, which was acquired in 2011, of 19.337 ha (Figure 2).

To aid in the understanding of the Site history and development, the following reports are included digitally in the report package:

- 2010/2011 Biennial Report, Bissett Creek Waste Disposal Site (Jp2g Consultants Inc. and AECOM, May 2012).

2.0 METHODOLOGY

Groundwater and surface water samples were collected by Jp2g personnel during the 2012/2013 monitoring program. The sampling and shipping methodology utilized during the 2012/2013 sampling program is detailed in the report titled *2010/2011 Biennial Report, Bissett Creek Waste Disposal Site* (Jp2g Consultants Inc. and AECOM, May 2012):

> *Groundwater and surface water level measurements and sample collection were conducted by an experienced Jp2g technician using field methodologies established by AECOM. All laboratory analyses were conducted by Exova Accutest Laboratories Limited in Ottawa, Ontario. Water samples were placed immediately in a chilled cooler for transport to the laboratory. The samples were delivered to the laboratory within 24 hours of collected. Field measurement of pH, electrical conductivity and water temperature were collected at the time of sampling…*

2.1 GROUNDWATER MONITORING PROGRAM

The monitoring network at the Site consists of eleven (11) groundwater monitors at eight (8) locations. Four (4) monitors are screened within the fine surficial sand (monitors BH3-II, BH5-I, BH6, and BH7), two are screened within the sand and gravel (monitors BH1-II and BH8), one is screened lower within the silty sand till (monitor BH2-II), one across the till/bedrock contact (monitor BH4-1), and three are screened within the granitic bedrock (monitors BH1-I, BH2-I, and BH3-I). During the 2012/2013 monitoring program, groundwater samples were collected on June 21, 2012 and July 8, 2013 from the eleven monitoring wells on-Site.

All the groundwater samples were submitted for analysis of the parameters listed in Table 1. The laboratory Certificates of Analysis are included in this report as Appendix B. Photographs of the groundwater monitoring locations are included in Appendix C. The results of the groundwater sampling program are discussed in Section 4.1, and are presented in Table 4 and Table 5.

2.2 SURFACE WATER MONITORING PROGRAM

Surface water samples were collected on June 21, 2012 and July 8, 2013 from existing surface water sampling stations SW-1 (UTM Zone 17; 727815, 5122216) and SW-2 (UTM Zone 17; 727811, 5121465). These surface water locations are equipped with staff gauges for measurement of the surface water elevation at these locations. Photographs of the surface water monitoring locations are included in Appendix C.

Surface water samples were submitted for analysis of the parameters listed in Table 1. The Laboratory Certificates of Analysis are provided as Appendix B. The results of the surface water sampling program are discussed in Section 4.2, and are presented in Table 6.

2.3 LANDFILL GAS MONITORING PROGRAM

Landfill gas is not currently managed or monitored at the Site. The large, open site area and isolated location from the public supports passive landfill gas management, which allows generated landfill gas to naturally disperse through the waste and the naturally-permeable cover soil to the atmosphere.

2.4 SITE INSPECTION AND OPERATIONS OVERVIEW

During the monitoring program completed in June 2012 and July 2013, Township staff completed an inspection of the Site property and made note of the status of operations. Results of this inspection along with detailed operations information, requested and received from the Township, have been included in Section 5.0.

As part of the 2013 groundwater monitoring program, each monitoring well at the Site was inspected for compliance with Ontario Regulation 903. The results of the monitoring well security inspections are detailed in Section 5.0.

3.0 GEOLOGICAL AND HYDROGEOLOGICAL CONTEXT

3.1 TOPOGRAPHY AND DRAINAGE

The Bissett Creek waste disposal Site is relatively remote, located in the Ottawa valley area, approximately 2 kilometres (km) south of the Ottawa River and north of Algonquin Park. The Site is located on the southwest flank of a low hill and drains southwest towards Bissett Creek, approximately 1 km away.

A review of the 2012 and 2013 precipitation data in comparison to the average precipitation for Chalk River (1981 to 2010; (Environment Canada, 2013)) indicated that the June 2012 rainfall was less than average (i.e. 53.4 millimetres (mm) versus 86.8 mm) and the July 2013 rainfall was also less than average (i.e. 48.2 mm versus 84.8 mm). Overall, both the 2012 and 2013 precipitation was observed to be less than average.

3.2 HYDROGEOLOGICAL SETTING

Regionally, the area is covered by 1 to 10 metres (m) of fine to medium grained sand and silt, underlain by a silty sand till. These shallow stoney and sandy soils are deposited over knobs and ridges of low permeability Precambrian bedrock (L.J. Chapman and D.F. Putnam, 1984). The bedrock in the area is part of the Grenville Province of the Canadian Shield, which is characterized by an abundance of metamorphosed granite gneisses.

The gneissic bedrock lies between 6 m and 15 m below ground surface, dipping at about 8% to the southwest towards Bissett Creek. Locally, the overburden thins to the northeast and is composed primarily of sand overlying a sand till. Several boreholes intersected discontinuous stringers of sand and gravel (Gartner Lee Limited, 2002).

The nearest domestic well is located approximately 1.25 km northwest of the Site near the Community of Bissett Creek. This well is not downgradient from the landfill. Groundwater moves predominantly horizontally in the sandy overburden. Where the bedrock is locally fractured, there is likely horizontal flow in the direction of Bissett Creek. There are no water well users downgradient of the Site (Jp2g Consultants Inc. and AECOM, May 2012).

3.2.1 GROUNDWATER FLOW DIRECTION

The groundwater elevation data collected from the wells in 2012 and 2013 as well as UTM coordinates for all monitoring wells are summarized in Table 2 and groundwater flow directions are depicted on Figure 5 and Figure 6. The groundwater elevations are depicted on a groundwater elevation graph (Figure 4).

In general, the historical groundwater elevations show that the water table fluctuates from season to season and from year to year. A local groundwater divide runs in a roughly northeast to southwest direction across the Site. This feature is created by the hill to the northeast of the Site, and likely extends southwest to the confluence of the intermittent tributary with Bissett Creek. The groundwater elevation data from 2001 to 2013 show that this groundwater divide drifts in a north-south direction across the Site from year to year and season to season. In

2012, the groundwater divide was located in the southern portion of the fill area. In 2013, the groundwater divide did not seem to be present at all. Shifts in the groundwater divide are common in flat water table conditions such as at this Site, and are likely due to annual fluctuations in the amount of recharge and the amount of precipitation received at the Site.

In 2012, groundwater flow in the overburden in the northern portion of the Site flowed towards the southwest with a horizontal hydraulic gradient of 0.015 and towards the south with a horizontal hydraulic gradient of 0.014. In the southern portion of the Site, the groundwater flowed towards the east with a horizontal hydraulic gradient of 0.004 and to the west with a horizontal hydraulic gradient of 0.004.

In 2013, groundwater flow in the overburden in the northern portion of the Site flowed towards the southwest with a horizontal hydraulic gradient of 0.01. In the southern portion of the Site, the groundwater flowed towards the southeast with a horizontal hydraulic gradient of 0.01.

In the bedrock aquifer, groundwater flow was consistently to the southwest in 2012 and 2013, with a gradient of 0.012 and 0.013, respectively.

It is important to know whether the water table mounds up into the waste in order to determine if groundwater flow is contributing leachate production. The elevation of the bottom of the waste in the main fill area ranges from 206.1 m above sea level (masl) at the western edge of the fill area to 203.3 masl along the southwestern edge of the fill area. In 2012 and 2013, water table elevations were recorded at monitor 5-I of 201.3 masl and 201.8 masl, respectively, and indicate that the water table does not appear to mound up into the waste.

Vertical groundwater flow components were determined from a comparison of the water elevations in nested wells sampling the shallow and deeper zones of the overburden aquifer (Table 3). In 2012, downward vertical gradients were observed at monitors BH1 and BH2 of 0.076 and 0.011, respectively, and an upward vertical gradient was observed at BH3 of 0.005. In 2013, a downward vertical gradient was observed at monitor BH1 of 0.072 and an upwards vertical gradient was observed at BH2 and BH3 of 0.052 and 0.007, respectively.

4.0 RESULTS AND DISCUSSION

Water quality analytical results from the monitoring program are used to assess the existence, extent, and intensity of impacts to the groundwater environments related to waste disposal Site activities. To ensure appropriate actions are in place to respond to any potential degradation in groundwater quality beyond an acceptable level, Site specific trigger levels and contingency plans need to be adhered to for the Site to aid in the assessment of impacts from leachate contamination and to help prevent adverse impacts to the environments surrounding the waste disposal Site.

This section presents the results of the 2012 and 2013 monitoring program completed at the Site as compared to available historical data and discusses observed trends in the groundwater quality.

4.1 GROUNDWATER QUALITY

The 2001 to 2013 groundwater chemistry data obtained from the analysis of water samples collected from the monitoring wells at the Site are summarized in Table 4 and Table 5, as provided by Jp2g Consultants Inc. The groundwater data has been compared with the Ontario Drinking Water Quality Standards (ODWQS) (Ministry of the Environment, June 2006), background water quality, and historical data. An assessment of compliance with the Reasonable Use Policy has been completed in accordance with the ECA for the Site.

4.1.1 BACKGROUND

When evaluating the impact of any waste disposal Site on a groundwater resource, a reference point or value must be established to assist in determining the magnitude of the impact. In this respect, the quality of the groundwater that is not impacted by the waste disposal Site operation (background water quality) should be used for comparison purposes. Historically, monitoring wells BH3-I (bedrock) and BH4-I (overburden) have been identified as wells with water quality representative of background conditions.

The background water quality in the overburden has historically reported low concentrations of alkalinity and field measured pH and ODWQS exceedances for dissolved organic carbon (DOC), iron, manganese, and organic nitrogen. In 2012 and 2013, the water quality at BH4-I was similar to historical results and the only parameter that did not meet the ODWQS was field measured pH in 2013.

The background water quality in the bedrock has historically reported low concentrations of alkalinity and field measured pH and an isolated ODWQS exceedance for organic nitrogen. In 2012 and 2013, the water quality at BH3-I was similar to historical results for all parameters except chemical oxygen demand (COD), which was elevated in 2013. Continued monitoring will determine whether this was an isolated occurrence or the beginning of a trend. Only field measured pH (low; 2013 only) did not meet the ODWQS at BH3-I in 2012 and 2013.

4.1.2 LEACHATE QUALITY

Monitor BH5, screened beneath the fill, represents leachate quality.

In previous reports, the leachate indicator parameters have been identified as:

Sodium	Chloride	Potassium	Alkalinity
TDS	Iron	COD	Nitrate

Historically, the leachate quality has reported concentrations below the ODWQS for field measured pH and concentrations greater than the ODWQS for nitrate, manganese, and organic nitrogen. In 2012 and 2013, the leachate quality at BH5 was similar to the background groundwater quality at BH4-I with the exception of elevated chloride, nitrate, and strontium at BH5 in 2013. Since chloride and nitrate are leachate indicator parameters for the Site, a slight impact from leachate is evident at BH5, which is expected given the location of this monitor within the waste disposal area. Continued monitoring will further characterize the leachate quality at the Site.

4.1.3 DOWN-GRADIENT WATER QUALITY

4.1.3.1 OVERBURDEN AQUIFER

Monitoring wells BH6 and BH7 are located in close proximity to, and downgradient of, the waste disposal area. Because of the location of the groundwater divide, monitoring wells BH6 and BH7 appear to be downgradient of only a portion of the waste disposal area.

Monitoring well BH6 shows leachate indicator parameter concentrations that are similar to the background range in 2012 and 2013 except for COD which was greater than background in 2013. Monitor BH6 is interpreted as not being affected by leachate in 2012 and 2013. With the exception of field measured pH (low; 2013 only), all analytical results were within the ODWQS limits at this location.

Monitoring well BH7 shows leachate indicator parameter concentrations that are similar to or lower than the background range in 2012 and 2013 except for COD which was greater than background in 2013. Monitor BH7 is interpreted as not being affected by leachate in 2012 and 2013. With the exception of field measured pH (low; 2012 only), all analytical results were within the ODWQS limits at this location.

Monitoring well BH2-II is located approximately 90 m southeast of the waste disposal area. This monitor is screened in the silty sand till overburden. Because of the location of the groundwater divide, monitoring well BH2-II appears to be downgradient of only a portion of the waste disposal area. Monitoring well BH2-II shows leachate indicator parameter concentrations that are similar to or lower than the background range in 2012 and 2013. Monitor BH2-II is interpreted as not being affected by leachate in 2012 and 2013. With the exception of field measured pH (low), all analytical results were within the ODWQS limits at this location.

Monitoring well BH3-II is located approximately 90 m northwest of the waste disposal area. Because of the location of the groundwater divide, monitoring well BH3-II does not appear to be directly downgradient of the waste disposal area. Monitoring well BH3-II shows leachate indicator parameter concentrations that are similar to or lower than the background range in 2012 and 2013 except for COD and nitrate which were greater than background in 2013. Monitor BH3-II is interpreted as not being affected by leachate in 2012 and 2013. With the exception of field measured pH (low), all analytical results were within the ODWQS limits at this location.

Monitoring well BH8 is located approximately 130 m southwest of the waste disposal area, between the access road to the Site and the TransCanada pipeline easement. Because of the location of the groundwater divide, monitoring well BH8 does not appear to be directly downgradient of the waste disposal area. Monitoring well BH8 shows leachate indicator parameter concentrations that are similar to or less than the background range in 2012 and 2013 with the exception of chloride, nitrate, and sodium which were greater than background in 2013. Given the location of this monitor adjacent to the Site access road, it is likely that these elevated concentrations are related to road deicing activities and are not landfill related. Therefore, monitor BH8 is interpreted as not being affected by leachate in 2012 and 2013. With the exception of field measured pH (low; 2012 only), all analytical results were within the ODWQS limits at this location.

Monitoring well BH1-II is located approximately 60 m west and downgradient of the waste disposal area and is completed in sand and gravel. All leachate indicator parameter concentrations are similar or less than the background range in 2012 and 2013 with the exception of nitrate. With the exception of field measured pH (low; 2012 only), all analytical results were within the ODWQS limits at this location, which is characteristic for this Site. Given the location of this well downgradient of the waste disposal area, the elevated nitrate concentrations may be related to leachate. Continued monitoring will determine if any other leachate parameters increase indicating an impact from the waste disposal Site.

The monitoring results to date for the overburden aquifer show that monitoring well BH1-II may be showing a slight impact from the waste disposal Site. All other locations do not appear to be affected by leachate from the Site.

4.1.3.2 BEDROCK AQUIFER

Monitoring wells BH1-I, BH2-I, and BH3-I are completed within the bedrock aquifer. Monitoring well BH3-I is considered representative of background conditions as discussed in Section 4.1.1.

Monitoring well BH2-I is located approximately 90 m southeast of the waste disposal area. Because of the groundwater flow direction in the bedrock aquifer, monitoring well BH2-I appears to be crossgradient of the waste disposal area. Monitoring well BH2-I shows leachate indicator parameter concentrations that are similar to or lower than the background range in 2012 and 2013. Monitor BH2-I is interpreted as not being affected by

leachate in 2012 and 2013. With the exception of field measured pH (low; 2012 only), all analytical results were within the ODWQS limits at this location.

Monitoring well BH1-I is located approximately 60 m west and downgradient of the waste disposal area. Compared to background, leachate indicator parameters alkalinity, TDS, chloride, nitrate, potassium, and sodium are elevated for 2012 and 2013. All analytical results were within the ODWQS limits at this location, which is similar to historical results. Given the location of this well downgradient of the waste disposal area, the elevated concentrations may be related to leachate. Continued monitoring will determine if any other leachate parameters increase indicating an impact from the waste disposal Site.

4.1.4 COMPLIANCE ASSESSMENT

To ensure appropriate actions are in place to respond to any potential degradation in groundwater quality beyond an acceptable level, site specific trigger levels have been developed for the Site. These are based on the MOE's Reasonable Use Concept (RUC) values for groundwater (MOE Procedure B-7-1). The MOE Reasonable Use Policy states that, in accordance with the appropriate criteria for particular uses, a change in quality of the groundwater on an adjacent property will be accepted only as follows:

> *The quality cannot be degraded by an amount in excess of 50% of the difference between background and the Ontario Drinking Water Quality Standards for non-health related parameters and in excess of 25% of the difference between background and the Ontario Drinking Water Quality Standards for health related parameters. Background is considered to be the quality of the groundwater prior to any man made contamination.*
>
> *MOE Procedure B-7-1.*

The maximum concentration of a particular contaminant that is considered acceptable in the groundwater beneath an adjacent property is calculated in accordance with the following relationship:

$$C_m = C_b + x\,(C_r - C_b)$$

Where:
- C_m = maximum concentration accepted
- C_b = background concentration
- C_r = Maximum concentration permitted in accordance with the Ontario Drinking Water Standards
- x = a constant that reduces the contamination to a level that is considered by the MOE to have a negligible effect on water use. i.e.
  0.5 for non-health related parameters
  0.25 for health related parameters.

In 2013, the RUC values were calculated using the median value of the background concentration (C_b) from a minimum of the previous five (5) sampling events. The maximum allowable concentration (C_m) of any particular parameter may be calculated using the background concentration of that parameter from unimpacted monitors up-gradient of the Site, the designated ODWQS for that parameter, and a constant that reflects whether the parameter is health or aesthetic-related as defined by the ODWQS. Where background concentrations were less

than the laboratory method detection limit, the method detection limit was used as the background concentration. The calculated C_m for the Site was set as the RUC value. Where the background level exceeded ODWQS, the C_b was set as the RUC value.

The RUC values for each parameter are summarized in Table 4 and Table 5. The RUC is assessed at monitors BH1-I, BH1-II, BH2-I, BH2-II, BH3-II, BH7, and BH8 to determine the degree of potential impairment of the groundwater at and just beyond the property boundary. Those parameters exhibiting concentrations greater than the RUC values are shown as bolded and italicized text without shading. In 2012 and 2013, the following parameters were present at concentrations greater than the RUC values determined for the Site at the monitors listed above:

Overburden:

- none

Bedrock:

- BH1-I: nitrate

The only exceedance of the RUC in 2012 and 2013 was nitrate at BH1-I, which is completed in the bedrock aquifer, which is consistent with historical results. The nitrate concentrations in BH1-I have decreased in recent years; the 2012 and 2013 concentrations are the lowest since 2003, indicating a recent decreasing trend. Since this is the only exceedance of the RUC, it is not considered a concern at this time. There are no domestic wells located downgradient of the Site, the nitrate concentrations are below the ODWQS, and the concentrations of nitrate have been decreasing at this location since 2007. Given the distance between the downgradient monitoring well BH1-I and the CAZ boundary, and the minor nature of the landfill effects at this location, the Site is interpreted as being in compliance with RUC at the CAZ boundary.

Given the minor possible leachate effects at the Site, it is proposed that the following trigger be used to initiate the installation of additional compliance monitors at the CAZ boundary: Consideration should be given to establishing additional compliance monitors at the CAZ boundary if groundwater sampling results from a monitoring event show that leachate indicator parameters chloride (mobile anion), boron and nitrate (health related) all exceed the ODWQS at a groundwater monitoring location and the exceedances are attributed to the landfill. Therefore, given the water quality discussion provided above, no further action is warranted at this time.

4.2 SURFACE WATER QUALITY

Two (2) downgradient surface water monitoring stations with staff gauge installations were monitored in 2012 and 2013. Surface water station SW1 is located in a wetland depression northwest of the Site (Figure 2). Good wetland vegetative growth was observed during the Site visits in 2012 and 2013 with no obvious leachate influences noted. Surface water station SW2 is located in an intermittent tributary of Bissett Creek, southwest of

the Site. Good vegetative growth was observed during the visits in 2012 and 2013 with no obvious leachate influences noted. Photographs of the surface water stations are included in Appendix C.

4.2.1 DOWN-GRADIENT WATER QUALITY

Table 6 summarizes the water quality at SW1 and SW2 for leachate indicator parameters along with a comparison to the Provincial Water Quality Objectives (PWQO). Since there was no background surface water to be sampled, the surface water quality was also compared to background overburden water quality.

At station SW1, COD (2012 only) was the only parameter that was greater than background overburden concentrations in 2012 and 2013. The elevated COD at SW1 is likely due to natural conditions since SW1 is located in a stagnant, low-lying area. All other landfill indicator parameters are less than or within the range of background overburden concentrations, indicating no leachate impacts are present at this location. With the exception of total phosphorous (2012 only), total phenolics (2012 only), field measured pH (low; 2012 only), and DO (low), all analytical results were within the PWQO limits at this location.

At station SW2, COD (2012 only) and iron were the only parameters that were greater than background overburden concentrations in 2012 and 2013. The elevated COD levels are likely due to natural conditions since SW2 is located downstream from a wetland. The iron concentrations at SW2 exceeded the PWQO. Elevated iron concentrations do not appear to be related to the waste disposal Site, since iron concentrations are frequently elevated in wetland settings. Also, the concentrations of iron at SW2 are significantly greater than the iron concentrations at BH5, which samples the leachate quality.

Based on the weak strength of the leachate produced, in addition to the distances of the wetland depression (SW1) and the intermittent tributary (SW2) to the fill area, the landfill is not expected to have adverse effects on the surface water quality at either location and no mitigative measures are recommended at this time.

5.0 SITE OPERATIONS

Operations information was provided to Cambium by the Township and discussed in the following sections. Information related to material quantities for 2012 and 2013 and litter collection activities, inspections, and cover material for 2013 has been included in Appendix D.

5.1 SITE ACCESS AND SECURITY

The Bissett Creek Site is located on Bissett Creek Road, just south of Highway 17. A lockable gate at the entrance controls access to the Site. Access is only permitted during operational hours, with the presence of a Site attendant.

The Site hours of operation during the reporting period were:

January, February, and March

Tuesday .....12:30 PM to 2:00 PM
Saturday.....12:45 PM to 3:45 PM

April through December

Tuesday .....12:30 PM to 3:30 PM
Saturday.....12:45 PM to 3:45 PM

5.2 DRAINAGE

On-Site drainage is controlled by the surface topography. No surface water features were created in 2012 or 2013.

5.3 ROADS

The access road has sufficient width at the entrance and within the Site to allow unimpeded winter travel and access for emergency and snow removal equipment. The Site access roads were observed to be well maintained and graded and were reported to be regularly cleared of snow with a sand mixture applied as needed by the Township during the winter months.

5.4 AESTHETICS

The intent of good housekeeping practices is to protect on-Site worker health and safety and the surrounding environment from nuisance effects and to minimize these effects by adopting measures as part of Site operations. Regular housekeeping is essential to control such nuisances as:

- Blowing and loose litter.
- Odour.
- Rodents and insects.
- Scavenging birds.

The Township completed housekeeping and maintenance activities at the Site conducting regular litter collection programs during each operating day throughout 2012 and 2013. Records related to litter collection activities in 2013 are included in Appendix D.

5.5 COMPLAINTS

No complaints were received with respect to the Site in 2012 or 2013.

5.6 MONITORING WELL CONDITION

All monitoring wells were inspected during the 2012 and 2013 monitoring program to maintain compliance with O. Reg. 903 and ensure accurate water quality results.

5.7 WASTE PLACEMENT, CELL DEVELOPMENT AND COVER MATERIAL

No topographic survey has been completed at the Site since November 2011.

As per Condition 13 of the ECA, the theoretical maximum volumetric capacity of the Site is 18,502 m^3.

In the 2010/2011 Biennial Report (Jp2g Consultants Inc. and AECOM, May 2012), the remaining capacity at the Site as of June 2000 was reported to be 13,433 cubic metres (m^3). The remaining capacity as of November 2011 was reported to be 8,970 m^3. Therefore, the total volume placed at the Site in the eleven (11) years between the two surveys was 4,463 m^3, which equates to approximately 405 m^3 annually.

An update on volume placed at the Site when an updated topographic survey is completed at the Site. This will be completed during the 2014/2015 monitoring period and the results will be included in the 2014/2015 Biennial Monitoring Report.

5.8 REMAINING SITE CAPACITY

An estimate of the remaining capacity at the Bissett Creek waste disposal Site can be determined using the average annual fill rate and the previous remaining capacity reported in the 2010/2011 Biennial Monitoring Report (Jp2g Consultants Inc. and AECOM, May 2012).

Using the average annual fill rate of the Site determined of 405 m^3, it is estimated that a total of 810 m^3 was placed at the Site between the November 2011 topographic survey and the autumn of 2013.

Subtracting the volume filled in 2012 and 2013 from the remaining capacity in 2011 of 8,970 m^3, resulted in a remaining capacity of approximately 8,160 m^3 as of autumn 2013.

Based on the calculated remaining volume and the calculated average annual fill rate, the remaining Site life of the Bissett Creek Site is approximately 20 years from the autumn of 2013. Actual Site life is dependent on the annual fill rate and cover and compaction methods.

5.9 MATERIALS SUMMARY

The Site accepts solid, non-hazardous municipal waste, scrap metal, white goods, tires, scrap wood, brush, leaves, and other yard waste. Waste is deposited into the landfill Site, brush and clean wood is burned, and white goods, scrap metal, and tires are removed by a licensed contractor.

The Township continued to participate in a blue box program at the Site in 2012 and 2013. The Township operates a curbside recycling program through a private contractor. The following materials are included in the curbside program:

- Metal and aluminum cans
- Glass containers and bottles
- Waste oil products
- Styrofoam
- Plastic bags
- Plastic containers and bottles
- Aluminum foil and plates
- Small appliances
- Milk and juice boxes/cartons
- Paper and cardboard

In addition to the materials listed above, the following materials are collected at the Site as part of the diversion program:

- White goods and scrap metal
- Waste electrical and electronic equipment (WEEE)
- Textiles and furniture
- Usable construction and demolition waste

According to Township records (Appendix D), the summary of the waste deliveries to the Site in 2012 and 2013 is included in Table 7.

In 2013, the Township records indicated a total of 14 appliances and 1.05 tonnes of scrap metal were removed from the Site. No tires were moved from the Site in 2013. Clean brush and lumber was received and stored separated at the Site in 2012 and 2013. A total of 20 units of WEEE were removed by the contractor in 2013. A total of 23 furniture items were diverted from landfilling in 2013. The bag counts included in Table 7 are within the range of historical quantities.

5.10 COMPLIANCE

The Township is currently managing the Site in compliance with the Site ECA.

6.0 CONCLUSIONS AND RECOMMENDATIONS

Based on the 2012 and 2013 monitoring program, Cambium makes the following conclusions regarding the Bissett Creek Site:

- The historical groundwater elevations show that the water table fluctuates from season to season and from year to year. A local groundwater divide runs in a roughly northeast to southwest direction across the Site. The 2012 and 2013 groundwater elevations indicate that the general direction of groundwater flow in the northern portion of the Site is towards the south and west and in the southern portion of the Site, towards the east, south, and west in the overburden. In the bedrock, groundwater flow was towards the southwest.
- An assessment of the Site's compliance with the MOE Reasonable Use Policy indicated the only exceedance of the Reasonable Use Concept in 2012 and 2013 was nitrate at BH1-I, which is completed in the bedrock aquifer and is consistent with historical results. Given the distance between the downgradient monitoring well BH1-I and the CAZ boundary, and the minor nature of the landfill effects at this location, the Site is interpreted as being in compliance with RUC at the CAZ boundary.
- Based on the weak strength of the leachate produced, in addition to the distances of the wetland depression (SW1) and the intermittent tributary (SW2) to the fill area, the landfill is not expected to have adverse effects on the surface water quality at either location and no mitigative measures are recommended at this time.
- Using the average annual fill rate of the Site determined of 405 m^3, it is estimated that a total of 810 m^3 was placed at the Site between the November 2011 topographic survey and the autumn of 2013.
- Subtracting the volume filled in 2012 and 2013 from the remaining capacity in 2011 of 8,970 m^3, resulted in a remaining capacity of approximately 8,160 m^3 as of autumn 2013.
- Based on the calculated remaining volume and the calculated average annual fill rate, the remaining Site life of the Bissett Creek Site is approximately 20 years from the autumn of 2013. Actual Site life is dependent on the annual fill rate and cover and compaction methods.

Based on the results of 2012 and 2013 monitoring programs, Cambium recommends the following:

- The surface water and groundwater sampling program for the Bissett Creek Site summarized in Table 1 should be completed in 2014 and 2015.
- An updated topographic survey should be completed during the 2014/2015 monitoring program to provide an update on volume placed at the Site and the remaining capacity and Site life.

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GLOSSARY OF TERMS

Active Face/Area
The portion of the landfill facility where waste is currently being deposited, spread and/or compacted prior to the placement of cover material.

Adverse Environmental Impact
Any direct or indirect undesirable effect on the environment resulting from an emission or discharge which is caused or likely to be caused by human activity.

Annual Report
Report documenting the results of water quality, environmental quality, and operations monitoring for the year, or for a period as prescribed in the Certificate of Approval.

Approved Design and Operations Plan
The design of a landfill site and it's facilities which have been submitted along with the application documents for which formal MOE approval has been issued through the Certificate of Approval.

Approved Site or Facility
A landfill site/facility for which there is an existing and current Certificate of Approval.

Aquifer
A geologic unit (soil or rock) that contains sufficient saturated permeable material to yield measurable quantities of water to wells and springs.

Attenuation
Natural process through which the concentrations of landfill generated contaminants are reduced to safe levels.

Borehole
Is a hole drilled for soil sampling purposes.

Buffer Area
An area of land situated within the peripheral area surrounding an active filling area, but limited in extent to the property boundary, assigned to provide space for remedial measures, contaminant control measures, and for the reduction or elimination of adverse environmental impact caused by migrating contaminants.

Certificate of Approval
The license or permit issued by the MOE for the operation of a landfill site. Issued to the owner of the site with conditions of compliance stated therein.

Contaminant
A compound, element or physical parameter, usually resulting from human activity, or found at elevated concentrations, that have or may have a harmful effect on public health or the environment.

Contaminant Migration Path
Route by which a contaminant will move from the site into adjacent properties or the natural environment. Usually a route that offers the least resistance to movement.

Contamination Attenuation Zone
The zone beneath the surface, located beyond the landfill site boundary, where contaminants will be naturally attenuated to predetermined levels. Also, see Reasonable Use Policy.

Contingency Plan
A documented plan detailing a co-ordinated course of action to be followed to control and remediate occurrences such as a fire, explosion, or release of contaminants in an uncontrolled manner that could threaten the environment and public health.

Cover Material
Material approved by the MOE that is used to cover compacted solid waste. Usually, a soil with suitable characteristics for specific end-use.

Site Development Plan and Operations Report
Development and Operations Plan or Report is a document detailing the planned sequence of activities through the landfill site's active life, the control systems, site facilities and monitoring systems, that are necessary. This document is required for obtaining a Certificate of Approval.

Design Capacity
The maximum amount of waste that is planned to be disposed of at a landfill site.

Detection Limit
Concentration under which a parameter cannot be quantitatively measured.

EAA or EA Act
Environmental Assessment Act, Revised Statutes of Ontario, 1990. One of the primary acts of legislation intended to protect, conserve and wisely manage Ontario's environment through regulating planning and development.

EPA
Environmental Protection Act, Revised Status of Ontario, 1990. EPA is another of the primary pieces of Provincial legislation governing the protection of the natural environment of the Province.

Evapotranspiration
The evaporation of all water from soil, snow, ice, vegetation and other surfaces, including the water absorbed by plants, that is released to the atmosphere as vapour.

Fill Area
The area of a landfill site designed and designated for the disposal of waste.

Final Cover
Soil material or soil in combination with synthetic membranes, overlain by vegetation in a planned landscape, placed over a waste cell that has reached the end of its active life.

Groundwater
Subsurface water that occurs beneath the water table in soils and rocks that are fully saturated.

Hydraulic Conductivity
The rate of flow of water through a cross-section under a specific hydraulic gradient. It is a property of the geologic formation and the fluid, in hydrogeologic applications where the fluid is water. (Units of m/day or cm/s).

Hydraulic Gradient
The head drop per unit distance in the direction of flow, the driving force for groundwater flow.

Hydrogeology
The study of subsurface waters and related geologic aspects of surface waters.

Impermeable Fill
Soil material that is placed as filling material that is sufficiently cohesive and fine grained to impede and restrict the flow of water through it.

In situ Testing
Testing done on-site, in the field, of material or naturally occurring substances in their original state.

Landfill Gas
Combustible gas (primarily methane and carbon dioxide) generated by the decomposition of organic waste materials.

Landfill Site
A parcel of land where solid waste is disposed of in or on land for the purposes of waste management.

Leachate
Water or other liquid that has been contaminated by dissolved or suspended particles due to contact with solid waste.

Leachate Breakout
Location where leachate comes to the ground surfaces; a seep of spring.

Limit of Filling
The outermost limit at which waste has been disposed of, or approved or proposed for disposal at a landfill.

MOE
Ontario Ministry of the Environment.

Monitoring
Regular or spontaneous procedures used to methodically inspect and collect data on the performance of a landfill site relating to environmental quality (i.e. air, leachate, gas, ground or surface water, unsaturated soils, etc.).

Monitoring Well
Is the constructed unit of casing and screen installed in a borehole.

Multi-Level Monitoring Well
More than one monitoring well installed at a given test well location.

Native Soil
Soil material occurring naturally in the ground at a location.

Natural Attenuation
Where contaminants are reduced to acceptable concentration levels by natural mechanisms (dilution, absorption onto the soil matrix, etc.), biological action, and chemical interaction.

Occupational Health and Safety Act
The primary act of legislation enacted by Ontario Ministry of Labour to regulate and control the safety in the workplace, also Occupational Health and Safety Act, Revised Statutes of Ontario, 1990.

Odour Control
Minimizing or eliminating the nuisance and undesirable impact of objectionable or unpleasant odours arising from waste disposal operations.

Open Burning
Burning any matter whereby the resultant combustion products are emitted directly to the atmosphere without passing through an adequate stack, duct, or chimney.

Operations Plan
A document detailing the waste disposal operations in a planned, and if necessary, a staged manner, that ensure compliance with regulatory provisions concerning the operations of a landfill site.

Operator (Site Operator)/Attendant
The individual or organization who, through ownership or under contract, manages and operates a landfill site for the purpose of waste disposal.

Owner
A person, persons, organization or municipal authority who own a landfill facility or part of a landfill facility, and in whose name the Certificate of Approval for the site is issued.

Percolation
The movement of infiltrating water through soil.

Permeability
Often used interchangeable with hydraulic conductivity, but not strictly correct. Permeability is a property of the porous media only. Dependent upon media properties that affect flow, diameter, sphericity, roundness and packing of the grains.

Piezometer
A well that intersects a confined aquifer.

Provisional Certificate of Approval (Provisional C of A)
Same as Certificate of Approval.

Reasonable Use Policy
A policy developed by the Ministry to stipulate limits to the level of groundwater quality impairment that may be permitted to occur at site property boundaries, to allow the reasonable use of adjacent properties or land without adversely affecting public health and the environment.

Recharge Zone
An area where precipitation or surface run-off infiltrates into the ground and then, through natural percolation enters an aquifer.

Recycling
Sorting, collecting or processing waste materials that can be used as a substitute for the raw materials in a process or activity for the production of (the same or other) goods. For example, the "Blue Box" system, in-plant scrap handling, or raw material recovery systems. Recycling is also the marketing of products made from recycled or recycled materials.

Reduction (of waste or component of 3Rs program)
Those actions, practices or processes which result in the production or generation of less waste.

Remedial Action
Corrective action taken to clean-up or remedy a spill, an uncontrolled discharge of a contaminant, or a breach in a facility or its operations, in order to minimize the consequent threat to public health and the environment.

Representative Sample
A small portion of soil, water, etc. which can be subjected to testing and analysis, that is expected to yield results that will reliably represent the identical characteristics of the source of the material or of a larger body of material.

Reuse (component of 3Rs program)
The use of an item again in its original form, for a similar purpose as originally intended, or to fulfil a different function.

Run-off
The part of precipitation (rain water, snow melt) that flows overland and does not infiltrate the surface material (soil or rock).

Saturated Zone
The zone of a subsurface soil where all voids are filled with water.

Sedimentation
The deposition of fine grained soil in an undesirable location, caused by the scouring, erosion and transportation of earth materials by surface run-off.

Sensitive Land Use
A land use where humans or the natural environment may experience an adverse environmental impact.

Settlement
The subsidence of the top surface and underlying waste of a landfill or waste cell as a result of densification under its own weight.

Site Capacity
The maximum amount of waste that is planned to be disposed (design capacity) or that has been disposed of at a landfill site.

Site Closure
The planned and approved cessation or termination of landfilling activities at a landfill site upon reaching its site capacity.

Site Life
The period of time from its inception through active period of waste disposal, to the time when a landfill site reaches its' site capacity, when it ceases to receive any further waste, including and up to closure.

Solid Waste
Any waste matter that cannot be characterized by its physical properties as a liquid waste product.

Solid Waste Disposal Site or Facility
A site or facility such as a landfill site where solid waste is disposed of.

Source Separation
The separation of various wastes at their point of generation for the purposes of recycling or further processing.

Standpipe
A monitoring well which intersects the water table aquifer.

Stormwater
Run-off that occurs as a direct result of a storm event or thaw.

Stormwater Detention
Control of stormwater by the construction of impoundments of structures for the purpose of regulating stormwater flows during high intensity rainfall events, that would otherwise transport excessive amounts of sediment, cause soil erosion or cause flooding.

Stratigraphy
The geologic sub-structuring, usually layered with different distribution, deposition and age.

Surface Run-off (Drainage)
See Run-off.

Surface Water
Water that occurs at the earth's surface (ponds, streams, rivers, lakes, oceans).

Sub-Soil
Soil horizons below the topsoil.

Test hole
Is a hole drilled for soil sampling purposes.

Topsoil
The uppermost layer of the soil containing appreciable organic materials in mineral soils. Adequate fertility to support plant growth.

Unsaturated Zone
(also vadose zone) - The zone in a porous sub-soil, where the voids are not completely water-filled, but contain some air-filled voids. Limited above by the land surface and below by the water-table.

Vector
A disease carrier and transmitter; usually an insect or rodent.

V.O.C.
Volatile organic compounds are those compounds which will readily volatilize (convert from liquid to gas phase) at conditions normally found in the environment.

Waste
Ashes, garbage, refuse, domestic waste, industrial waste, or municipal refuse and other used products as are designated or interpreted by the provisions of the Environmental Protection Act.

Waste Disposal Site (Facility)
Any land or land covered by water upon, into, in or through which, or building or structure in which, waste is deposited or processed and any machinery or equipment or operation required for the treatment or disposal of waste.

Waste Management System
All facilities, equipment and operations for the complete management of waste, including the collection, handling, transportation, storage, processing and disposal thereof, and may include one or more waste disposal sites.

Water Table
The water level attained in a monitoring well which screens the surficial unconfined aquifer.

Water Balance
Amounts of water to various components in a system so that water entering the system equals the amount of water contained within and discharged out of a system.

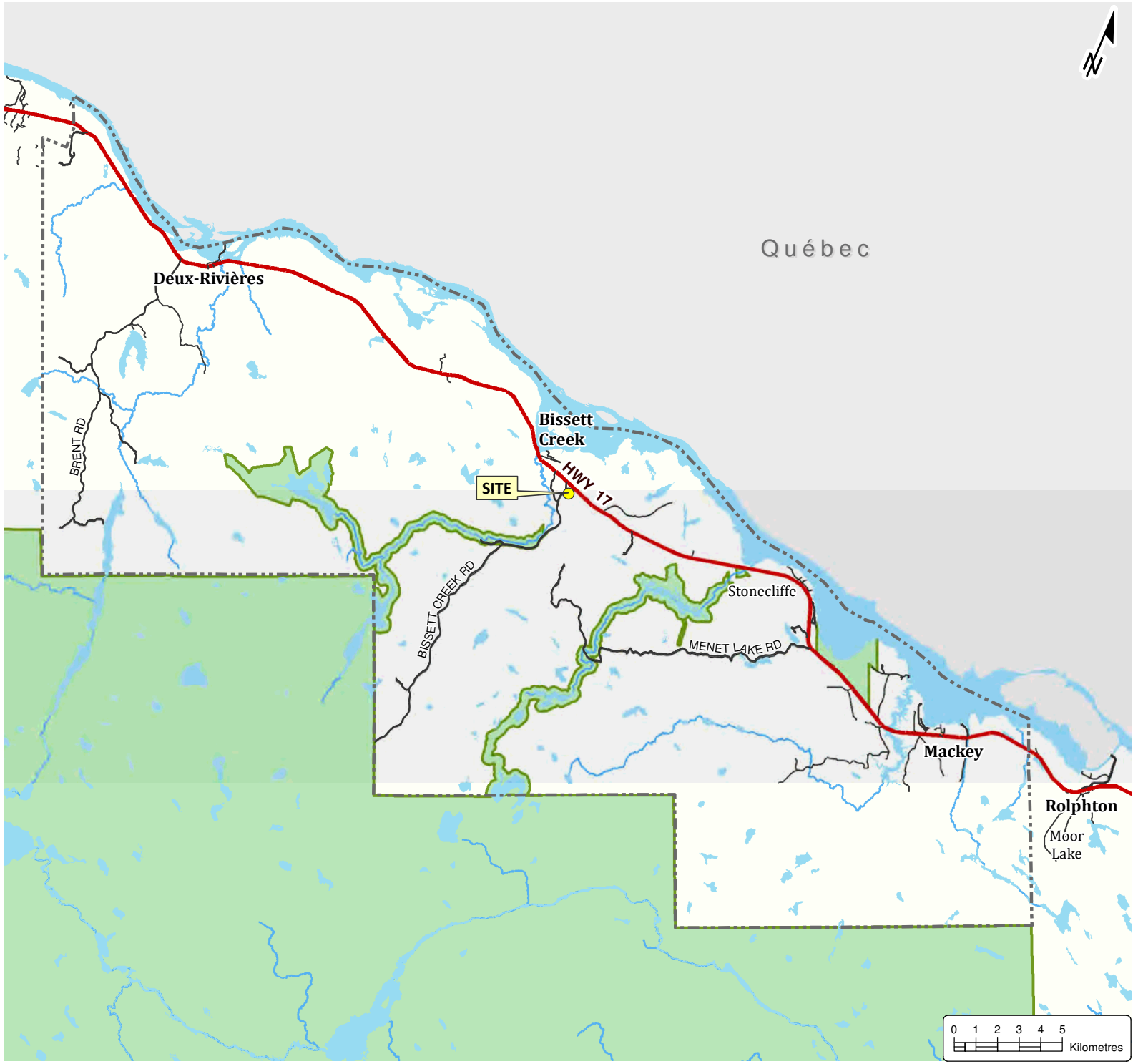
Water Level
The level of water in a well.

Well Casing
The pipe that is used to construct a well.

Well Screen
A filtering device used to keep sediment from entering a well.

Wetlands
Areas where water is at, near or above the land surface long enough to be capable of supporting aquatic or hydrolytic vegetation, and which have soils indicative of wet conditions.

Appended Figures

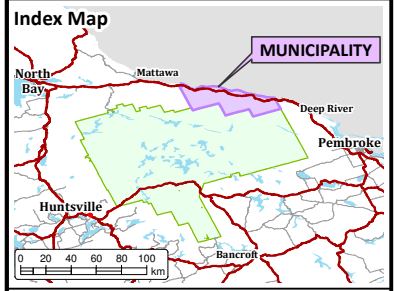


BISSETT CREEK WASTE DISPOSAL SITE

The Municipality of the United Townships of Head, Clara & Maria

LEGEND

- Municipal Boundary
- Highway
- Minor Road
- Water Area
- River/Creek
- Provincial Park



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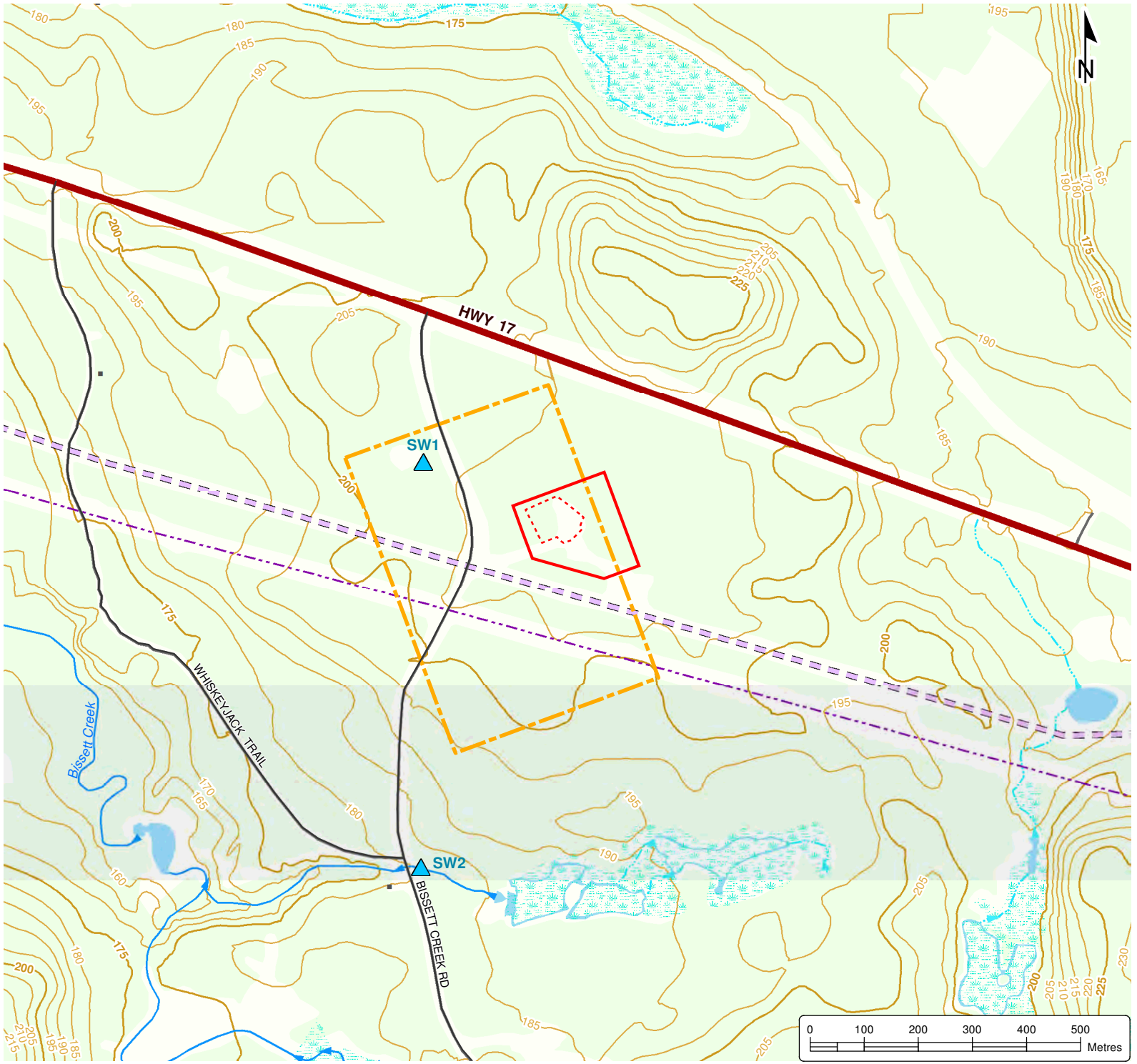
REGIONAL LOCATION PLAN

Project No.:	2923-003	Date:	May 2014
		Rev.:	
Scale:	1:250,000	Projection:	NAD 1983 UTM Zone 17N
Created by:	GMH	Checked by:	DFB
Figure:	1		



BISSETT CREEK WASTE DISPOSAL SITE

The Municipality of the United Townships of Head, Clara & Maria

LEGEND

- Surface Water Sampling Location
- Approved Waste Disposal Area
- Original Property Boundary
- Contaminant Attenuation Zone(CAZ) (owned by Township)
- Building
- Highway
- Minor Road
- Hydro Line
- Natural Gas Pipeline
- Watercourse, Permanent
- Watercourse, Intermittent
- Contour (index)
- Contour (5m)
- Wetland Area
- Water Area
- Wooded Area

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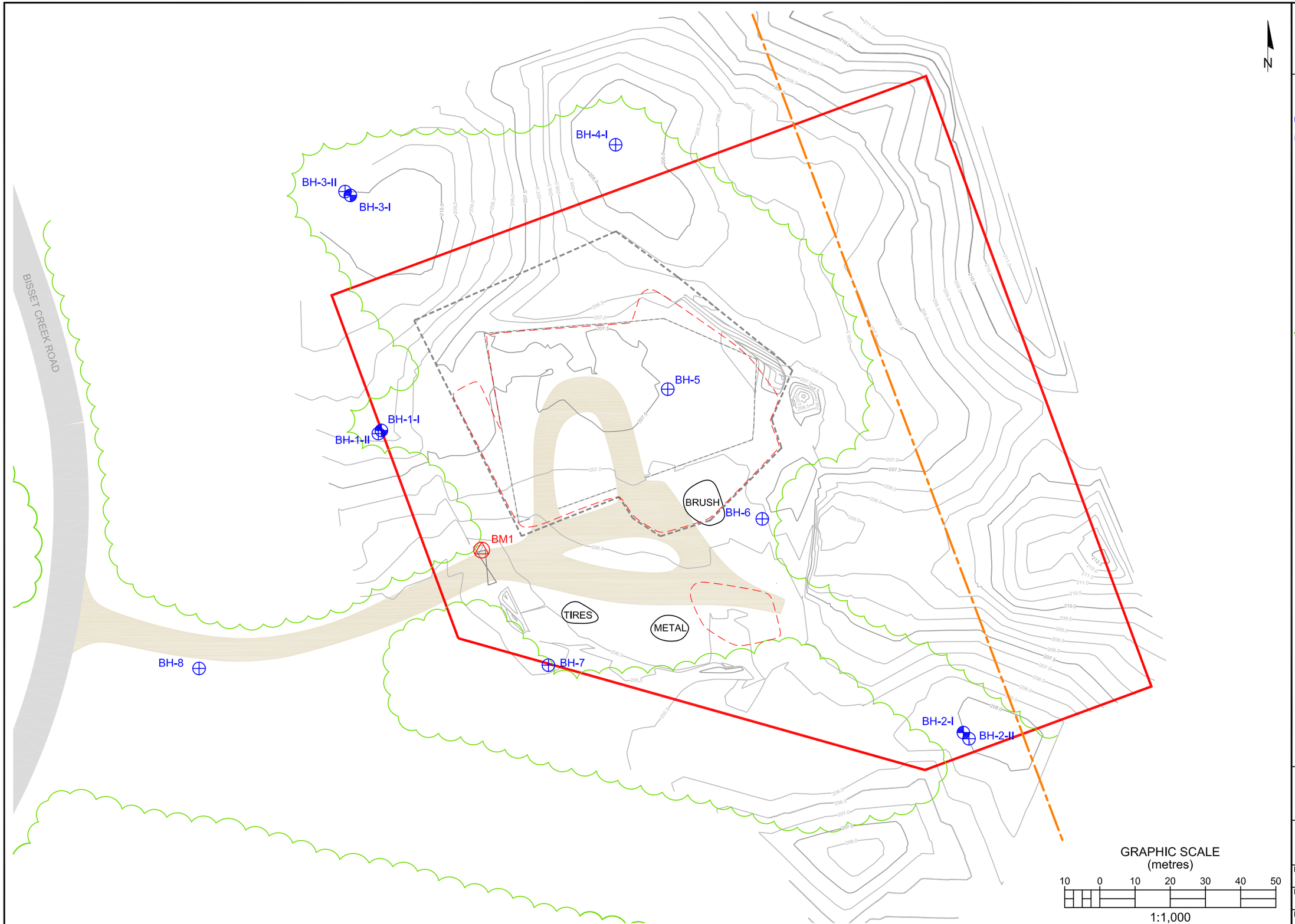
LOCAL TOPOGRAPHY PLAN

Project No.:	2923-003	Date:	May 2014
		Rev.:	
Scale:	1:10,000	Projection:	NAD 1983 UTM Zone 17N
Created by:	GMH	Checked by:	DFB
Figure:	2		

BISSETT CREEK WASTE DISPOSAL SITE

The Municipality of the United Townships of Head, Clara & Maria



LEGEND

- BM1 — Benchmark
- BH-2-II — Overburden Monitoring Well
- BH-2-I — Bedrock Monitoring Well
- Primary Topographic Contour Line
- Secondary Topographic Contour Line
- Existing Limit of Waste (0.5ha)
- Approved Waste Disposal Area (0.6ha)
- Property Line (2.9ha)
- Contaminant Attenuation Zone (CAZ)
- Fence
- Gate
- On-site Road
- Road
- Treeline

Notes:
1. Contours based on JP2G Consultants, Inc. November 18, 2011.
2. Base mapping features are © Queen's Printer of Ontario, 2010 (this does not constitute an endorsement by the Ministry of Natural Resources or the Ontario Government).
3. Distances on this plan are in metres and can be converted to feet by dividing by 0.3048.

Benchmarks:
1. Top of threads on lowest bolt on northwest side of north steel gate post.
   Elevation 206.307 m.

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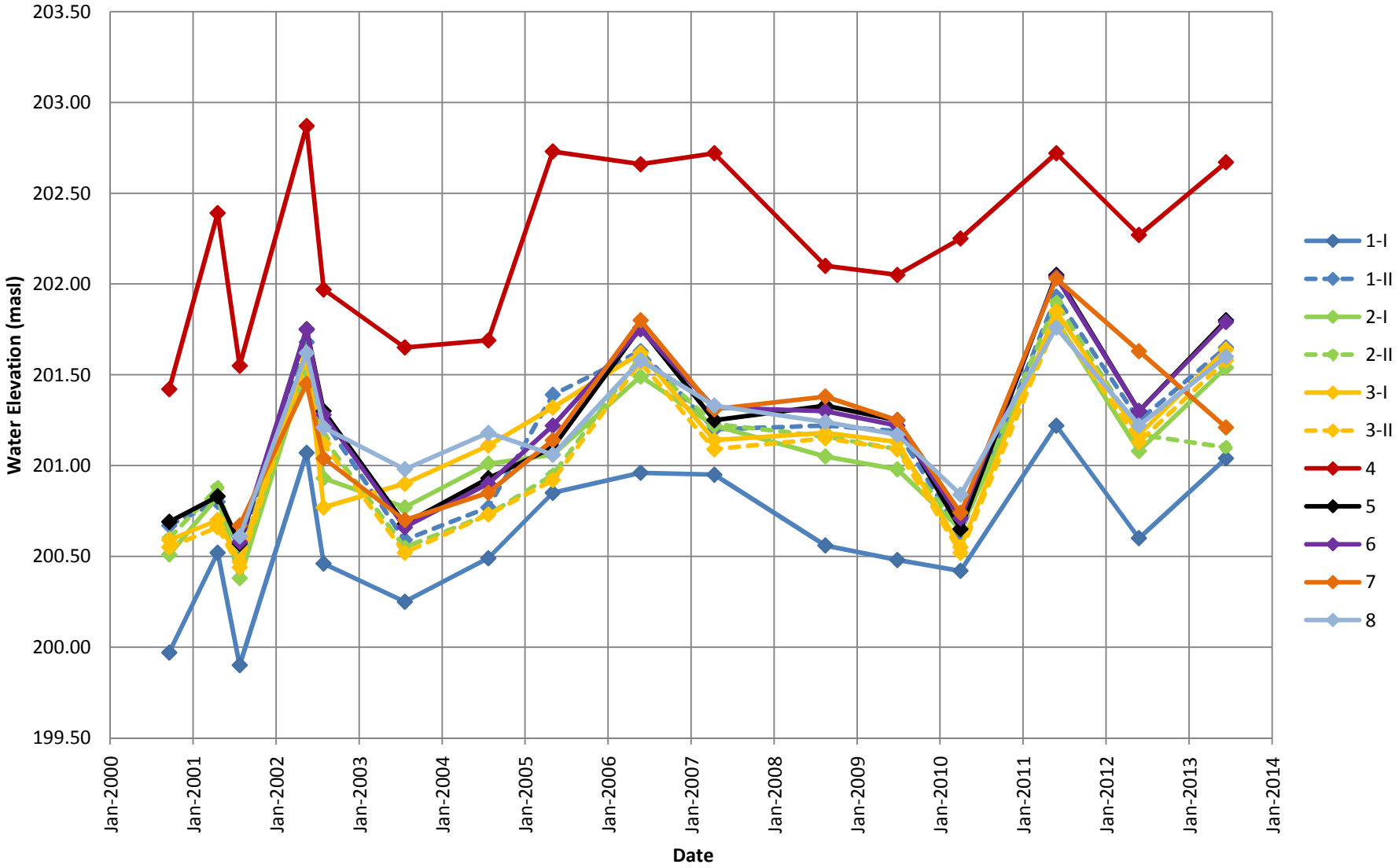
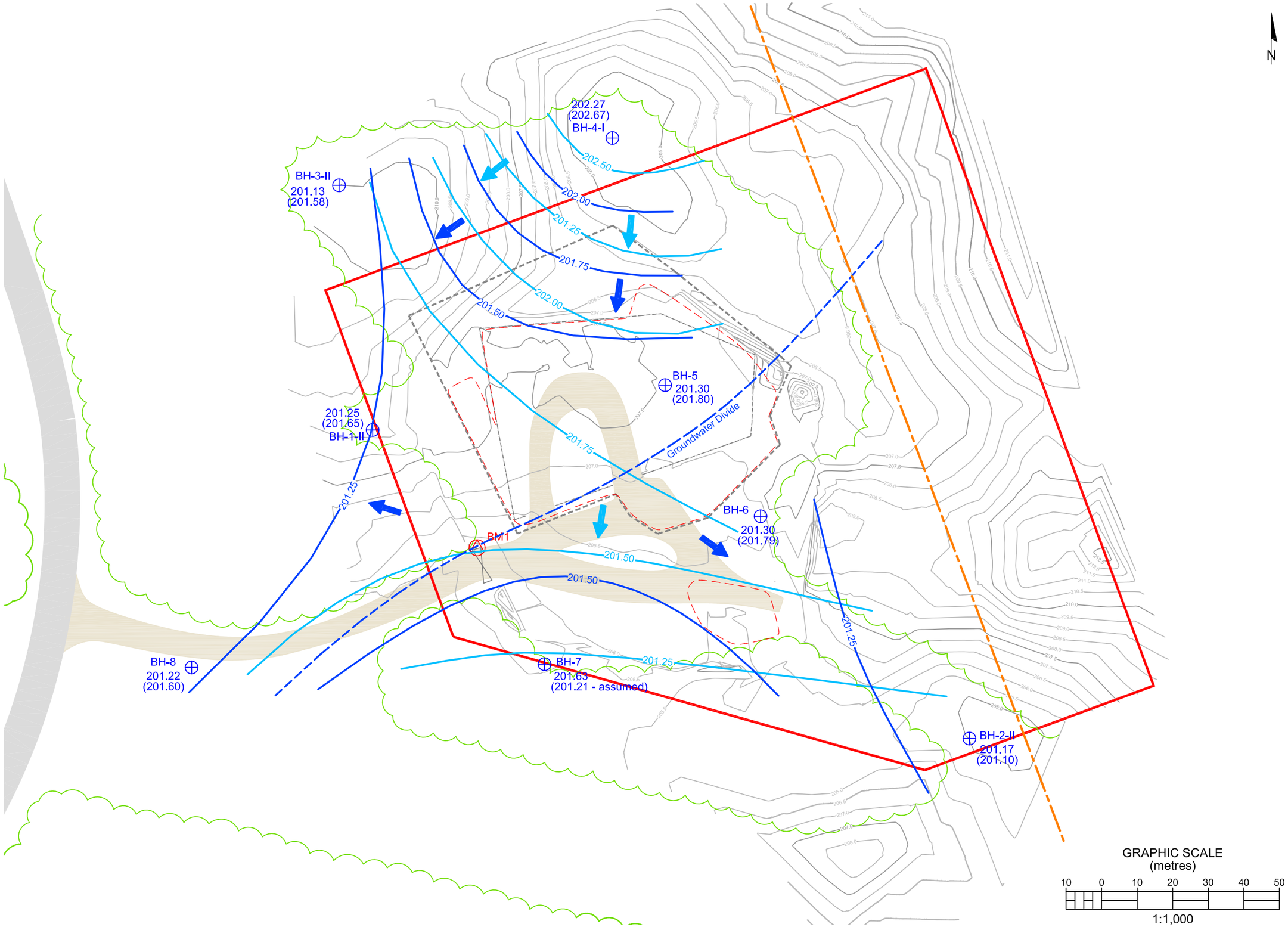
EXISTING CONDITIONS

Project No.:	Date:	May 2014
2923-003	Rev.:	
Horizontal Scale: 1:1000	Vertical Scale:	N/A
Drawn By: GMH	Checked By: CMT	Figure: 3

Figure 4: Groundwater Elevations





BISSETT CREEK WASTE DISPOSAL SITE

The Municipality of the United Townships of Head, Clara & Maria

LEGEND

- BM1 — Benchmark
- BH-2-II — Overburden Monitoring Well
- 201.22 (201.60) — Groundwater Elevation June 20, 2012 (July 8, 2013)
- Groundwater Contour (June 20, 2012)
- Groundwater Contour (July 8, 2013)
- Groundwater Direction (June 20, 2012)
- Groundwater Direction (July 8, 2013)
- Primary Topographic Contour Line
- Secondary Topographic Contour Line
- Existing Limit of Waste (0.5ha)
- Approved Waste Disposal Area (0.6ha)
- Property Line (2.9ha)
- Contaminant Attenuation Zone (CAZ)
- Fence
- Gate
- On-site Road
- Road
- Treeline

Notes:
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3. Distances on this plan are in metres and can be converted to feet by dividing by 0.3048.

Benchmarks:
1. Top of threads on lowest bolt on northwest side of north steel gate post.
   Elevation 206.307 m.

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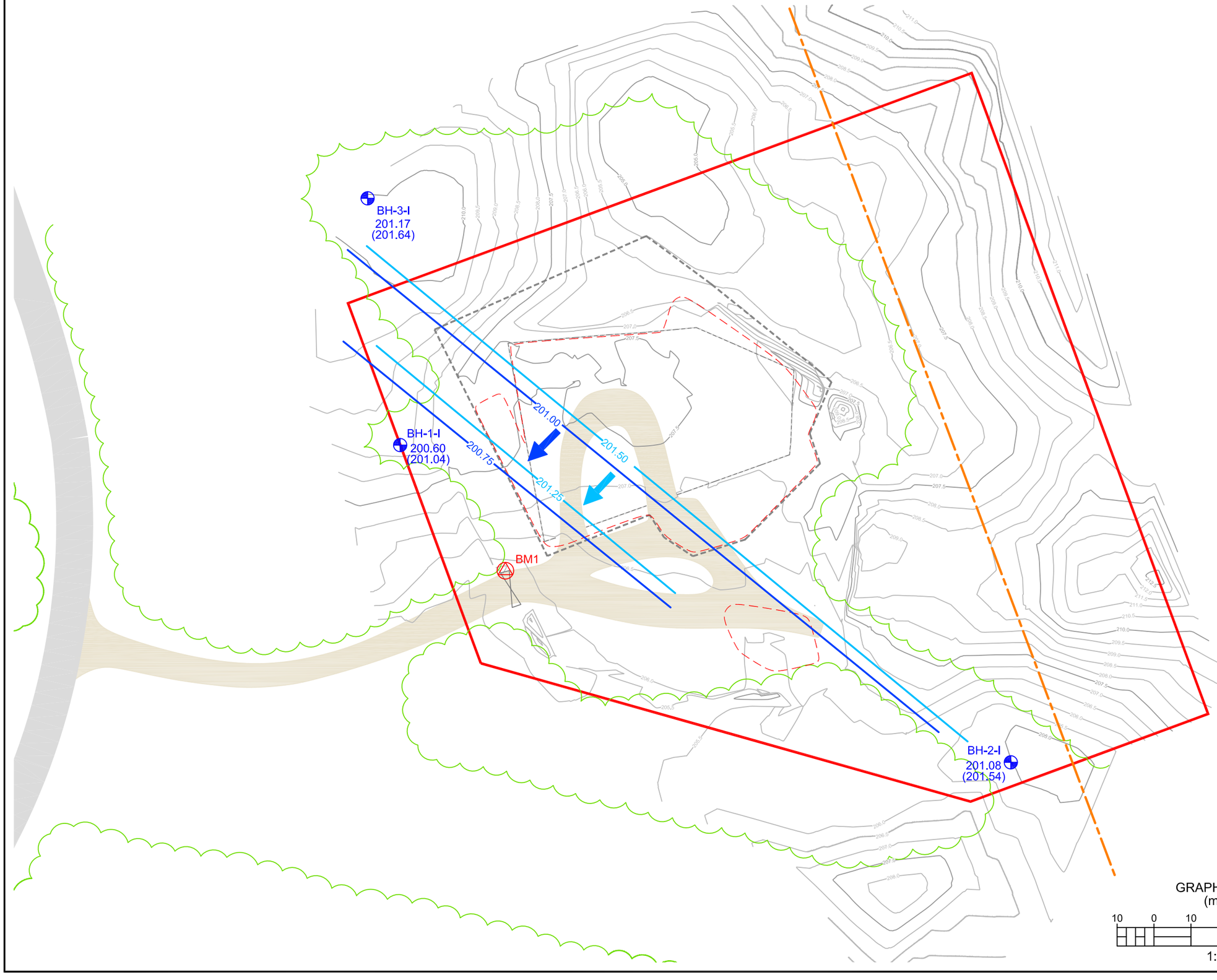
OVERBURDEN GROUNDWATER CONFIGURATION

Project No.: 2923-003		Date: May 2014	Rev.:
Horizontal Scale: 1:1000		Vertical Scale: N/A	
Drawn By: NLB	Checked By: CMT	Figure: 5	

BISSETT CREEK WASTE DISPOSAL SITE

The Municipality of the United Townships of Head, Clara & Maria



LEGEND

- BM1 — Benchmark
- BH-2-I — Bedrock Monitoring Well
- 201.22 (201.60) — Groundwater Elevation June 20, 2012 (July 8, 2013)
- Groundwater Contour (June 20, 2012)
- Groundwater Contour (July 8, 2013)
- Groundwater Direction (June 20, 2012)
- Groundwater Direction (July 8, 2013)
- Primary Topographic Contour Line
- Secondary Topographic Contour Line
- Existing Limit of Waste (0.5ha)
- Approved Waste Disposal Area (0.6ha)
- Property Line (2.9ha)
- Contaminant Attenuation Zone (CAZ)
- Fence
- Gate
- On-site Road
- Road
- Treeline

GRAPHIC SCALE (metres)

10 0 10 20 30 40 50

1:1,000

Notes:
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Benchmarks:
1. Top of threads on lowest bolt on northwest side of north steel gate post.
   Elevation 206.307 m.

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BEDROCK GROUNDWATER CONFIGURATION

Project No.:	Date:	May 2014
2923-003	Rev.:	
Horizontal Scale: 1:1000	Vertical Scale:	N/A
Drawn By: NLB	Checked By: CMT	Figure: 6

Appended Tables

Table 1

Groundwater and Surface Water Monitoring Program

Bisset Creek Waste Disposal Site

Location	Task	Frequency	Analytical Parameters
Groundwater 1-I, 1-II, 2-II, 2-II, 3-I, 3-II, 4-I, 5-I, 6, 7, 8 1 QA/QC Duplicate	• Measure groundwater levels • Groundwater sampling • Field measurements (pH, temperature, conductivity, oxygen reduction potential)	Once Annually (Spring)	Alkalinity, Ammonia – Total, Boron, Calcium, Chloride, COD, Conductivity, Copper, Iron, Magnesium, Manganese, Nitrate, Nitrite, pH, Phenols, Potassium, Sodium, Strontium, Sulphate, TDS, TKN
Surface Water SW1, SW2 1 QA/QC Duplicate	• Surface water sampling • Flow estimates • Field measurements (pH, temperature, conductivity, dissolved oxygen, oxygen reduction potential)	Once Annually (Spring)	Alkalinity, Ammonia – Total, Boron, Calcium, Chloride, COD, Conductivity, Copper, Iron, Magnesium, Manganese, Nitrate, Nitrite, pH, Phenols, Phosphorous - Total, Potassium, Sodium, Strontium, Sulphate, TDS, TKN, TSS, Zinc

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Table 2: Groundwater Elevation Data

Monitor	1-I	1-II	2-I	2-II	3-I	3-II	4	5	6	7	8
Top of Pipe Elevation	209.25	209.29	205.36	205.30	210.42	210.53	204.84	207.85	207.70	206.19	205.63
Ground Elevation	208.54	208.58	204.59	204.58	209.78	209.80	204.06	207.06	206.99	205.47	204.87
UTM Coordinates (Zone 17)	727995, 5122096	727994, 5122095	728160, 5122010	728162, 5122008	727986, 5122163	727984, 5122164	728061, 5122177	728076, 5122108	728103, 5122071	728042, 5122029	727943, 5122028
Water Elevations (Date)											
16-Oct-00	199.97	200.67	200.51	200.60	200.59	200.55	201.42	200.69	-	-	-
17-May-01	200.52	200.80	200.83	200.88	200.70	200.66	202.39	200.83	-	-	-
22-Aug-01	199.90	200.54	200.38	200.48	200.47	200.44	201.55	200.57	200.58	200.67	200.61
12-Jun-02	201.07	201.68	201.55	201.63	201.62	201.58	202.87	201.75	201.75	201.45	201.62
26-Aug-02	200.46	201.25	200.93	201.15	200.77	201.12	201.97	201.30	201.28	201.04	201.21
18-Aug-03	200.25	200.59	200.77	200.55	200.90	200.52	201.65	200.68	200.66	200.70	200.98
19-Aug-04	200.49	200.77	201.01	200.73	201.11	200.73	201.69	200.93	200.90	200.85	201.18
30-May-05	200.85	201.39	201.06	200.95	201.32	200.92	202.73	201.10	201.22	201.14	201.06
20-Jun-06	200.96	201.63	201.49	201.60	201.62	201.57	202.66	201.76	201.75	201.80	201.58
10-May-07	200.95	201.20	201.22	201.23	201.14	201.09	202.72	201.25	201.32	201.31	201.33
10-Sep-08	200.56	201.22	201.05	201.16	201.18	201.15	202.10	201.33	201.30	201.38	201.24
23-Jul-09	200.48	201.19	200.98	201.09	201.13	201.09	202.05	201.25	201.22	201.25	201.17
27-Apr-10	200.42	200.63	200.65	200.65	200.55	200.52	202.25	200.65	200.71	200.74	200.84
22-Jun-11	201.22	201.93	201.80	201.90	201.85	201.79	202.72	202.05	202.04	202.03	201.76
20-Jun-12	200.60	201.25	201.08	201.17	201.17	201.13	202.27	201.30	201.30	201.63	201.22
08-Jul-13	201.04	201.65	201.54	201.10	201.64	201.58	202.67	201.80	201.79	201.21	201.60

Notes:

1. All measurements are reported relative to metres above sea level (masl).
2. "-" indicates water level not available/obtained.
3. Shaded cells indicate bedrock monitoring wells.
4. Unformatted cells indicate deep overburden monitoring wells.

Table 3: Summary of Vertical Gradients

Monitor No.	Top of Pipe Elevation (m)	Stick-Up (m)	Depth of Well	Elevation at Ground Surface	Bottom of well elevation	Difference in bottom of screen elevation (m)	Vertical Gradients Shallow-Deep: +downwards, -upwards	
							20-Jun-12	08-Jul-13
1-I	209.25	0.78	18.69	208.47	190.56	-8.50	0.076	0.072
1-II	209.29	0.75	10.23	208.54	199.06			
2-I	205.36	0.68	8.92	204.68	196.44	-2.48	0.011	-0.052
2-II	205.30	0.62	6.38	204.68	198.92			
3-I	210.42	0.58	15.57	209.84	194.85	-4.60	-0.005	-0.007
3-II	210.53	0.69	11.08	209.84	199.45			

Notes:

1. Negative values indicate an upward vertical gradient and positive values indicate a downward vertical gradient.

Table 4: Summary of Groundwater Quality Data - Overburden

Parameter	ODWQS[1]	RUC[8]	BH 1-II	BH 1-II	BH 1-II	BH 1-II	BH 1-II	BH 1-II	BH 1-II	BH 1-II	BH 1-II	BH 1-II	BH 1-II	BH 1-II	BH 1-II	BH 1-II
			16-Oct-00	17-May-01	29-Aug-02	18-Aug-03	19-Aug-04	30-May-05	20-Jun-06	10-May-07	10-Sep-08	23-Jul-09	28-Apr-10	22-Jun-11	20-Jun-12	08-Jul-13
Alkalinity (mg/L as $CaCO_3$)	500	266.5	36	17	23	17	19	16	21	16	16	22	10	14	10	15
Conductivity (µs/cm)	NV	NV	-	-	-	57	73	50	83	42	77	66	32	54	47	60
Solids - Total Dissolved (TDS)	500	288.25	120	100	61	37	48	33	54	27	50	43	21	35	31	39
Oxygen Demand - Chemical (COD)	NV	NV	14	8	<5	<5	<5	<5	<5	<5	<5	<5	5	15	<5	10
Chloride	250	125.5	2	1	3	2	3	2	2	1	4	2	1	3	-	3
Nitrogen - Ammonia (NH_3)	NV	NV	0.070	0.060	<0.02	<0.02	0.09	<0.02	0.05	<0.02	<0.02	<0.02	<0.02	0.11	<0.02	<0.02
Nitrogen - Nitrate (NO_3)	10	2.575	***3.56***	***9.95***	***3.29***	0.27	1.75	0.85	1.83	0.42	1.77	1.52	0.16	1.13	1.08	1.67
Nitrogen - Nitrite (NO_2)	1	0.325	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	0.150	<0.10	<0.10	<0.1
Nitrogen - Total Kjeldahl (TKN)	NV	NV	0.21	0.28	0.12	<0.05	0.19	<0.05	0.10	<0.05	<0.10	<0.10	<0.10	<0.10	<0.10	<0.1
Sulphate	500	257.25	17	13	8	18	8	8	7	5	5	6	4	4	5	3
Boron	5	2.505	0.11	0.03	<0.05	0.01	<0.01	0.01	0.02	0.01	<0.01	0.01	<0.01	0.03	<0.01	0.01
Calcium	NV	NV	10	12	10	5	9	4	7	4	7	6	3	5	4	7
Copper	1	0.5015	<0.001	<0.001	0.001	<0.001	<0.001	<0.001	0.066	0.002	<0.001	<0.001	0.001	<0.001	<0.001	<0.001
Iron	0.3	0.2325	0.06	0.02	<0.01	<0.001	<0.01	<0.03	<0.03	0.03	<0.03	0.06	0.10	0.07	<0.03	<0.03
Magnesium	NV	NV	3	4	3	2	2	1	2	<1	2	2	<1	1	<1	2
Manganese	0.05	0.043	**0.390**	**0.250**	0.036	0.013	0.010	<0.01	<0.01	<0.01	0.030	***0.050***	0.030	0.030	<0.01	0.02
Potassium	NV	NV	1	2	1	1	1	<1	<1	<1	1	1	<1	<1	<1	<1
Sodium	200	103.5	11	7	4	3	3	2	2	<2	<2	<2	<2	2	<2	2
Strontium	NV	NV	0.147	0.180	0.109	0.062	0.095	0.066	0.089	0.052	0.091	0.070	0.035	0.058	0.050	0.073
Phenolics - Total	NV	NV	0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Organic Nitrogen	0.15	0.125	***0.140***	**0.220**	**>0.10**	<0.05	0.10	<0.05	0.05	-	<0.10	<0.10	-	<0.10	<0.10	-
Water Temp. (^{o}C) [6]	NV	NV	8.4	9.6	9.0	9.3	8.4	8.7	10.9	9.5	9.0	8.8	8.4	8.3	10.5	9.7
Conductivity (µs/cm) [6]	NV	NV	120	140	75	70	57	49	72	34	64	55	32	51	42	50
pH (pH units) [6]	6.5-8.5	NV	7.25	**6.09**	**6.39**	6.86	6.80	7.20	**6.27**	**8.55**	**6.27**	6.70	7.10	7.7	**6.40**	7.00

Notes:

1. Ontario Drinking Water Quality Standard (ODWQS).
2. Parameter name in *parenthesis* indicate alternate chemical names.
3. Bold and Shaded values exceed ODWQS
4. "-" indicates value not analyzed.
5. NV indicates no value.
6. Field Analysis
7. Units are mg/L unless otherwise specified
8. Reasonable Use Criteria (RUC) Guideline B-7
9. Bold and italicized values exceed RUC criteria

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Table 4: Summary of Groundwater Quality Dat
Overburden

Parameter	ODWQS[1]	BH 2-II	BH 2-II	BH 2-II	BH 2-II	BH 2-II	BH 2-II	BH 2-II	BH 2-II	BH 2-II	BH 2-II	BH 2-II	BH 2-II	BH 2-II	BH 2-II
		16-Oct-00	17-May-01	29-Aug-02	18-Aug-03	19-Aug-04	30-May-05	20-Jun-06	10-May-07	10-Sep-08	23-Jul-09	28-Apr-10	22-Jun-11	21-Jun-12	08-Jul-13
Alkalinity (mg/L as $CaCO_3$)	500	70	33	27	22	18	16	14	17	20	23	7	20	15	21
Conductivity (µs/cm)	NV	-	-	-	62	51	42	45	37	53	54	43	40	44	45
Solids - Total Dissolved (TDS)	500	132	56	42	40	33	27	29	24	35	35	28	26	29	29
Oxygen Demand - Chemical (COD)	NV	51	14	<5	<5	<5	<5	<5	<5	<5	<5	<5	20	<5	8
Chloride	250	4	<1	1	3	1	2	3	2	1	2	<1	1	2	<1
Nitrogen - Ammonia (NH_3)	NV	0.030	<0.02	<0.02	<0.02	0.11	0.07	0.06	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Nitrogen - Nitrate (NO_3)	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
Nitrogen - Nitrite (NO_2)	1	<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
Nitrogen - Total Kjeldahl (TKN)	NV	<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
Sulphate	500	15	5	8	25	8	7	6	4	4	6	12	4	5	4
Boron	5	0.10	0.01	<0.05	0.01	0.01	0.01	0.01	<0.01	<0.01	0.01	<0.01	<0.01	<0.01	<0.01
Calcium	NV	14	9	7	7	5	3	4	3	4	5	3	3	3	4
Copper	1	0.002	<0.001	<0.001	<0.001	<0.001	<0.001	***0.670***	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Iron	0.3	**2.42**	0.04	0.02	<0.01	0.01	<0.03	<0.03	0.07	0.11	0.18	***0.27***	0.15	0.09	0.08
Magnesium	NV	10	3	3	3	3	1	2	1	2	2	1	1	2	2
Manganese	0.05	**0.390**	**0.070**	<0.005	<0.005	<0.01	<0.01	<0.01	<0.01	0.030	***0.050***	0.030	0.020	<0.01	0.010
Potassium	NV	4	1	3	2	2	<1	<1	<1	<1	<1	<1	<1	<1	<1
Sodium	200	12	<2	2	<2	2	<2	<2	<2	<2	<2	<2	<2	<2	<2
Strontium	NV	0.086	0.031	0.028	0.028	0.025	0.021	0.022	0.022	0.022	0.020	0.013	0.016	0.018	0.018
Phenolics - Total	NV	0.004	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Organic Nitrogen	0.15	**0.310**	**0.27**	<0.06	<0.05	0.00	***0.14***	0.00	< 0.200	< 0.200	<0.10	<0.10	<0.10	<0.10	-
Water Temp. (^oC) [6]	NV	9.0	7.6	9.4	9.3	8.9	6.9	7.9	7.3	9.2	7.7	6.9	7.0	8.2	7.2
Conductivity (µs/cm) [6]	NV	140	90	61	22	40	37	30	28	44	44	37	45	39	35
pH (pH units) [6]	6.5-8.5	7.99	7.45	7.41	7.25	6.87	6.90	7.33	**8.67**	6.76	7.40	7.20	6.9	**6.20**	**6.30**

Notes:
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3. Bold and Shaded values exceed ODWQS
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6. Field Analysis
7. Units are mg/L unless otherwise specified
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9. Bold and italicized values exceed RUC criteria

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Table 4: Summary of Groundwater Quality Dat
Overburden

Parameter	ODWQS[1]	BH 3-II	BH 3-II	BH 3-II	BH 3-II	BH 3-II	BH 3-II	BH 3-II	BH 3-II	BH 3-II	BH 3-II	BH 3-II	BH 3-II	BH 3-II	BH 3-II
		16-Oct-00	17-May-01	29-Aug-02	18-Aug-03	19-Aug-04	30-May-05	20-Jun-06	10-May-07	10-Sep-08	23-Jul-09	28-Apr-10	22-Jun-11	20-Jun-12	08-Jul-13
Alkalinity (mg/L as $CaCO_3$)	500	19	18	20	16	17	20	8	16	15	10	20	14	20	16
Conductivity (µs/cm)	NV	-	-	-	54	49	53	38	42	53	45	67	47	70	47
Solids - Total Dissolved (TDS)	500	48	52	30	35	32	35	25	27	35	29	44	31	46	31
Oxygen Demand - Chemical (COD)	NV	14	<5	<5	<5	<5	<5	<5	<5	10.00	<5	<5	15	<5	50.00
Chloride	250	1	1	1	2	2	3	<1	1	2	2	3	2	3	1
Nitrogen - Ammonia (NH_3)	NV	<0.02	<0.02	<0.02	<0.02	0.08		0.04	<0.02	<0.02	<0.02	<0.02	0.03	<0.02	<0.02
Nitrogen - Nitrate (NO_3)	10	0.21	0.360	<0.10	0.320	<0.10	0.23	<0.10	<0.10	0.47	0.12	0.65	0.26	0.82	0.29
Nitrogen - Nitrite (NO_2)	1	<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
Nitrogen - Total Kjeldahl (TKN)	NV	0.08	0.090	<0.05	0.07	0.11	0.11	<0.05	0.09	0.12	<0.10	<0.10	<0.10	0.10	<0.1
Sulphate	500	8	8	7	18	8	8	7	6	5	7	7	7	7	6
Boron	5	0.02	0.130	<0.05	<0.01	<0.01	0.010	<0.01	<0.01	<0.01	<0.01	0.02	0.02	0.02	<0.01
Calcium	NV	6	5	4	5	4	4	3	4	4	4	5	4	5	4
Copper	1	0.003	0.004	<0.001	0.001	<0.001	0.001	0.079	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Iron	0.3	**0.58**	**0.54**	<0.01	<0.01	<0.01	<0.03	<0.03	0.06	0.04	0.11	0.19	0.090	0.05	0.03
Magnesium	NV	2	2	2	2	2	1	1	2	2	1	2	2	2	1
Manganese	0.05	**0.030**	0.010	<0.005	<0.005	<0.01	<0.01	<0.01	0.030	0.030	***0.050***	0.020	0.020	<0.01	0.010
Potassium	NV	1	<1	3	2	1	<1	1	<1	1	<1	<1	1	<1	<1
Sodium	200	2	3	<2	3	2	3	<2	<2	<2	2	4	<2	3	3
Strontium	NV	0.046	0.039	0.030	0.037	0.028	0.032	0.026	0.027	0.031	0.028	0.037	0.026	0.043	0.030
Phenolics - Total	NV	0.002	0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Organic Nitrogen	0.15	<0.08	<0.090	<0.05	<0.07	0.03	-	<0.05	< 0.09	< 0.09	< 0.09	-	<0.10	<0.10	-
Water Temp. (^oC) [6]	NV	7.9	8.8	8.9	8.7	8.4	8.4	9.6	8.5	9.1	8.4	7.7	7.8	9.2	8.6
Conductivity (µs/cm) [6]	NV	60	60	48	44	32	46	26	33	44	41	66	40	58	38
pH (pH units) [6]	6.5-8.5	7.64	**6.41**	7.92	6.81	6.89	**8.60**	7.52	8.44	6.80	7.60	7.2	7.40	**6.20**	7.00

Notes:
1. Ontario Drinking Water Quality Standard (ODWQS).
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3. Bold and Shaded values exceed ODWQS
4. "-" indicates value not analyzed.
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6. Field Analysis
7. Units are mg/L unless otherwise specified
8. Reasonable Use Criteria (RUC) Guideline B-7
9. Bold and italicized values exceed RUC criteria

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Table 4: Summary of Groundwater Quality Dat
Overburden

Parameter	ODWQS[1]	BH 4	BH 4	BH 4	BH 4	BH 4	BH 4	BH 4	BH 4	BH 4	BH 4	BH 4	BH 4	BH 4	BH 4
		16-Oct-00	17-May-01	29-Aug-02	18-Aug-03	19-Aug-04	30-May-05	20-Jun-06	10-May-07	10-Sep-08	23-Jul-09	28-Apr-10	22-Jun-11	21-Jun-12	08-Jul-13
Alkalinity (mg/L as $CaCO_3$)	500	-	41	68	-	43	19	22	31	75	43	15	22	32	34
Conductivity (µs/cm)	NV	-	-	-	-	127	47	70	77	199	137	57	58	129	107
Solids - Total Dissolved (TDS)	500	-	96	114	-	83	31	46	50	129	89	37	38	84	70
Oxygen Demand - Chemical (COD)	NV	-	48.0	5.0	-	<5	<5	<5	5.0	65.0	6.0	<5	-	14	10.0
Chloride	250	-	1	1	-	3	2	1	2	1	1	2	1	2	1
Nitrogen - Ammonia (NH_3)	NV	-	0.03	<0.02	-	0.24	<0.02	0.07	0.26	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Nitrogen - Nitrate (NO_3)	10	-	0.13	0.10	-	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Nitrogen - Nitrite (NO_2)	1	-	<0.10	<0.10	-	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Nitrogen - Total Kjeldahl (TKN)	NV	-	0.37	0.08	-	0.24	<0.05	0.13	0.25	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Sulphate	500	-	19	22	-	16	8	10	8	13	19	10	8	22	16
Boron	5	-	0.02	<0.05	-	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Calcium	NV	-	8	14	-	11	3	5	6	17	7	5	3	7	8
Copper	1	-	0.003	0.005	-	0.002	0.002	0.007	0.003	0.001	0.003	0.002	0.002	0.004	0.003
Iron	0.3	-	0.08	0.01	-	0.02	<0.03	**1.00**	**1.19**	**12.40**	**1.67**	0.15	0.14	***0.24***	0.18
Magnesium	NV	-	4	7	-	5	1	2	2	5	2	2	1	2	3
Manganese	0.05	-	**0.060**	0.032	-	<0.01	<0.01	**0.130**	**0.080**	**0.450**	**0.190**	0.020	0.040	<0.01	0.010
Potassium	NV	-	3	5	-	3	1	3	2	8	4	2	1	3	2
Sodium	200	-	8	18	-	8	3	4	4	12	14	3	8	6	6
Strontium	NV	-	0.048	0.064	-	0.058	0.021	0.033	0.033	0.100	0.045	0.017	0.013	0.033	0.032
Phenolics - Total	NV	0.007	<0.001	<0.001	-	<0.001	<0.001	<0.001	0.003	0.046	0.009	<0.001	<0.001	<0.001	<0.001
Organic Nitrogen	0.15	-	**0.34**	**>0.06**	-	0.00	<0.05	0.06	0.00	<0.10	<0.10	<0.10	<0.10	<0.10	-
Water Temp. (^oC) [6]	NV	11.2	9.1	12.0	22.2	15.0	8.3	10.7	7.0	12.1	11.9	6.4	8.6	11.0	9.5
Conductivity (µs/cm) [6]	NV	360	380	438	242	110	50	49	139	247	107	66	48	102	76
pH (pH units) [6]	6.5-8.5	7.77	7.57	7.92	6.97	7.37	7.64	6.67	7.03	**6.39**	7.10	7.20	7.2	7.4	**6.40**

Notes:
1. Ontario Drinking Water Quality Standard (ODWQS).
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4. "-" indicates value not analyzed.
5. NV indicates no value.
6. Field Analysis
7. Units are mg/L unless otherwise specified
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9. Bold and italicized values exceed RUC criteria

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Table 4: Summary of Groundwater Quality Dat
Overburden

Parameter	ODWQS[1]	BH 5	BH 5	BH 5	BH 5	BH 5	BH 5	BH 5	BH 5	BH 5	BH 5	BH 5	BH 5	BH 5	BH 5
		16-Oct-00	17-May-01	29-Aug-02	18-Aug-03	19-Aug-04	30-May-05	20-Jun-06	10-May-07	10-Sep-08	23-Jul-09	28-Apr-10	22-Jun-11	21-Jun-12	08-Jul-13
Alkalinity (mg/L as $CaCO_3$)	500	64	59	28	34	26	29	19	38	24	30	56	26	22	21
Conductivity (µs/cm)	NV	-	-	-	126	91	78	69	113	83	93	164	70	84	171
Solids - Total Dissolved (TDS)	500	160	148	74	82	59	51	45	74	54	61	107	46	55	111
Oxygen Demand - Chemical (COD)	NV	11	13	5	<5	<5	<5	<5	<5	<5	<5	5	10	7	15
Chloride	250	4	3	4	2	3	<1	<1	1	1	<1	2	1	<1	7
Nitrogen - Ammonia (NH_3)	NV	0.330	<0.02	<0.02	<0.02	0.04	0.03	0.06	<0.02	<0.02	<0.02	0.02	<0.02	<0.02	<0.02
Nitrogen - Nitrate (NO_3)	10	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	**10.10**
Nitrogen - Nitrite (NO_2)	1	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Nitrogen - Total Kjeldahl (TKN)	NV	0.71	0.35	0.24	0.19	0.28	<0.05	0.21	0.33	<0.10	<0.10	0.15	<0.10	<0.10	<0.10
Sulphate	500	16	17	10	13	11	10	9	11	9	8	9	8	7	4
Boron	5	0.14	0.27	<0.05	0.10	0.07	0.06	0.06	0.06	0.04	0.04	0.06	0.04	0.04	0.03
Calcium	NV	18	14	7	8	6	4	5	10	6	5	15	6	7	19
Copper	1	0.003	0.002	0.026	0.014	0.013	0.008	0.082	0.008	0.010	0.009	0.002	0.005	0.007	0.008
Iron	0.3	0.14	0.07	<0.01	0.01	<0.01	<0.03	<0.03	<0.03	<0.03	<0.03	0.09	0.06	<0.03	<0.03
Magnesium	NV	5	4	1	2	2	1	1	3	2	1	4	2	2	4
Manganese	0.05	**0.340**	**0.070**	0.038	0.019	0.010	<0.01	<0.01	<0.01	0.010	0.020	0.030	0.030	<0.01	0.020
Potassium	NV	2	2	1	2	1	<1	<1	1	1	1	2	1	1	2
Sodium	200	22	22	9	14	9	8	5	7	4	6	12	3	4	6
Strontium	NV	0.184	0.165	0.086	0.090	0.072	0.062	0.060	0.095	0.082	0.084	0.179	0.074	0.085	0.195
Phenolics - Total	NV	0.003	0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Organic Nitrogen	0.15	**0.380**	<0.35	<0.24	<0.19	**0.24**	<0.05	-	< 0.33	< 0.33	<0.10	***0.13***	<0.10	<0.10	-
Water Temp. (°C) [6]	NV	10.1	9.5	10.7	9.7	9.4	8.6	9.1	8.9	9.9	8.8	8.5	8.2	9.4	8.6
Conductivity (µs/cm) [6]	NV	220	190	116	130	71	72	51	101	73	70	164	56	75	134
pH (pH units) [6]	6.5-8.5	7.12	**6.22**	6.55	**6.03**	7.25	**6.14**	**6.09**	6.85	**6.33**	6.70	6.5	6.6	**5.70**	**6.10**

Notes:
1. Ontario Drinking Water Quality Standard (ODWQS).
2. Parameter name in *parenthesis* indicate alternate chemica
3. Bold and Shaded values exceed ODWQS
4. "-" indicates value not analyzed.
5. NV indicates no value.
6. Field Analysis
7. Units are mg/L unless otherwise specified
8. Reasonable Use Criteria (RUC) Guideline B-7
9. Bold and italicized values exceed RUC criteria

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Table 4: Summary of Groundwater Quality Dat
Overburden

Parameter	ODWQS[1]	BH 6	BH 6	BH 6	BH 6	BH 6	BH 6	BH 6	BH 6	BH 6	BH 6	BH 6	BH 6	BH 6
		22-Aug-01	22-Aug-02	18-Aug-03	19-Aug-04	30-May-05	20-Jun-06	10-May-07	10-Sep-08	23-Jul-09	28-Apr-10	22-Jun-11	20-Jun-12	08-Jul-13
Alkalinity (mg/L as $CaCO_3$)	500	39	34	26	18	25	18	27	24	25	29	30	29	28
Conductivity (µs/cm)	NV	-	-	87	70	105	58	70	60	65	69	66	70	64
Solids - Total Dissolved (TDS)	500	72	59	57	46	68	38	46	39	42	45	43	46	42
Oxygen Demand - Chemical (COD)	NV	6	<5	<5	<5	<5	<5	<5	<5	<5	<5	20	<5	22
Chloride	250	2	1	2	3	2	<1	2	2	2	1	1	<1	<1
Nitrogen - Ammonia (NH_3)	NV	<0.02	0.04	0.04	0.24	0.06	0.06	0.04	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Nitrogen - Nitrate (NO_3)	10	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Nitrogen - Nitrite (NO_2)	1	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Nitrogen - Total Kjeldahl (TKN)	NV	0.31	0.08	0.28	0.26	0.08	<0.05	0.22	<0.10	<0.10	<0.10	0.14	<0.10	<0.10
Sulphate	500	10	11	21	12	20	8	8	5	6	5	5	6	5
Boron	5	<0.01	<0.05	<0.01	<0.01	0.01	0.02	0.01	<0.01	<0.01	0.01	<0.01	<0.01	<0.01
Calcium	NV	10	9	8	6	7	4	6	5	4	7	5	5	6
Copper	1	<0.001	<0.001	<0.001	<0.001	<0.001	0.083	0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Iron	0.3	0.03	0.05	<0.01	0.02	<0.03	<0.03	<0.03	0.15	0.17	***0.27***	***0.30***	0.21	0.04
Magnesium	NV	4	2	2	2	2	2	2	2	2	3	2	2	2
Manganese	0.05	**0.460**	**0.258**	**0.113**	<0.01	<0.01	<0.01	<0.01	<0.01	***0.050***	0.030	0.020	0.010	0.010
Potassium	NV	3	3	3	3	2	1	2	2	2	1	1	1	1
Sodium	200	4	5	3	4	6	3	2	<2	2	2	4	<2	3
Strontium	NV	0.057	0.048	0.055	0.054	0.071	0.035	0.037	0.030	0.034	0.037	0.033	0.032	0.034
Phenolics - Total	NV	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Organic Nitrogen	0.15	**0.310**	0.04	**0.24**	0.02	0.02	0.00	**0.18**	<0.10	<0.10	<0.10	<0.14	<0.10	-
Water Temp. (^oC) [6]	NV	10.2	9.5	10.1	9.2	8.6	10.5	8.0	9.5	7.7	7.6	7.9	11.2	8.1
Conductivity (µs/cm) [6]	NV	193	75	87	59	95	40	55	49	57	67	52	55	49
pH (pH units) [6]	6.5-8.5	7.61	7.52	6.54	6.95	6.70	6.85	7.11	6.79	7.20	7.0	6.8	6.6	**6.40**

Notes:
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3. Bold and Shaded values exceed ODWQS
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6. Field Analysis
7. Units are mg/L unless otherwise specified
8. Reasonable Use Criteria (RUC) Guideline B-7
9. Bold and italicized values exceed RUC criteria

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Table 4: Summary of Groundwater Quality Dat
Overburden

Parameter	ODWQS[1]	BH 7	BH 7	BH 7	BH 7	BH 7	BH 7	BH 7	BH 7	BH 7	BH 7	BH 7	BH 7	BH 7	BH 7
		22-Aug-01	29-Aug-02	18-Aug-03	19-Aug-04	30-May-05	20-Jun-06	20-Jun-06	10-May-07	10-Sep-08	23-Jul-09	28-Apr-10	22-Jun-11	21-Jun-12	08-Jul-13
Alkalinity (mg/L as $CaCO_3$)	500	25	18	13	10	10	7	7	7	10	6	9	8	7	12
Conductivity (µs/cm)	NV			43	33	34	34	33	43	35	31	36	30	30	31
Solids - Total Dissolved (TDS)	500	60	25	28	22	22	22	22	28	23	20	23	20	20	20
Oxygen Demand - Chemical (COD)	NV	61	<5	<5	<5	-	<5	<5	<5	5	<5	<5	20	<5	76
Chloride	250	3	1	1	3	3	<1	1	1	3	2	2	1	<1	<1
Nitrogen - Ammonia (NH_3)	NV	<0.02	<0.02	<0.02	0.05	0.02	0.05	0.05	0.05	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Nitrogen - Nitrate (NO_3)	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
Nitrogen - Nitrite (NO_2)	1	<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
Nitrogen - Total Kjeldahl (TKN)	NV	0.45	0.08	<0.05	0.27	0.09	<0.05	0.08	0.24	<0.10	<0.10	<0.10	<0.10	<0.10	<0.1
Sulphate	500	14	6	18	7	8	6	6	<1	5	6	7	5	6	4
Boron	5	<0.01	<0.05	<0.01	<0.1	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Calcium	NV	8	3	4	3	2	3	2	3	3	4	3	2	2	3
Copper	1	0.001	<0.001	<0.001	<0.001	<0.001	0.080	0.007	0.003	0.001	0.001	<0.001	0.005	0.002	<0.001
Iron	0.3	0.02	0.01	<0.01	0.02	<0.03	0.04	<0.03	<0.03	0.08	0.14	0.10	0.15	0.17	0.06
Magnesium	NV	2	<1	1	2	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Manganese	0.05	**0.320**	**0.056**	**0.053**	0.020	<0.01	<0.01	<0.01	<0.01	0.010	0.040	0.020	<0.01	<0.01	0.010
Potassium	NV	3	2	4	3	1	1	1	1	1	2	1	<1	<1	<1
Sodium	200	5	7	3	3	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2
Strontium	NV	0.092	0.037	0.047	0.036	0.040	0.036	0.037	0.051	0.036	0.031	0.039	0.032	0.031	0.033
Phenolics - Total	NV	0.003	<0.001	<0.001	0.001	<0.001	<0.001	<0.01	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Organic Nitrogen	0.15	<0.45	<0.08	<0.05	**0.22**	0.07	0.00	0.03	-	-	<0.10	<0.10	<0.10	<0.10	-
Water Temp. (^oC) [6]	NV	9.5	8.8	8.9	8.1	7.9	9.7	-	8.0	8.8	8.1	7.8	6.9	8.4	7.8
Conductivity (µs/cm) [6]	NV	165	33	59	26	30	22	-	33	27	34	36	24	25	26
pH (pH units) [6]	6.5-8.5	7.16	7.56	6.78	7.43	7.40	7.35	-	7.22	6.63	8.20	7.00	6.9	**6.20**	6.50

Notes:
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6. Field Analysis
7. Units are mg/L unless otherwise specified
8. Reasonable Use Criteria (RUC) Guideline B-7
9. Bold and italicized values exceed RUC criteria

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Table 4: Summary of Groundwater Quality Dat
Overburden

Parameter	ODWQS[1]	BH 8	BH 8	BH 8	BH 8	BH 8	BH 8	BH 8	BH 8	BH 8	BH 8	BH 8	BH 8	BH 8	BH 8	BH 8
		22-Aug-01	29-Aug-02	18-Aug-03	19-Aug-04	30-May-05	20-Jun-06	10-May-07	10-Sep-08	10-Sep-08	23-Jul-09	23-Jul-09	28-Apr-10	22-Jun-11	21-Jun-12	08-Jul-13
Alkalinity (mg/L as $CaCO_3$)	500	19	17	13	13	10	<5	13	11	11	<5	<5	13	8	<5	11
Conductivity (µs/cm)	NV			126	238	167	220	70	282	277	201	200	47	79	136	156
Solids - Total Dissolved (TDS)	500	204	77	82	155	109	143	46	183	180	131	130	31	51	88	101
Oxygen Demand - Chemical (COD)	NV	58	<5	<5	<5	<5	<5	<5	<5	5	<5	<5	<5	25	<5	19
Chloride	250	77	16	21	55	37	53	8	78	74	49	49	2	14	29	34
Nitrogen - Ammonia (NH_3)	NV	<0.02	<0.02	<0.02	0.07	<0.02	0.07	0.21	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Nitrogen - Nitrate (NO_3)	10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	0.91
Nitrogen - Nitrite (NO_2)	1	<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
Nitrogen - Total Kjeldahl (TKN)	NV	0.39	0.16	0.11	0.18	0.80	0.10	0.21	<0.10	<0.10	<0.10	<0.10	0.11	<0.10	<0.10	<0.1
Sulphate	500	7	13	16	7	8	6	5	3	3	5	5	5	5	4	4
Boron	5	<0.01	<0.05	<0.01	<0.01	<0.01	0.04	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Calcium	NV	15	<1	2	2	2	4	2	5	4	4	4	4	1	1	2
Copper	1	<0.001	<0.001	<0.001	<0.001	0.001	0.045	0.003	<0.001	<0.001	<0.001	<0.001	0.001	<0.001	<0.001	<0.001
Iron	0.3	<0.01	0.01	<0.01	<0.01	<0.03	<0.03	<0.03	0.06	0.05	0.05	0.09	0.12	0.13	0.07	0.05
Magnesium	NV	5	<1	<1	<1	<1	<1	<1	1	1	<1	<1	1	<1	<1	<1
Manganese	0.05	**0.200**	<0.005	<0.005	<0.01	<0.01	<0.01	<0.01	<0.01	0.010	<0.01	***0.050***	<0.01	0.030	<0.01	<0.01
Potassium	NV	3	2	1	1	<1	1	<1	2	1	2	2	<1	<1	<1	<1
Sodium	200	35	23	20	40	26	33	9	45	47	30	30	<2	12	18	28
Strontium	NV	0.152	0.013	0.024	0.036	0.028	0.057	0.026	0.069	0.066	0.046	0.040	0.033	0.009	0.018	0.020
Phenolics - Total	NV	0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.001	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Organic Nitrogen	0.15	<0.39	<0.16	<0.11	0.11	< 0.80	0.03	0.00	0.00	0.00	-	-	<0.11	<0.10	<0.10	-
Water Temp. (^oC) [6]	NV	13.1	12.0	13.4	11.3	9.0	10.7	8.5	12.0	12.0	9.9	9.9	8.6	8.2	9.6	9.3
Conductivity (µs/cm) [6]	NV	337	106	126	186	163	157	56	251	251	190	190	46	62	115	126
pH (pH units) [6]	6.5-8.5	**6.34**	7.65	6.92	7.40	7.80	**6.27**	7.19	6.57	6.57	6.60	6.60	6.80	7.0	**6.40**	6.90

Notes:
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4. "-" indicates value not analyzed.
5. NV indicates no value.
6. Field Analysis
7. Units are mg/L unless otherwise specified
8. Reasonable Use Criteria (RUC) Guideline B-7
9. Bold and italicized values exceed RUC criteria

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Table 5: Summary of Groundwater Quality Data - Bedrock

Parameter	ODWQS[1]	RUC[8]	BH 1-I	BH 1-I	BH 1-I	BH 1-I	BH 1-I	BH 1-I	BH 1-I	BH 1-I	BH 1-I	BH 1-I	BH 1-I	BH 1-I	BH 1-I	BH 1-I
			16-Oct-00	17-May-01	29-Aug-02	18-Aug-03	19-Aug-04	30-May-05	20-Jun-06	10-May-07	10-Sep-08	23-Jul-09	28-Apr-10	22-Jun-11	20-Jun-12	08-Jul-13
Alkalinity (mg/L as $CaCO_3$)	500	258.75	42	35	46	57	79	63	105	128	141	138	105	133	145	136
Conductivity (µs/cm)	NV	NV	-	-	-	250	310	257	374	414	427	419	348	381	405	388
Solids - Total Dissolved (TDS)	500	266.25	168	124	128	163	201	167	243	***269***	***278***	***272***	226	248	263	252
Oxygen Demand - Chemical (COD)	NV	NV	16	11	<5	<5	<5	<5	<5	<5	<5	<5	<5	15.00	<5	17.00
Chloride	250	125.5	15	17	23	22	25	23	22	19	18	14	13	11	12	12
Nitrogen - Ammonia (NH_3)	NV	NV	<0.02	0.020	<0.02	<0.02	0.03	<0.02	0.06	<0.02	<0.02	0.04	<0.02	<0.02	<0.02	<0.02
Nitrogen - Nitrate (NO_3)	10	2.605	0.21	0.24	1.69	***4.29***	***7.59***	***7.46***	***8.78***	***9.41***	***8.46***	***8.33***	***7.52***	***7.20***	***6.31***	***6.19***
Nitrogen - Nitrite (NO_2)	1	0.325	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	0.19	<0.10	<0.10	<0.10
Nitrogen - Total Kjeldahl (TKN)	NV	NV	0.17	0.13	0.06	0.07	0.25	<0.05	0.15	<0.05	<0.10	<0.10	0.15	<0.10	<0.10	<0.10
Sulphate	500	253.5	32	14	11	22	13	11	12	14	20	36	21	22	19	20
Boron	5	2.505	0.04	0.020	<0.05	0.01	<0.01	<0.01	<0.01	0.01	<0.01	0.02	0.01	0.02	0.02	0.03
Calcium	NV	NV	19	19	27	34	40	33	49	54	58	58	48	48	52	55
Copper	1	0.5005	0.004	<0.001	<0.001	<0.001	<0.001	0.001	0.069	<0.001	<0.001	0.001	<0.001	0.002	<0.001	<0.001
Iron	0.3	0.165	**0.400**	0.090	0.010	<0.01	<0.01	<0.03	<0.03	<0.03	<0.03	<0.03	0.090	<0.03	<0.03	<0.03
Magnesium	NV	NV	4	3	5	5	8	6	9	10	10	11	9	9	9	10
Manganese	0.05	0.03	**0.130**	***0.040***	0.007	<0.005	<.0.1	<0.01	<0.01	0.020	<0.01	***0.040***	0.030	0.020	<0.01	<0.01
Potassium	NV	NV	2	1	1	2	2	2	2	2	3	3	2	2	2	3
Sodium	200	101	13	4	3	5	7	5	7	7	9	11	8	9	8	9
Strontium	NV	NV	0.062	0.048	0.056	0.076	0.105	0.094	0.149	0.151	0.175	0.154	0.126	0.143	0.146	0.141
Phenolics - Total	NV	NV	0.003	<0.001	<0.001	<0.001	<0.001	<0.001	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Organic Nitrogen	0.15	0.12	**0.17**	0.11	<0.06	<0.07	**0.22**	<0.05	0.09	<0.05	<0.10	<0.10	< 0.15	-	<0.10	-
Water Temp. (^oC) [6]	NV	NV	10.1	9.4	9.2	13.9	11.5	9.3	10.2	9.5	10.8	9.0	8.6	9.1	10.4	14.0
Conductivity (µs/cm) [6]	NV	NV	200	175	181	332	254	264	275	341	391	354	349	282	336	288
pH (pH units) [6]	6.5-8.5	NV	7.90	7.60	7.56	7.10	6.86	7.24	**6.02**	7.52	**6.41**	7.00	7.50	7.1	7.2	6.8

Notes:

1. Ontario Drinking Water Quality Standard (ODWQS).
2. Parameter name in *(parenthesis)* indicate alternate chemical names.
3. Bold and Shaded values exceed ODWQS
4. "-" indicates value not analyzed.
5. NV indicates no value.
6. Field Analysis
7. Units are mg/L unless otherwise specified
8. Reasonable Use Criteria (RUC) Guideline B-7
9. Bold and italicized values exceed RUC criteria

CAMBIUM

Table 5: Summary of Groundwater Quality Da
Bedrock

Parameter	ODWQS[1]	BH 2-I	BH 2-I	BH 2-I	BH 2-I	BH 2-I	BH 2-I	BH 2-I	BH 2-I	BH 2-I	BH 2-I	BH 2-I	BH 2-I	BH 2-I	BH 2-I
		16-Oct-00	17-May-01	29-Aug-02	18-Aug-03	19-Aug-04	30-May-05	20-Jun-06	10-May-07	10-Sep-08	23-Jul-09	28-Apr-10	22-Jun-11	21-Jun-12	08-Jul-13
Alkalinity (mg/L as $CaCO_3$)	500	34	25	35	28	26	21	22	27	26	29	24	26	26	27
Conductivity (µs/cm)	NV				63	60	49	58	55	62	60	55	56	60	61
Solids - Total Dissolved (TDS)	500	60	40	48	41	39	32	38	36	40	39	36	36	39	40
Oxygen Demand - Chemical (COD)	NV	11	11	<5	<5	<5	<5	<5	<5	<5	<5	<5	5	<5	81
Chloride	250	1	<1	<1	1	1	2	<1	1	2	<1	1	<1	<1	<1
Nitrogen - Ammonia (NH_3)	NV	<0.02	0.070	<0.02	<0.02	<0.02	<0.02	0.04	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Nitrogen - Nitrate (NO_3)	10	0.57	0.41	0.21	0.16	0.16	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Nitrogen - Nitrite (NO_2)	1	<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
Nitrogen - Total Kjeldahl (TKN)	NV	0.06	1.860	<0.05	<0.05	0.060	0.140	<0.05	0.540	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Sulphate	500	5	5	6	14	7	7	5	4	4	6	4	5	5	4
Boron	5	0.02	0.01	<0.05	<0.01	<0.01	<0.01	0.01	<0.01	<0.01	0.01	<0.01	<0.01	<0.01	<0.01
Calcium	NV	9	7	9	8	7	6	6	6	7	5	7	6	5	8
Copper	1	<0.001	<0.001	0.003	<0.001	<0.001	<0.001	0.084	0.003	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Iron	0.3	***0.17***	0.010	**0.350**	<0.001	<0.01	<0.03	<0.03	<0.03	0.040	0.040	**0.320**	0.09	<0.03	<0.03
Magnesium	NV	4	2	3	2	2	2	2	2	2	1	2	2	2	2
Manganese	0.05	<0.01	<0.01	**0.186**	<0.005	<0.01	<0.01	<0.01	<0.01	0.010	***0.050***	0.030	0.030	<0.01	0.010
Potassium	NV	1	1	2	<1	<1	<1	<1	<1	1	<1	<1	<1	<1	<1
Sodium	200	<2	<2	<2	<2	2	<2	<2	<2	<2	<2	<2	<2	<2	<2
Strontium	NV	0.035	0.024	0.026	0.023	0.023	0.021	0.022	0.025	0.023	0.021	0.021	0.020	0.020	0.021
Phenolics - Total	NV	0.002	<0.001	<0.001	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Organic Nitrogen	0.15	<0.06	**1.790**	<0.05	<0.05	<0.060	< 0.14	0.000	< 0.540	<0.10	<0.10		<0.10	<0.10	-
Water Temp. (^oC) [6]	NV	9.7	7.8	9.4	8.6	7.8	7.8	8.6	7.8	8.7	7.2	7.3	6.4	8.3	7.1
Conductivity (µs/cm) [6]	NV	75	60	68	90	53	44	40	44	51	53	53	30	50	48
pH (pH units) [6]	6.5-8.5	8.03	6.90	7.81	8.43	7.48	7.25	**6.31**	8.14	6.78	7.20	7.10	6.9	**6.20**	6.70

Notes:

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6. Field Analysis
7. Units are mg/L unless otherwise specified
8. Reasonable Use Criteria (RUC) Guideline B-7
9. Bold and italicized values exceed RUC criteria

CAMBIUM

Table 5: Summary of Groundwater Quality Da
Bedrock

Parameter	ODWQS[1]	BH 3-I	BH 3-I	BH 3-I	BH 3-I	BH 3-I	BH 3-I	BH 3-I	BH 3-I	BH 3-I	BH 3-I	BH 3-I	BH 3-I	BH 3-I	BH 3-I
		16-Oct-00	17-May-01	29-Aug-02	18-Aug-03	19-Aug-04	30-May-05	20-Jun-06	10-May-07	10-Sep-08	23-Jul-09	28-Apr-10	22-Jun-11	21-Jun-12	08-Jul-13
Alkalinity (mg/L as $CaCO_3$)	500	26	18	20	23	14	17	13	17	15	14	23	16	19	21
Conductivity (µs/cm)	NV				52	45	41	43	48	47	47	74	45	56	52
Solids - Total Dissolved (TDS)	500	56	44	38	34	29	27	28	31	31	31	48	29	36	34
Oxygen Demand - Chemical (COD)	NV	11	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	15	<5	157.00
Chloride	250	2	2	1	2	1	<1	<1	1	1	<1	3	<1	<1	1
Nitrogen - Ammonia (NH_3)	NV	<0.02	<0.02	<0.02	<0.02	0.05	0.03	0.06	0.16	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Nitrogen - Nitrate (NO_3)	10	0.42	0.30	0.18	0.24	0.14	<0.10	<0.10	<0.10	0.11	<0.10	0.73	0.11	0.32	0.14
Nitrogen - Nitrite (NO_2)	1	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	0.16	<0.10	<0.10	<0.10
Nitrogen - Total Kjeldahl (TKN)	NV	0.08	<0.05	<0.05	<0.05	0.05	0.24	0.08	0.30	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Sulphate	500	13	10	7	15	8	8	7	6	5	7	7	6	6	5
Boron	5	0.05	0.02	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.02	0.01	<0.01	<0.01
Calcium	NV	7	6	5	5	4	4	4	4	4	5	8	4	5	5
Copper	1	0.001	<0.001	<0.001	<0.001	0.002	<0.001	0.085	<0.001	<0.001	<0.001	<0.001	0.002	<0.001	<0.001
Iron	0.3	0.14	0.060	<0.01	<0.01	<0.01	<0.03	<0.03	<0.03	<0.03	0.05	0.080	0.040	<0.03	<0.03
Magnesium	NV	4	2	3	2	2	1	1	1	1	2	2	1	2	2
Manganese	0.05	0.030	<0.01	0.011	0.005	<0.01	<0.01	<0.01	<0.01	0.020	***0.040***	0.030	<0.01	<0.01	0.010
Potassium	NV	<1	<1	2	<1	<1	<1	<1	<1	<1	<1	1	<1	<1	<1
Sodium	200	6	4	<2	2	2	<2	<2	<2	<2	<2	3	<2	<2	<2
Strontium	NV	0.053	0.036	0.026	0.026	0.024	0.023	0.022	0.027	0.022	0.024	0.042	0.023	0.028	0.026
Phenolics - Total	NV	0.003	0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Organic Nitrogen	0.15	<0.08	0.07	<0.05	<0.05	0.00	**0.21**	0.02	***0.14***	***0.14***	<0.10		<0.10	<0.10	-
Water Temp. (^oC) [6]	NV	7.7	8.6	8.7	8.9	8.5	8.8	9.3	8.5	8.7	9.0	8.2	7.8	9.4	8.3
Conductivity (µs/cm) [6]	NV	80	60	60	60	35	40	31	39	39	43	80	37	47	38
pH (pH units) [6]	6.5-8.5	7.57	6.50	6.77	6.74	6.89	7.74	6.90	8.33	6.68	7.90	7.6	7.0	**6.40**	6.60

Notes:

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3. Bold and Shaded values exceed ODWQS
4. "-" indicates value not analyzed.
5. NV indicates no value.
6. Field Analysis
7. Units are mg/L unless otherwise specified
8. Reasonable Use Criteria (RUC) Guideline B-7
9. Bold and italicized values exceed RUC criteria

Table 6: Summary of Surface Water Quality

Parameter	PWQO[1]	SW-1	SW-1	SW-1	SW-1	SW-1	SW-1	SW-1	SW-1	SW-1
		29-Aug-02	30-May-05	20-Jun-06	10-May-07	10-Sep-08	23-Jul-09	22-Jun-11	21-Jun-12	08-Jul-13
Alkalinity (mg/L as $CaCO_3$)	dec >25% of bkgd.	8	<5	<5	<5	5	5	<5	<5	<5
Conductivity (µs/cm)	NV		65	23	22	28	19	32	21	24
Hardness (mg/L as CaCO3)	NV	-	-	-	-	-	-	5	2	5
Solids - Total Dissolved (TDS)	NV	18	42	15	14	18	12	21	14	16
Oxygen Demand - Chemical (COD)	NV	88	68	108	53	123	89	120	126	<5
Chloride	NV		3	<1	3	1	2	1	<1	3
Un-ionized Ammonia	0.02	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Nitrogen - Ammonia (NH_3) & Ammonium (NH_4)	NV	0.03	0.21	0.03	0.37	0.05	<0.02	0.03	0.04	0.02
Nitrogen - Nitrate (NO_3)	NV	<0.10	1	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.1
Nitrogen - Nitrite (NO_2)	NV	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.1
Nitrogen - Total Kjeldahl (TKN)	NV	2.32	1.76	1.94	1.51	2.05	11.00	0.92	2.14	1.29
Phosphorous - Total	0.03	**0.06**	-	**0.06**	**0.06**	**1.11**	**0.70**	0.01	**0.06**	0.01
Sulphate	NV	<1	10	2	5	<1	<3	2	<3	<3
Boron	0.2	<0.05	0.01	0.01	<0.01	<0.01	0.10	<0.1	<0.1	<0.01
Cadmium	0.0001	<0.0001		<0.0001	<0.0001	<0.0001	<0.01	<0.01	<0.01	<0.0001
Calcium	NV	1	2	1	<1	3	1	2	1	2
Copper	0.001	<0.001	<0.001	<0.001	<0.001	0.001	<0.01	<0.01	<0.01	<0.001
Iron	0.3	0.21	0.13	0.20	0.08	**0.63**	**0.90**	0.20	0.20	0.19
Magnesium	NV	<1	<1	<1	<1	<1	<1	<1	<1	<1
Manganese	NV	0.246	0.120	0.160	0.110	0.680	0.620	0.240	0.420	0.240
Potassium	NV	1	3	2	2	3	2	2	1	3
Sodium	NV	2	<2	<2	<2	<2	<2	<2	<2	<2
Strontium	NV	0.008	0.005	0.007	0.006	0.076	<0.05	<0.05	<0.05	0.006
Zinc	0.02	**0.026**		**0.030**	0.020	**0.070**	**0.070**	<0.05	<0.05	0.020
Phenolics - Total	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	**0.005**	<0.001
Organic Nitrogen	NV	2.29		1.91	1.14	2.00	< 11.0	-	2.10	-
Water Temp. (^oC) [5]	NV	17.6	23.5	24.1	20	15.5	19.2	8.1	25.8	21.1
Conductivity (µs/cm) [5]	NV	70	21	18	12	24	20	21	18	18
pH (pH units) [5]	6.5-8.5	**5.72**	**6.28**	7.14	7.46	**6.2**	**6.4**	**6.3**	**5.3**	6.6
Disolved Oxygen (DO) [5]	5	**1.33**	**1.55**	6.14	7.87	6.38	**3.54**	**3.99**	**2.37**	**2.77**

Notes:

1. Provincial Water Quality Objective (PWQO).
2. Bold and Shaded values exceed PWQO criteria
3. "-" indicates value not analyzed.
4. NV indicates no value.
5. Field Analysis
6. Units are mg/L unless otherwise specified

Table 6: Summary of Surface Water Quality

Parameter	PWQO[1]	SW-2	SW-2	SW-2	SW-2	SW-2	SW-2	SW-2	SW-2	SW-2	SW-2	SW-2	SW-2	SW-2
		16-Oct-00	17-May-01	29-Aug-02	19-Aug-04	30-May-05	20-Jun-06	10-May-07	10-Sep-08	23-Jul-09	28-Apr-10	22-Jun-11	21-Jun-12	08-Jul-13
Alkalinity (mg/L as $CaCO_3$)	dec >25% of bkgd.	21	12	26	17	15	14	9	16	14	8	12	15	12
Conductivity (µs/cm)	NV	-	-	-	41	33	32	32	41	40	39	38	44	36
Hardness (mg/L as CaCO3)	NV	-	-	-	-	-	-	-	-	-	18	14	21	21
Solids - Total Dissolved (TDS)	NV	52	32		27	22	21	21	27	26	225	25	29	23
Oxygen Demand - Chemical (COD)	NV	38	32	45	43	40	90	28	38	37	23	60	34	15
Chloride	NV	1.00	<1	<1	-	2	<1	4	1	2	1	1	<1	<1
Un-ionized Ammonia	0.02	0.0106	0.0001	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Nitrogen - Ammonia (NH_3) & Ammonium (NH_4)	NV	0.59	0.03	0.05	0.08	0.21	0.07	0.17	0.10	0.08	<0.02	0.03	0.04	0.02
Nitrogen - Nitrate (NO_3)	NV	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	0.150	0.11	<0.10	<0.10	<0.1
Nitrogen - Nitrite (NO_2)	NV	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.1
Nitrogen - Total Kjeldahl (TKN)	NV		0.44	0.76	0.65	0.73	0.85	0.50	0.73	0.66	0.35	0.43	0.46	0.58
Phosphorous - Total	0.03	<0.01	0.01	**0.04**	**0.06**		**0.05**	<0.01	**0.05**	**0.05**	<0.01	<0.01	<0.01	<0.01
Sulphate	NV	6	6	4	-	5	3	4	1	3	6	4	4	<3
Boron	0.2	<0.01	0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.1	<0.01	<0.1	<0.01	<0.01
Cadmium	0.0001	<0.0001	<0.0001	<0.0001	<0.0001		0.000	<0.0001	<0.0001	<0.01	<0.0001	<0.01	<0.0001	<0.0001
Calcium	NV	5	2	5	5	4	4	3	4	5	4	4	5	5
Copper	0.001	<0.001	<0.001	<0.001	<0.001	0.001	<0.001	<0.001	<0.001	<0.01	<0.001	<0.01	<0.001	<0.001
Iron	0.3	**0.46**	**0.47**	**2.47**	**3.16**	**1.18**	**2.43**	**0.62**	**1.94**	**1.80**	**0.44**	**0.80**	**0.71**	**0.93**
Magnesium	NV	3	2	3	1	1	1	1	1	2	2	1	2	2
Manganese	NV	0.010	0.020	0.166	0.190	0.080	0.160	0.040	0.100	0.090	0.02	0.040	0.020	0.020
Potassium	NV	1	<1	<1	<1	<1	1	1	<1	<1	<1	<1	<1	<1
Sodium	NV	<2	<2	<2	3	<2	<2	<2	2	<2	<2		<2	<2
Strontium	NV	0.039	0.030	0.041	0.036	0.030	0.029	0.020	0.290	<0.05	0.028	<0.05	0.037	0.035
Zinc	0.02	<0.01	<0.01	<0.005	<0.01		<0.01	<0.01	<0.01	<0.05	<0.01	<0.05	<0.01	<0.01
Phenolics - Total	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Organic Nitrogen	NV	-	0.41	0.71	0.57	0.52	0.78	0.33	0.63	0.58	<0.35	0.40	0.42	-
Water Temp. (^oC) [5]	NV	8.1	13.1	16.3	15.2	18.3	20.9	17	14	18.3	13.9	18.3	23.5	20
Conductivity (µs/cm) [5]	NV	50	40	45	50	53	29	26	35	35	37	30	36	28
pH (pH units) [5]	6.5-8.5	8.01	7.01	7.27	7.08	7.11	6.65	7.06	**6.47**	7.4	7.2	**6.3**	**6.1**	6.5
Disolved Oxygen (DO) [5]	5	9.5	10.12	**3.83**	10.59	**4.01**	6.18	6.58	6.39	6.43	5.99	5.09	6.83	7.02

Notes:

1. Provincial Water Quality Objective (PWQO).
2. Bold and Shaded values exceed PWQO criteria
3. "-" indicates value not analyzed.
4. NV indicates no value.
5. Field Analysis
6. Units are mg/L unless otherwise specified

Table 7: Summary of 2012 and 2013 Waste Quantities

2012				2013			
Month	**Private**	**Business**	**# of Bags**	**Month**	**Private**	**Business**	**# of Bags**
January	14	0	190	January	8	0	103
February	16	0	151	February	10	0	90
March	17	0	173	March	15	0	82
April	31	0	166	April	20	0	151
May	30	3	182	May	32	7	208
June	19	3	203	June	29	14	191
July	26	20	238	July	33	25	237
August	37	12	193	August	66	18	281
September	32	9	172	September	38	11	214
October	26	6	194	October	43	12	300
November	18	0	78	November	26	0	93
December	21	0	86	December	14	0	124
TOTAL	**287**	**53**	**2026**	**TOTAL**	**334**	**87**	**2074**

Note: The municipal truck collected and delivered to the Bissett Creek site 1,168 bags in 2012 and 1,412 bags in 2013. These are included in the above totals.

Appendix A

Environmental Compliance Approval Number. A412406

Ontario

Ministry of the Environment
Ministère de l'Environnement

AMENDMENT TO ENVIRONMENTAL COMPLIANCE APPROVAL
NUMBER A412406
Notice No. 4
Issue Date: April 4, 2013

The Corporation of the Township of Head, Clara and Maria
15 Township Hall Rd
Stonecliffe, Ontario
K0J 2L0

Site Location: Bissett Creek Waste Disposal Site
93 Bissett Creek Rd Part of North Half of Lot 13, Concession 13
Head, Clara and Maria Township, County of Renfrew

You are hereby notified that I have amended Approval No. A412406 issued on March 27, 1980 and amended on November 19, 2001, November 27, 2003, October 4, 2004, and July 19, 2006 foruse and operation of a 0.6 hecatre landfilling area within a total site area of 2.881 hectares and contaminant attenuation zone of 19.337 hectares, as follows:

The following item is added to Schedule "A" of the Approval:

12. Letter from Kevin Mooder, J2pg Consultants Inc. dated November 11, 2011, stating compliance with Condition 17 of the Approval, and supporting documentation of: Plan of Survey Plan 49R-16963 registered April 21, 2009; letters of Patent dated August 31, 2011 indicating the land ownership and various covenants and easements.

The reasons for this amendment to the Approval are as follows:

1. To establish that Condition 17 has been fulfilled and that the Township has acquired the contaminant attenuation zone from the Ministry of Natural Resources.
2. To clarify the legal property extent and size of the landfilling site and contaminant attenuation zone.

This Notice shall constitute part of the approval issued under Approval No. A412406 dated March 27, 1980, as amended.

In accordance with Section 139 of the Environmental Protection Act, you may by written Notice served upon me and the Environmental Review Tribunal within 15 days after receipt of this Notice, require a hearing by the Tribunal. Section 142 of the Environmental Protection Act provides that the Notice requiring the hearing shall state:

1. The portions of the environmental compliance approval or each term or condition in the environmental compliance approval in respect of which the hearing is required, and;
2. The grounds on which you intend to rely at the hearing in relation to each portion appealed.

Pursuant to subsection 139(3) of the Environmental Protection Act, a hearing may not be required with respect to any terms and conditions in this environmental compliance approval, if the terms and conditions are substantially the same as those contained in an approval that is amended or revoked by this environmental compliance approval.

The Notice should also include:

3. The name of the appellant;
4. The address of the appellant;
5. The environmental compliance approval number;
6. The date of the environmental compliance approval;
7. The name of the Director, and;
8. The municipality or municipalities within which the project is to be engaged in.

And the Notice should be signed and dated by the appellant.

This Notice must be served upon:

The Secretary*
Environmental Review Tribunal
655 Bay Street, Suite 1500
Toronto, Ontario
M5G 1E5

AND

The Director appointed for the purposes of Part II.1 of
the Environmental Protection Act
Ministry of the Environment
2 St. Clair Avenue West, Floor 12A
Toronto, Ontario
M4V 1L5

*** Further information on the Environmental Review Tribunal's requirements for an appeal can be obtained directly from the Tribunal at: Tel: (416) 212-6349, Fax: (416) 314-4506 or www.ert.gov.on.ca**

The above noted activity is approved under s.20.3 of Part II.1 of the Environmental Protection Act.

DATED AT TORONTO this 4th day of April, 2013

Dale Gable, P.Eng.
Director
appointed for the purposes of Part II.1 of the
Environmental Protection Act

CM/
c: District Manager, MOE Ottawa
Kevin Mooder, Jp2g Consultants Inc.

Ontario

Ministry of the Environment **Ministère de l'Environnement**

AMENDMENT TO PROVISIONAL CERTIFICATE OF APPROVAL
WASTE DISPOSAL SITE
NUMBER A412406
Notice No. 4
Issue Date: July 19, 2006

The Corporation of the Township of Head, Clara and Maria
15 Township Hall Road
Stonecliffe, Ontario
K0J 2L0

Site Location: Bissett Creek Waste Disposal Site
Part of North Half of Lot 13, Concession 13
Head, Clara and Maria Township, County of Renfrew

You are hereby notified that I have amended Provisional Certificate of Approval No. A412406 issued on March 27, 1980 and amended on November 19, 2001, November 27, 2003, and October 4, 2004 for use and operation of a 0.6 hecatre landfilling area within a total site area of 2.0 hectares, as follows:

I. Condition (17) is hereby revoked and replaced with:

(17) By December 31, 2006, the Owner shall submit to the Director for approval:

i) a completed plan of survey for the property showing the landfill area and the Site area including the buffer and lands purchased or to be purchased from the Ministry of Natural Resources;
ii) documents showing land ownerships of surveyed property; and
iii) a copy of registration of plan of survey.

The reason for this amendment to the Certificate of Approval is as follows:

To approve the Township's request to extend the deadline for acquiring buffer lands from the Ministry of Natural Resources.

This Notice shall constitute part of the approval issued under Provisional Certificate of Approval No. A412406 dated March 27, 1980, as amended.

In accordance with Section 139 of the Environmental Protection Act, R.S.O. 1990, Chapter E-19, as amended, you may by written notice served upon me and the Environmental Review Tribunal within 15 days after receipt of this Notice, require a hearing by the Tribunal. Section 142 of the Environmental Protection Act, provides that the Notice requiring the hearing shall state:

1. The portions of the approval or each term or condition in the approval in respect of which the hearing is required, and;
2. The grounds on which you intend to rely at the hearing in relation to each portion appealed.

The Notice should also include:

3. The name of the appellant;
4. The address of the appellant;
5. The Certificate of Approval number;
6. The date of the Certificate of Approval;
7. The name of the Director;
8. The municipality within which the waste disposal site is located;

And the Notice should be signed and dated by the appellant.

This Notice must be served upon:

The Secretary*
Environmental Review Tribunal
2300 Yonge St., Suite 1700
P.O. Box 2382
Toronto, Ontario
M4P 1E4

AND

The Director
Section 39, *Environmental Protection Act*
Ministry of the Environment
2 St. Clair Avenue West, Floor 12A
Toronto, Ontario
M4V 1L5

*** Further information on the Environmental Review Tribunal's requirements for an appeal can be obtained directly from the Tribunal at: Tel: (416) 314-4600, Fax: (416) 314-4506 or www.ert.gov.on.ca**

The above noted waste disposal site is approved under Section 39 of the Environmental Protection Act.

DATED AT TORONTO this 19th day of July, 2006

Tesfaye Gebrezghi, P.Eng.
Director
Section 39, *Environmental Protection Act*

DL/
c: District Manager, MOE Ottawa
Kevin Mooder, Jp2g Consultants Inc.

Ontario

Ministry of the Environment | **Ministère de l'Environnement**

AMENDMENT TO PROVISIONAL CERTIFICATE OF APPROVAL
WASTE DISPOSAL SITE
NUMBER A412406
Notice No. 2

The Corporation of the Township of Head, Clara and Maria
15 Township Hall Road
Stonecliffe, Ontario
K0J 2L0

Site Location: Bissett Creek Waste Disposal Site
Part of North Half of Lot 13, Concession 13
Head, Clara and Maria Township, County of Renfrew

You are hereby notified that I have amended Provisional Certificate of Approval No. A412406 issued on March 27, 1980 and amended on December 5, 2003 for continued use and operation of a 0.6 hectare landfilling area within a total site area of 2.0 hectare, as follows:

The following item is added to Schedule "A" of the Certificate:

11. Letter and supporting documentation dated March 23, 2004, from Mark A. Bruce, J2pg Consultants Inc, in compliance with Condition 16 of the Certificate, proposing a plan for Fill Beyond Approval Limit Remediation.

The following conditions are added to the Certificate:

24. By July 31, 2005, the Owner shall finalize the construction of final cover over the designated Fill Beyond Approval Area as outlined in Drawing 1 of Item 11, Schedule "A". The final cover shall consist of a total of 600 mm of soil layer and 150 mm of top soil layer with slopes within a maximum of 4H:1V and a minimum of 20H:1V. Hydroseeding of the covered area shall be completed within a year of the application of the final cover.

The reason for this amendment to the Certificate of Approval is as follows:

1. The reason for Condition 24 is to ensure that environmental impacts from the designated area are minimized and controlled.

This Notice shall constitute part of the approval issued under Provisional Certificate of Approval No. A412406 dated March 27, 1980, and amended on December 5, 2003.

In accordance with Section 139 of the Environmental Protection Act, R.S.O. 1990, Chapter E-19, as amended, you may by written notice served upon me and the Environmental Review Tribunal within 15 days after receipt of this Notice, require a hearing by the Tribunal. Section 142 of the Environmental Protection Act, provides that the Notice requiring the hearing shall state:

1. The portions of the approval or each term or condition in the approval in respect of which the hearing is required, and;
2. The grounds on which you intend to rely at the hearing in relation to each portion appealed.

The Notice should also include:

3. The name of the appellant;
4. The address of the appellant;
5. The Certificate of Approval number;
6. The date of the Certificate of Approval;
7. The name of the Director;
8. The municipality within which the waste disposal site is located;

And the Notice should be signed and dated by the appellant.

This Notice must be served upon:

The Secretary*
Environmental Review Tribunal
2300 Yonge St., 12th Floor
P.O. Box 2382
Toronto, Ontario
M4P 1E4

AND

The Director
Section 39, *Environmental Protection Act*
Ministry of Environment and Energy
2 St. Clair Avenue West, Floor 12A
Toronto, Ontario
M4V 1L5

*** Further information on the Environmental Review Tribunal's requirements for an appeal can be obtained directly from the Tribunal at: Tel: (416) 314-4600, Fax: (416) 314-4506 or www.ert.gov.on.ca**

The above noted waste disposal site is approved under Section 39 of the Environmental Protection Act.

DATED AT TORONTO this 4th day of October, 2004

Ian Parrott, P.Eng.
Director
Section 39, *Environmental Protection Act*

NP/
c: District Manager, MOE Ottawa
Mark A. Bruce, P.Eng., Jp2g Consultants Inc.

Ontario

Ministry of the Environment **Ministère de l'Environnement**

AMENDMENT TO PROVISIONAL CERTIFICATE OF APPROVAL
WASTE DISPOSAL SITE
NUMBER A412406

The Corporation of the Township of Head, Clara and Maria
15 Township Hall Road
Stonecliffe, Ontario
K0J 2L0

Site Location: Bissett Creek Waste Disposal Site
Part of North Half of Lots 12 and 13, Concession 13
Township of Head, Clara and Maria
County of Renfrew

You are hereby notified that I have amended Provisional Certificate of Approval No. A412406 issued on March 27, 1980 for the continued use and operation of a 0.6 hectare landfilling area within a total site area of 2.0 hectares,, as follows:

Condition 14 has been hereby revoked and replaced with the following Conditions.

14. The Site shall be developed and operated in accordance with Item 8, Schedule "A", *Bissett Creek Waste Disposal Site, Site Development and Operations Plan* prepared by Jp2g Consultants Inc. dated May 2002.

15. The Owner shall ensure that all wastes received at the Site are managed and disposed of in accordance with Ontario Regulation 347, R.R.O. and as amended, and that the Site is operated in a safe and secure manner which minimizes the impacts of dust, noise, litter, vector and vermin on the general public, Site personnel and the natural environment.

16. By March 31, 2004, the Owner shall submit to the Director for approval, plans, specifications and schedules for the area designated as Fill Beyond Approved Limits. Remediation of the area designated as Fill Beyond Approved Limits shall be undertaken within 90 days of Director's approval of the plans, specifications and schedules.

17. By July 31, 2004, the Owner shall submit to the Director for approval:

i) a completed plan of survey for the property showing the landfill area and the Site area including the buffer and lands purchased or to be purchased from the Ministry of Natural Resources;
ii) documents showing land ownerships of surveyed property; and
iii) a copy of registration of plan of survey.

18. No burning of wastes shall be permitted at the Site with the exception of controlled burning of brush and other clean wood wastes as may be necessary from time to time and at the discretion of the Site operator. Any controlled burning of brush and other clean wood wastes shall be undertaken in accordance with MOE Guideline C-7, *Burning at Landfill Sites* and Section 4.21, *Open Burning of Waste*, excerpted from the MOE *Guidance Manual for Landfill Sites Receiving Municipal Waste (C-8-1)* dated November 1993. The Owner shall also refer to applicable guidelines, policies and regulations issued by the Ministry of Natural Resources and local by-laws.

19. Groundwater and surface water monitoring shall be undertaken in accordance with Section 9.0 of Item 8 and Section 6. of Item 9, Schedule "A". Monitoring results shall be accompanied by:

i) estimate of leachate volumes, assessment of trends;
ii) assessment of contaminant levels and trends;
iii) assessment of leachate migration encompassing direction, flows, rates; and
iv) statement of conformance with Reasonable Use Guideline B-7 and Procedure B-7-1.

20. By May 31, 2004 and by May 31 every two (2) years thereafter, the Owner shall submit to the District Manager, a report detailing the analyses of the previous two (2) calendar years of monitoring results and Site operations. The scope of

the report shall be as outlined in Section 10.0 of Item 8, Schedule "A".

21. In the event that the results of the monitoring program indicate off-site exceedences of criteria, the Owner shall notify the District Manager in writing within two (2) weeks of receipt of the monitoring results. The notification shall address reasons for the exceedences, assessment of remedial actions required, a schedule for remediation and the need to implement other contingency measures as may be appropriate to bring the Site back into compliance.

22. Any part of the monitoring program or the programs outlined in Items 8 and 9, Schedule "A", may be revised at any time by the District Manager at his/her discretion. The Owner may, in writing to the District Manager, request revisions to the monitoring program including frequency of scheduled events and parameters to be tested.

23. At least one (1) year prior to the anticipated closure of the Site, the Owner shall submit a closure, post-closure monitoring, maintenance, inspection and reporting program to the Director for approval.

SCHEDULE "A"

8. *Bissett Creek Waste Disposal Site, Site Development and Operations Plan* prepared by Jp2g Consultants Inc. dated May 2002.

9. *Bissett Creek Landfill Site, Hydrogeology and 2000-2001 Monitoring Report*, prepared by Gartner Lee Limited dated May 2002.

10. *Application and Supporting Documentation for a Category 56 Amendment to the C. of A. for the Bissett Creek Waste Disposal Site* prepared by Jp2g Consultants Inc. dated May 2001.

The reasons for this amendment to the Certificate of Approval are as follows:

1 Condition 14 ensures that the Site will be developed and operated in accordance with the design and operations report.
2. Condition 15 ensures that the Site is operated responsibly and in accordance with applicable guidelines, policies and regulations.
3. Condition 16 enforces remediation of a small area identified as Fill Beyond Approved Limits.
4. Condition 17 sets a deadline for the submission of documents showing the ownership of all the lands comprising this Site including the Contaminant Attenuation Zone for the purposes of registration on title.
5. Condition 18 provides guidance on burning of clean wood wastes at the Site.
6. Condition 19 requires surface and ground water monitoring.
7. Condition 20 requires the submission of a report every two years rather than yearly, to reduce the costs to the Owner while maintaining the integrity of the monitoring program.
8. Condition 21 ensures that the MOE will be promptly notified of any exceedences regardless of the formal reporting schedule.
9. Condition 22 allows the District Manager to modify or revise the monitoring program as deemed appropriate while allowing the Owner to request changes to the program at any time without the need to amend this Certificate.
10. Condition 23 ensures that a sound closure plan is in place before the Site has reached final capacity.

This Notice shall constitute part of the approval issued under Provisional Certificate of Approval No. A412406 dated March 27, 1980 and amended November 19, 2001.

In accordance with Section 139 of the Environmental Protection Act, R.S.O. 1990, Chapter E-19, as amended, you may by written notice served upon me and the Environmental Review Tribunal within 15 days after receipt of this Notice, require a hearing by the Tribunal. Section 142 of the Environmental Protection Act, provides that the Notice requiring the hearing shall state:

1. The portions of the approval or each term or condition in the approval in respect of which the hearing is required, and;
2. The grounds on which you intend to rely at the hearing in relation to each portion appealed.

The Notice should also include:

3. The name of the appellant;

4. The address of the appellant;
5. The Certificate of Approval number;
6. The date of the Certificate of Approval;
7. The name of the Director;
8. The municipality within which the waste disposal site is located;

And the Notice should be signed and dated by the appellant.

This Notice must be served upon:

The Secretary*
Environmental Review Tribunal
2300 Yonge St., 12th Floor
P.O. Box 2382
Toronto, Ontario
M4P 1E4

AND

The Director
Section 39, *Environmental Protection Act*
Ministry of Environment and Energy
2 St. Clair Avenue West, Floor 12A
Toronto, Ontario
M4V 1L5

*** Further information on the Environmental Review Tribunal's requirements for an appeal can be obtained directly from the Tribunal at: Tel: (416) 314-4600, Fax: (416) 314-4506 or www.ert.gov.on.ca**

The above noted waste disposal site is approved under Section 39 of the Environmental Protection Act.

DATED AT TORONTO this 27th day of November, 2003

Ian Parrott, P.Eng.
Director
Section 39, *Environmental Protection Act*

JH/
c: District Manager, MOE Ottawa
Lauree J. Armstrong, Jp2g Consultants Inc.

Ontario

Ministry of the Environment | **Ministère de l'Environnement**

AMENDMENT TO PROVISIONAL CERTIFICATE OF APPROVAL
WASTE DISPOSAL SITE
NUMBER A412406
Notice No. 1

Corporation of the Township of Head, Clara, and Maria
15 Township Hall Road,
Head, Clara and Maria, Ontario,
K0J 2L0

Site Location: Bissett Creek Waste Disposal Site
Part of North Half Lot 13, Concession XIII
Geographic Township of Maria
Township of Head, Clara and Maria, County of Renfrew

You are hereby notified that I have amended Provisional Certificate of Approval No. A412406 issued on March 27, 1980 for the continued use and operation of a 0.6 hectare landfilling site within a total site area of 2.0 hectares, as follows:

All in accordance with the following plans and specifications which are added to Schedule "A":

5. The Application for a Provisional Certificate of Approval for a Waste Disposal Site dated May 15, 2001 and signed by Mr. Brian Whitehead of Jp2g Consultants Inc. on behalf of the Township of Head, Clara & Maria.
6. The document entitled "Application and Supporting Documentation for a Category 56 Amendment to the C. of A. for the Bissett Creek Waste Disposal Site, Township of Head, Clara and Maria, C. of A. No. A412406" dated May 2001 by Jp2g Consultants Inc.
7. The letter dated November 8, 2001 to Mr. John A. Kaasalainen, P.Eng. of the Ministry of the Environment, Environmental Assessment and Approvals Branch from Mr. Brian Whitehead, Planning Consultant of Jp2g Consultants Inc. providing additional information with respect to the theoretical capacity for the Site.

The following conditions are added to the Provisional Certificate of Approval:

DEFINITIONS

1. For the purposes of this Certificate of Approval, unless the contrary intention appears, the following words and phrases shall have the following meaning.

1.1 "Adverse Effect" is as defined in the Environmental Protection Act, R.S.O. 1990, as amended.
1.2 "Applicant" and/or "Owner" means the Township of Head, Clara & Maria.
1.3 "Certificate" means the Provisional Certificate of Approval No. A412406, as amended from time to time, including all schedules attached to and forming part of the Certificate.
1.4 "Director" means the one or more persons who from time to time are so designated for the purpose of Part V of the Environmental Protection Act.
1.5 "District Manager" means the District Manager of the Ministry's Ottawa District Office.
1.6 "EPA" means the Environmental Protection Act, R.S.O. 1990, Chapter E.19, as amended.
1.7 "MOE" and/or "Ministry" means the Ministry of the Environment.
1.8 "Site" means the entire waste disposal site including the 0.6 ha landfilling area and the buffer lands.
1.9 "Supporting Documentation" refers to the documents listed in Schedule "A" of the Certificate.

GENERAL

2. This waste disposal site shall be designed and operated in accordance with the documents listed in Schedule “A” and with the conditions in this Certificate of Approval. Should there be any discrepancies between any of the Schedules and the conditions in this Certificate, the conditions shall take precedence. Should there be discrepancies between the documents listed in Schedule "A", the document bearing the most recent date shall take precedence.

3. The requirements specified in this Provisional Certificate of Approval are the requirements under the **Environmental Protection Act**, R.S.O. 1990. The issuance of this Provisional Certificate of Approval in no way abrogates the Applicant's legal obligations to take all reasonable steps to avoid violating other applicable provisions of this legislation and other legislation and regulations.

4. The requirements of this Provisional Certificate of Approval are severable. If any requirement of this Provisional Certificate of Approval, or the application of any requirement of this Provisional Certificate of Approval to any circumstance, is held invalid, the application of such requirement to other circumstances and the remainder of this Provisional Certificate of Approval shall not be affected in any way.

5. The Applicant shall ensure compliance with all the terms and conditions of this Provisional Certificate of Approval. Any non-compliance constitutes a violation of the **Environmental Protection Act**, R.S.O. 1990 and is grounds for enforcement.

6. (a) The Applicant shall, forthwith upon request of the Director, District Manager, or

Provincial Officer (as defined in the Act), furnish any information requested by such persons with respect to compliance with this Provisional Certificate of Approval, including but not limited to, any records required to be kept under this Provisional Certificate of Approval; and

(b) In the event the Applicant provides the Ministry with information, records, documentation or notification in accordance with this Provisional Certificate of Approval (for the purposes of this condition referred to as "Information"),

(i) the receipt of Information by the Ministry;
(ii) the acceptance by the Ministry of the Information's completeness or accuracy; or
(iii) the failure of the Ministry to prosecute the Applicant, or to require the Applicant to take any action, under this Provisional Certificate of Approval or any statute or regulation in relation to the Information;

shall not be construed as an approval, excuse or justification by the Ministry of any act or omission of the Applicant relating to the Information, amounting to non-compliance with this Provisional Certificate of Approval or any statute or regulation.

7. The Applicant shall allow Ministry personnel, or a Ministry authorized representative(s), upon presentation of credentials, to:

carry out any and all inspections authorized by Section 156, 157 or 158 of the **Environmental Protection Act**, R.S.O. 1990, Section 15, 16 or 17 of the **Ontario Water Resources Act**, R.S.O. 1990, or Section 19 or 20 of the **Pesticides Act**, R.S.O. 1990, as amended from time to time, of any place to which this Provisional Certificate of Approval relates; and,

without restricting the generality of the foregoing, to:

(i) enter upon the premises where the records required by the conditions of this Provisional Certificate of Approval are kept;
(ii) have access to and copy, at reasonable times, any records required by the conditions of this Provisional Certificate of Approval;
(iii) inspect at reasonable times any facilities, equipment (including monitoring and control equipment), practices, or operations required by the conditions of this Provisional Certificate of Approval; and
(iv) sample and monitor at reasonable times for the purposes of assuring compliance with the conditions of this Provisional Certificate of Approval.

8. The Applicant shall ensure that all communications/correspondence made pursuant to this Provisional Certificate of

Approval includes reference to the Provisional Certificate of Approval number A412406.

9. The Applicant shall notify the Director in writing of any of the following changes within thirty (30) days of the change occurring:

(a) change of Applicant or operator of the Site or both;
(b) change of address or address of the new Applicant;
(c) change of partners where the Applicant or operator is or at any time becomes a partnership, and a copy of the most recent declaration filed under the **Business Names Act**, 1991 shall be included in the notification to the Director;
(d) any change of name of the corporation where the Applicant or operator is or at any time becomes a corporation, and a copy of the most current "Initial Notice or Notice of Change" (form 1 or 2 of O. Reg. 182, Chapter C-39, R.R.O. 1990 as amended from time to time), filed under the **Corporations Information Act** shall be included in the notification to the Director; and
(e) change in directors or officers of the corporation where the Applicant or operator is or at any time becomes a corporation, and a copy of the most current "Initial Notice or Notice of Change" as referred to in 9(d), supra.

10. In the event of any change in ownership of the Site, the Applicant shall notify, in writing, the succeeding owner of the existence of this Provisional Certificate of Approval, and a copy of such notice shall be forwarded to the Director.

11. Any information relating to this Provisional Certificate of Approval and contained in Ministry files may be made available to the public in accordance with the provisions of the **Freedom of Information and Protection of Privacy Act**, R.S.O. 1990, C. F-31.

12. All records and monitoring data required by the conditions of this Provisional Certificate of Approval must be kept on the Owner's premises for a minimum period of two (2) years from the date of their creation.

DESIGN AND OPERATION

13. The theoretical maximum volumetric capacity for waste disposal at this site is 18,502 cubic meters as per Item 7 of Schedule "A".

14. Within six months of the date of this Notice, the Applicant shall submit to the Director for approval an updated design & operations report and supporting hydrogeological study outlining how the remaining capacity of the Site is to be utilized. These reports shall include the following information:

- site plans showing the waste disposal footprint, buffer zones, and contaminant attenuation zones, if required, including the ownership of such lands;
- site operation and development plans;
- daily/intermediate/final cover requirements;
- security, fencing, signage, site supervision, housekeeping and screening requirements;
- surface drainage plans, leachate and gas control plans;
- a proposed monitoring program for landfill gas, leachate, groundwater, and surface water including trigger mechanisms and contingency plans;
- reporting requirements; and
- closure plans.

The reasons for this amendment to the Certificate of Approval are as follows:

The reason for this amendment is to ensure that the continued use of the site is done in an environmentally acceptable manner. The reasons for the individual conditions of this Certificate are as follows:

1. The reason for Condition (1) is to define the specific meaning of terms used to simplify the conditions in this Certificate.

2. The reason for Condition (2) is to ensure that the Site is operated in accordance with the application and supporting documentation submitted by the Applicant, and not in a manner which the Director has not been asked to consider.

3. The reason for Conditions (3), (4), (5), (8), (9), (10), (11), and (12) is to clarify the legal rights and responsibilities of the Applicant.

*4. The reason for Conditions (6) and (7) is to ensure that the appropriate Ministry staff have ready access to information and the operations of the Site which is approved under this Provisional Certificate of Approval. Condition (9) is supplementary to the powers of entry afforded a Provincial Officer pursuant to the **Environmental Protection Act**, the **Ontario Water Resources Act**, and the **Pesticides Act**, as amended.*

5. The reason for Condition (13) is to establish the theoretical maximum volumetric capacity for waste disposal at this site.

6. The reason for Condition (14) is to ensure that the continued use and operation of the Site is done in an environmentally acceptable manner.

This Notice shall constitute part of the approval issued under Provisional Certificate of Approval No. A412406 dated March 27, 1908

In accordance with Section 139 of the Environmental Protection Act, R.S.O. 1990, Chapter E-19, as amended, you may by written notice served upon me and the Environmental Review Tribunal within 15 days after receipt of this Notice, require a hearing by the Tribunal. Section 142 of the Environmental Protection Act, provides that the Notice requiring the hearing shall state:

1. The portions of the approval or each term or condition in the approval in respect of which the hearing is required, and;
2. The grounds on which you intend to rely at the hearing in relation to each portion appealed.

The Notice should also include:

3. The name of the appellant;
4. The address of the appellant;
5. The Certificate of Approval number;
6. The date of the Certificate of Approval;
7. The name of the Director;
8. The municipality within which the waste disposal site is located;

And the Notice should be signed and dated by the appellant.

This Notice must be served upon:

The Secretary*
Environmental Review Tribunal
2300 Yonge St., 12th Floor
P.O. Box 2382
Toronto, Ontario
M4P 1E4

AND

The Director
Section 39, *Environmental Protection Act*
Ministry of the Environment
2 St. Clair Avenue West, Floor 12A
Toronto, Ontario
M4V 1L5

*** Further information on the Environmental Review Tribunal's requirements for an appeal can be obtained directly from the Tribunal at: Tel: (416) 314-4600, Fax: (416) 314-4506 or www.ert.gov.on.ca**

The above noted waste disposal site is approved under Section 39 of the Environmental Protection Act.

DATED AT TORONTO this 19th day of November, 2001

Ian Parrott, P.Eng.
Director
Section 39, *Environmental Protection Act*

JK/
c: District Manager, MOE Ottawa
Brian Whitehead, Jp2g Consultants Inc.

Appendix B
Laboratory Certificates of Analysis

EXOVA OTTAWA

Certificate of Analysis

Exova

Client: Jp2g Consultants Inc.
1150 Morrison Dr., Suite 410
Ottawa, ON
K2H 8S9
Attention: Mr. Andrew Buzza
PO#:
Invoice to: Jp2g Consultants Inc. (Ottawa)

Report Number:	1314221
Date Submitted:	2013-07-09
Date Reported:	2013-07-15
Project:	Bissett Creek 2006023 N
COC #:	160937

Dear Andrew Buzza:

Please find attached the analytical results for your samples. If you have any questions regarding this report, please do not hesitate to call (613-727-5692).

Report Comments:

APPROVAL: Digitally signed by Lorna Wilson Date: 2013.07.15 15:50:29 -04'00'

Lorna Wilson
Laboratory Supervisor, Inorganics

Certificate of Analysis

Client: Jp2g Consultants Inc.
1150 Morrison Dr., Suite 410
Ottawa, ON
K2H 8S9
Attention: Mr. Andrew Buzza
PO#:
Invoice to: Jp2g Consultants Inc. (Ottawa)

Report Number: 1314221
Date Submitted: 2013-07-09
Date Reported: 2013-07-15
Project: Bissett Creek 2006023 N
COC #: 160937

Group	Analyte	MRL	Units	Guideline	Lab I.D. Sample Matrix Sample Type Sampling Date Sample I.D.	1040657 Groundwater 2013-07-08 BH#2-II	1040658 Groundwater 2013-07-08 BH#2-I	1040659 Groundwater 2013-07-08 BH#7	1040660 Groundwater 2013-07-08 BH#1-I
Calculations	Ion Balance	0.01				N/A-LC	N/A-LC	N/A-LC	1.03
	TDS (COND - CALC)	1	mg/L	AO-500		29	40	20	252
General Chemistry	Alkalinity as CaCO3	5	mg/L	OG-500		21	27	12	136
	Cl	1	mg/L	AO-250		<1	<1	<1	12
	Conductivity	5	uS/cm			45	61	31	388
	N-NO2	0.10	mg/L	MAC-1.0		<0.10	<0.10	<0.10	<0.10
	N-NO3	0.10	mg/L	MAC-10.0		<0.10	<0.10	<0.10	6.19
	SO4	3	mg/L	AO-500		4	4	4	20
Metals	B	0.01	mg/L	IMAC-5.0		<0.01	<0.01	<0.01	0.03
	Ca	1	mg/L			4	8	3	55
	Cu	0.001	mg/L	AO-1.0		<0.001	<0.001	<0.001	<0.001
	Fe	0.03	mg/L	AO-0.3		0.08	<0.03	0.06	<0.03
	K	1	mg/L			<1	<1	<1	3
	Mg	1	mg/L			2	2	<1	10
	Mn	0.01	mg/L	AO-0.05		0.01	0.01	0.01	<0.01
	Na	2	mg/L	AO-200		<2	<2	<2	9
	Sr	0.001	mg/L			0.018	0.021	0.033	0.142
Nutrients	COD	5	mg/L			8	81	76	17
	N-NH3	0.02	mg/L			<0.02	<0.02	<0.02	<0.02
	Phenols	0.001	mg/L			<0.001	<0.001	<0.001	<0.001
	Total Kjeldahl Nitrogen	0.10	mg/L			<0.10	<0.10	<0.10	<0.10

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Client: Jp2g Consultants Inc.
1150 Morrison Dr., Suite 410
Ottawa, ON
K2H 8S9
Attention: Mr. Andrew Buzza
PO#:
Invoice to: Jp2g Consultants Inc. (Ottawa)

Report Number: 1314221
Date Submitted: 2013-07-09
Date Reported: 2013-07-15
Project: Bissett Creek 2006023 N
COC #: 160937

Group	Analyte	MRL	Units	Guideline	Lab I.D. Sample Matrix Sample Type Sampling Date Sample I.D.	1040661 Groundwater 2013-07-08 BH#8	1040662 Groundwater 2013-07-08 BH#9
Calculations	Ion Balance	0.01				N/A-LC	N/A-LC
	TDS (COND - CALC)	1	mg/L	AO-500		101	98
General Chemistry	Alkalinity as CaCO3	5	mg/L	OG-500		11	10
	Cl	1	mg/L	AO-250		34	32
	Conductivity	5	uS/cm			156	151
	N-NO2	0.10	mg/L	MAC-1.0		<0.10	<0.10
	N-NO3	0.10	mg/L	MAC-10.0		0.91	0.98
	SO4	3	mg/L	AO-500		4	4
Metals	B	0.01	mg/L	IMAC-5.0		<0.01	<0.01
	Ca	1	mg/L			2	2
	Cu	0.001	mg/L	AO-1.0		<0.001	<0.001
	Fe	0.03	mg/L	AO-0.3		0.05	0.04
	K	1	mg/L			<1	<1
	Mg	1	mg/L			<1	<1
	Mn	0.01	mg/L	AO-0.05		<0.01	0.01
	Na	2	mg/L	AO-200		28	28
	Sr	0.001	mg/L			0.020	0.017
Nutrients	COD	5	mg/L			19	23
	N-NH3	0.02	mg/L			<0.02	0.03
	Phenols	0.001	mg/L			<0.001	<0.001
	Total Kjeldahl Nitrogen	0.10	mg/L			<0.10	<0.10

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Project: Bissett Creek 2006023 N
COC #: 160937

QC Summary

Analyte	Blank	QC % Rec	QC Limits
Run No 0 **Analysis Date** 2013-07-15 **Method** C Ion Balance			
Ion Balance			
TDS (COND - CALC)			
Run No 253966 **Analysis Date** 2013-07-10 **Method** C SM4500-NH3D			
N-NH3	<0.02 mg/L	93	85-115
Run No 254004 **Analysis Date** 2013-07-10 **Method** M SM3120B-3500C			
Ca	<1 mg/L	100	80-120
K	<1 mg/L	100	80-120
Mg	<1 mg/L	97	80-120
Na	<2 mg/L	101	80-120
Run No 254053 **Analysis Date** 2013-07-11 **Method** C SM4500-Norg-C			
Total Kjeldahl Nitrogen	<0.10 mg/L	101	77-123
Run No 254058 **Analysis Date** 2013-07-12 **Method** C SM5220C			
COD	<5 mg/L	104	80-120
Run No 254079 **Analysis Date** 2013-07-10 **Method** SM 2320B			

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Project: Bissett Creek 2006023 N
COC #: 160937

QC Summary

Analyte	Blank	QC % Rec	QC Limits
Alkalinity as CaCO3	<5 mg/L	99	95-105
Conductivity	<5 uS/cm	100	95-105
Run No 254148 **Analysis Date** 2013-07-11 **Method** C SM4500-NO3-F			
N-NO2	<0.10 mg/L	107	80-120
N-NO3	<0.10 mg/L	107	80-120
Run No 254175 **Analysis Date** 2013-07-11 **Method** SM 4110C			
Cl	<1 mg/L	101	90-110
SO4	<3 mg/L	108	90-110
Run No 254187 **Analysis Date** 2013-07-12 **Method** C SM5530D			
Phenols	<0.001 mg/L	93	73-127
Run No 254234 **Analysis Date** 2013-07-12 **Method** C SM4500-NO3-F			
N-NO2	<0.10 mg/L	100	80-120
N-NO3	<0.10 mg/L	97	80-120
Run No 254252 **Analysis Date** 2013-07-15 **Method** C SM4500-Norg-C			
Total Kjeldahl Nitrogen	<0.10 mg/L	96	77-123
Run No 254266 **Analysis Date** 2013-07-12 **Method** EPA 200.8			
B	<0.01 mg/L	100	81-119

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COC #: 160937

QC Summary

Analyte	Blank	QC % Rec	QC Limits
Cu	<0.001 mg/L	99	86-114
Fe	<0.03 mg/L	108	88-112
Mn	<0.01 mg/L	99	91-109
Sr	<0.001 mg/L	103	91-109
Run No 254329 **Analysis Date** 2013-07-15 **Method** M SM3120B-3500C			
Ca	<1 mg/L	99	80-120
Mg	<1 mg/L	97	80-120
Na	<2 mg/L	101	80-120

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Certificate of Analysis

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Report Number: 1314220
Date Submitted: 2013-07-09
Date Reported: 2013-07-16
Project: Bissett Creek 2006023 N
COC #: 160936

Dear Andrew Buzza:

Please find attached the analytical results for your samples. If you have any questions regarding this report, please do not hesitate to call (613-727-5692).

Report Comments:

APPROVAL: _____

Lorna Wilson
Laboratory Supervisor, Inorganics

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Report Number: 1314220
Date Submitted: 2013-07-09
Date Reported: 2013-07-16
Project: Bissett Creek 2006023 N
COC #: 160936

Group	Analyte	MRL	Units	Guideline	Lab I.D. Sample Matrix Sample Type Sampling Date Sample I.D.	1040651 Groundwater 2013-07-08 BH#1-II	1040652 Groundwater 2013-07-08 BH#3-II	1040653 Groundwater 2013-07-08 BH#3-I	1040654 Groundwater 2013-07-08 BH#4
Calculations	Ion Balance	0.01				N/A-LC	N/A-LC	N/A-LC	N/A-LC
	TDS (COND - CALC)	1	mg/L	AO-500		39	31	34	70
General Chemistry	Alkalinity as CaCO3	5	mg/L	OG-500		15	16	21	34
	Cl	1	mg/L	AO-250		3	1	1	1
	Conductivity	5	uS/cm			60	47	52	107
	N-NO2	0.10	mg/L	MAC-1.0		<0.10	<0.10	<0.10	<0.10
	N-NO3	0.10	mg/L	MAC-10.0		1.67	0.29	0.14	<0.10
	SO4	3	mg/L	AO-500		3	6	5	16
Metals	B	0.01	mg/L	IMAC-5.0		0.01	<0.01	<0.01	<0.01
	Ca	1	mg/L			7	4	5	8
	Cu	0.001	mg/L	AO-1.0		<0.001	<0.001	<0.001	0.003
	Fe	0.03	mg/L	AO-0.3		<0.03	0.03	<0.03	0.18
	K	1	mg/L			<1	<1	<1	2
	Mg	1	mg/L			2	1	2	3
	Mn	0.01	mg/L	AO-0.05		0.02	0.01	0.01	0.01
	Na	2	mg/L	AO-200		2	3	<2	6
	Sr	0.001	mg/L			0.073	0.030	0.026	0.032
Nutrients	COD	5	mg/L			10	50	157	10
	N-NH3	0.02	mg/L			<0.02	<0.02	<0.02	<0.02
	Phenols	0.001	mg/L			<0.001	<0.001	<0.001	<0.001
	Total Kjeldahl Nitrogen	0.10	mg/L			<0.10	<0.10	<0.10	<0.10

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Project: Bissett Creek 2006023 N
COC #: 160936

Group	Analyte	MRL	Units	Guideline	Lab I.D. Sample Matrix Sample Type Sampling Date Sample I.D.	1040655 Groundwater 2013-07-08 BH#5	1040656 Groundwater 2013-07-08 BH#6
Calculations	Ion Balance	0.01				N/A-LC	N/A-LC
	TDS (COND - CALC)	1	mg/L	AO-500		111	42
General Chemistry	Alkalinity as CaCO3	5	mg/L	OG-500		21	28
	Cl	1	mg/L	AO-250		7	<1
	Conductivity	5	uS/cm			171	64
	N-NO2	0.10	mg/L	MAC-1.0		<0.10	<0.10
	N-NO3	0.10	mg/L	MAC-10.0		10.1*	<0.10
	SO4	3	mg/L	AO-500		4	5
Metals	B	0.01	mg/L	IMAC-5.0		0.03	<0.01
	Ca	1	mg/L			19	6
	Cu	0.001	mg/L	AO-1.0		0.008	<0.001
	Fe	0.03	mg/L	AO-0.3		<0.03	0.04
	K	1	mg/L			2	1
	Mg	1	mg/L			4	2
	Mn	0.01	mg/L	AO-0.05		0.02	0.01
	Na	2	mg/L	AO-200		6	3
	Sr	0.001	mg/L			0.195	0.034
Nutrients	COD	5	mg/L			15	22
	N-NH3	0.02	mg/L			<0.02	<0.02
	Phenols	0.001	mg/L			<0.001	<0.001
	Total Kjeldahl Nitrogen	0.10	mg/L			<0.10	<0.10

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Project: Bissett Creek 2006023 N
COC #: 160936

QC Summary

Analyte	Blank	QC % Rec	QC Limits
Run No 0 **Analysis Date** 2013-07-15 **Method** C Ion Balance			
Ion Balance			
TDS (COND - CALC)			
Run No 253966 **Analysis Date** 2013-07-10 **Method** C SM4500-NH3D			
N-NH3	<0.02 mg/L	93	85-115
Run No 254004 **Analysis Date** 2013-07-10 **Method** M SM3120B-3500C			
Ca	<1 mg/L	100	80-120
K	<1 mg/L	100	80-120
Mg	<1 mg/L	97	80-120
Na	<2 mg/L	101	80-120
Run No 254051 **Analysis Date** 2013-07-15 **Method** SM 4110C			
Cl	<1 mg/L	100	90-110
SO4	<3 mg/L	107	90-110
Run No 254053 **Analysis Date** 2013-07-11 **Method** C SM4500-Norg-C			
Total Kjeldahl Nitrogen	<0.10 mg/L	85	77-123

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COC #: 160936

QC Summary

Analyte	Blank	QC % Rec	QC Limits
Run No 254058 **Analysis Date** 2013-07-12 **Method** C SM5220C			
COD	<5 mg/L	104	80-120
Run No 254066 **Analysis Date** 2013-07-11 **Method** C SM5530D			
Phenols	<0.001 mg/L	97	73-127
Run No 254079 **Analysis Date** 2013-07-10 **Method** SM 2320B			
Alkalinity as CaCO3	<5 mg/L	99	95-105
Conductivity	<5 uS/cm	100	95-105
Run No 254148 **Analysis Date** 2013-07-11 **Method** C SM4500-NO3-F			
N-NO2	<0.10 mg/L	107	80-120
N-NO3	<0.10 mg/L	107	80-120
Run No 254175 **Analysis Date** 2013-07-11 **Method** SM 4110C			
Cl	<1 mg/L	101	90-110
SO4	<3 mg/L	108	90-110
Run No 254187 **Analysis Date** 2013-07-12 **Method** C SM5530D			
Phenols	<0.001 mg/L	93	73-127
Run No 254234 **Analysis Date** 2013-07-12 **Method** C SM4500-NO3-F			
N-NO3	<0.10 mg/L	87	80-120

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QC Summary

Analyte	Blank	QC % Rec	QC Limits
Run No 254252 **Analysis Date** 2013-07-15 **Method** C SM4500-Norg-C			
Total Kjeldahl Nitrogen	<0.10 mg/L	96	77-123
Run No 254261 **Analysis Date** 2013-07-15 **Method** C SM5220C			
COD	<5 mg/L	108	80-120
Run No 254266 **Analysis Date** 2013-07-12 **Method** EPA 200.8			
B	<0.01 mg/L	100	81-119
Cu	<0.001 mg/L	99	86-114
Fe	<0.03 mg/L	108	88-112
Mn	<0.01 mg/L	99	91-109
Sr	<0.001 mg/L	103	91-109
Run No 254307 **Analysis Date** 2013-07-15 **Method** C SM4500-NO3-F			
N-NO2	<0.10 mg/L	107	80-120
N-NO3	<0.10 mg/L	115	80-120

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EXOVA OTTAWA

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Report Number: 1314222
Date Submitted: 2013-07-09
Date Reported: 2013-07-15
Project: Bissett Creek 2006023 N
COC #: 160937

Dear Andrew Buzza:

Please find attached the analytical results for your samples. If you have any questions regarding this report, please do not hesitate to call (613-727-5692).

Report Comments:

APPROVAL: _____

Lorna Wilson
Laboratory Supervisor, Inorganics

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Date Submitted: 2013-07-09
Date Reported: 2013-07-15
Project: Bissett Creek 2006023 N
COC #: 160937

Group	Analyte	MRL	Units	Guideline	Lab I.D. / Sample Matrix / Sample Type / Sampling Date / Sample I.D.	1040663 Surfacewater 2013-07-08 SW#1	1040664 Surfacewater 2013-07-08 SW#2
Calculations	Hardness as CaCO3	1	mg/L			5	21
	Ion Balance	0.01				N/A-LC	N/A-LC
	TDS (COND - CALC)	1	mg/L			16	23
General Chemistry	Alkalinity as CaCO3	5	mg/L			<5	12
	Cl	1	mg/L			3	<1
	Conductivity	5	uS/cm			24	36
	N-NO2	0.10	mg/L			<0.10	<0.10
	N-NO3	0.10	mg/L			<0.10	<0.10
	SO4	3	mg/L			<3	<3
Metals	B	0.01	mg/L	IPWQO-0.200		<0.01	<0.01
	Ca	1	mg/L			2	5
	Cd	0.0001	mg/L	PWQO-0.0002		<0.0001	<0.0001
	Cu	0.001	mg/L	PWQO-0.005		<0.001	<0.001
	Fe	0.03	mg/L	PWQO-0.30		0.19	0.93*
	K	1	mg/L			3	<1
	Mg	1	mg/L			<1	2
	Mn	0.01	mg/L			0.24	0.02
	Na	2	mg/L			<2	<2
	Sr	0.001	mg/L			0.006	0.035
	Zn	0.01	mg/L	PWQO-0.030		0.02	<0.01
Nutrients	COD	5	mg/L			<5	15
	N-NH3	0.02	mg/L			0.02	0.02
	Phenols	0.001	mg/L	PWQO-0.001		<0.001	<0.001
	Total Kjeldahl Nitrogen	0.10	mg/L			1.29	0.58
	Total P	0.01	mg/L	IPWQO-0.02		0.01	<0.01

Guideline = PWQO - Ontario *** = Guideline Exceedence**
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Date Reported: 2013-07-15
Project: Bissett Creek 2006023 N
COC #: 160937

QC Summary

Analyte	Blank	QC % Rec	QC Limits
Run No 0 **Analysis Date** 2013-07-15 **Method** C SM2340B			
Hardness as CaCO3			
Ion Balance			
TDS (COND - CALC)			
Run No 253966 **Analysis Date** 2013-07-10 **Method** C SM4500-NH3D			
N-NH3	<0.02 mg/L	93	85-115
Run No 254053 **Analysis Date** 2013-07-11 **Method** C SM4500-Norg-C			
Total Kjeldahl Nitrogen	<0.10 mg/L	101	77-123
Run No 254055 **Analysis Date** 2013-07-11 **Method** C SM4500-PF			
Total P	<0.01 mg/L	103	85-115
Run No 254058 **Analysis Date** 2013-07-12 **Method** C SM5220C			
COD	<5 mg/L	104	80-120
Run No 254079 **Analysis Date** 2013-07-10 **Method** SM 2320B			
Alkalinity as CaCO3	<5 mg/L	99	95-105
Conductivity	<5 uS/cm	100	95-105

Guideline = PWQO - Ontario *** = Guideline Exceedence**
** = Analysis completed at Mississauga, Ontario.
Results relate only to the parameters tested on the samples submitted.
Methods references and/or additional QA/QC information available on request.

MRL = Method Reporting Limit, AO = Aesthetic Objective, OG = Operational Guideline, MAC = Maximum Acceptable Concentration, IMAC = Interim Maximum Acceptable Concentration, STD = Standard, PWQO = Provincial Water Quality Guideline, IPWQO = Interim Provincial Water Quality Objective, TDR = Typical Desired Range

Client: Jp2g Consultants Inc.
1150 Morrison Dr., Suite 410
Ottawa, ON
K2H 8S9
Attention: Mr. Andrew Buzza
PO#:
Invoice to: Jp2g Consultants Inc. (Ottawa)

Report Number: 1314222
Date Submitted: 2013-07-09
Date Reported: 2013-07-15
Project: Bissett Creek 2006023 N
COC #: 160937

QC Summary

Analyte	Blank	QC % Rec	QC Limits
Run No 254120 **Analysis Date** 2013-07-11 **Method** M SM3120B-3500C			
Ca	<1 mg/L	99	80-120
K	<1 mg/L	94	80-120
Mg	<1 mg/L	97	80-120
Na	<2 mg/L	102	80-120
Run No 254175 **Analysis Date** 2013-07-11 **Method** SM 4110C			
Cl	<1 mg/L	101	90-110
SO4	<3 mg/L	108	90-110
Run No 254187 **Analysis Date** 2013-07-12 **Method** C SM5530D			
Phenols	<0.001 mg/L	93	73-127
Run No 254234 **Analysis Date** 2013-07-12 **Method** C SM4500-NO3-F			
N-NO2	<0.10 mg/L	100	80-120
N-NO3	<0.10 mg/L	97	80-120
Run No 254266 **Analysis Date** 2013-07-12 **Method** EPA 200.8			
B	<0.01 mg/L	100	81-119
Cd	<0.0001 mg/L	99	86-114
Cu	<0.001 mg/L	99	86-114

Guideline = PWQO - Ontario *** = Guideline Exceedence**
** = Analysis completed at Mississauga, Ontario.
Results relate only to the parameters tested on the samples submitted.
Methods references and/or additional QA/QC information available on request.

MRL = Method Reporting Limit, AO = Aesthetic Objective, OG = Operational Guideline, MAC = Maximum Acceptable Concentration, IMAC = Interim Maximum Acceptable Concentration, STD = Standard, PWQO = Provincial Water Quality Guideline, IPWQO = Interim Provincial Water Quality Objective, TDR = Typical Desired Range

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1150 Morrison Dr., Suite 410
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Invoice to: Jp2g Consultants Inc. (Ottawa)

Report Number: 1314222
Date Submitted: 2013-07-09
Date Reported: 2013-07-15
Project: Bissett Creek 2006023 N
COC #: 160937

QC Summary

Analyte	Blank	QC % Rec	QC Limits
Fe	<0.03 mg/L	108	88-112
Mn	<0.01 mg/L	99	91-109
Sr	<0.001 mg/L	103	91-109
Zn	<0.01 mg/L	97	89-111

Guideline = PWQO - Ontario *** = Guideline Exceedence**
** = Analysis completed at Mississauga, Ontario.
Results relate only to the parameters tested on the samples submitted.
Methods references and/or additional QA/QC information available on request.

MRL = Method Reporting Limit, AO = Aesthetic Objective, OG = Operational Guideline, MAC = Maximum Acceptable Concentration, IMAC = Interim Maximum Acceptable Concentration, STD = Standard, PWQO = Provincial Water Quality Guideline, IPWQO = Interim Provincial Water Quality Objective, TDR = Typical Desired Range

Appendix C
Site Photographs

Photo 1 Groundwater monitoring wells BH1-I and BH1-II, July 2013

Photo 2 Groundwater monitoring wells BH2-I, July 2013

Photo 3 Groundwater monitoring wells BH2-II, July 2013

Photo 4 Groundwater monitoring wells BH3-I and BH3-II, July 2013

Photo 5 Groundwater monitoring wells BH4, July 2013

Photo 6 Groundwater monitoring wells BH5, July 2013

Photo 7 Groundwater monitoring wells BH6, July 2013

Photo 8 Groundwater monitoring wells BH7, July 2013

Photo 9 Groundwater monitoring wells BH8, July 2013

Photo 10 Surface water monitoring station SW-1 (context), July 2013

Photo 11 Surface water monitoring station SW-1, July 2013

Photo 12 Surface water monitoring station SW-2, July 2013

Appendix D
Township Records

2012 combined stats - recycling and garbage updated April 2013 to do datacall

	STONECLIFFE				BISSETT & DEUX RIVIERES									
2012	Bags of Garbage Collected	Bags Garbage Deliverd to site	Bags Garbage from Tipping Tickets	Recyclables Tipping Tickets - Info	Bags of Garbage Collected	Bags Garbage Deliverd to site	Bags Garbage from Tipping Tickets	Recyclables Tipping Tickets - Info	B.A.G.S Stats	Bags of Garbage Returned from Recyclers	P/U vs. Delivered Garbage Totals	Monthly Garbage Bag Totals		
JAN P/U	189				157				230		**346**	**461**		January
JAN DEL		82				33					**115**			
FEB P/U	231				113				254		**344**	**480**		February
FEB DEL		98				38					**136**			
MAR P/U	301				119				329		**420**	**608**		March
MAR DEL		134				54					**188**			
APR P/U	220				104				499		**324**	**528**		April
APR DEL		142				62					**204**			
MAY P/U	255		68	90	133		167	21	480		**623**	**751**		May
MAY DEL		79				49					**128**			
JUN P/U	165		196	163	78				512		**439**	**727**		June
JUN DEL		73		244		125	90	14			**288**			
JULY P/U	187				119				760		**306**	**1657**		July
JULY DEL		124	438	311		119	624	98		46	**1351**			
AUG P/U	276				108				574		**384**	**1606**		August
AUG DEL		137	575	378		85	397	38		28	**1222**			
SEP P/U	202				101				592		**303**	**935**		September
SEP DEL		145	386	200		71				30	**632**			
OCT P/U	192		2		136				539		**330**	**753**		October
OCT DEL		126	203	101		58	4			32	**423**			
NOV P/U		175	4			78			148		**257**	**360**		November
NOV DEL			71				27			5	**103**			
DEC P/U		179				86			627		**265**	**416**		December
DEC DEL			87				52			12	**151**			
									5544			**9282**		

Annual form to be completed to assist in calculating the volume of material that was actually landfilled and/or diverted to assit with Jp2g in completion of bi-annual reports for MOE and for annual Municipal Datacall for recycling - data collected from form F605.					Cumulative totals	
ITEM	STONECLIFFE SITE		BISSETT SITE		QUANITITY DISPOSED OF	DISPOSAL METHOD
2012	MATERIAL IN	MATERIAL OUT	MATERIAL IN	MATERIAL OUT		
For last column L- Landfilled; R - Removed by recycler; U - reused by ratepayer; B - Burned						
YARD WASTE						
Pine Needles	6.5	6.5			6.5	B
Brush	58.5	58.5	9	9	67.5	B
Leaves/Hay/Grass	1					
Ashes - cans 18 pails = 1 load	186.3	186.3			186.3	L
TIRES	107	3	80		3	R
WHITE GOODS						
Refrigerators	5		3			
Stove/Ovens/Ranges	5	1	3	2	3	R
Freezers	1					
Washers/Dishwashers	3		1			
Dryers			1	1	1	R
Air Conditioners	1	1	3	3	5	R
Small Appliances - mixers, fans, toasters, etc.	39	39	20	20	3- L 56R	3-L 56R
Microwaves	2	2	6	6	8	R
COMPUTERS	1		1			
Monitors	17	17	3	3	20	R
Processing Units	1	1			1	R
Printers	2	2	1	1	3	R
ELECTRONICS						
Televisions	25	26	8	8	34	R
DVDs, VCRs, Stereos	11	11	3	3	14	R

TOYS, LEISURE & SPORTS EQUIPMENT (Treadmills, skis, skates, sewing machines, bikes, large toys, etc.)	12	10			1-l 9-U	1L 9U
ELECTICAL & ELECTRONIC TOOLS	4	3			3	R
Vacuums, Power tools, Power washers etc.	6	6			3	1- U 3-L 2-R
TEXTILES (carpets, clothes, rugs, drapes etc.)	7rugs	7	5 rugs	5	12	L
SCRAP METAL	1485 kg	935kg	840 kg	1230kg	2165 kg	R
BBQs	11	10	8	3	5	R
CONSTRUCTION MATERIAL (mixed)	8	8			8	L
Demolition/construction waste- CY	79.3	76.8				76.8
Clean Wood	50 kg 7 lds	50 kg 2	230kg -3lds		50 kg 4	b
Treated wood	4.5 loads 90 kg	60		1load	5.5 loads 90 kg	L
Drywall	200kg	200			200	L
Asphalt shingles (always landfill)	4.1 cy	1.1cy	3.21		4.21cy	L
Brick & concrete						
CONTAMINATED FILL						
Suitable for cover	55					
Cupboards, shelves, counter tops	2	2	1	1	3	L
Windows	2	2	4	1	3	U
Doors	1	1	3	3	4	U
Bathroom fixtures - toilet, tubs, showers, etc.	4	4			4	L
FURNITURE						
Upholstered Furniture Large	10		3	3	7	R
Upholstered Furniture Small	18	14	1	1	13	R
Bed frames and headboards	3				3	U
Mattresses & Box springs Large.	11		4	4	10	R
Mattresses & Box springs Small	26	8	3	3	11	
Other furniture - tables, charis, dressers, lawn furniture/chairs etc.	19	16	15		27	11-R 5-U 6-L
VEHCILE ACCIDENT						
BURNT OR DUMPED CONTENTS						

NOTES						
Tarps	2	2			2	L
boat	1	1			1	L
Furance Scrap Metal	1					
Truck cap	1	1			1	U
Riding Mower	1		2			
Boat	1		2		2	L
Clean wood	100 kg					
Lawn Mowers	1	1	1	1	2	1 R 1 U
Hot Water Tank	1					
railway ties	3					
hot Water Tank			1	1	1	1R
large speakers	2	2			2	R
paddle boat	1	1			1	R
speakers	2	2			2	R
large window	1					

2013 combined stats - recycling and garbage

	STONECLIFFE				BISSETT & DEUX RIVIERES										
2013	Bags of Garbage Collected	Bags Garbage Deliverd to site	Bags Garbage from Tipping Tickets	Recyclables Tipping Tickets - Info	Bags of Garbage Collected	Bags Garbage Deliverd to site	Bags Garbage from Tipping Tickets	Recyclables Tipping Tickets - Info	B.A.G.S Stats	Returned Matresses	Returned Blue Box	Bags of Garbage Returned from Recyclers	P/U vs. Delivered Garbage Totals	Monthly Garbage Bag Totals	
JAN P/U	226				87				341	1	13	14	**313**	**414**	January
JAN DEL		85				16							**101**		
FEB P/U	153				77				393	5	12	17	**230**	**324**	February
FEB DEL		81				13							**94**		
MAR P/U	175				66				390	6	9	15	**241**	**367**	March
MAR DEL		110				16							**126**		
APR P/U	181				107				543	29	15	44	**288**	**417**	April
APR DEL		84	1			44							**129**		
MAY P/U	237		26	9	109		391	15	289	3	11	14	**763**	**1096**	May
MAY DEL		231	3	2		99							**333**		
JUN P/U	185		117	92	101		262	28	767	2	8	10	**665**	**1042**	June
JUN DEL		287				90							**377**		
JULY P/U	259				160				987				**419**	**1748**	July
JULY DEL		249	330	202		77	673	158					**1329**		
AUG P/U	288		2		175				1577	29		66	**465**	**1870**	August
AUG DEL		238	439	412		106	622	99					**1405**		
SEP P/U	241				143				1348	13		26	**384**	**602**	September
SEP DEL		146				71	1						**218**		
OCT P/U	261				204				849	8		8	**465**	**703**	October
OCT DEL		141	1			96							**238**		
NOV P/U	186				93				370			19	**279**	**400**	November
NOV DEL		119	1				1						**121**		
DEC P/U	178				90				712			33	**268**	**362**	December
DEC DEL		60				34							**94**		
									8566			266		**9345**	
					1412	662									
						2074									

Annual form to be completed to assist in calculating the volume of material that was actually landfilled and/or diverted to assit with Jp2g in completion of bi-annual reports for MOE and for annual Municipal Datacall for recycling - data collected from form F605.					Cumulative totals	
ITEM	STONECLIFFE SITE		BISSETT SITE		QUANITITY DISPOSED OF	DISPOSAL METHOD
2013	MATERIAL IN	MATERIAL OUT	MATERIAL IN	MATERIAL OUT		
For last column L- Landfilled; R - Removed by recycler; U - reused by ratepayer; B - Burned						
YARD WASTE						
Pine Needles - loads	12	12			12	B
Brush - loads	34	34	1		35	B
Leaves/Hay/Grass	9	9			9	B
Ashes - cans 18 pails = 1 load in kg	227.36	227.36				227.36 kg L
TIRES	48	4	1		4	4R
WHITE GOODS						
Refrigerators	8		4			
Stove/Ovens/Ranges	2		6			
Freezers			1			
Washers/Dishwashers			1			
Dryers						
Air Conditioners	2	2			2	1R
Small Appliances - mixers, fans, toasters, etc.	38	26	12	9	36	33-R 17L
Microwaves	5	4	8	5	9	11-R 1-U
COMPUTERS			1	1	1	R
Monitors	5	3	2	2	5	5-R
Processing Units	1	1	1	1	2	2-R
Printers	2	2	2	2	4	4-R
ELECTRONICS						
Televisions	33	33	11	11	44	R
DVDs, VCRs, Stereos	16	16	3	3	19	19R
TOYS, LEISURE & SPORTS EQUIPMENT (Treadmills, skis, skates, sewing machines, bikes, large toys, etc.)	4	3	10	10	8	11R- 2U

ELECTICAL & ELECTRONIC TOOLS			2	2	2	R
Vacuums, Power tools, Power washers etc.	13	13	5	5	15	2-R 16L
TEXTILES (carpets, clothes, rugs, drapes etc.)	3	3	3	3	6	L
SCRAP METAL in Kg	1830kg	1660	1050kg	1050	2835kg	R
BBQs	2	2	50	4	6	R
CONSTRUCTION MATERIAL (mixed)						
Demolition/construction waste- CY	70.5	68.5	1.5	3.5	71	L
Clean Wood	1110kg	1110	780kg	780	1890kg	B
Treated wood						
Drywall						
Asphalt shingles (always landfill)	9	9	1.5	1.5	9.5	L
Brick & concrete						
CONTAMINATED FILL						
Suitable for cover						
Cupboards, shelves, counter tops			1	1	1	L
Windows	5	5			5	U
Doors	4	4			4	U
Bathroom fixtures - toilet, tubs, showers, etc.	13	9	1	1		9-L
FURNITURE						
Upholstered Furniture Large	3	3	1	1	4	R
Upholstered Furniture Small	7	7	2	2	9	R
Bed frames and headboards	3	3			3	L
Mattresses & Box springs Large.	15	15	8	8	23	R
Mattresses & Box springs Small	9	9	5	5	14	R
Other furniture - tables, charis, dressers, lawn furniture/chairs etc.	14	14	7	7	13	6R 16-L 2U
VEHCILE ACCIDENT						
BURNT OR DUMPED CONTENTS						

NOTES						
Tarps						
boat	1					
Furance Scrap Metal						
Truck cap						
Riding Mower						
Boat			2			
Clean wood						
Lawn Mowers						
Hot Water Tank						
railway ties						
hot Water Tank						
large speakers						
paddle boat						
speakers						
large window						
eye wash stations			2	2	2	U
Bike			3	3	3	SCRAP METAL R
anoe			1	1	1	U
Bikes	2	2				2R
Laundry Tub	1	1				1R

Townships of Head, Clara & Maria
Disposal Site Inspection Record

15 Township Hall Road
Stonecliffe, Ontario
K0J 2K0

Phone: 613-586-2526
Fax: 613-586-2596

Month Dec 2013 **Date:** Sat Dec 21 2013 **Site:** Bissett

Area Inspected:

- Condition of Active Disposal Area ok Tire pile ok Scrap metal ok
  Re-use area ok Wood waste pile ok
- Condition of surface water drainage works — Water in swale Yes (No)
- Visual inspection of water for signs of contamination none
- Indication whether or not flow is discharged on or off-site no
- Presence of any ponded water on site and location no
- Road conditions—excessive erosion ok excessive dust — other —
- Litter—site perimeter good along fences good
- Condition of interim cover ok final cover ok
- Presence of scavenger birds Yes vector[1] — vermin — animals —
- Condition of on-site facilities—Gate ok Electric Fence — Locks ok Signs ok
- Condition of wells —
- Amount of stockpiled cover material to ensure sufficient daily cover is available yes
- Presence of leachate springs - yes (no)
- [1]Vector—wildlife that can carry disease—mosquitoes, dogs, foxes, flying foxes and bats, rats, flies, cockroaches

Deficiencies found that require attention: none

Action Taken to Remediate Deficiencies and Proposed Actions to be Taken to Prevent Reoccurrence in Future

Date Remedial Action completed: _____ Initials: _____

Form Completed By: Bill Donnelly Title: Osa

Signature: Bill Donnelly

Townships of Head, Clara & Maria
Disposal Site Inspection Record

15 Township Hall Road
Stonecliffe, Ontario
K0J 2K0

Phone: 613-586-2526
Fax: 613-586-2596

Month Nov 2013 **Date:** Sat Nov 30/2013 **Site:** Bissett

Area Inspected:

- Condition of Active Disposal Area good Tire pile ok Scrap metal ok
- Re-use area good Wood waste pile ok
- Condition of surface water drainage works — Water in swale Yes (No)
- Visual inspection of water for signs of contamination —
- Indication whether or not flow is discharged on or off-site no
- Presence of any ponded water on site and location no
- Road conditions---excessive erosion ok excessive dust — other —
- Litter---site perimeter good along fences good
- Condition of interim cover ok final cover ok
- Presence of scavenger birds Yes vector[1] — vermin — animals —
- Condition of on-site facilities---Gate ok Electric Fence — Locks ok Signs ok
- Condition of wells —
- Amount of stockpiled cover material to ensure sufficient daily cover is available yes
- Presence of leachate springs - yes (no)

[1]Vector---wildlife that can carry disease---mosquitoes, dogs, foxes, flying foxes and bats, rats, flies, cockroaches

Deficiencies found that require attention: None

Action Taken to Remediate Deficiencies and Proposed Actions to be Taken to Prevent Reoccurrence in Future

Date Remedial Action completed: Initials:

Form Completed By: B. Donnelly

Signature: Bill Donnelly Title: DSA

Townships of Head, Clara & Maria
Disposal Site Inspection Record

15 Township Hall Road
Stonecliffe, Ontario
K0J 2K0

Phone: 613-586-2526
Fax: 613-586-2596

Month Oct 2013 **Date:** Sat Oct 26/13 **Site:** Bissett

Area Inspected:

- Condition of Active Disposal Area ok Tire pile ok Scrap metal ok
  Re-use area ok Wood waste pile ok
- Condition of surface water drainage works — Water in swale Yes (No)
- Visual inspection of water for signs of contamination — none
- Indication whether or not flow is discharged on or off-site No
- Presence of any ponded water on site and location No
- Road conditions—excessive erosion ok excessive dust — other —
- Litter—site perimeter good along fences good
- Condition of interim cover ok final cover ok
- Presence of scavenger birds Yes vector[1] — vermin — animals —
- Condition of on-site facilities—Gate ok Electric Fence — Locks ok Signs ok
- Condition of wells —
- Amount of stockpiled cover material to ensure sufficient daily cover is available yes
- Presence of leachate springs - yes (no)
- [1]Vector—wildlife that can carry disease—mosquitoes, dogs, foxes, flying foxes and bats, rats, flies, cockroaches

Deficiencies found that require attention: Contractor is required for winter Call etc

Action Taken to Remediate Deficiencies and Proposed Actions to be Taken to Prevent Reoccurrence in Future

I Have contacted our Contractor

Date Remedial Action completed: _____ Initials: _____

Form Completed By: Bill Donnelly Title: OSA

Signature: Bill Donnelly

Townships of Head, Clara & Maria
Disposal Site Inspection Record

15 Township Hall Road
Stonecliffe, Ontario
K0J 2K0

Phone: 613-586-2526
Fax: 613-586-2596

Month Sept / 13 **Date:** Sat Sept 21 2013 **Site:** Bissett

Area Inspected:

- Condition of Active Disposal Area ok Tire pile ok Scrap metal ok
  Re-use area ok Wood waste pile ok
- Condition of surface water drainage works ✓ Water in swale Yes (No)
- Visual inspection of water for signs of contamination None
- Indication whether or not flow is discharged on or off-site no
- Presence of any ponded water on site and location no
- Road conditions—excessive erosion ok excessive dust ok other ✓
- Litter—site perimeter good along fences good
- Condition of interim cover ok final cover ok
- Presence of scavenger birds Yes vector[1] ✓ vermin ✓ animals ✓
- Condition of on-site facilities—Gate ok Electric Fence ok Locks ok Signs ok
- Condition of wells ✓
- Amount of stockpiled cover material to ensure sufficient daily cover is available yes
- Presence of leachate springs - yes (no)
- [1]Vector—wildlife that can carry disease—mosquitoes, dogs, foxes, flying foxes and bats, rats, flies, cockroaches

Deficiencies found that reqnire attention: None

Action Taken to Remediate Deficiencies and Proposed Actions to be Taken to Prevent Reoccurrence in Future

Date Remedial Action completed: _____ Initials: _____

Form Completed By: Bill Donnelly Title: DSA

Signature: Bill Donnelly

Townships of Head, Clara & Maria
Disposal Site Inspection Record

15 Township Hall Road
Stonecliffe, Ontario
K0J 2K0

Phone: 613-586-2526
Fax: 613-586-2596

Month Aug 2013 **Date:** Sat Aug 24/2013 **Site:** Biss-11

Area Inspected:

- Condition of Active Disposal Area ok Tire pile ok Scrap metal ok
  Re-use area ok Wood waste pile ok
- Condition of surface water drainage works — Water in swale Yes (No)
- Visual inspection of water for signs of contamination none
- Indication whether or not flow is discharged on or off-site no
- Presence of any ponded water on site and location no
- Road conditions—excessive erosion ok excessive dust ok other —
- Litter—site perimeter good along fences good
- Condition of interim cover ok final cover ok
- Presence of scavenger birds Yes vector[1] — vermin — animals —
- Condition of on-site facilities—Gate ok Electric Fence ok Locks ok Signs ok
- Condition of wells —
- Amount of stockpiled cover material to ensure sufficient daily cover is available yes
- Presence of leachate springs - yes (no)
- [1]Vector—wildlife that can carry disease—mosquitoes, dogs, foxes, flying foxes and bats, rats, flies, cockroaches

Deficiencies found that require attention: none

Action Taken to Remediate Deficiencies and Proposed Actions to be Taken to Prevent Reoccurrence in Futnre

Compaction was done on Wed aug 07
all is ok

Date Remedial Action completed: aug 07 2013 Initials: BD

Form Completed By: Bill Donnelly Title: DSA

Signature: Bill Donnelly

Townships of Head, Clara & Maria
Disposal Site Inspection Record

15 Township Hall Road
Stonecliffe, Ontario
K0J 2K0

Phone: 613-586-2526
Fax: 613-586-2596

Month July 2013 **Date:** Sat JL 27/2013 **Site:** Bissett

Area Inspected:

- Condition of Active Disposal Area full Tire pile ok Scrap metal ok
  Re-use area ok Wood waste pile ok
- Condition of surface water drainage works — Water in swale Yes (No)
- Visual inspection of water for signs of contamination none
- Indication whether or not flow is discharged on or off-site no
- Presence of any ponded water on site and location no
- Road conditions—excessive erosion ok excessive dust ok other —
- Litter—site perimeter good along fences good
- Condition of interim cover ok final cover ok
- Presence of scavenger birds Yes vector[1] — vermin — animals —
- Condition of on-site facilities—Gate ok Electric Fence ok Locks ok Signs ok
- Condition of wells —
- Amount of stockpiled cover material to ensure sufficient daily cover is available yes
- Presence of leachate springs - yes (no)
- [1]Vector—wildlife that can carry disease—mosquitoes, dogs, foxes, flying foxes and bats, rats, flies, cockroaches

Deficiencies found that require attention: Compaction required

Action Taken to Remediate Deficiencies and Proposed Actions to be Taken to Prevent Reoccurrence in Future

Compaction will be done on Aug 07

Date Remedial Action completed: _____ Initials: _____

Form Completed By: Bill Donnelly Title: DSA

Signature: Bill Donnelly

Townships of Head, Clara & Maria
Disposal Site Inspection Record

15 Township Hall Road
Stonecliffe, Ontario
K0J 2K0

Phone: 613-586-2526
Fax: 613-586-2596

Month June 2013 **Date:** Sat Jun 15 2013 **Site:** Bissett

Area Inspected:

- Condition of Active Disposal Area ok Tire pile ok Scrap metal ok
  Re-use area ok Wood waste pile ok
- Condition of surface water drainage works — Water in swale Yes (No)
- Visual inspection of water for signs of contamination None
- Indication whether or not flow is discharged on or off-site no
- Presence of any ponded water on site and location no
- Road conditions—excessive erosion ok excessive dust ok other —
- Litter—site perimeter good along fences good
- Condition of interim cover ok final cover ok
- Presence of scavenger birds Yes vector[1] — vermin — animals —
- Condition of on-site facilities—Gate ok Electric Fence ok Locks ok Signs ok
- Condition of wells —
- Amount of stockpiled cover material to ensure sufficient daily cover is available yes
- Presence of leachate springs - yes (no)
- [1]Vector—wildlife that can carry disease—mosquitoes, dogs, foxes, flying foxes and bats, rats, flies, cockroaches

Deficiencies found that require attention: None

Action Taken to Remediate Deficiencies and Proposed Actions to be Taken to Prevent Reoccurrence in Future

On June 10 & 11 all required spring work was done by our contractor

Date Remedial Action completed: June 11 / 2013 Initials: BD

Form Completed By: Bill Donnelly Title: DSA

Signature: Bill Donnelly

Townships of Head, Clara & Maria
Disposal Site Inspection Record

15 Township Hall Road
Stonecliffe, Ontario
K0J 2K0

Phone: 613-586-2526
Fax: 613-586-2596

Month May 2013 **Date:** Sat May 25 2013 **Site:** Bissett

Area Inspected:

- Condition of Active Disposal Area ok Tire pile ok Scrap metal ok
  Re-use area ok Wood waste pile ok
- Condition of surface water drainage works — Water in swale Yes (No)
- Visual inspection of water for signs of contamination None
- Indication whether or not flow is discharged on or off-site No
- Presence of any ponded water on site and location None
- Road conditions—excessive erosion ok excessive dust ok other —
- Litter—site perimeter good along fences good
- Condition of interim cover ok final cover ok
- Presence of scavenger birds Yes vector[1] — vermin — animals —
- Condition of on-site facilities—Gate ok Electric Fence ok Locks ok Signs ok
- Condition of wells —
- Amount of stockpiled cover material to ensure sufficient daily cover is available yes
- Presence of leachate springs - yes (no)
- [1]Vector—wildlife that can carry disease—mosquitoes, dogs, foxes, flying foxes and bats, rats, flies, cockroaches

Deficiencies found that require attention: Compaction is now required also fire break

Action Taken to Remediate Deficiencies and Proposed Actions to be Taken to Prevent Reoccurrence in Future

I have spoke with our Contractor it will be done early June

Date Remedial Action completed: _____ Initials: _____

Form Completed By: Bill Donnelly Title: DSA

Signature: Bill Donnelly

Townships of Head, Clara & Maria
Disposal Site Inspection Record

15 Township Hall Road
Stonecliffe, Ontario
K0J 2K0

Phone: 613-586-2526
Fax: 613-586-2596

Month Apr 2013 **Date:** Sat Apr 27 2013 **Site:** Bissett

Area Inspected:

- Condition of Active Disposal Area ok ? Tire pile ok Scrap metal ok
  Re-use area ok Wood waste pile ok
- Condition of surface water drainage works — Water in swale Yes (No)
- Visual inspection of water for signs of contamination none
- Indication whether or not flow is discharged on or off-site no
- Presence of any ponded water on site and location no
- Road conditions—excessive erosion ok excessive dust — other —
- Litter—site perimeter good along fences good
- Condition of interim cover ok final cover ok
- Presence of scavenger birds Yes vector[1] — vermin — animals —
- Condition of on-site facilities—Gate ok Electric Fence ok Locks ok Signs ok
- Condition of wells —
- Amount of stockpiled cover material to ensure sufficient daily cover is available yes
- Presence of leachate springs - yes (no)
- [1]Vector—wildlife that can carry disease—mosquitoes, dogs, foxes, flying foxes and bats, rats, flies, cockroaches

Deficiencies found that require attention: Spring work is required by our contractor

Action Taken to Remediate Deficiencies and Proposed Actions to be Taken to Prevent Reoccurrence in Future

I have contacted our contractor and work will be done early in May

Date Remedial Action completed: _____ Initials: _____

Form Completed By: Bill Donnelly Title: OSA

Signature: Bill Donnelly

Townships of Head, Clara & Maria
Disposal Site Inspection Record

15 Township Hall Road
Stonecliffe, Ontario
K0J 2K0

Phone: 613-586-2526
Fax: 613-586-2596

Month March 2013 **Date:** Sat Mar 23 2013 **Site:** Bissett

Area Inspected:

- Condition of Active Disposal Area ok Tire pile ok Scrap metal ok
  Re-use area ok Wood waste pile ok
- Condition of surface water drainage works — Water in swale Yes (No)
- Visual inspection of water for signs of contamination None
- Indication whether or not flow is discharged on or off-site no
- Presence of any ponded water on site and location no
- Road conditions—excessive erosion ok excessive dust — other —
- Litter—site perimeter good along fences good
- Condition of interim cover ok final cover ok
- Presence of scavenger birds Yes vector[1] — vermin — animals —
- Condition of on-site facilities—Gate ok Electric Fence — Locks ok Signs ok
- Condition of wells —
- Amount of stockpiled cover material to ensure sufficient daily cover is available yes
- Presence of leachate springs - yes (no)
- [1]Vector—wildlife that can carry disease—mosquitoes, dogs, foxes, flying foxes and bats, rats, flies, cockroaches

Deficiencies found that require attention: None

Action Taken to Remediate Deficiencies and Proposed Actions to be Taken to Prevent Reoccurrence in Future

Date Remedial Action completed: _____ Initials: _____

Form Completed By: Bill Donnelly Title: DSA

Signature: Bill Donnelly

Townships of Head, Clara & Maria
Disposal Site Inspection Record

15 Township Hall Road
Stonecliffe, Ontario
K0J 2K0

Phone: 613-586-2526
Fax: 613-586-2596

Month Feb 2013 **Date:** Sat Feb 02 2013 **Site:** Bissett

Area Inspected:

- Condition of Active Disposal Area ok Tire pile ok Scrap metal ok
  Re-use area ok Wood waste pile ok
- Condition of surface water drainage works — Water in swale Yes (No)
- Visual inspection of water for signs of contamination None
- Indication whether or not flow is discharged on or off-site no
- Presence of any ponded water on site and location no
- Road conditions—excessive erosion — excessive dust — other —
- Litter—site perimeter good along fences good
- Condition of interim cover ok final cover ok
- Presence of scavenger birds Yes vector[1] — vermin — animals —
- Condition of on-site facilities—Gate ok Electric Fence — Locks ok Signs ok
- Condition of wells —
- Amount of stockpiled cover material to ensure sufficient daily cover is available yes
- Presence of leachate springs - yes (no)
- [1]Vector—wildlife that can carry disease—mosquitoes, dogs, foxes, flying foxes and bats, rats, flies, cockroaches

Deficiencies found that require attention: None

Action Taken to Remediate Deficiencies and Proposed Actions to be Taken to Prevent Reoccurrence in Future

Date Remedial Action completed: _____ Initials: _____

Form Completed By: Bill Donnelly Title: OSA

Signature: Bill Donnelly

Townships of Head, Clara & Maria
Disposal Site Inspection Record

15 Township Hall Road
Stonecliffe, Ontario
K0J 2K0

Phone: 613-586-2526
Fax: 613-586-2596

Month Feb 2013 **Date:** Sat Feb 09 2013 **Site:** Bissett

Area Inspected:

- Condition of Active Disposal Area ok Tire pile ok Scrap metal ok
  Re-use area ok Wood waste pile ok
- Condition of surface water drainage works — Water in swale Yes (No)
- Visual inspection of water for signs of contamination none
- Indication whether or not flow is discharged on or off-site no
- Presence of any ponded water on site and location no
- Road conditions—excessive erosion ok excessive dust — other —
- Litter—site perimeter good along fences good
- Condition of interim cover ok final cover ok
- Presence of scavenger birds Yes vector[1] — vermin — animals —
- Condition of on-site facilities—Gate ok Electric Fence ok Locks ok Signs ok
- Condition of wells —
- Amount of stockpiled cover material to ensure sufficient daily cover is available yes
- Presence of leachate springs - yes (no)
- [1]Vector—wildlife that can carry disease—mosquitoes, dogs, foxes, flying foxes and bats, rats, flies, cockroaches

Deficiencies found that require attention: none

Action Taken to Remediate Deficiencies and Proposed Actions to be Taken to Prevent Reoccurrence in Future

Date Remedial Action completed: _____ Initials: _____

Form Completed By: Bill Donnelly Title: OSA

Signature: Bill Donnelly

Townships of Head, Clara & Maria
Disposal Site Inspection Record

15 Township Hall Road
Stonecliffe, Ontario
K0J 2K0

Phone: 613-586-2526
Fax: 613-586-2596

Month Feb 2013 **Date:** Sat Feb 16 2013 **Site:** Bissett

Area Inspected:

- Condition of Active Disposal Area ok Tire pile ok Scrap metal ok
  Re-use area ok Wood waste pile ok
- Condition of surface water drainage works — Water in swale Yes (No)
- Visual inspection of water for signs of contamination None
- Indication whether or not flow is discharged on or off-site No
- Presence of any ponded water on site and location No
- Road conditions—excessive erosion ok excessive dust — other —
- Litter—site perimeter good along fences good
- Condition of interim cover ok final cover ok
- Presence of scavenger birds Yes vector[1] — vermin — animals —
- Condition of on-site facilities—Gate ok Electric Fence — Locks ok Signs ok
- Condition of wells —
- Amount of stockpiled cover material to ensure sufficient daily cover is available yes
- Presence of leachate springs - yes (no)
- [1]Vector—wildlife that can carry disease—mosquitoes, dogs, foxes, flying foxes and bats, rats, flies, cockroaches

Deficiencies found that require attention: None

Action Taken to Remediate Deficiencies and Proposed Actions to be Taken to Prevent Reoccurrence in Future

Date Remedial Action completed: _____ Initials: _____

Form Completed By: Bill Donnelly Title: OSA

Signature: Bill Donnelly

Townships of Head, Clara & Maria
Disposal Site Inspection Record

15 Township Hall Road
Stonecliffe, Ontario
K0J 2K0

Phone: 613-586-2526
Fax: 613-586-2596

Month Feb 2013 **Date:** Sat Feb 23 2013 **Site:** Bisset

Area Inspected:

- Condition of Active Disposal Area ok Tire pile ok Scrap metal ok
  Re-use area ok Wood waste pile ok
- Condition of surface water drainage works — Water in swale Yes (No)
- Visual inspection of water for signs of contamination None
- Indication whether or not flow is discharged on or off-site no
- Presence of any ponded water on site and location No
- Road conditions—excessive erosion ok excessive dust — other —
- Litter—site perimeter good along fences good
- Condition of interim cover ok final cover ok
- Presence of scavenger birds Yes vector[1] — vermin — animals —
- Condition of on-site facilities—Gate ok Electric Fence — Locks ok Signs ok
- Condition of wells —
- Amount of stockpiled cover material to ensure sufficient daily cover is available yes
- Presence of leachate springs - yes (no)
- [1]Vector—wildlife that can carry disease—mosquitoes, dogs, foxes, flying foxes and bats, rats, flies, cockroaches

Deficiencies found that require attention: None

Action Taken to Remediate Deficiencies and Proposed Actions to be Taken to Prevent Reoccurrence in Future

Date Remedial Action completed: _____ Initials: _____

Form Completed By: Bill Donnelly Title: OSA

Signature: Bill Donnelly

Townships of Head, Clara & Maria
Disposal Site Inspection Record

15 Township Hall Road
Stonecliffe, Ontario
K0J 2K0

Phone: 613-586-2526
Fax: 613-586-2596

Month Jan 2013 **Date:** Sat Jan 26 2013 **Site:** Bissett

Area Inspected:

- Condition of Active Disposal Area good Tire pile ok Scrap metal ok
  Re-use area good Wood waste pile ok
- Condition of surface water drainage works — Water in swale Yes (No)
- Visual inspection of water for signs of contamination None
- Indication whether or not flow is discharged on or off-site No
- Presence of any ponded water on site and location No
- Road conditions—excessive erosion ok excessive dust — other —
- Litter—site perimeter good along fences good
- Condition of interim cover ok final cover ok
- Presence of scavenger birds Yes vector[1] — vermin — animals —
- Condition of on-site facilities—Gate ok Electric Fence — Locks ok Signs ok
- Condition of wells —
- Amount of stockpiled cover material to ensure sufficient daily cover is available yes
- Presence of leachate springs - yes (no)
- [1]Vector—wildlife that can carry disease—mosquitoes, dogs, foxes, flying foxes and bats, rats, flies, cockroaches

Deficiencies found that require attention: None

Action Taken to Remediate Deficiencies and Proposed Actions to be Taken to Prevent Reoccurrence in Future

Date Remedial Action completed: _____ Initials: _____

Form Completed By: Bill Donnelly Title: OSA

Signature: Bill Donnelly

Townships of Head, Clara & Maria
Disposal Site Inspection Record

15 Township Hall Road
Stonecliffe, Ontario
K0J 2K0

Phone: 613-586-2526
Fax: 613-586-2596

Month Jan 2013 **Date:** Sat Jan 19 2013 **Site:** Bissett

Area Inspected:

- Condition of Active Disposal Area ok Tire pile ok Scrap metal ok
  Re-use area ok Wood waste pile ok
- Condition of surface water drainage works — Water in swale Yes (No)
- Visual inspection of water for signs of contamination None
- Indication whether or not flow is discharged on or off-site No
- Presence of any ponded water on site and location No
- Road conditions—excessive erosion ok excessive dust — other —
- Litter—site perimeter good along fences good
- Condition of interim cover ok final cover ok
- Presence of scavenger birds Yes vector[1] — vermin — animals —
- Condition of on-site facilities—Gate ok Electric Fence — Locks ok Signs ok
- Condition of wells —
- Amount of stockpiled cover material to ensure sufficient daily cover is available yes
- Presence of leachate springs - yes (no)
- [1]Vector—wildlife that can carry disease—mosquitoes, dogs, foxes, flying foxes and bats, rats, flies, cockroaches

Deficiencies found that require attention: None

Action Taken to Remediate Deficiencies and Proposed Actions to be Taken to Prevent Reoccurrence in Future

Date Remedial Action completed: _____ Initials: _____

Form Completed By: Bill Donnelly Title: DSA

Signature: Bill Donnelly

Townships of Head, Clara & Maria
Disposal Site Inspection Record

15 Township Hall Road
Stonecliffe, Ontario
K0J 2K0

Phone: 613-586-2526
Fax: 613-586-2596

Month Jan 2013 **Date:** Sat Jan 12 2013 **Site:** Bissett

Area Inspected:

- Condition of Active Disposal Area ok Tire pile ok Scrap metal ok
  Re-use area ok Wood waste pile ok
- Condition of surface water drainage works _____ Water in swale Yes (No)
- Visual inspection of water for signs of contamination None
- Indication whether or not flow is discharged on or off-site no
- Presence of any ponded water on site and location no
- Road conditions—excessive erosion ok excessive dust — other —
- Litter—site perimeter good along fences good
- Condition of interim cover ok final cover ok
- Presence of scavenger birds Yes vector[1] — vermin — animals —
- Condition of on-site facilities—Gate ok Electric Fence — Locks ok Signs ok
- Condition of wells —
- Amount of stockpiled cover material to ensure sufficient daily cover is available yes
- Presence of leachate springs - yes (no)
- [1]Vector—wildlife that can carry disease—mosquitoes, dogs, foxes, flying foxes and bats, rats, flies, cockroaches

Deficiencies found that require attention: None

Action Taken to Remediate Deficiencies and Proposed Actions to be Taken to Prevent Reoccurrence in Future

Date Remedial Action completed: _____ Initials: _____

Form Completed By: Bill Donnelly Title: DSA

Signature: Bill Donnelly

Townships of Head, Clara & Maria
Disposal Site Inspection Record

15 Township Hall Road
Stonecliffe, Ontario
K0J 2K0

Phone: 613-586-2526
Fax: 613-586-2596

Month Jan 2013 **Date:** Sat Jan 05 2013 **Site:** Bissett

Area Inspected:

- Condition of Active Disposal Area ok Tire pile ok Scrap metal ok
  Re-use area ok Wood waste pile ok
- Condition of surface water drainage works — Water in swale Yes (No)
- Visual inspection of water for signs of contamination None
- Indication whether or not flow is discharged on or off-site no
- Presence of any ponded water on site and location no
- Road conditions—excessive erosion ok excessive dust — other —
- Litter—site perimeter good along fences good
- Condition of interim cover ok final cover ok
- Presence of scavenger birds Yes vector[1] — vermin — animals —
- Condition of on-site facilities—Gate ok Electric Fence — Locks ok Signs ok
- Condition of wells —
- Amount of stockpiled cover material to ensure sufficient daily cover is available yes
- Presence of leachate springs - yes (no)
- [1]Vector—wildlife that can carry disease—mosquitoes, dogs, foxes, flying foxes and bats, rats, flies, cockroaches

Deficiencies found that require attention: None

Action Taken to Remediate Deficiencies and Proposed Actions to be Taken to Prevent Reoccurrence in Future

Date Remedial Action completed: _____ Initials: _____

Form Completed By: Bill Donnelly Title: DSA

Signature: Bill Donnelly

Townships of Head, Clara & Maria
Disposal Site Inspection Record

15 Township Hall Road
Stonecliffe, Ontario
K0J 2K0

Phone: 613-586-2526
Fax: 613-586-2596

Month Nov 2013 **Date:** Sat Nov 30/2013 **Site:** Bissett

Area Inspected:

- Condition of Active Disposal Area good Tire pile ok Scrap metal ok
- Re-use area good Wood waste pile ok
- Condition of surface water drainage works — Water in swale Yes (No)
- Visual inspection of water for signs of contamination —
- Indication whether or not flow is discharged on or off-site no
- Presence of any ponded water on site and location no
- Road conditions---excessive erosion ok excessive dust — other —
- Litter---site perimeter good along fences good
- Condition of interim cover ok final cover ok
- Presence of scavenger birds Yes vector[1] — vermin — animals —
- Condition of on-site facilities---Gate ok Electric Fence — Locks ok Signs ok
- Condition of wells —
- Amount of stockpiled cover material to ensure sufficient daily cover is available yes
- Presence of leachate springs - yes (no)

[1]Vector---wildlife that can carry disease---mosquitoes, dogs, foxes, flying foxes and bats, rats, flies, cockroaches

Deficiencies found that require attention: None

Action Taken to Remediate Deficiencies and Proposed Actions to be Taken to Prevent Reoccurrence in Future

Date Remedial Action completed: Initials:

Form Completed By: B. Donnelly

Signature: Bill Donnelly Title: DSA

Townships of Head, Clara & Maria
Disposal Site Inspection Record

15 Township Hall Road
Stonecliffe, Ontario
K0J 2K0

Phone: 613-586-2526
Fax: 613-586-2596

Month July 2013 **Date:** Sat JL 27/2013 **Site:** Bissett

Area Inspected:

- Condition of Active Disposal Area full Tire pile ok Scrap metal ok
  Re-use area ok Wood waste pile ok
- Condition of surface water drainage works — Water in swale Yes (No)
- Visual inspection of water for signs of contamination none
- Indication whether or not flow is discharged on or off-site no
- Presence of any ponded water on site and location no
- Road conditions—excessive erosion ok excessive dust ok other —
- Litter—site perimeter good along fences good
- Condition of interim cover ok final cover ok
- Presence of scavenger birds Yes vector[1] — vermin — animals —
- Condition of on-site facilities—Gate ok Electric Fence ok Locks ok Signs ok
- Condition of wells —
- Amount of stockpiled cover material to ensure sufficient daily cover is available yes
- Presence of leachate springs - yes (no)
- [1]Vector—wildlife that can carry disease—mosquitoes, dogs, foxes, flying foxes and bats, rats, flies, cockroaches

Deficiencies found that require attention: Compaction required

Action Taken to Remediate Deficiencies and Proposed Actions to be Taken to Prevent Reoccurrence in Future

Compaction will be done on Aug 07

Date Remedial Action completed: _____ Initials: _____

Form Completed By: Bill Donnelly Title: DSA

Signature: Bill Donnelly

Townships of Head, Clara & Maria
Disposal Site Litter Control Record

15 Township Hall Road
Stonecliffe, Ontario
K0J 2K0

Phone: 613-586-2526
Fax: 613-586-2596

Site: Bissett Dec 2013

Date of Litter Pick-up	Time of Litter Pick-Up	Area of Disposal Site Litter Cleared From (Active Cell, Roadway, Along Electric Fence, Bush, etc.)	Signature
Tue Dec 03	PM	Active Cell	BD
Sat Dec 07	PM	Active Cell	BD
Tue Dec 10	PM	Active cell + area	BD
Sat Dec 14	PM	Active Cell	BD
Tue Dec 17	PM	Active Cell	BD
Sat Dec 21	PM	Active Cell	BD
Tue Dec 24	PM	Active Cell	BD
Sat Dec 28	PM	Active Cell	BD
Tue Dec 31	PM	-	Vince

Form Completed By: Bill Donnelly Title: DSA

Signature: Bill Donnelly

Townships of Head, Clara & Maria
Disposal Site Litter Control Record

15 Township Hall Road
Stonecliffe, Ontario
K0J 2K0

Phone: 613-586-2526
Fax: 613-586-2596

Site: Bissett Nov 2013

Date of Litter Pick-up	Time of Litter Pick-Up	Area of Disposal Site Litter Cleared From (Active Cell, Roadway, Along Electric Fence, Bush, etc.)	Signature
Sat Nov 02	PM	Active Cell, area	BD
Tue 05	PM	Active Cell	BD
Sat 09	PM	Active Cell + Fence	BD
Tue 12	PM	Active Cell	BD
Sat 16	PM	Active Cell + area	BD
Tue 19	PM	Active Cell	BD
Sat 23	PM	Active Cell + Rec	BD
Tue 26	PM	Active Cell	BD
Sat 30	PM	Active Cell + area	BD

Form Completed By: Bill Donnelly Title: DSA

Signature: Bill Donnelly

Townships of Head, Clara & Maria
Disposal Site Litter Control Record

15 Township Hall Road
Stonecliffe, Ontario
K0J 2K0

Phone: 613-586-2526
Fax: 613-586-2596

Site: Bissett Oct 2013

Date of Litter Pick-up	Time of Litter Pick-Up	Area of Disposal Site Litter Cleared From (Active Cell, Roadway, Along Electric Fence, Bush, etc.)	Signature
Tue 01	PM	Active Cell + Area	BD
Sat 05	PM	active Cell	BD
Tue 08	PM	Active Cell + Road	BD
Sat 12	PM	Active Cell + Fence	BD
Tue 15	PM	active Cell	BD
Sat 19	PM	active Cell + Area	BD
Tue 22	PM	Active Cell + Bush	BD
Sat 26	PM	active Cell	BD
Tue 29	PM	Active Cell + Road	BD

Form Completed By: Bill Donnelly Title: OSA

Signature: Bill Donnelly

Townships of Head, Clara & Maria
Disposal Site Litter Control Record

15 Township Hall Road
Stonecliffe, Ontario
K0J 2K0

Phone: 613-586-2526
Fax: 613-586-2596

Site: Bissett Sept 2013

Date of Litter Pick-up	Time of Litter Pick-Up	Area of Disposal Site Litter Cleared From (Active Cell, Roadway, Along Electric Fence, Bush, etc.)	Signature
Tue 03	PM	Active Cell + Area	BD
Sat 07	PM	Active Cell	BD
Tue 10	PM	Active Cell + Fence	BD
Sat 14	PM	Active Cell	BD
Tue 17	PM	Active Cell + Area	BD
Sat 21	PM	Active Cell + Bush	BD
Tue 24	PM	Active Cell + Fence	BD
Sat 28	PM	Active Cell	BD

Form Completed By: Bill Donnelly Title: DSA

Signature: Bill Donnelly

The Corporation of The United Townships of HEAD·CLARA·MARIA
A Natural Playground

Townships of Head, Clara & Maria
Disposal Site Litter Control Record

15 Township Hall Road
Stonecliffe, Ontario
K0J 2K0

Phone: 613-586-2526
Fax: 613-586-2596

Site: Bissett Aug 2013

Date of Litter Pick-up	Time of Litter Pick-Up	Area of Disposal Site Litter Cleared From (Active Cell, Roadway, Along Electric Fence, Bush, etc.)	Signature
Sat 03	PM	Active Cell + Area	BD
Tue 06	PM	Active cell + Fence	BD
Sat 10	PM	Active Cell	BD
Tue 13	PM	Active Cell + Bush	BD
Sat 17	PM	Active Cell	BD
Tue 20	PM	Active Cell + Area	BD
Sat 24	PM	Active Cell	BD
Tue 27	PM	Active Cell + Rec Area	BD
Sat 31	PM	Active Cell	BD

Form Completed By: Bill Donnelly Title: DSA

Signature: Bill Donnelly

Townships of Head, Clara & Maria
Disposal Site Litter Control Record

15 Township Hall Road
Stonecliffe, Ontario
K0J 2K0

Phone: 613-586-2526
Fax: 613-586-2596

Site: Bissett July 2013

Date of Litter Pick-up	Time of Litter Pick-Up	Area of Disposal Site Litter Cleared From (Active Cell, Roadway, Along Electric Fence, Bush, etc.)	Signature
Tue 02	PM	Active Cell + area	BD
Sat 06	PM	Active Cell	BD
Tue 09	PM	Active Cell + Fence	BD
Sat 13	PM	Active Cell	BD
Tue 16	PM	Active Cell + Road	BD
Sat 20	PM	Active Cell + Bush	BD
Tue 23	PM	Active Cell	BD
Sat 26	PM	Road + Rec Cent.	BD
Tue 30	PM	Active Cell	BD

Form Completed By: Bill Donnelly Title: DSA

Signature: Bill Donnelly

Townships of Head, Clara & Maria
Disposal Site Litter Control Record

15 Township Hall Road
Stonecliffe, Ontario
K0J 2K0

Phone: 613-586-2526
Fax: 613-586-2596

Site: Bissett June 2013

Date of Litter Pick-up	Time of Litter Pick-Up	Area of Disposal Site Litter Cleared From (Active Cell, Roadway, Along Electric Fence, Bush, etc.)	Signature
Sat Jn 01	PM	Active Cell	BD
Tue Jn 04	PM	Active Cell + Fence	BD
Sat Jn 08	PM	Active Cell + Area	BD
Tue Jn 11	PM	Active Cell	BD
Sat Jn 15	PM	Active Cell + Road	BD
Tue Jn 18	PM	Active Cell + Bush	BD
Sat Jn 22	PM	Active Cell	BD
Tue Jn 25	PM	Active Cell + Area	BD
Sat Jn 29	PM	Active Cell + Bush	BD

Form Completed By: Bill Donnelly Title: DSA

Signature: Bill Donnelly

Townships of Head, Clara & Maria
Disposal Site Litter Control Record

15 Township Hall Road
Stonecliffe, Ontario
K0J 2K0

Phone: 613-586-2526
Fax: 613-586-2596

Site: Bissett May 2013

Date of Litter Pick-up	Time of Litter Pick-Up	Area of Disposal Site Litter Cleared From (Active Cell, Roadway, Along Electric Fence, Bush, etc.)	Signature
Sat May 04	PM	Active Cell	BD
Tue May 07	PM	Active Cell + Fence	BD
Sat May 11	PM	Active Cell + Bush	BD
Tue May 14	PM	Bush	BD
Sat May 18	PM	Active Cell + Road	BD
Tue May 21	PM	Active Cell + Area	BD
Sat May 25	PM	Active Cell	BD
Tue May 28	PM	Road + Bush	BD

Form Completed By: Bill Donnelly Title: DSA

Signature: Bill Donnelly

Townships of Head, Clara & Maria
Disposal Site Litter Control Record

15 Township Hall Road
Stonecliffe, Ontario
K0J 2K0

Phone: 613-586-2526
Fax: 613-586-2596

Site: Bissett Apr 2013

Date of Litter Pick-up	Time of Litter Pick-Up	Area of Disposal Site Litter Cleared From (Active Cell, Roadway, Along Electric Fence, Bush, etc.)	Signature
Tue apr 02		Vines	
Sat apr 06		Vines	
Tue apr 09	PM	Active Cell + area	BD
Sat apr 13	PM	Fences	BD
Tue apr 16	PM	Road + Bush	BD
Sat apr 20	PM	Active Cell + Bush	BD
Tue apr 23	PM	Active Cell	BD
Sat apr 27	PM	Active Cell + area	BD
Tue Apr 30	PM	Active Cell + Bush	BD

Form Completed By: Bill Donnelly Title: OSA

Signature: Bill Donnelly

Townships of Head, Clara & Maria
Disposal Site Litter Control Record

15 Township Hall Road
Stonecliffe, Ontario
K0J 2K0

Phone: 613-586-2526
Fax: 613-586-2596

Site: Bissett Feb 2013

Date of Litter Pick-up	Time of Litter Pick-Up	Area of Disposal Site Litter Cleared From (Active Cell, Roadway, Along Electric Fence, Bush, etc.)	Signature
Sat Feb 02	PM	Active Cell	BD
Tue Feb 05	PM	Active Cell + Area	BD
Sat Feb 09	PM	Active Cell	BD
Tue Feb 12	PM	Active Cell	BD
Sat Feb 16	PM	Active Cell + Rec Bin	BD
Tue Feb 19	PM	Active Cell	BD
Sat Feb 23	PM	Active Cell	BD
Tue Feb 26	PM	Active Cell	BD

Form Completed By: Bill Donnelly Title: DSA

Signature: Bill Donnelly

Townships of Head, Clara & Maria
Disposal Site Litter Control Record

15 Township Hall Road
Stonecliffe, Ontario
K0J 2K0

Phone: 613-586-2526
Fax: 613-586-2596

Site: Bissett Jan 2013

Date of Litter Pick-up	Time of Litter Pick-Up	Area of Disposal Site Litter Cleared From (Active Cell, Roadway, Along Electric Fence, Bush, etc.)	Signature
Sat Jan 05	PM	Active Cell	BD
Tue Jan 08	PM	Active Cell	BD
Sat Jan 12	PM	Active cell	BD
Tue Jan 15	PM	Active Cell	BD
Sat Jan 19	PM	Active Cell + Area	BD
Tue Jan 22	PM	Active Cell	BD
Sat Jan 26	PM	Ø	BD
Tue Jan 29	PM	Activ Cell	

Form Completed By: Bill Donnelly Title: DSA

Signature: Bill Donnelly

Townships of Head, Clara & Maria
Disposal Site Cover Application Record

15 Township Hall Road
Stonecliffe, Ontario
K0J 2K0

Phone: 613-586-2526
Fax: 613-586-2596

Site: Bissett Nov 13 2013

Date of Cover Application	Time of Cover Application	Type and Thickness of Cover Applied	Hours of Contractor at disposal site per visit	Other Activities performed by Contractor (compaction, road building, other maintenance etc.)
Wed Nov 13	PM	Sand 10-12 cm		Prepaired Winter Cell + General Tidy

Form Completed By: Bill Donnelly Title: OSA

Townships of Head, Clara & Maria
Disposal Site Cover Application Record

15 Township Hall Road
Stonecliffe, Ontario
K0J 2K0

Phone: 613-586-2526
Fax: 613-586-2596

Site: Bissett Sept 06/2013

Date of Cover Application	Time of Cover Application	Type of Cover Applied	Thickness of Cover Applied	Other Activities performed by Contractor (compaction, road building, other maintenance etc.)
Fri Sept 06	AM	Sand	10-12 cm	Compaction - etc

Form Completed By: Bill Donnelly Title: OSA

Townships of Head, Clara & Maria
Disposal Site Cover Application Record

15 Township Hall Road
Stonecliffe, Ontario
K0J 2K0

Phone: 613-586-2526
Fax: 613-586-2596

Site: Bissett Aug 07 2013

Date of Cover Application	Time of Cover Application	Type of Cover Applied	Thickness of Cover Applied	Other Activities performed by Contractor (compaction, road building, other maintenance etc.)
Aug 07	AM	Sand	10-12 cm	Compaction + general tidy up.

Form Completed By: Bill Donnelly Title: OSA

Townships of Head, Clara & Maria
Disposal Site Cover Application Record

15 Township Hall Road
Stonecliffe, Ontario
K0J 2K0

Phone: 613-586-2526
Fax: 613-586-2596

Site: Bissett Jan 11 2013

Date of Cover Application	Time of Cover Application	Type of Cover Applied	Thickness of Cover Applied	Other Activities performed by Contractor (compaction, road building, other maintenance etc.)
Jan 11/2013	PM	Sand	30 cm	Buffer Zone Complete + Mun Cell + general tidy up

Form Completed By: Bill Donnelly Title: DSA