

FINAL 2019 Annual Monitoring Report

Croft Waste Disposal Site Magnetawan, Ontario

Prepared for:

Municipality of Magnetawan

4304 Highway 520 Magnetawan, ON P0A 1P0

Attn: Nicole Gourlay Clerk-Administrator

December 12, 2019

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Contact:	Nicole Gourlay
	Clerk-Administrator
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Issuing Office:	Sudbury, ON
Primary Pinchin Contact:	Tim McBride

Author:

Alana Valle Project Technologist 705.280.0682 avalle@pinchin.com

Reviewer:

Tim McBride, B.Sc., P. Geo., QP_{ESA} Operations Manager – Sudbury Director, Landfill & Municipal Services 705.521.0560 ext 3416 tmcbride@pinchin.com



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1.0 INTRODUCTION

Pinchin Ltd. (Pinchin) was retained by the Corporation of the Municipality of Magnetawan (Client) to prepare the 2019 annual groundwater and surface water monitoring report for the Croft Waste Disposal Site (the Site). The following report provides a detailed evaluation and summary of the 2019 monitoring data and was completed to constitute the 2019 Annual Monitoring Report. This document includes, but is not limited to, a summary of historical geochemical data, a review/evaluation of the historical and current geochemical data (as well as groundwater flow), and a summary of geochemical trends.

The purpose of completing the monitoring program was to assess the hydraulic media for contaminants of concern as a compliance requirement under the Site Certificate of Approval (CofA) Number **A7034002** and the applicable regulatory requirements during the spring and fall of 2019. To achieve the reporting objectives of this Site monitoring program, Pinchin carried out groundwater and surface water sampling at the Site in general accordance with the documents referenced within this report.

1.1 Location

The Site property is located in Lot 26, Concession 11, within the Municipality of Magnetawan, District of Parry Sound, Ontario and is located approximately 12 kilometres (km) east-northeast of the Township of Magnetawan, Ontario. The Site is situated in an undeveloped area and the visibility of landfilling activities is limited from the adjacent roadway due to mature tree growth. The Site location is indicated on Figure 1 (all Figures are provided in Appendix I).

The Site is located at Universal Transverse Mercator (UTM) coordinates Zone 17U, 593,659 meters (m) Easting and 5,058,398 m Northing (North American Datum 1983). Landfill coordinates were obtained using a Global Positioning System and are accurate within 10 m.

1.1.1 Site Survey and Aerial Photography

At the time of preparation of this report, previous survey information of the Site and existing monitoring well elevations were provided to Pinchin for review. The available top of casing monitoring well elevation data obtained from the previous survey has been used in the following sections of this report to calculate groundwater elevation contours.

A topographic survey of the Site was completed using an Unmanned Aerial Vehicle (UAV) in conjunction with the spring 2019 monitoring event by Pinchin for the purpose of creating an accurate aerial image of the Site, while also capturing the current Site topographic conditions.



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1.2 Ownership and Key Personnel

The Site is owned and operated by the Corporation of the Municipality of Magnetawan, located in Magnetawan, Ontario. The project was completed for the following representative on behalf of the Municipality:

Nicole Gourlay, Clerk-Administrator

Municipality of Magnetawan Government Office

4304 Highway #520

Magnetawan, ON P0A 1P0

The Competent Environmental Practitioner (CEP) for the Site groundwater and surface water monitoring program was Mr. Tim McBride of Pinchin Ltd. Mr. McBride's contact information is provided below:

Mr. Tim McBride, B.Sc., P.Geo., Q.P._{ESA} Pinchin Ltd. 957 Cambrian Heights Drive, Suite #203 Sudbury, ON P3C 5S5

1.3 Description and Development of the Site

The Site is operated as a domestic landfill for municipal and non-hazardous solid industrial and commercial wastes to be utilized by residences of the area. The Site was approved with a total fill area of 2.5 hectares (ha) within a 33.7 ha property. A road with a locked gate is located east of the Site which provides access to the Site from the west side of 25th and 26th Side Road approximately 1 km north of the intersection of 25th and 26th Side Road and Highway 520.

The active landfilling area is currently located within the northern portion of the Site. A site capacity survey was completed by D.M. Wills on November 1, 2018 which resulted in an estimated remaining capacity of approximately 23,565 cubic metres (m³) and an approximate remaining life expectancy of 39 years.

A map illustrating the site features is provided as Figure 2.

1.3.1 Site Document Review

Pinchin reviewed the following report for the Site and are referenced within this document:

 Report entitled "2018 Annual Monitoring Report, Croft Waste Disposal Site, Magnetawan, Ontario" completed by D.M. Wills Associates Limited for the Corporation of the Municipality of Magnetawan dated March 2019 (the 2018 D.M. Wills Monitoring Report).



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A copy of this document can be obtained from the Client. Pinchin has relied on the information available in the previous environmental report reviewed for the Site as part of this assessment. Information reviewed within this report is referenced in pertinent sections throughout this document.

1.4 Monitoring and Reporting Program Objectives and Requirements

The site specific CofA for the Site was not provided to Pinchin for review at the time of this monitoring period. The monitoring and reporting completed by Pinchin has been generally developed based on the Ministry of Environment, Conservation and Parks (MECP) document entitled "*Monitoring and Reporting for Waste Disposal Sites Groundwater and Surface Water Technical Guidance Document*" dated November 2010, as well as the Client's request for 2019 monitoring and annual reporting.

1.5 Assumptions and Limitations

Pinchin has assumed that the information generated from historical investigations is accurate and has been completed in accordance with standard engineering practices and regulations. It should be noted that the historical background information made available to Pinchin by the Client was limited, and as such, previous reports have been relied on for information where required.

The scope of the monitoring activities was limited to the parameters listed in the 2018 D.M. Wills Monitoring Report for groundwater and surface water and was limited to the immediate area surrounding the Site. The investigations were limited solely to the groundwater within the monitoring well installations on-Site and the surface water surrounding the Site. The investigation does not constitute an exhaustive investigation of the Site property or adjacent properties for potentially unknown contaminants and/or other unknown sources of environmental impact.

Pinchin's limitation of liability and scope of work is as follows:

- The work performed in this report was carried out in accordance with the Terms and Conditions made part of our contract. The conclusions presented herein are based solely upon the scope of services and time and budgetary limitations described in our contract;
- The report has been prepared in accordance with generally accepted environmental study and/or engineering practices. No other warranties, either expressed or implied, are made as to the professional services provided under the terms of our contract and included in this report;
- The services performed and outlined in this report were based, in part, upon a previously installed monitoring network, established by others and approved by the applicable regulatory agencies. Our opinion cannot be extended to portions of the Site which were unavailable for direct observations, reasonably beyond the control of Pinchin;



- The objective of this report was to assess the water quality conditions at the Site, given the context of our contract, with respect to existing environmental regulations within the applicable jurisdiction;
- The Site history interpreted herein relies on information supplied by others, such as local, provincial and federal agencies, as well as Site personnel. No attempt has been made to independently verify the accuracy of such information, unless specifically noted in our report;
- Our interpretations relating to the landfill-derived leachate plume at the Site are described in this report. Where testing was performed, it was executed in accordance with our contract for these services. It should be noted that other compounds or materials not tested for may be present in the Site environment;
- The conclusions of this report are based, in part, on the information provided by others. The possibility remains that unexpected environmental conditions may be encountered at the Site in locations not specifically investigated. Should such an event occur, Pinchin must be notified in order that we may determine if modifications to our conclusions are necessary;
- The utilization of Pinchin's services during future monitoring at the Site will allow Pinchin to observe compliance with the conclusions and recommendations contained herein. It will also provide for changes as necessary to suit field conditions as they are encountered; and
- Any use which a third party makes of this report, or any reliance on or decisions to be made based on it, are the responsibility of such third parties. Pinchin accepts no responsibility for damages, if any, suffered by any third party as a result of decisions made or actions based on this report.

2.0 PHYSICAL SETTING

2.1 Geology and Hydrogeology

The Site is located in an area of low relief with numerous small shallow lakes and wetlands interspersed within forested lands dominated by black spruce and poplar. According to the 2018 D.M. Wills Report, the Ontario Geological Survey mapping indicates that the regional geology near the Site is dominated by Precambrian bedrock with local areas of very thin overburden and sand pockets. The underlying Precambrian bedrock is of gneissic composition with very little weathering and lies within the Ahmic Domain of the Central Gneiss Belt. According to the report, mapping indicates the presence of a



glaciocustrine sand deposit in the vicinity of the Site, as well as a historical sand pit that operated in the area which is likely where the landfill was developed.

The 2018 D.M. Wills Report indicates that to the north of the Site, bedrock outcrops at surface and rises gradually in elevation toward the north, defining a minor east-west trending ridge approximately 50 m north of the Site. To the east of the Site, the bedrock gradually dips southward from the east-west trending ridge. To the south and west of the Site, the shallow bedrock is inferred to define a minor northwest trending bedrock ridge. The report also indicates that the overburden in this area appeared to be thin and was composed of sandy silt till and sand.

Based on the borehole logs for the monitoring wells and drive points at the Site, the subsoil conditions beneath the Site consist of sand and sandy silt till overlying gneissic bedrock. Borehole logs for the monitoring wells on-Site are provided in Appendix II, with the exception of the borehole log for BH1. No other borehole logs were provided to Pinchin for review.

Static water levels were recorded by Pinchin in all of the accessible wells for each of the 2019 groundwater monitoring events. Water levels were measured prior to purging and developing in preparation for sampling, to ensure the water levels are representative of static conditions. Tables that summarize the spring and fall 2019 groundwater elevations, as measured by Pinchin personnel, are presented in Table 1 (all tables are provided in Appendix III).

In general, the static groundwater levels exist within 4 m of surface for most wells, with the deepest depth to water (3.20 metres below ground surface (mbgs)) recorded at BH8, located northwest of he Site, during the fall monitoring event. Groundwater movement at the Site has been established (by water level contouring), as being directed in a northerly direction, with the highest groundwater elevations recorded at BH1 and the lowest at BH9. In addition, there appears to be a radial influence on the groundwater table associated with the apparent groundwater mounding within the above grade waste deposits.

2.2 Surface Water Features

An unnamed tributary to Ahmic Lake is located to the south of the Site, where surface water monitoring location SW1 is located. Love Lake is located approximately 500 m northeast of the Site, where surface water monitoring location SW2 is located to monitor overland flow into the lake from the north side of the Site. A third surface water monitoring location, SW3, is situated in a pool of water along the northwest edge of the landfill footprint to characterize surface water run-off originating within the landfill footprint.



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2.3 Historical Data

Pinchin reviewed the 2018 D.M. Wills Annual Monitoring Report to evaluate historical data and groundwater and surface water quality conditions. No other water quality data from the existing monitoring well network was available to review as part of this monitoring program.

2.3.1 Historical Groundwater Data

The 2018 D.M. Wills Monitoring Report indicated that monitoring well BH1 was determined to be located upgradient of the waste deposits and has historically been used to monitor background water quality at the Site. Based on the results of the 2018 D.M. Wills Monitoring Report, minor leachate effects are present immediately downgradient of the landfill along the limit of waste as measured at wells BH10 and BH11. The report also indicated that well BH9 may also be experiencing minor leachate effects for multiple parameters (i.e., dissolved organic carbon (DOC), iron and manganese were in exceedance of the Guideline B-7 Criteria). The furthest downgradient well, BH8, was interpreted to be slightly affected by landfill leachate as elevated concentrations of DOC were identified in the fall of 2018. It was noted in the report that a significant distance to the downgradient (northern) property boundary exists to allow for natural attenuation of DOC.

The 2018 D.M. Wills Report also indicated that additional well installations were recommended to further characterize the groundwater at the Site; one cross-gradient well east of DP9, one downgradient monitoring well east-northeast of BH11 and one downgradient monitoring well directly north of the proposed limit of the waste.

2.3.2 Historical Surface Water Data

A review of the 2018 D.M. Wills Monitoring Report identified leachate effects at surface water locations SW1 and SW2. These effects were interpreted to be minor and to potentially be mostly attributed to naturally elevated parameters of iron, aluminum, phenols, total phosphorous and cobalt.

Additionally, the report indicated that the establishment of an additional surface water monitoring location was recommended. This monitoring location would be useful to characterize the surface water conditions at a hydraulically unconnected surface water body to determine whether the elevated parameter concentrations at SW1 and SW2 are a result of natural background influence or if there is an impact from the landfill leachate.



3.0 METHODOLOGY

3.1 Scope of Work

The objectives of the monitoring program as requested by the Client included the following scope of work:

- Mobilization to the Site during the spring and fall of 2019 and collection of groundwater and surface water samples from the existing well network and surface water monitoring locations;
- Submission of the groundwater and surface water samples to an accredited analytical laboratory for analysis of the chemical parameters outlined in the previous 2018 D.M.
 Wills Monitoring Report; and
- Preparation of a report outlining the 2019 field work completed and the analytical results, an evaluation of the results and any subsequent recommendations.

The investigation methodology was also conducted in general accordance with, and reference is made to, the following regulatory and guidance documents:

- MECP document entitled "*Guidance on Sampling and Analytical Methods for Use at Contaminated Sites in Ontario*", dated December 1996 (MECP Sampling Guideline);
- MECP document entitled "*Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act*", dated March 9, 2004 amended July 1, 2011 (Analytical Methods);
- Ontario Regulation 169/03 "Ontario Drinking Water Quality Standards" under the Safe Drinking Water Act", dated 2002;
- MECP document entitled "*Technical Support Document for Ontario Drinking Water Standards, Objectives and Guidelines*", dated June 2003 (ODWQS Guideline);
- MECP document entitled "Incorporation of the Reasonable Use Concept into MECPE Groundwater Management Activities, Guideline B-7 (formerly 15-08)" (Guideline B-7), dated April 1994;
- MECP document entitled "*Determination of Contaminant Limits and Attenuation Zones, Procedure B-7-1*", (formerly referenced by 15-08);
- Ontario Regulation 903 R.R.O. 1990 "Wells", under the Ontario Water Resources Act;
- MECP document entitled "*Water Management Policies Guidelines Provincial Water Quality Objectives*" (PWQO), dated July 1994, revised February 1999;



- MECP document entitled "*Rationale for the Development of Soil and Groundwater* Standards for Use at Contaminated Sites in Ontario" (Table 3.1 - Aquatic Protection Values) dated April 15, 2011; and
- Canadian Council of Ministers of the Environment (CCME) document entitled "Canadian Water Quality Guidelines" (Table 3-1 – Summary Guidelines for Freshwater Aquatic Life) dated November 2008.

3.2 Groundwater Monitoring Well Locations

Historically, the original groundwater monitoring well network for the Site was established in 2003 and consisted of seven shallow overburden wells (BH1, BH2, BH3, BH4, BH5, BH6 and BH7). Monitoring wells BH2, BH3, BH5, BH6 and BH7 were found to be destroyed, prior to 2016. Additional monitoring wells (BH8, BH9, BH10 and BH11) and drive point monitors (DP6, DP7, DP8 and DP9) were installed in June 2015 to replace the destroyed wells. In the spring of 2017, monitoring well BH4 and drive point monitor DP6 were also found to be destroyed due to landfilling operations at the Site.

The current groundwater monitoring well network at the Site consists of five overburden groundwater monitoring wells (BH1, BH8, BH9, BH10 and BH11) and three drive point monitors (DP7, DP8 and DP9). The locations of all the monitoring wells included in the current monitoring program are illustrated on Figure 2. Detailed locations with coordinates in NAD 83 and the available monitoring well elevations for top of casing are provided in Table 1.

All groundwater monitoring wells were sampled during the spring and fall 2019 sampling events, with the exception of DP8 in the spring and fall due to the well having insufficient volume to sample at the time of the monitoring events and DP9 in the spring and fall, as this drive point could not be located.

The following table presents a summary of the well construction details and respective on-Site positions of the groundwater monitoring network, based on the borehole logs provided in Appendix II. Construction details for monitoring well BH1 are unknown as Pinchin was not provided the borehole log for this well to review at the time of preparation of this report. All wells were inspected and found to be in good condition. No wells displayed evidence of a condition non-compliant with Ontario Regulation 903. A photographic log of all groundwater monitoring wells are provided in Appendix IV.



Well ID	Condition	Total Depth (mbgs)	Screened Interval (mbgs)	Screened Interval (masl)	Unit Screened
BH1	Good	Unknown			
BH8	Good	5.72	1.2 – 5.7	290.4 - 285.9	Gneissic bedrock
BH9	Good	3.89	0.8 - 3.9	288.4 – 285.6	Sand and Gneissic bedrock
BH10	Good	4.06	0.9 - 4.1	290.0 - 286.8	Sand and Gneissic bedrock
BH11	Good	4.39	0.9 - 4.4	289.9 – 286.4	Gneissic bedrock
DP7	Good	1.72	1.0 – 1.7	288.3 - 287.6	Sandy silt till
DP8	Good	1.41	0.7 – 1.4	289. 8 – 289.1	Sand
DP9	Could not locate	1.27	0.5 – 1.3	289.5 – 288.7	Sand

The following table illustrates the location of each of the monitoring wells with respect to its rationale in the annual monitoring program.

Monitoring Well ID	Location	Rationale
BH1	Southwest of the Site.	Background
BH8	Northwest of the Site.	Downgradient
BH9	Immediately northwest of the Site.	Downgradient
BH10	Immediately east of the Site.	Immediately Downgradient



Monitoring Well ID	Location	Rationale
BH11	Immediately northeast of the Site.	Immediately Downgradient
DP7	Northwest of the Site.	Downgradient
DP8	East of the Site.	Downgradient
DP9	East of the Site.	Downgradient

3.3 Surface Water Monitoring Locations

The Site has three historical points for surface water monitoring, SW1 through SW3. All surface water monitoring locations were monitored during the spring and fall 2019 sampling events. The following table illustrates the location of each of the surface water monitoring locations with respect to its rationale in the annual monitoring program.

Monitoring Well ID	Location	Rationale
SW1	Stream to the south of the Site, at culvert on west side of 25 th and 26 th Side Road North.	Upstream Monitoring Location
SW2	Love Lake, north of the Site.	Downstream Monitoring Location
SW3	Pool of water at northwest corner of the Site.	Source Monitoring Location

The locations of the surface water monitoring locations are illustrated on Figure 2. Details regarding the surface water monitoring locations are provided in Table 2. Photos of all surface water monitoring locations are provided in Appendix IV.

3.4 Monitoring Frequency

As per previous annual monitoring events, groundwater and surface water was sampled twice annually by Pinchin during 2019, in the spring and fall. Groundwater and surface water sampling events occurred on the following dates:

- Spring June 11 and 12, 2019; and
- Fall September 25, 2019.



3.5 Monitoring Parameters

3.5.1 Groundwater Monitoring Parameters

Groundwater samples were submitted for laboratory analysis of the parameters listed in the previous 2018 D.M. Wills Annual Water Quality Monitoring Report. At the time of sample collection, field readings for the parameters temperature, pH, conductivity, oxidation reduction potential (ORP) and dissolved oxygen (DO) were measured.

3.5.2 Surface Water Monitoring Parameters

Surface water samples were submitted for laboratory analysis of the parameters listed in in the previous 2018 D.M. Wills Annual Water Quality Monitoring Report. At the time of sample collection, field readings for the parameters temperature, pH, conductivity, ORP and DO were also measured in the surface water samples.

3.6 Monitoring Procedures and Methods

3.6.1 Standard Operating Procedures

The following Pinchin Standard Operating Procedures (SOPs) were followed by Pinchin field personnel for each portion of this project:

- Groundwater Sampling SOP; and
- Surface Water Sampling SOP.

All Pinchin monitoring SOPs have been developed in accordance with the MECP Sampling Document and are consistent with standard engineering practices.

3.6.2 Groundwater Monitoring Activities

To perform the groundwater monitoring activities, the following tasks were conducted:

- Pinchin notified the Client prior to field activities, and subsequently mobilized staff from the local Sudbury office to the Site to complete the sampling program;
- Static groundwater levels were collected using a Solinsttm water level tape. Measurements were collected from the top of riser pipe;
- During the monitoring events, groundwater from each monitoring well was purged prior to the collection of the sample, using a moderate-flow sample methodology via high-density polyethylene (HDPE) 3/8" tubing and a Waterratm inertial footvalve system. The HDPE system was chosen as an approved method to minimize sediment/particulate within each sample, and to minimize sample agitation and well trauma in accordance with the MECP Sampling Document. Pinchin purged a minimum of three well volumes to a maximum of six well volumes using the inertial pump system until the well volume column was



representative of the surrounding formation. During purging activities, additional groundwater monitoring parameters were collected from each monitoring well using a YSI-556 water quality meter for measurement of field parameters. Sample residual was disposed of onto the ground surface, on-site and up-gradient within the landfill confines;

- Groundwater samples were collected using the HDPE system in accordance with the MECP Sampling Document. Dissolved metals were field-filtered using a dedicated in-line 0.45 micron disposable filter. Upon completion of field sampling and monitoring activities, all samples collected were submitted to the project laboratory, AGAT Laboratories (AGAT) in Mississauga, Ontario. All parameters were analyzed by the project laboratory using MECP approved procedures and are consistent with the analytical methods prescribed in the Analytical Methods document; and
- The groundwater samples collected were analyzed at the project laboratory for the parameters listed in the D.M. Wills 2018 Monitoring Report. Groundwater sample results were compared to the applicable ODWQS as applied in accordance with the ODWQS Guideline document. Groundwater sample results were also compared to the reasonable usage parameters and were assessed using Guideline B-7 to establish and determine levels of contaminant discharges to the groundwater formation, which would be considered acceptable by the MECP from naturally attenuating landfill sites, with respect to human consumption and potable considerations.

3.6.3 Surface Water Monitoring Activities

To perform the surface water monitoring activities, the following tasks were conducted:

- Pinchin notified the Client prior to field activities, and subsequently mobilized staff from the local Sudbury office to the Site;
- All field activities at each monitoring location were initiated at down-stream locations working up-stream to avoid sediment disturbance and influencing sample integrity;
- Care was taken during collection of surface water samples to ensure that a
 representative sample was collected, and that underlying sediments were not disturbed.
 For the surface water samples only, no filtration was done (in accordance with MECP
 surface water sampling protocols). In the future, and as per previous monitoring events,
 the component of the samples identified for the analysis of aluminum should be field
 filtered;



- Surface water samples were collected during each sampling event using a direct grab sampling methodology in accordance with the MECP Sampling Document. Upon completion of field sampling and monitoring activities, all samples collected were submitted to AGAT. All parameters were analyzed by the project laboratory using MECP approved procedures and are consistent with the analytical methods prescribed in the Analytical Methods document;
- During sampling activities, surface water monitoring field parameters were collected at each surface water monitoring location using a YSI-556 water quality meter; and
- Surface water samples were analyzed during the monitoring event at the pre-determined monitoring locations for parameters listed in the 2018 D.M. Wills Monitoring Report.
 Sample results were compared to the applicable PWQO criteria.

3.6.4 Groundwater and Surface Water Field Measurements

Prior to sampling groundwater in the wells, Pinchin monitored groundwater depth using a Solinst[™] 30metre electronic water level meter. The water level tape is calibrated in 1.0 mm increments. Reproducibility of the depth measurements is generally within 2.0 mm or less.

Subsequent to groundwater depth measurement and during purging activities, additional groundwater monitoring parameters were collected from each monitoring well using a YSI-556 water quality meter for measurement of field parameters. Field parameters at each surface water monitoring location were also collected using the YSI-556. The following field parameters were measured during the 2019 monitoring program:

- *Dissolved Oxygen* (DO) refers to the relative quantity of oxygen molecules which are dissolved or carried within a quantity of water. Oxygen enters water as rooted aquatic plants and algae undergo photosynthesis, and as oxygen is transferred across an air and water interface. Oxygen's solubility in water is indirectly correlated with water's temperature, salinity and pressure. DO concentrations have a significant effect on groundwater quality by regulating the valence state of trace of metals and constraining the bacterial metabolism of dissolved organic species;
- Conductivity is the measurement of water's capacity to pass an electrical current. It is considered to be a reasonable indicator of ionic activity and dissolved solids concentration levels. It is affected by the presence of inorganic dissolved solids which carry a negative charge such as chloride, nitrate, sulfate and phosphate anions or a positive charge such as sodium, magnesium, calcium, iron, and aluminum cations. Organic compounds such as oil and phenol do no conduct an electrical current very well



and would therefore have low conductivity in water. Conductivity is also directly correlated to the water temperature. Specific conductivity is a measurement of conductivity values which have been compensated to 25°C;

- *pH* is a measure of water's acidic/basic properties on a logarithmic scale from 1 (strongly acidic) to 14 (strongly alkaline or basic). It determines the solubility and biological availability of chemical constituents such as nutrients and heavy metals. For example, in addition to affecting how much and what form of phosphorus is most abundant in the water, pH also determines whether aquatic life can use it. The degree to which heavy metals are soluble determines their toxicity. Metals tend to be more toxic at lower pH values because they are more soluble. Excessively high and low pHs can have serious environmental and health effects. A high pH may cause the release of iron, copper or lead into potable water, corrosion on water pipes and water using appliances and reduces the effectiveness of water disinfection with chlorine. Low pH values corrode substances such as metals and plastics. Fluctuations in groundwater pH values may be indicative of groundwater contamination;
- *Temperature;* has a dramatic influence on water quality. The rate of chemical reactions is generally correlated to temperature, which in turn affects the biological availability of nutrients within the water. As previously mentioned, oxygen's solubility in water is indirectly correlated with its temperature. Declining concentrations of oxygen within warming water is magnified by aquatic plants increasing metabolism as water temperature increases. Low concentrations of DO weaken aquatic plants resistance to disease, parasites and other pollutants; and
- Oxidation-reduction potential (ORP) characterizes the oxidation-reduction state of the water on a scale from approximately -300mV (strongly reducing) up to +500mV (strongly oxidizing). The primary application of ORP is recording significant changes in the redox potential which is observed when purging a stagnant water column in piezometer and replacing it with "fresh" groundwater.

Field parameter data collected at the groundwater and surface water monitoring locations are provided in Appendix III.



3.6.5 Record Keeping and Field Notes

Field notes were collected during the water quality monitoring events and recorded relevant observations including, but not limited to:

- Dates and time of work being completed;
- Instrumentation and instrument condition;
- Calibration methods and results;
- Field parameter measurements;
- Field personnel conducting the investigations;
- Field methods used;
- Sampling location identifications;
- Sampling equipment and condition;
- Sample identification (i.e., type, media, number of containers, etc.);
- Sample preparation methods (i.e., preservatives, filtration, etc.);
- Field QA/QC measurements;
- Field and sample identifiers;
- Anomalous conditions (i.e., damage to monitoring wells);
- Photographs of monitoring wells and monitoring stations;
- Weather conditions at the time of the monitoring events; and
- Field conditions.

All raw data and field notes are preserved and retained in Pinchin's custody.

3.7 Quality Assurance for Sampling and Analysis

Pinchin uses recognized industry standards, including the Canadian Council of Ministers of the Environment (CCME) *Subsurface Assessment Handbook for Contaminated Sites* and MECP's manual *Guidance on Sampling and Analytical Methods for Use at Contaminated Sites in Ontario* for conducting environmental assessments. For quality assurance, all work is supervised and internally reviewed by senior staff members. As such, various QA/QC protocols were followed during the water quality sampling events to ensure that representative samples were obtained and that representative analytical data were reported by the laboratory.



Field QA/QC protocols that were employed by Pinchin included the following:

- Clean, labelled and pre-preserved (when applicable) sample containers were provided by the laboratory;
- Water quality samples were placed in laboratory-supplied sample jars;
- The monitoring wells were purged to remove stagnant water prior to sample collection so that representative groundwater samples could be obtained. Dedicated purging and sampling equipment was used for monitoring well development, purging and sampling to minimize the potential for cross-contamination;
- All water quality samples were placed in coolers on ice immediately upon collection, with appropriate sample temperatures maintained prior submission to the laboratory;
- Dedicated and disposable Nitrile[™] gloves were used for all sample handling;
- All non-dedicated monitoring and sampling equipment (i.e., water level meter and YSI-556) was cleaned before initial use and between uses to minimize the potential for crosscontamination by washing with an Alconox[™]/potable water mixture followed by a deionized water rinse;
- Field duplicate groundwater and surface water samples were collected during the spring and fall sampling event (1 in 10); and
- Sample collection and handling procedures were performed in general accordance with the MECP Sampling Guideline.

The AGAT laboratory has an established QA/QC program and is a member of the Canadian Association for Laboratory Accreditation (CALA) and is accredited by the Standards Council of Canada (SCC) for specified environmental analyses. AGAT's internal laboratory QA/QC consisted of the analysis of laboratory duplicate, method blank, matrix spike and spiked blank samples, an evaluation of relative percent difference calculations for laboratory duplicate samples, and an evaluation of surrogate recoveries for the method blank, matrix spike and spiked blank samples.

3.8 Data Quality Evaluation

In order to provide confidence in the data obtained, a comprehensive QA/QC component was included in the monitoring program. The QA/QC procedures developed for this monitoring program are prepared in accordance with MECP Sampling Document, and in most cases, exceed the minimum requirements.

Water quality samples collected by Pinchin were generated in accordance with acceptable procedures. No analytical hold times were exceeded for samples submitted for analyses and sample temperatures upon receipt at the project laboratory were below 10° Celsius.



Relative per cent difference (RPD) values (the absolute difference between two values divided by the average value and expressed as a per cent) were calculated between the parent sample and the field duplicate as part of the QA/QC program. RPD results of sample and duplicate analyses that are less than 50 percent indicate an acceptable level of analytical uncertainty. RPD values calculated for measured analyte concentrations for sample and duplicate pairs that exceed 50 per cent generally warrant discussion because they may indicate the presence of elevated analytical uncertainty and a potential for making interpretive errors based on the analysis results. Use of calculated RPD values to assess analytical uncertainty when using measured analyte concentrations for sample duplicate pairs is not appropriate when either measured analyte concentration is within a multiple of 5 of the method detection limit (a value designated as the practical quantification limit (PQL)), where analytical uncertainty is typically elevated.

All field instrumentation calibration checks were completed by Pinchin field staff members prior to use on-Site. All field operations conducted by Pinchin field staff members were completed using standard equipment decontamination and sampling procedures, and no deviations from the sampling plan were noted.

4.0 ASSESSMENT, INTERPRETATION AND DISCUSSION

4.1 Groundwater Quality Monitoring

4.1.1 The Reasonable Use Criteria Assessment (RUC)

Guideline B-7, the "reasonable use concept" (RUC) approach, is the MECP's groundwater management strategy for mitigating the effect of contamination on properties adjacent to its source. It establishes procedures for determining the reasonable use of groundwater on a property adjacent to sources of contaminants and establishes limits on the discharge of contaminants from facilities which dispose of waste into the shallow subsurface.

The application of "reasonable use" is outlined in Procedure B-7-1 "*Determination of Contaminant Limits and Attenuation Zones*". The procedure determines the maximum concentration (Cm) of a particular contaminant that would be acceptable in the groundwater beneath an adjacent property and is calculated in accordance with the relationship:

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

 C_b – This is the background concentration of the particular groundwater contaminant in consideration before it has been affected by human activities. From this it is possible to calculate the extent of human activities impact on contaminant levels.



 C_r – In accordance with the Ontario Water Management Guideline, this is the maximum concentration of a particular contaminant that should be present in the groundwater. This value is dependent on property's use of the groundwater as outlined in B-7. It also allows for the total amount of contamination. Pinchin conservatively assumes that the reasonable use of the groundwater on-site is potentially for potable drinking purposes.

x - As determined by the MECP, this constant determines the extent which the contamination has on the groundwater's use. For drinking water x is 0.5 for non-health related parameters or 0.25 for health related parameters. For other reasonable uses it is 0.5.

Contamination concentrations which exceed C_m may have an appreciable effect on the use of an adjacent property and as such the Site should be managed in a manner to minimize environmental damage, or the operation should be modified. It is acceptable to modify the operation of the disposal site to meet the specified limits. However, if these limits are exceeded, all waste disposals, except for that done in conjunction with a reasonable plan for closure or with remedial activities, should be terminated until the specified limits have been met, or until monitoring data indicate that these limits will be met. Determination of the replacement of contaminated water supplies and the abatement of the contaminant plume must be made on a case-by-case basis in accordance of "*Resolution of Groundwater Quality Interference Problems*", Guideline B-9. For the purpose of evaluating compliance with respect to the RUC, Pinchin has compared the calculated C_m values versus the applicable downgradient compliance monitoring wells.

4.1.2 The Ontario Drinking Water Quality Standards (ODWQS)

Through the establishment of the ODWQS, the province of Ontario has determined legally enforceable standards on contaminants in drinking water. The standards are designed to protect public health by restricting the quality of specific contaminants in drinking water. Three categories of contaminates are regulated under the Ontario Regulation 169/03 Drinking Water Standards:

- Microbiological Originating from human and animals waste, coliforms and bacteria are common in the environment. Most are harmless however their presence may be indicative of other harmful bacteria in the water. Under the ODWQS, Escherichia coli ("E. Coli"), fecal coliforms and total coliforms must be non-detectable in drinking water;
- Chemical ODWQS regulates maximum quantities of organic and inorganic chemicals allowed in drinking water. Industrial discharges or agricultural runoff are not necessarily removed by drinking water treatment. Consuming water exhibiting a greater concentration of these chemicals than the ODWQS may cause serious health problems; and



Radiation – Natural and artificial radio nuclides are also regulated in the ODWQS.
 Standards are expressed as maximum allowable concentrations in becquerels per litre ("L"). Radiological contaminants include radio nuclides, such as radium 228, which are caused from the erosion of naturally occurring deposits, or artificial radio nuclides, such as tritium, released into the water by nuclear power plants. Radiological contaminants do not naturally occur within the study area and the disposal of radiological waste was not suspected in the Site and as a result radiation was not monitored for this study.

The ODWQS Guideline Document is the MECP technical guidance document which provides guidance on applicability of the ODWQS and also provides applicable interim guidelines where legal standards are absent. Both the ODWQS and Guideline B-7 were used in assessing the groundwater results obtained during the 2019 monitoring program.

4.2 Groundwater Results

The following discussion of parameters documents the groundwater quality in comparison to the calculated reasonable use criteria as per Guideline B-7. The reasonable criteria are MECP's groundwater management strategy for mitigating the effect of contamination on properties adjacent to its source. It establishes procedures for determining what constitutes the reasonable use of groundwater on a property adjacent to sources of contaminants and establishes limits on the discharge of contaminants from landfills which have a potential to migrate hydraulically downgradient and off-site and impair the current and future groundwater use at downgradient properties. To implement Guideline B-7, groundwater samples collected from downgradient monitoring wells have been compared to the calculated RUC values (C_m).

Monitoring well BH1 is located potentially hydraulically upgradient of the Site and has been used to estimate the background water quality coming onto the Site. An average of the historical results from BH1 has been applied as the source of background water quality for the Guideline B-7 calculations.

The analytical data for each well in comparison to the applicable regulatory criteria is provided in Tables 3 through 8. An evaluation of the RUC criteria in comparison to the downgradient compliance wells is provided in Tables 9 and 10 for the spring and fall events, respectively. Copies of the laboratory analytical reports are presented in Appendix V. The following is a breakdown of the water quality observed the monitoring well locations with comparison to the background quality and leachate being produced on-Site.



4.2.1 Background Water Quality Evaluation

Monitoring Well BH1

Background water quality observed southwest of the waste fill area at BH1 did not identify elevated levels of common landfill-related contaminant parameters such as conductivity, total dissolved solids (TDS), chloride, sulphate, calcium, sodium, potassium or nitrate. During the spring and fall sampling events, concentrations of hardness (low), alkalinity (low), dissolved organic carbon (DOC), iron, manganese, aluminum and turbidity were quantified above the recommended levels specified in the ODWQS. These parameters are either operational guidelines or aesthetic objectives for drinking water systems set by the ODWQS and are not considered to be a significant environmental concern originating from the Site.

4.2.2 Leachate Source Quality Evaluation

No groundwater monitoring wells in the existing monitoring well network are situated within the active landfill area to evaluate the source leachate quality.

4.2.3 Immediately Downgradient Water Quality Evaluation

Monitoring Well BH10

In comparison to background water quality, groundwater observed immediately east of the waste fill area at BH10 was observed to have higher concentrations of conductivity, alkalinity, TDS, chloride, sulphate, sodium, potassium and nitrate, indicating temperate impacts from the landfill, which is consistent with historical observations at this location. It is expected that the groundwater at this location is impacted with minor amounts of landfill leachate considering its close proximity to the active fill zone. Elevated hardness (high), alkalinity (high), TDS, DOC, nitrate, chloride, sodium, boron, turbidity and manganese concentrations were identified at BH10 that exceeded both the ODWQS and/or the Guideline B-7 criteria. Hardness, alkalinity, TDS, DOC, chloride, sodium, turbidity and manganese are either operational guidelines or aesthetic objectives for drinking water systems set by the ODWQS and are not considered to be a significant environmental concern originating from the Site. Furthermore, elevated concentrations of DOC, manganese and turbidity are also quantified at the background monitoring location and therefore are not considered to be landfill derived.

Nitrate (a health-related parameter) was quantified in the fall at BH10 to be in exceedance of both the ODWQS and the Guideline B-7. Concentrations of nitrate observed at this location fluctuate considerably throughout the historical monitoring record; therefore, these concentrations should be confirmed during the next sampling event. Boron (a health-related parameter) was quantified to be in exceedance of the Guideline B-7 criteria during the fall of 2019 at BH10. This concentration is consistent with the historical monitoring record at this location.



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Monitoring Well BH11

In comparison to background water quality, groundwater observed immediately northeast of the Site at BH11 was observed to have higher concentrations of conductivity, alkalinity, TDS, chloride, sulphate, sodium, potassium and nitrate, indicating temperate impacts from the landfill, which is consistent with historical observations at this location. It is expected that the groundwater at this location is impacted with minor amounts of landfill leachate considering its close proximity to the active fill zone. Elevated hardness (high), alkalinity (high), TDS, DOC, nitrate, chloride, sodium, boron, turbidity, manganese, iron and aluminum concentrations were identified at BH11 that exceeded both the ODWQS and/or the Guideline B-7 criteria. Hardness, alkalinity, TDS, DOC, chloride, sodium, turbidity, manganese, iron and aluminum are either operational guidelines or aesthetic objectives for drinking water systems set by the ODWQS and is not considered to be a significant environmental concern originating from the Site. Furthermore, elevated concentrations of DOC, iron, manganese, aluminum and turbidity are also quantified at the background monitoring location and therefore are not considered to be landfill derived.

Nitrate (a health-related parameter) was quantified in the fall at BH11 to be in exceedance of both the ODWQS and the Guideline B-7. Concentrations of nitrate observed at this location fluctuate considerably throughout the historical monitoring record; therefore, these concentrations should be confirmed during the next sampling event. Boron (a health-related parameter) was quantified to be in exceedance of the Guideline B-7 criteria during the spring and fall of 2019 at BH11. This concentration is consistent with the historical monitoring record at this location.

4.2.4 Downgradient Water Quality Evaluation

Monitoring Well BH8

In comparison to background water quality, groundwater observed northwest of the Site was observed to have generally similar concentrations of conductivity, alkalinity, TDS, nitrate, chloride, sulphate, calcium, sodium and potassium, indicating little to no impacts from the landfill, which is consistent with historical observations at this location. It is interpreted that natural attenuation of the landfill leachate is occurring with distance from the active fill zone. Elevated hardness (low), alkalinity (low), turbidity and aluminum concentrations were identified at BH8 that exceeded the ODWQS. Concentrations of alkalinity (low) quantified during the spring and fall of 2019 exceeded the Guideline B-7 criteria. These parameters are either operational guidelines or aesthetic objectives for drinking water systems set by the ODWQS and are not considered to be a significant environmental concern originating from the Site. Furthermore, elevated concentrations of all of these parameters are also quantified at the background monitoring location and therefore are not considered to be landfill derived.



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Monitoring Well BH9

In comparison to background water quality, groundwater observed northwest of the Site at BH9 was observed to have slightly higher concentrations of conductivity, alkalinity, TDS, chloride, sulphate, calcium, sodium and potassium, indicating minor impacts from the landfill, which is consistent with historical observations at this location. These elevated concentrations are also observed to attenuate to concentrations similar to background conditions at the further downgradient monitoring location, BH8. Elevated hardness (high), DOC, manganese, iron, aluminum and turbidity concentrations were identified at BH9 that exceeded the ODWQS. The concentration of TDS quantified during the fall of 2019 exceeded the Guideline B-7 criteria. These parameters are either operational guidelines or aesthetic objectives for drinking water systems set by the ODWQS and are not considered to be a significant environmental concern originating from the Site. Furthermore, elevated concentrations of these parameters (with the exception of high hardness) are also quantified at the background monitoring location and therefore are not considered to be landfill derived.

Drive Point Monitor DP7

In comparison to background water quality, groundwater observed furthest downgradient to the northwest of the Site at DP7 was observed to have generally similar concentrations of conductivity, alkalinity, TDS, nitrate, chloride, sulphate, calcium, sodium and potassium, indicating little to no impacts from the landfill. It is interpreted that natural attenuation of the landfill leachate is occurring with distance from the active fill zone. Elevated pH (low), hardness (low), alkalinity (low) and DOC concentrations were identified at DP7 that exceeded the ODWQS. Concentrations of alkalinity (low) quantified during the spring at DP7 were in exceedance of the Guideline B-7 criteria. These parameters are either operational guidelines or aesthetic objectives for drinking water systems set by the ODWQS and are not considered to be a significant environmental concern originating from the Site. Furthermore, elevated concentrations of all of these parameters (with the exception of low pH) are also quantified at the background monitoring location and therefore are not considered to be landfill derived.

Drive Point Monitor DP8

Drive point monitoring location DP8, located east of the Site, was observed to have insufficient groundwater volume to sample at the time of sampling for both the spring and fall 2019 monitoring events.

Drive Point Monitor DP9

Drive point monitoring location DP9, located east of the Site, could not be located during the spring and fall 2019 monitoring events.



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4.3 Groundwater Trend Analysis

A hydrograph was developed to identify any changes in the historical and current groundwater elevation data over time for each of the wells. A series of time versus concentration graphs were also developed to evaluate the concentrations of several select landfill indicator parameters (including alkalinity, chloride, dissolved organic carbon, pH, total dissolved solids, nitrate, aluminum and copper) at each monitoring well for the Site. Current and historical groundwater quality data was utilized to identify any apparent trends or inconsistencies in the water quality within the monitoring well network. The trend analysis graphs are provided in Appendix VI.

The groundwater elevations displayed on the hydrograph indicate generally stable elevations with respect to time at all monitoring well locations, with the exception of BH8 which produced a water elevation lower than the historical record during the fall of 2019. This groundwater elevation should be confirmed during the next fall sampling event.

In general, the landfill indicator parameters are demonstrating fairly stable trends with respect to time at all monitoring well locations, with some exceptions. Concentrations of alkalinity are generally stable, with all concentrations quantified outside of the ODWQS limits except for BH9 and BH11 which are within the limits; Alkalinity concentrations at BH10 are demonstrating a trend decreasing to levels within the limits. Chloride concentrations are generally low and stable, with the exception of BH11 which has high concentrations and does not demonstrate an apparent trend. Concentrations of DOC, pH and TDS are both stable except for well BH11 which is demonstrating an increasing trend for these parameters. TDS concentrations at BH9 have also been demonstrating a slightly decreasing trend. Concentrations of nitrate are generally stable, with the exception of BH10 and BH11 which is demonstrating any apparent trends. Aluminum concentrations are stable with the exception of BH1 which is demonstrating an increasing trend. Additionally, aluminum concentrations at BH11 appear to confirm that the 2017 concentrations at this location are anomalous. Copper concentrations are generally not stable, with BH11 demonstrating an increasing trend.

Concentrations of chloride and TDS quantified at BH10 and nitrate at BH10 and BH11 in the fall of 2019 were significantly higher than the historical record at these locations. These anomalous concentrations should be confirmed during the next sampling events.

Further monitoring investigations are required in order to confirm the trends observed during this monitoring period.



4.4 Groundwater Field Measurement Results

On June 11/12 and September 25, 2019 Pinchin collected groundwater monitoring parameters from each of the well locations using a YSI-556 water quality meter for measurement of field parameters. The field parameter measurements are provided in Tables 3 through 8.

A review of the field parameters for the project identified no significant concerns in the water quality during the monitoring events. The water quality at the Site monitoring locations did not change significantly between each of the monitoring locations and the measured field parameters were within the normal variability associated with shallow groundwater monitoring systems, with the exception of wells BH10 and BH11 which were observed to have higher conductivity measurements which is an indicator of stagnant anaerobic conditions and possibly impact from leachate generated from the landfill.

4.5 Surface Water Quality Monitoring

4.5.1 The Provincial Water Quality Objectives (PWQO)

The PWQO are numerical and narrative criteria which serve as chemical and physical indicators representing satisfactory levels for surface water and groundwater where it discharges to the surface. The PWQO are levels which are protective of the water quality for all forms of aquatic life during their indefinite exposures to the water. The PWQO levels include protection for anthropogenic recreational water uses where there is a high potential of exposure and are based on public health and aesthetic considerations.

In general, the PWQO stated that the surface water quality of a water body shall be "free from contaminating levels of substances and materials attributable to human activities which in themselves, or in combination with other factors can: settle to form objectionable deposits; float as debris or scum or oil or other matter to form nuisances; product objectionable colour, odour, taste, or turbidity; injure, are toxic to, or produce adverse physiological or behavioural responses in humans, animals, or plants; or enhance the production of undesirable aquatic life or result in the dominance of nuisance species".

4.5.2 Aquatic Protection Values (APV)

Under Ontario Regulation 153/04, the MECP have developed APVs to protect aquatic organisms exposed to contaminants from migration of contaminated groundwater to surface water. Protection of aquatic biota from migration of contaminants by overland flow is provided by a Site being designated an environmentally sensitive area if the property includes or is adjacent to a water body or includes land that is within 30 m of a water body.

APVs are designed to provide a scientifically defensible and reasonably conservative level of protection for most aquatic organisms from the migration of contaminated groundwater to surface water resources.



4.5.3 Canadian Water Quality Guidelines (CWQG)

The CWQG were developed by the Canadian Council of Resources and Environment, to provide basic scientific information about the effects of water quality parameters on uses in order to assess water quality issues and concerns and to establish water quality objectives for specific sites. The guidelines contain recommendations for chemical, physical, radiological and biological parameters necessary to protect and enhance designated uses of water. They apply only to inland surface waters and groundwater, and not to estuarine and marine waterbodies. The rationale for each parameter is included to assist in the development of water quality objectives to suit local water conditions.

4.6 Surface Water Results

Pinchin collected surface water samples from all surface water monitoring locations during the spring and fall monitoring events in 2019. Surface water samples were collected to monitor the surface water for contaminants of concern as a compliance requirement. A summary of water quality monitoring data relative to the regulatory standards is presented in the attached Tables 11 through 13. Copies of the laboratory analytical reports are presented in Appendix V.

Surface water monitoring location SW1, located within the creek to the south of the Site at the culvert on 25th and 26th Side Road, is considered representative of background water quality conditions and is characterized by naturally elevated concentrations of pH (low), phenols, iron, total phosphorous, aluminum and cobalt. These parameter concentrations exceeded the PWQO and/or the CWQG during the 2019 sampling events, which is consistent with the observations at this location throughout the historical monitoring record. Additional PWQO exceedances were quantified for zinc during the spring and fall 2019 monitoring events and an additional CWQG was quantified for chloride during the spring event. These zinc and chloride concentrations are not consistent with the historical observations and are therefore interpreted to be anomalous. This interpretation should be confirmed during the next sampling event. Exceedances of the APV were quantified at this location for potassium.

Surface water monitoring location SW3, located in the pool of water at the northwest edge of the waste deposits, is considered to be representative of source surface water quality at the Site. Minor leachate impacts are observed at this location, with PWQO and/or APV and/or CWQG exceedances quantified in 2019 for potassium, nitrite, phenols, iron, total phosphorous, aluminum, lead, cobalt, boron and copper. These impacts are interpreted to improve with distance from the landfill, as lower concentrations are quantified at the downgradient monitoring location, SW2. PWQO and/or APV and/or CWQG exceedances at downgradient surface water monitoring location SW2 include pH (low), potassium, phenols, iron, total phosphorous, aluminum and cobalt. These elevated concentrations are not interpreted to be landfill derived as PWQO exceedances of these parameters were also quantified at the background monitoring location (SW1) indicating that they are naturally elevated.



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4.7 Surface Water Trend Analysis

A series of time versus concentration graphs were developed to evaluate the concentrations of several select landfill indicator parameters (including alkalinity, chloride, dissolved organic carbon, pH, total dissolved solids, nitrate, aluminum and copper) at each surface water monitoring location for the Site. Current and historical surface water quality data was utilized to identify any apparent trends or inconsistencies in the water quality at the Site. The time versus concentration graphs are provided in Appendix VII.

In general, the landfill indicator parameters are demonstrating stable trends with respect to time at all surface water monitoring locations, with some exceptions. Concentrations of alkalinity, DOC, TDS and nitrate are generally stable except for SW3 which has demonstrated a deceasing trend for each of these parameters since 2017. Concentrations of chloride are increasing at SW1, but decreasing at SW3. The elevated spring 2019 chloride concentration at SW1 appears to be anomalous and should be confirmed during future sampling events. Concentrations of pH are demonstrating slightly decreasing trends at all surface water monitoring locations, with SW1 and SW2 consistently below the PWQO range. Concentrations of aluminum are generally stable at SW3, but are demonstrating increasing trends at SW1 and SW2 since 2017.

Further monitoring investigations are required in order to confirm the trends observed during this monitoring period.

4.8 Surface Water Field Measurement Results

On June 11/12 and September 25, 2019, Pinchin collected surface water monitoring parameters from each surface water monitoring location using a YSI-556 water quality meter for real-time in-situ measurement of field parameters. The field parameter measurements are provided in Tables 11 through 13.

A review of the field parameters for the project identified no significant concerns in the water quality during the monitoring event. The quality at the surface water monitoring locations did not change significantly between each of the monitoring locations, with the exception of low pH measurements at SW1 and SW2. Surface water flow measurements were not obtained.

4.9 Groundwater Flow Interpretation

The hydraulic flow vector was historically estimated to range to the north. The groundwater flow direction may be influenced by seasonal variations in the amount of precipitation, by aquifer heterogeneity and the deposited fill material at the Site. Groundwater level trends indicate seasonal fluctuations in the depth to groundwater which is consistent with seasonal fluctuations in precipitation events. The depth to groundwater measurement results are presented in Table 1.



During the spring monitoring event on June 11 and 12, 2019, the depth to groundwater was observed to range from 0.07 metres above the ground surface at BH10 to 1.76 mbgs at BH8. During the fall monitoring event on September 25, 2019, the depth to groundwater was observed to range from 0.21 mbgs at DP8 to 3.20 mbgs at BH8.

Accurate triangulation of the water table elevations was undertaken for the 2019 sampling events using the available monitoring well system and the survey elevation data provided by the Client. The inferred groundwater contours for both the spring and fall events are presented on Figures 3 and 4, respectively. The presentation of the groundwater contours and the associated inferred groundwater flow direction for the 2019 sampling events, as illustrated on Figures 3 and 4, indicates that groundwater flows radially at the Site, directed towards the west, north and east.

4.10 Leachate Characterization

The Site is an operating landfill with minor operational or maintenance being overseen by the Client. The Site does not have a leachate collection system whereby leachate quality monitoring and characterization is being completed. Currently, there is no groundwater monitoring well included in the existing monitoring well network at the Site that is situated within the active landfill area or which is considered representative of source leachate water quality. Therefore, leachate at the Site cannot be characterized at the time of preparation of this report.

4.11 Contaminant Attenuation Zone

A Contaminant Attenuation Zone (CAZ) has not been established for the Site. However, it should be noted that based on the current observed water quality data, landfill derived leachate impacts appear to attenuate prior to the property boundary. Future investigations should involve the development of a CAZ for this Site.

4.12 Adequacy of the Monitoring Program

At this time there is currently no formal monitoring program for the Site. Pinchin recommends continuation of sampling the groundwater and surface water two times per year (spring and fall) to establish any notable trends or impacts emanating from the landfill. The results of inspection and monitoring will be reported annually to the MECP. After that time, and with the establishment of baseline data/source data leachate concentrations, a review of all data will then be used to establish the expected level of impact and the need and scope for long term monitoring.

During these sampling and reporting events, it is recommended that the monitoring well network be evaluated for adequacy and determine if there is a need for additional monitoring locations.



4.12.1 Monitoring Well Network Efficiency

Pinchin concludes that the current groundwater monitoring well network is not considered adequate for evaluating the Croft Waste Disposal Site geological and hydrogeological characteristics immediately to the north of the landfill (for evaluating downgradient groundwater quality migrating from the Site). As there are currently no groundwater monitoring wells situated directly north of the Site, it is recommended that a new monitoring well be installed to evaluate downgradient water quality in this direction. Additionally, due to the high concentrations of landfill indicator parameters quantified at the eastern downgradient monitoring locations, it is recommended that an additional well be installed further downgradient in the east to evaluate the extent of the leachate impacts closer to the property boundary.

The groundwater quality observed in monitoring well BH1 appears to have minor derived impacts and as such, has been used within this report for assessing the Site's water quality data to Guideline B-7 RUC (i.e., background well).

4.12.2 Background Monitoring Well Efficiency

Based on a review of the groundwater contaminant data from BH1, as well as the assumed groundwater flow direction, monitoring well BH1 has been identified as a best-case background location. A review of the dataset (as provided on Table 3) from BH1 did not identify elevated levels of common landfill-related contaminant parameters, with the exception of hardness and alkalinity which are naturally lower than the ODWQS and DOC which is naturally elevated. At this time, monitoring well BH1 is considered adequate for monitoring background groundwater quality.

4.13 Supplemental Monitoring: Sediment, Benthic and/or Toxicity Monitoring

No supplemental monitoring was completed as part of the 2019 monitoring program completed by Pinchin.

4.14 Assessment of the Need for Implementation of Contingency Measures

There are currently no set trigger levels designed for the Site. At this time Pinchin does not recommend any need or implementation for contingency measures.

4.15 Waste Disposal Site Gas Impacts

At this time no evidence has been documented to suggest that methane gas generation from the Site is a significant concern.



4.16 Effectiveness of Engineered Controls

With the exception of the intermittent landfill cover, there are no operational engineered controls in effect at the Site. The Client should continue to maintain the integrity of the landfill cover as per the CofA. Annual monitoring and inspections should continue to be completed to ensure regular maintenance is occurring on an as needed basis. At the time of the 2019 monitoring events no significant damage or concerns were noted.

4.17 Control Systems Monitoring

Environmental control systems are designed, constructed, and utilized at some waste disposal sites to reduce or increase an environmental variable to an acceptable level, or to maintain an environmental variable within an acceptable range, in order to prevent a negative environmental outcome. Certain environmental control systems such as a leachate collection system or a methane gas collection system can provide the basis for operator intervention to bring about or maintain a desired condition to operate the landfill. The Site does not currently operate any control systems; therefore no control system monitoring was completed as part of the 2019 monitoring program.

4.18 QA/QC Results

In order to provide confidence in the data obtained, a comprehensive QA/QC component was included in the monitoring program. The QA/QC procedures developed for this monitoring program are prepared in accordance with MECP Sampling Document, and in most cases, exceed the minimum requirements.

Water quality samples collected by Pinchin were generated in accordance with acceptable procedures. No analytical hold times were exceeded for samples submitted for analyses and sample temperatures upon receipt at the project laboratory were below 10° Celsius.

Two groundwater duplicate sample pairs and one surface water duplicate sample pair were collected from the Site during the spring and fall sampling events and submitted for laboratory analysis of the full suite of analytical parameters. Al duplicate data for 2019 are provided in Tables 14 and 15 for groundwater and surface water, respectively.



The following table summarizes the duplicate pairs for 2019:

Sampling Event	Duplicate Sample ID	Original Sample ID
Spring 2019	GW DUP	BH9
	SW DUP	SW1
	GW DUP	BH11
Fail 2019	SW DUP	SW2

The calculated RPDs for the original and field duplicate groundwater sample has been compared to the performance standards considered acceptable by Pinchin (i.e., 50%). Each of the calculated RPDs met the corresponding performance standard, with the exception of total suspended solids for the fall groundwater duplicate and turbidity for the spring surface water duplicate.

Upon review of the QA/QC results for spring and fall sampling programs, Pinchin has not identified any significant concerns that would warrant the invalidation of any of the field or laboratory data, therefore considers the data generated as part of this program to be reliable.

The analytical laboratory employed to perform the laboratory analyses (AGAT) is accredited by the Standards Council of Canada/Canadian Association for Laboratory Accreditation in accordance with ISO/IEC 17025:1999 – "*General Requirements for the Competence of Testing and Calibration Laboratories*" for the tested parameters and has met the standards for proficiency testing developed by the Standards Council of Canada for parameters set out in the Soil, Ground Water and Sediment Standards.

Sample analysis dates provided on the laboratory analytical reports issued by AGAT indicate that all sample analyses were performed within the required sample/extract hold times, as indicated by the dates presented in columns for each sample parameter on the analytical report. The laboratory minimum detection limits were reported to be at or lower than the required MECP reporting detection limits for the parameters analyzed. A comparison of the internal laboratory duplicate samples indicates that all samples and the respective duplicates are within acceptable limits.



5.0 CONCLUSIONS

Based on the work completed, the following is a summary of the activities and findings of the 2019 water quality monitoring program:

- Groundwater samples were collected from all monitoring wells at the Site on June 11/12 and September 25, 2019, with the exception of DP8 in the spring and fall due to the drive point well having an insufficient sample volume at the time of sampling and DP9 during the spring and fall as the drive point monitor could not be located during the sampling events. All groundwater samples were submitted for laboratory analysis of parameters identified in the 2018 D.M. Wills Annual Monitoring Report. The groundwater quality was assessed based on the ODWQS and Guideline B-7;
- Surface water samples were collected from all monitoring locations on June 11/12 and September 25, 2019 and were submitted for laboratory analysis of parameters identified in the 2018 D.M. Wills Annual Monitoring Report. Surface water quality was assessed based on the PWQO;
- During the spring monitoring event on June 11 and 12, 2019, the depth to groundwater was observed to range from 0.07 metres above the ground surface at BH10 to 1.76 mbgs at BH8. During the fall monitoring event on September 25, 2019, the depth to groundwater was observed to range from 0.21 mbgs at DP8 to 3.20 mbgs at BH8. Groundwater flow at the Site is interpreted to flow radially, directed towards the west, north and east;
- All reported concentrations in the groundwater samples submitted for analysis satisfied the respective ODWQS parameters with the exception the following:
 - Hardness (high) at BH9, BH10 and BH11;
 - Hardness (low) at BH1, BH8 and DP7;
 - Nitrate at BH10 and BH11;
 - Chloride at BH10;
 - DOC at BH1, BH9, BH10, BH11 and DP7;
 - Manganese at BH1, BH9, BH10 and BH11;
 - Turbidity at BH1, BH8, BH9, BH10 and BH11;
 - Iron at BH1, BH9 and BH11;
 - Aluminum at BH1, BH8, BH9 and BH11;
 - Alkalinity (high) at BH10;


- Alkalinity (low) at BH1, BH8 and DP7;
- TDS at BH10 and BH11; and
- pH (low) at DP7.
- All reported concentrations in the groundwater samples collected from the downgradient monitoring wells met the applicable Guideline B-7 criteria for all parameters analyzed, with the exception of the following:
 - TDS at BH9, BH10 and BH11;
 - Nitrate at BH10 and BH11;
 - Chloride at BH10 and BH11;
 - Sodium at BH10 and BH11;
 - Boron at BH10 and BH11;
 - Alkalinity (low) at BH8; and
 - Alkalinity (high) at BH10 and BH11.
- All reported concentrations in the surface water samples submitted for analysis satisfied the respective PWQO, APV and/or CWQG parameters, with the exception of the following:
 - pH (low) at SW1 and SW2;
 - Chloride at SW1;
 - Potassium at all locations;
 - Phenols at all locations;
 - Iron at all locations;
 - Aluminum at all locations;
 - Cobalt at all locations;
 - Total phosphorous at all locations;
 - Zinc at SW1;
 - Nitrite at SW3;
 - Lead at SW3;
 - Copper at SW3; and
 - Boron at SW3.



Based on the results obtained from the existing groundwater monitoring wells and surface water monitoring locations, Pinchin has not identified any significant landfill related impacts at the Site. Concentrations of TDS and alkalinity (low) parameters within the groundwater samples analyzed at the furthest downgradient monitoring locations (i.e., BH8 and BH9) are likely attributed to either naturally occurring conditions within the shallow unconfined aquifer on-site or from temperate impacts from leachate sourced from the waste deposits at the Site. All exceedances of the Guideline B-7 RUC are related to operational guidelines and/or aesthetic objectives associated with drinking water systems set by the ODWQS and are not considered to be an immediate significant human health or environmental concern originating from the Site, with the exception of nitrate which is a health-related parameter. The elevated concentrations of nitrate and boron are only quantified in the eastern downgradient wells which are located in close proximity to the waste deposits. These concentrations are interpreted to attenuate with further distance from the Site.

6.0 **RECOMMENDATIONS**

Based on a review of the existing dataset and regulatory requirements to date, Pinchin recommends the following:

- Continue with routine monitoring of all the available groundwater monitoring wells and surface water monitoring locations. Groundwater and surface water monitoring shall be completed with analyses for the parameters identified in the historical monitoring record. It is recommended that groundwater and surface water monitoring be completed during the spring and late fall to generate a baseline data set, to evaluate trends, and to determine the need and scope of a long-term monitoring program for the Site. Considering the dataset completed thus far, it is Pinchin's opinion that sampling should continue in 2020 before the adequacy of the monitoring program can be fully evaluated;
- As there are currently no downgradient groundwater monitoring wells situated directly north of the Site, it is recommended that a new monitoring well be installed to evaluate downgradient water quality in this direction;
- Due to the high concentrations of landfill indicator parameters quantified at the eastern downgradient monitoring locations (i.e., BH10 and BH11), it is recommended that an additional well be installed further downgradient in the east to evaluate the extent of the leachate impacts closer to the property boundary;
- The Client should continue to ensure that the requirements as specified in the CofA are complied with; and



• A contaminant attenuation zone (CAZ) should be developed and defined for the Site in order to effectively apply the RUC Guideline B-7 and confirm the downgradient leachate impacts of elevated nitrate concentrations.

7.0 MONITORING AND SCREENING CHECKLIST

In accordance with the MECP Landfill Standards, the Monitoring and Screening Checklist for the Site completed by the Pinchin CEP is completed and provided in Appendix VIII.

8.0 DISCLAIMER

This Water Quality Monitoring Program was performed for the Corporation of the Municipality of Magnetawan (Client) in order to investigate the environmental condition of the groundwater and surface water at the Croft Waste Disposal Site (Site). The term recognized environmental condition means the presence or likely presence of any hazardous substance on a property under conditions that indicate an existing release, past release, or a material threat of a release of a hazardous substance into structures on the property or into the ground, groundwater, or surface water of the property. This Water Quality Monitoring Program does not quantify the extent of the extent of the current and/or recognized environmental condition or the cost of any remediation.

Conclusions derived are specific to the immediate area of study and cannot be extrapolated extensively away from sample locations. Samples have been analyzed for a limited number of contaminants that are expected to be present at the Site, and the absence of information relating to a specific contaminant does not indicate that it is not present.

No environmental site assessment can wholly eliminate uncertainty regarding the potential for recognized environmental conditions on a property. Performance of this Water Quality Monitoring Program to the standards established by Pinchin is intended to reduce, but not eliminate, uncertainty regarding the potential for recognized environmental conditions on the Site and recognizes reasonable limits on time and cost.

This Water Quality Monitoring Program was performed in general compliance with currently acceptable practices for environmental site investigations, and specific Client requests, as applicable to this Site.

This report was prepared for the exclusive use of the Client, subject to the conditions and limitations contained within the duly authorized work plan. Any use which a third party makes of this report, or any reliance on or decisions to be made based on it, are the responsibility of the third parties. If additional parties require reliance on this report, written authorization from Pinchin will be required. Pinchin disclaims responsibility of consequential financial effects on transactions or property values, or



requirements for follow-up actions and costs. No other warranties are implied or expressed. Furthermore, this report should not be construed as legal advice.

Pinchin will not be responsible for any consequential or indirect damages. Pinchin will only be held liable for damages resulting from the negligence of Pinchin. Pinchin will not be liable for any losses or damage if the Client has failed, within a period of two years following the date upon which the claim is discovered within the meaning of the Limitations Act, 2002 (Ontario), to commence legal proceedings against Pinchin to recover such losses or damage.

Pinchin makes no other representations whatsoever, including those concerning the legal significance of its findings, or as to other legal matters touched on in this report, including, but not limited to, ownership of any property, or the application of any law to the facts set forth herein. With respect to regulatory compliance issues, regulatory statutes are subject to interpretation and these interpretations may change over time.

APPENDIX I Figures









APPENDIX II Borehole Logs

BOREH	IOLE LOG	PROJECT	603	3643	4		B	BOR	EH	HOLE: DP7 1 of 1 June 9, 2015 ED BY TLC/SRB				
Subsurface Croft Land Client: To	Investigation Ifill wwnship of Magnetawan	Northing: Easting: Methodolog Contractor:	y: F	Iand .	N/A N/A Auge N/A	4 4 * *		DAT LOG GRO	E: GE	Ju D B D E	ne 9, Y LEV	2015 TLC 289.	:/SRB 30 m	ASL
DEPTH (m) (mASL)	STRATIGRAPHIC D	ESCRIPTION	MONITOR DETAILS & NUMBER	NUMBER	TYPE	N VALUE	% WATER	% REC	% RQD	RE	CO\ (%	/ERY	F	2QD (%)
0.3 289.0 0.5 288.8 1 1.7 287.6	TOPSOIL Dark brown to black, silty topsoil, tr occasional rootlets, moist becoming i 0.2 m. SAND Brown to grey fine to medium sand, silt, saturated. -Changing to a silty fine sand with o and cobles below about 0.4 m. SANDY SILT TILL Brown to grey silty sand to sandy sil observed, trace fine gravel, moist to -Hand auger refusal in dense till at a Borehole teminated at 1.72 m in assupoint refusal on assumed bedrock.	ace to some sand, saturated below about trace fine gravel, trace ccasional fine gravel t till, brown oxidation wet, dense. bout 0.8 m amed till due to drive			GS									

Printed: Jan 15, 16 File Location:



BOREHO	DLE LOG	PROJECT:	603	3643	i434BOREHOLE: DP81 of 1N/ADATE: June 9, 2015N/ALOGGED BYTLC/SRBN/AGROUND ELEY290.54 m ASL										
Subsurface In Croft Landfi Client: Tow	nvestigation 11 ⁄nship of Magnetawan	Northing: Easting: Methodolog Contractor:	N/A N/A gy: Hand Auger N/A BATE: June 9, 2015 LOGGED BY TLC/SRB GROUND ELEV 290.54 m ASL										L		
DEPTH (m) (mASL)	STRATIGRAPHIC DE	SCRIPTION	MONITOR DETAILS & NUMBER	IUMBER	YPE 6	NALUE WY	MATER H	REC	RQD	REC	COV (%)	ERY)	F	₹QI (%))
1.4 1.4 1.4 1.4 1.4 1.4 1.4 1.4	TOPSOIL Dark brown to black, silty topsoil, trac occasional rootlets, moist. SAND Brown to grey fine to medium sand, tr silt, wet. -Becoming saturated below about 0.4 -Changing to a silty fine sand with trad about 0.5 m. -Hand auger refusal in dense soil at ab Borehole teminated at 1.41 m in assur drive point refusal on assumed bedroc	ee to some sand, ace fine gravel, trace m. ce fine gravel below bout 0.9 m med silty sand due to k.				N	9/9	9/0	90	25		5100	25 5		
Printed: Ja	an 15, 16								-						2/

.

BOREH	OLE LOG	PROJECT:	603	36434			BOREHOLE: DP9 1 of 1 DATE: June 9, 2015 LOGGED BY TLC/SRB GROUND ELEV 289.97 m ASL E B B RECOVERY RQD						f 1	
Subsurface I Croft Landf Client: Toy	nvestigation ill vnship of Magnetawan	Northing: Easting: Methodolog Contractor:	y: ŀ	ן ז Iand Au ז	N/A N/A uger N/A	1	DAT LOG GRC	E: GE DUN	Jun D BY D EI	e 9, 2 .EV	2015 TLC/ 289.9	/SRB 97 m	AS	L
DEPTH (m) (mASL)	STRATIGRAPHIC DESC	CRIPTION	MONITOR DETAILS & NUMBER	NUMBER	SA	N VALUE & WATER	& REC	& RQD	REC	COVI (%)	ERY	F	2QI (%)	•
0.2 289.8 1 1.3 288.7	TOPSOIL Dark brown to black, silty topsoil, trace to occasional rootlets, saturated. SAND Grey fine to medium sand, trace fine gras saturated. -Changing to a medium sand with trace f about 0.7 m. -Grey silty sand noted below about 0.9 m -Hand auger refusal in dense soil at abou Borehole teminated at 1.27 m in assumed	to some sand, vel, trace sîlt, fine sand below n. It 1.0 m. d silty fine sand.			GS G			<u> </u>		50 75			0 75	



BOREHO	EHOLE LOGPROJECT: 60336434BOREHOLE: BH8face InvestigationNorthing:N/ADATE: June 22, 2015										1	of 1	
Subsurface In Croft Landfi Client: Tow	nvestigation ill vnship of Magnetawan	Northing: Easting: Methodolog Contractor:	y: Au por	ger/C	N/A N/A Coring	A g g	D L G	AT OG RO	E: GEI UNI	June D BY D ELI	22, 2015 SRB EV 291.0	53 m A	SL
DEPTH (m) (mASL)	STRATIGRAPHIC DE	SCRIPTION	MONITOR DETAILS & NUMBER	UMBER	YPE 6	VALUE WA	WATER	REC	RQD	REC	OVERY (%)	R((%	2D %)
0.2 291.5	TOPSOIL Dark brown, silty topsoil, trace to som moist. SAND Brown fine to medium sand, trace coa medium gravel, moist.	ne sand, trace rootlets, f		1	SS	9	019	ale.	82	25 5	0 75 100	25 50	75100
1.0 1 90.6 1	GNEISSIC BEDROCK Grey to black metamorphic bedrock, s biotite with garnet mineralization, mas	some quartzite and ssive.		3	HQ).23m		100	100				Î
2				4	HQ			100	100		Į		
				- 6	HQ			100	92		-		
				7	HQ			100	92				•
5.7 35.9	Borehole terminated at 5.72 m in Gnie	ssic Bedrock.											

Subsurface Croft Lan Client: T	e In ndfil Tow	vestigation 1	Northing:	the second se		4		B	OR	EH	OLE:	BH9		1 01 1
	_	nship of Magnetawan	Easting: Methodolog Contractor	gy: Aug : pon	ger/C til dr	N/A N/A oring	A g g	D L G	AT OG RO	E: GEI UN	June D BY D EL	e 22, 201 SR EV 289	l5 В 0.52 п	ASL
(m) (mASL)	STRATIGRAPHY	STRATIGRAPHIC DES	CRIPTION	MONITOR DETAILS & NUMBER	NUMBER	TYPE	N VALUE WY	% WATER	% REC	% RQD	REC	COVERY (%)	25	RQD (%)
1 -		SAND Brown fine to medium sand, some fine g -0.15 m layer of brown to grey silty fine at about 0.2 m. -0.15 m layer of medium to coarse sand, saturated, at bedrock contact.	ravel, wet. sand, trace gravel some gravel,		2	SS	4							
288.2		GNEISSIC BEDROCK Grey to black metamorphic bedrock, sor biotite with garnet mineralization, massi	ne quartzite and ve,		3	HQ			100	100				
3.9 285.6	NUNNIN	Borehole terminated at 3.89 m in Gniess	ic Bedrock.		5	HQ			100	100		-		

BORE	HOLE LOG	PROJECT:	603	3643	4		B	OR	EH	OLE	: BH10		1 of 1
Subsurfac Croft La Client:	ce Investigation ndfill Township of Magnetawan	Northing: Easting: Methodolog Contractor:	y: Au por	ger/C ntil di	N/A N/A Coring	A g g		OAT. OG GRO	E: GEI UN	Jun D BY D EL	e 23, 20 7 SF LEV 29	15 2B 0.87 m	ASL
DEPTH (m)	AHATIGRAPHIC I	DESCRIPTION	ONITOR ETAILS NUMBER	BER	E EVAN	ALUE	ATER	EC	QD	REC	COVER	Y I	RQD (%)
mASL)	STRI		20 v	MUN	LΥΡ	N N	% M	% R	% R	25	50 75 100	25 :	50 75 10
0.2 90.7	TOPSOIL Dark brown, silty topsoil, trace to moist. Brown silty sand, trace fine grave	some sand, trace rootlets,		1	SS	0							
1	-Becoming fine sand and saturated -Changing to a fine to medium san	below about 0.76 m d below about 0.9 m.		2	SS	23							
				3	SS	21							
2.1 18.7	GNEISSIC BEDROCK Grey to black metamorphic bedroc biotite with garnet mineralization,	k, some quartzite and massive.		4 5	HQ HQ			100 100					
3				. 6	HQ			100					
4.1 4 36.8	Borehole terminated at 4.06 m in C	Gniessic Bedrock.		- 00									
rinted	Jan 15, 16									_		Δ=	CO

BORE	HC	LE LOG	PROJECT	603	D336434 BOREHOLE: BH11 1 of 1 N/A DATE: June 24, 2015 N/A DATE: June 24, 2015 LOGGED BY JNB GROUND ELEV 290.74 m ASL								
Subsurfa Croft La Client:	ce In indfil Tow	vestigation 1 nship of Magnetawan	Northing: Easting: Methodolog Contractor:	y: Au por	iger/C	N/A N/A Coring	A g g	DAT LOC GRO	E: GE DUN	Jun D BY D EL	e 24, 2015 JNB EV 290.	74 m AS	L
DEPTH (m) (mASL)	TRATIGRAPHY	STRATIGRAPHIC DES	SCRIPTION	MONITOR DETAILS & NUMBER	NUMBER	LYPE	A VALUE	s WATER	s RQD	REC	COVERY (%)	RQI (%)	D)
1 - 2 - 3 - 4 - 4 - 4 - 4 -		GNEISSIC BEDROCK Grey to black metamorphic bedrock, so biotite with garnet mineralization, mas Borehole terminated at 4.39 m in Gnies	ome quartzite and sive.			HQ				25	50 75 100	25 50 75	510
Printec	l:Ja	n 15, 16											

APPENDIX III Summary Tables

TABLE 1 Groundwater Monitoring Location Data Croft Waste Disposal Site Magnetawan , Ontario

		1	1	1		1	-		r			
er	(AA	sl)	5	rom (m)	mo.	the ()	(s8q	ter m	UT	M Coordina	ates	
quun,	cs/m	urfa (ma.	atio []	OC J face	evel ent fr m)	C (m	to r (m	l Wa vatic l)				
N CI	m/bh	nd S tion	Eler	of T I Sur	ter I reme OC (Well TO	epth wate	latec ! Ele (mas		8t	(m)	Comments
lell	te (a	irou. leva	200	ght ound	Wa easu T	otal from	D_{D}	alcu evel	one.	rthii (m)	ing	
12	Da	E		Hei Gra	Me	ц Г	Gro	L C	N	No	East	
	8-May-14				0.93			292.89				
	30-Oct-14				0.91			292.91				
	9-Jun-15	-							-			
	22-Jun-15	-										
	6-Aug-15				1.78			292.04				
BH1	22-Oct-15	NA	293.82						17	5058316	593651	
2	13-Oct-16		255.02		1.66			292.16		5050510	575051	
	18-May-17 25 Oct 17	-			0.97			292.85	-			
	25-Oct-17 2-May-18				0.92			292.90	-			
	17-Oct-18				1.06			292.76				
	11-Jun-19			0.72	0.95	4.34	0.23	292.87				
	25-Sep-19			0.65	1.42	4.29	0.77	292.40				
	30-Oct-14	-										
	9-Jun-15											
	22-Jun-15				2.24			290.23				
	23-Jun-15	-			4.04			200.42	-			
	6-Aug-15	-			4.04			288.43				
BH8	13-Oct-16	291.63	292.47		4.20			288.27	17	5058519	593552	
	18-May-17	1			2.36			290.11				
	25-Oct-17				2.43			290.04				
	2-May-18	-			1.69			290.78	-			
	11-Jun-19			0.83	2.59	6.52	1.76	289.88				
	25-Sep-19			0.75	3.95	6.45	3.20	288.52				Partial sample
	8-May-14											
	30-Oct-14							-				
	9-Jun-15	-			1 84			288.60				
	23-Jun-15				1.04			200.00				
	6-Aug-15				1.98			288.46				
BH9	22-Oct-15	289.52	290.44		1.83			288.61	17	5058495	593597	
	13-Oct-16				1.79			288.65				
	25-Oct-17	-			1.18			289.26	-			
	2-May-18				0.95			289.49				
	17-Oct-18	1			1.41			289.03				
	11-Jun-19	-		0.99	1.10	4.61	0.11	289.34	-			
<u> </u>	25-Sep-19 8-May-14			0.93	1.42	4.62	0.49	289.02				
	30-Oct-14											
	9-Jun-15											
	22-Jun-15								-			
	23-Jun-15	-			1.13			290.70				
	6-Aug-15 22-Oct-15				2.22			290.09				
BH10	13-Oct-16	290.87	291.83		1.23			290.60	17	5058446	593730	
	18-May-17	1			0.86			290.97				
	25-Oct-17	-			0.80			291.03	-			
	2-May-18 17-Oct-18	-			0.79			291.04	-			
	11-Jun-19			0.93	0.86	4.92	-0.07	290.97				
	25-Sep-19			0.83	1.19	4.83	0.36	290.64				
	8-May-14											
	30-Oct-14	-							-			
	22-Jun-15											
	23-Jun-15											
	6-Aug-15				2.41			290.20	-			
BH11	22-Oct-15	290.74	292.61		2.46			290.15	17	5058508	593716	
	13-Oct-16	-			1.93			290.66	-			
	25-Oct-17				1.01			291.60				
	2-May-18				0.91			291.70				
	17-Oct-18	-		0.54	1.10	4.01	0.00	291.51	-			
	25-Sep-19	-		0.74	1.07	4.81	0.53	291.54				
	8-May-14			0.00	1.17	4.72	0.55	271.42				
	30-Oct-14]]			
	9-Jun-15				1.22			288.55				
	22-Jun-15	-							1			
	6-Aug-15	1			1.88		1	287.89	1			
DP 7	22-Oct-15	280.20	280 77			D	RY		17	5058202	503561	
Dr-/	13-Oct-16	207.30	207.//			D	RY		1/	5056505	575501	
	18-May-17	-		┝───	1.73		ł	288.04	-			
	23-Oct-17 2-May-18	1			1.04	<u>г</u>	RY	288.13	1			
	17-Oct-18	1		-	1.51			288.26	1			
	11-Jun-19]		1.21	1.28	1.93	0.07	288.49]			
	25-Sep-19			1.13	1.36	1.81	0.23	288.41				
	8-May-14 30-Oct-14	1							1			
	9-Jun-15	1			1.59		1	289.47	1			
	22-Jun-15	1							1			
	23-Jun-15	ł		<u> </u>	1.0-				ł			
	6-Aug-15	1			1.89			289.17	1			
DP-8	13-Oct-16	290.54	291.06		1.70		1	289.36	17	5058497	593754	

								======				(
	18-May-17					DI	RY					
	25-Oct-17				2.06			289.00				
	2-May-18				1.35			289.71				
	17-Oct-18				2.04			289.02				
	11-Jun-19					DI	RY					
	25-Sep-19			1.23	1.44	2.13	0.21	289.62				
	8-May-14											
	30-Oct-14											
	9-Jun-15				1.28			289.64				
	22-Jun-15											
	23-Jun-15											
	6-Aug-15	1			1.58			289.34	NA	NA	NA	
DB 0	22-Oct-15	200.07	200.02			DI	RY		INA	INA	INA	
DP-9	13-Oct-16	289.97	290.92		1.33			289.59				
	18-May-17				1.11			289.81				
	25-Oct-17				1.18			289.74				
	2-May-18				1.08			289.84				
	17-Oct-18				1.22			289.70				
	11-Jun-19]					Could r	ot locate				
	25-Sep-19]					Could I	ior iocate				

- Meters below ground surface Meters above sea level Top of casing No data available
- Notes: mbgs masl TOC NA

	Su	urface Wat Crof Ma	TABL ter Monito ft Waste D agnetawar	E 2 oring Location Data disposal Site n, Ontario
Surface	UT	M Coordina	ites	
Water Monitoring Location	əuoZ	Easting (m)	Northing (m)	Comments
SW1	17	593875	5058303	Stagnant
SW2	17	593527	5058933	
SW3	17	593584	5058502	Stagnant

					TABLE 3						
				Groundwat	ter Quality R	esults - BH-1	L				
				Croft	Waste Dispo	sal Site					
				Ma	gnetawan, Or	ntario					
	1	1									
					C	Sample Designa	ition				
Parameter	Units				Sample C	DU1	mm/aa/yyyy)				ODWQS
		08/06/2015	10/22/2015	10/12/2016	05/18/2017	DELI 10/25/2017	05/02/2018	10/17/2019	06/11/2010	00/25/2010	1
all I ab	nH Unite	6 55	10/22/2015 NA	6	6.3	6.2	6.2	61	6.67	6.54	6595
Conductivity	uS/cm	92	1111	596	96	97	68	134	57	146	-
Hardness	mg/L	34		185	16	25	19	33	17.2	32	80-100
Total Dissolved Solids	mg/L	126		416	114	78	46	128	76	90	500
Alkalinity	mg/L	32		55	26	38	25	38	24	39	30-500
Chloride	mg/L	7.9		54	5	5	5	7	1.9	5.34	250
Sodium	mg/L	1.2		30	5.61	6.32	3.33	5.23	3.9	7.55	200
Calcium	mg/L	9.9		63.1	5.42	8.24	6.11	10.5	5.5	9.62	-
Magnesium	mg/L	2.3		6.75	0.699	1.12	0.859	1.62	0.86	1.84	-
Potassium	mg/L	1.4		2.95	1.16	1.79	1.09	1.5	1.2	1.82	-
Sulphate	mg/L	<1		154	5	154	1	19	2.1	10.20	500
Ammonia	mg/L	<0.05		0.09	0.12	0.23	0.08	0.08	0.4	0.21	-
Nitrate as N	mg/L mg/I	<0.1		<0.1	<0.1	<0.1	<0.1	<0.1	<0.05	<0.05	10
Total Kieldahl Nitrogen	mg/L	<0.01		<0.03	<0.05	<0.05	<0.05	<0.05	<0.03	<0.03	1
Phenolics	mg/L mg/L	<0.001		<0.001	<0.001	0.004	<0.001	<0.001	<0.001	<0.001	
Dissolved Organic Carbon	mg/L	7.2		13.3	16.1	15.8	8.2	17.5	10.6	8.50	5
Chemical Oxygen Demand	mg/L	76		62	108	63	27	74	28	31	-
Iron	mg/L	8.5		16.7	1.49	4.94	2.29	8.76	4.35	7.32	0.3
Manganese	mg/L	1.5		4.1	0.579	0.611	0.45	0.819	0.46	0.86	0.05
Phosphorus	mg/L	0.7		0.1	0.8	0.29	0.06	0.27	0.22	0.06	-
Orthophosphate	mg/L										-
Turbidity	NTU	60		94.1	507	158	22.9	118	58.4	44.2	5
Total Suspended Solids	mg/L	140		142	822	422	56	181	150	61	-
BOD	mg/L	<2		2	<20	6	<2	3	<5	<5	-
Anion Sum		0.869		5.84	0.74	0.96	0.66	1.35			-
Cation Sum	0/	1.13		5.09	0.6	0.82	0.55	0.92 N/A	-		-
Silver	70 mg/L	<0.0001		<0.001	<0.0001	<0.0001	<0.0001	<0.0001	<0.002	<0.002	-
Aluminum	mg/L	0.53		0.199	0.253	0.321	0.311	0.883	0.537	0.44	0.1
Antimony	mg/L	< 0.0005		< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.003	< 0.003	0.006
Arsenic	mg/L	< 0.001		< 0.001	< 0.001	0.001	0.001	0.004	< 0.003	< 0.003	0.010
Barium	mg/L	0.033		0.192	0.025	0.032	0.013	0.045	0.024	0.04	1
Beryllium	mg/L	< 0.0005		< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.001	< 0.001	-
Bismuth	mg/L	< 0.001		< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.002	< 0.002	-
Boron	mg/L	< 0.01		0.202	0.014	0.015	0.025	0.026	0.017	0.03	5
Cadmium	mg/L	< 0.0001		< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.001	< 0.001	0.005
Chromium	mg/L	< 0.005		0.003	<0.001	0.001	<0.001	0.002	< 0.003	< 0.003	0.05
Cobalt	mg/L	0.031		0.0686	0.0071	0.0087	0.0044	0.0105	0.005	0.01	-
Copper Malak daman	mg/L	0.0087		<0.0016	<0.0027	<0.0005	<0.0025	<0.0039	0.007	0.01	1
Niekal	mg/L	0.0003		<0.0005	<0.0003	<0.0003	<0.0003	<0.0003	<0.002	<0.002	-
Phoenhate	mg/L	0.0017		<0.004	<0.2	<0.2	<0.2	<0.0002	<0.005	<0.005	
Lead	mg/L mg/L	0.00094		0.0002	0.0005	0.0005	0.0002	0.0016	0.001	0.002	0.01
Selenium	mg/L	< 0.002		< 0.001	< 0.0001	0.002	0.002	0.006	< 0.004	< 0.004	0.05
Sillicon	mg/L	7.4		5.05	3.13	4.05	2.52	3.6	3.22	5.90	-
Tin	mg/L	< 0.001		< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.002	0.05	-
Strontium	mg/L	0.06		0.068	0.019	0.048	0.035	0.06	0.031	< 0.002	-
Titanium	mg/L	0.14		0.009	0.027	0.034	0.025	0.072	0.056	0.08	-
Uranium	mg/L	0.002		0.0012	0.0008	0.0007	0.0005	0.0014	< 0.002	< 0.002	0.02
Vanadium	mg/L	0.0057		0.0071	0.0023	0.0027	0.0023	0.0077	0.004	0.01	-
Zinc	mg/L	< 0.005		< 0.005	< 0.005	< 0.005	< 0.005	0.02	< 0.005	0.03	5
Field Measurements			r			r					i
Temperature	oC	4.91	-	5.22	6.37	6.24	8.08	6.45	10.3	13.1	-
рн	pH Units	-	-	-	-	-	-	-	6.4	5.4	6.5-8.5
Oridation Roduction Detection	uS/cm	6.55	-	786	-	-	0.08	0.19	/8.40	118.50	-
Dissolved Oxygen	m-7	-	-	-	-	-	-	-	143.3	1 /0.3	-
Dissolved Oxygen	mg/L	-	-	-	-	-	-	-	1.21	1.18	-

Notes:

Ontario Drinking Water Quality Standards" under the Safe Drinking Water Act", dated 2002, and "Technical Support Document for Ontario Drinking Water Standards, Objectives and Guidelines", dated June 2003.

 BOLD
 Exceeds ODWQS

 INSV
 Insufficient volume to allow for sampling

 NC
 Not Calculated

 CNL
 Could Not Locate

 LS
 Limited Sample

 Units
 All Units in mg/L Unless Otherwise Noted.

TABLE 4 Groundwater Quality Results - BH-8 Croft Waste Disposal Site Magnetawan, Ontario														
				Mag	netawan, O	itario								
					S	ample Designa	tion							
Parameter	Units				Sample Co	ollection Date (mm/dd/yyyy)				ODWQS			
		09/07/2015	10/22/2015	10/12/2017	05/19/2017	BH-8	05/02/2019	10/17/2019	06/11/2010	00/25/2010				
all I ab	pH Unite	7 97	7.62	7.2	67	7	05/02/2018	67	6.62	6.72	6595			
DH Lab Conductivity	uS/cm	450	200	124	88	103	68	94	35	70	0.5-8.5			
Hardness	mg/L	190	62	39	18	20	10	27	9.8	22.8	80-100			
Total Dissolved Solids	mg/L	298	158	118	110	80	42	58	50	68	500			
Alkalinity	mg/L	180	86	48	31	34	18	28	11	23	30-500			
Chloride	mg/L	16	3.5	1	< 0.001	< 0.1	<1	<1	0.5	0.4	250			
Sodium	mg/L	9.9	1.9	2.7	8.35	7.9	7.37	3.36	2.8	2.5	200			
Calcium	mg/L	53	17	11.3	5.8	6.28	2.97	7.39	2.9	6.2	-			
Magnesium	mg/L	15	5.1	2.59	0.926	1.06	0.533	2.1	0.7	1.8	-			
Potassium	mg/L	12	5.6	3.14	1.42	1.65	0.888	2.02	0.8	1.70	-			
Sulphate	mg/L mg/I	31	8.6	10	0.014	1/	12	1/	5.1	8.8	500.0			
Annionia Nitrate as N	mg/L	<0.11	<0.05	<0.1	<0.01	<0.1	0.01	0.01	<0.05	0.02	- 10			
Nitrite as N	mg/L mg/L	0.032	<0.01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	10			
Total Kjeldahl Nitrogen	mg/L	0.25	<0.2	0.3	0.4	0.3	0.4	0.2	0.36	0.86	-			
Phenolics	mg/L	0.0012	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	NA	-			
Dissolved Organic Carbon	mg/L	3	1.5	3.4	5	9.7	3.9	58	2.6	3.1	5			
Chemical Oxygen Demand	mg/L	120	14	127	59	109	54	37	<5	12	-			
Iron	mg/L	< 0.1	0.39	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	0.05	< 0.010	0.3			
Manganese	mg/L	0.1	0.12	0.055	0.926	0.027	0.01	0.03	0.01	0.02	0.05			
Phosphorus	mg/L	9.2	0.61	0.68	0.22	0.53	0.26	0.2	0.13	0.21	-			
Orthophosphate	mg/L	4100	220	000	225	451	105	204	1/2	102	-			
Turbidity Total Sugrandad Salida	NIU ma/l	4100	1100	900	225	451	207	304	162	192	5			
	mg/L	4200	1100	952 ND (20)	212	<20	291	234	-154	<5	-			
Anion Sum	mg/L	4.64	1.99	1.2	0.94	1.05	0.65	0.95		•				
Cation Sum		4.6	1.48	0.99	0.76	0.79	0.54	0.75			-			
Ion Balance	%	0.44	NC	-9.6			-9				-			
Silver	mg/L	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.002	< 0.002	-			
Aluminum	mg/L	0.031	0.0064	0.046	0.142	0.094	0.167	0.042	0.101	0.065	0.1			
Antimony	mg/L	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.003	< 0.003	0.006			
Arsenic	mg/L	< 0.001	0.0013	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.003	< 0.003	0.010			
Barium	mg/L	0.1	0.082	0.053	0.022	0.032	0.009	0.035	0.019	0.033	1.00			
Beryllium	mg/L	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.001	<0.001	-			
Bismuth	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	- 5			
Cadmium	mg/L	<0.0001	<0.001	0.0003	<0.001	<0.001	< 0.0001	0.0008	< 0.001	<0.001	0.005			
Chromium	mg/L	< 0.005	< 0.005	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.003	< 0.003	0.05			
Cobalt	mg/L	< 0.0005	0.00065	0.0007	0.0007	0.0012	0.0008	0.0013	< 0.001	0.001	-			
Copper	mg/L	< 0.001	< 0.001	0.0019	0.0277	0.0179	0.0222	0.00068	0.011	0.008	1			
Molybdenum	mg/L	0.013	0.0015	0.0011	0.0039	0.0011	0.0017	0.0005	< 0.002	< 0.002	-			
Nickel	mg/L	0.019	0.0032	0.004	0.011	0.01	0.006	0.007	0.005	0.006	-			
Phosphate	mg/L			< 0.0002	< 0.2	< 0.2	< 0.2	< 0.2	< 0.10	<0.10	-			
Lead	mg/L	<0.0005	<0.0005	<0.0001	0.0001	0.0001	<0.0001	<0.0001	<0.001	<0.001	0.01			
Selenium	mg/L mg/I	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.004	<0.004	0.05			
Tin	mg/L	<0.001	<0.001	<0.005	<0.005	<0.005	<0.005	<0.005	<0.002	4.42	-			
Strontium	mg/L	0,16	0.056	0.039	0.029	0.025	0.014	0.03	0.015	<0.020	-			
Titanium	mg/L	< 0.005	< 0.005	< 0.005	0.007	< 0.005	0.005	< 0.005	0.005	0.003	-			
Uranium	mg/L	0.0022	0.00017	0.0001	0.0002	0.0002	0.0001	0.0002	< 0.002	< 0.002	0.02			
Vanadium	mg/L	0.00074	< 0.0005	0.002	0.0009	< 0.0005	< 0.0005	< 0.0005	< 0.002	< 0.002	-			
Zinc	mg/L	< 0.005	0.0088	0.01	0.088		0.018	0.031	0.017	0.032	5			
Field Measurements														
Temperature	oC	-	-	-	-	-	-	-	11.3	Partial sample,	-			
pH	pH Units	6.91	5.37	6.43	7.45	7.38	7.8	7.78	6.8	no field chem	-			
Coductivity	uS/cm	368	179	114	-	-	0.1	0.11	43.3	-	-			
Discolved Oxygen	mv mc/	-	-	-	-	-	-	-	111	-	-			
Dissolveu Oxygell	mg/L	-	-	-	-	-	-	-	12.4	-	-			

Ontario Drinking Water Quality Standards*

Quality Ontario Regulation 169/03 "Ontario Drinking Water Quality Standards" under the Safe Drinking Water Act", dated 2002, and "Technical Support Document for Ontario Drinking Water Standards, Objectives and Guidelines", dated June 2003.

BOLD	Exceeds ODWQS
INSV	Insufficient volume to allow for sampling
NC	Not Calculated
CNL	Could Not Locate
LS	Limited Sample
Units	All Units in mg/L Unless Otherwise Noted.

<table-container> Parame Parame</table-container>	TABLE 5 Groundwater Quality Results - BH-9 Croft Waste Disposal Site Magnetawan, Ontario											
Image Image <t< th=""><th>Parameter</th><th>Units</th><th></th><th></th><th></th><th></th><th></th><th></th><th></th><th></th><th></th><th>ODWQS</th></t<>	Parameter	Units										ODWQS
pht 1.0pht 1.0pht 1.0pht 3.0pht 3.0<			08/06/2015	10/22/2015	10/12/2016	05/18/2017	10/25/2017	05/02/218	10/17/2018	06/11/2019	09/25/2019	1
Conductoryety <th>pH Lab</th> <th>pH Units</th> <th>7.56</th> <th>6.78</th> <th>6.9</th> <th>7.2</th> <th>7.1</th> <th>6.5</th> <th>6.7</th> <th>7.27</th> <th>7.04</th> <th>6.5-8.5</th>	pH Lab	pH Units	7.56	6.78	6.9	7.2	7.1	6.5	6.7	7.27	7.04	6.5-8.5
Itandownongh2002002001370147094701470948091409248930Abaladyengl120170203115217171202031162171120203120203120203 <td>Conductivity</td> <td>uS/cm</td> <td>730</td> <td>750</td> <td>1050</td> <td>678</td> <td>587</td> <td>523</td> <td>735</td> <td>289</td> <td>694</td> <td>-</td>	Conductivity	uS/cm	730	750	1050	678	587	523	735	289	694	-
Tad baselsmgL040040040040040040040040040ChandengL230640120132132132132040070132120ChandengL03630120413413420230630130230230630130230230630130 <td>Hardness</td> <td>mg/L</td> <td>220</td> <td>220</td> <td>240</td> <td>156</td> <td>157</td> <td>147</td> <td>276</td> <td>104</td> <td>235</td> <td>80-100</td>	Hardness	mg/L	220	220	240	156	157	147	276	104	235	80-100
AkalanymgL17017017017017017117007017118385.30SalanngL6417284.863.047.284.849.047.07.064.47.007.07	Total Dissolved Solids	mg/L	496	462	668	454	378	262	494	174	398	500
Checksnghis6464126ets55635073232064.0472.04730CakianngL647281.840.940.144.483.0473.057.5.37.5.3PanakanngL111187.77.5.581.38.8.812.244.1440.707.5.3 </td <td>Alkalinity</td> <td>mg/L</td> <td>210</td> <td>170</td> <td>203</td> <td>187</td> <td>182</td> <td>171</td> <td>200</td> <td>97</td> <td>181</td> <td>30-500</td>	Alkalinity	mg/L	210	170	203	187	182	171	200	97	181	30-500
SchummgL530530132613 <th< td=""><td>Chloride</td><td>mg/L</td><td>48</td><td>64</td><td>126</td><td>65</td><td>50</td><td>23</td><td>20</td><td>6.04</td><td>22.60</td><td>250</td></th<>	Chloride	mg/L	48	64	126	65	50	23	20	6.04	22.60	250
Calcian mpl. 64 72 81.3 49.3 44.4 89.4 89.3 44.3 89.3 7.3 <	Sodium	mg/L	50	50	132	61.3	47.7	29.8	23.9	10.8	23.9	200
Migenam me1 13 11 5.07 7.55 8.14 8.88 12.8 1.11 0.107 Sulphan me1 1.75 8.8 1.28 1.5 6.00 5.77 6.55 6.01 5.77 6.55 6.01 5.77 6.55 6.01 6.01 1.78 2.13 1.00 6.147 5.77 6.55 6.010 6.001 <	Calcium	mg/L	64	72	81.8	49.9	49.3	44.4	89.4	34.50	76.50	-
Prison mip 11 10 24.8 11 1017 9.15 108 0.08 0.08 0.00 Annonia mpL 2.22 0.37 0.08 0.60 0.71 1.78 2.13 1.14 1.14 1.14 0.10 Nimita an mpL 0.011 0.021 0.021 0.015 0.016 0.015	Magnesium	mg/L	13	11	8.67	7.55	8.34	8.88	12.8	4.41	10.70	-
Shiphalemp1	Potassium	mg/L	17	19	24.8	11	10.7	9.75	15	6.08	9.87	-
Amman Inglig 2.2 0.07 0.03 0.01 1.01 2.13 1.01 1.01 1.01 1.01 Nating an mgl -0.01 0.001 -0.05	Sulphate	mg/L	75	88	128	75	56	62	180	37.70	95.80	500.0
Name Name <th< td=""><td>Ammonia Nitroto og N</td><td>mg/L</td><td><0.1</td><td>2.61</td><td>0.82</td><td>0.6</td><td>0.71</td><td>-0.1</td><td>2.15</td><td><0.05</td><td><0.10</td><td>10</td></th<>	Ammonia Nitroto og N	mg/L	<0.1	2.61	0.82	0.6	0.71	-0.1	2.15	<0.05	<0.10	10
Name A Nome <	Nitrite as N	mg/L	<0.01	2.61	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.10	10
Inder Neurogen Big D 0.0001 <th< td=""><td>Total Kialdahl Nitrogan</td><td>mg/L</td><td><0.01</td><td>1.1</td><td>2.7</td><td><0.05</td><td><0.05</td><td><0.05</td><td><0.05</td><td>1 70</td><td>2.73</td><td>1</td></th<>	Total Kialdahl Nitrogan	mg/L	<0.01	1.1	2.7	<0.05	<0.05	<0.05	<0.05	1 70	2.73	1
Description mpL 200 101 003 102 102 102 102 103 <t< td=""><td>Phenolics</td><td>mg/L</td><td><0.001</td><td><0.001</td><td>0.007</td><td><0.001</td><td><0.001</td><td><0.001</td><td>4.2</td><td><0.001</td><td>0.003</td><td></td></t<>	Phenolics	mg/L	<0.001	<0.001	0.007	<0.001	<0.001	<0.001	4.2	<0.001	0.003	
Constant Degree Demind ingl. 330 31 359 15.5 16.4 160 160 36 69 - Inm mgl. 1.6 1.1 133 2.95 11.1 2.51 0.31 Magines mgl. 1.6 1.1 133 111 1.38 2.97 1.14 4.86 0.052 Onchoposphate mgl. 1.2 1.3 0.41 0.58 0.18 0.8 0.21 0.1 0.32 Turbidy NTU 38000 510 758 1110 134 1600 2710 121 106 Turbidy NTU 38000 1100 112 3 2.0 20 <5	Dissolved Organic Carbon	mg/L	20	14	40	23	16.4	33.2	20	16.7	24.1	5
no. org.t 1.9 0.71 -0.1 0.263 11.4 18.7 17.7 11.1 25.1 0.3 Magance mgL 1.2 1.3 0.41 0.58 0.18 0.8 0.72 0.1 0.32 . Ondephophate mgL 1.2 1.3 0.41 0.58 0.18 0.8 0.72 0.1 0.32 . . Ordephophate mgL 1.2 1.3 0.41 0.58 1.660 270 2.12 1.00 -5 Tool Suppended Solids mgL 7.18 7.18 10.3 7.18 6.23 5.37 8.37 Loi Susm 7.18 7.18 10.3 7.18 6.30 .	Chemical Oxygen Demand	mg/L	380	81	159	155	16.4	160	169	36	69	
Manganese mgL 1.6 1.1 1.03 1.11 1.38 2.79 5.65 1.74 4.16 0.57 Onthophophate mgL 12 1.3 0.41 0.58 0.18 0.8 0.72 0.11 0.32 Onthophophate mgL 55000 1100 758 1130 281 1000 2010 151 196 5 Tankinghod mgL 55000 11600 1750 1130 281 1000 2010 212 100 100 100 2010 410 110 2010 420 420 43 43 43 430 431 430 431 430 431 430 431 430 431 430 431 430 430 430 430 430 430 430 430 430 430 430 430 430 430 430 430 430 <	Iron	mg/L	1.9	0.71	<0.1	0.263	11.4	18.7	17.7	11.1	25.1	0.3
Pinosphores mgL 12 1.3 0.41 0.85 0.18 0.8 0.72 0.11 0.22 Ontophophate myL X V <	Manganese	mg/L	1.6	1.1	1.03	1.11	1.38	2.79	5.65	1.64	4.16	0.05
Octophophatic mgL Stood fibo 758 11.30 281 1990 2010 151 196 5 Tachidiyad mgL 55000 1600 1750 1600 334 1660 2770 212 100 - BOD mgL 55000 1600 1750 160 344 1660 2770 212 100 - BOD mgL -2 -2 ND (30) 12 3 20 -20 -2 -5 -5 -5 -7 8.37 -	Phosphorus	mg/L	12	1.3	0.41	0.58	0.18	0.8	0.72	0.1	0.32	· ·
Turbiny NTU 38000 510 788 1130 290 2010 151 196 5 Toad Supended Solids mgL 5000 1600 1750 1600 394 1660 2770 212 100 Anion Sum 7.18 7.18 10.3 7.18 6.0 5.5 4.49 6.94 Calcin Sum 7.18 1.10 1.1 6.06 5.5 4.49 6.94 Calcin Sum Calcin Sum Calcin Sum Calcin Sum Calcin Sum Calcin Sum Calcin Sum Calcin Sum Calcin Sum Calcin Sum Calcin Sum Calcin Sum	Orthophosphate	mg/L										-
Tacal Segonded Solids mg/L 5.5000 1600 1750 1600 34 1660 2770 212 100 - BDD mg/L -2 -2 N N 100 12 3 20 -2.0 -5.0 <.5 . Anion Sum - 7.18 7.18 10.3 7.18 6.23 5.37 8.37 .	Turbidity	NTU	38000	510	758	1130	281	1900	2010	151	196	5
BOD mpL -2 -2 ND (30) 12 3 20 -20 -3 -5 -5 Cation Sam 7,18 7,18 10.3 7.18 6.23 5.37 8.37 Lon Balance % 0.1 0.1 3.9 -8.4 -6.3 -8.9 -9.3 Silver mgL -0.0001 <td>Total Suspended Solids</td> <td>mg/L</td> <td>55000</td> <td>1600</td> <td>1750</td> <td>1600</td> <td>394</td> <td>1660</td> <td>2770</td> <td>212</td> <td>100</td> <td>-</td>	Total Suspended Solids	mg/L	55000	1600	1750	1600	394	1660	2770	212	100	-
Axion Sum7.187.107	BOD	mg/L	<2	<2	ND (30)	12	3	20	<20	<5	<5	-
Cation Sum · 7.17 7.16 11.2 6.06 5.5 4.49 6.94 Bine Balance % 0.11 0.02 <0.0001	Anion Sum		7.18	7.18	10.3	7.18	6.23	5.37	8.37			-
Ion Balance % 0.1 0.1 3.9 -6.3 -6.3 -6.9 -9.3 -100 -100 -100 Siber mgL 0.0001 -00001 -00001 -00001 -00005 -00001 -00001 -00001 -00001 -00001 -00001 -00005 -00005 -00005	Cation Sum		7.17	7.16	11.2	6.06	5.5	4.49	6.94			-
Silver mg/L -0.0001 <0.0001 <0.0001 <0.0001 <0.0001 <0.0001 <0.0001 <0.0001 <0.0001 <0.0001 <0.0001 <0.0001 <0.0001 <0.0001 <0.0001 <0.0001 <0.0001 <0.0001 <0.0001 <0.0001 <0.0001 <0.0001 <0.0001 <0.0001 <0.0001 <0.0001 <0.0001 <0.0001 <0.0001 <0.0001 <0.0001 <0.0001 <0.0001 <0.0001 <0.0001 <0.0001 <0.0001 <0.0001 <0.0001 <0.0001 <0.0001 <0.0001 <0.0001 <0.0001 <0.0001 <0.0001 <0.0001 <0.0001 <0.0001 <0.0001 <0.0001 <0.0001 <0.0001 <0.0001 <0.0001 <0.0001 <0.0001 <0.0001 <0.0001 <0.0001 <0.0001 <0.0001 <0.0001 <0.0001 <0.0001 <0.0001 <0.0001 <0.0001 <0.0001 <0.0001 <0.0001 <0.0001 <0.0001 <0.0001 <0.0001 <0.0001 <0.0001 <0.0001 <0.0001 <0	Ion Balance	%	0.1	0.1	3.9	-8.4	-6.3	-8.9	-9.3			-
Aluminum mg/L 0.1 0.027 0.08 0.057 0.065 0.1 0.095 0.109 0.109 0.101 0.103 0.006 Antimony mg/L 0.0001 <0.0005	Silver	mg/L	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.002	< 0.002	-
Antimony mpL <0.0005 <0.0005 <0.0005 <0.0005 <0.0005 <0.0001 <0.0001 <0.0001 <0.0001 <0.0001 <0.0003 <0.0003 <0.0003 <0.0003 <0.0003 <0.0003 <0.0003 <0.0003 <0.0003 <0.0003 <0.0003 <0.0003 <0.0003 <0.0003 <0.0003 <0.0003 <0.0003 <0.0003 <0.0003 <0.0003 <0.0003 <0.0003 <0.0003 <0.0003 <0.0003 <0.0003 <0.0003 <0.0003 <0.0001 <0.0001 <0.0001 <0.0001 <0.0001 <0.0001 <0.0001 <0.0001 <0.0001 <0.0001 <0.0001 <0.0001 <0.0001 <0.0001 <0.0001 <0.0001 <0.0001 <0.0001 <0.0001 <0.0001 <0.0001 <0.0001 <0.0001 <0.0001 <0.0001 <0.0001 <0.0001 <0.0001 <0.0001 <0.0001 <0.0001 <0.0001 <0.0001 <0.0001 <0.0001 <0.0001 <0.0001 <0.0001 <0.0001 <0.0001 <0.0001	Aluminum	mg/L	0.1	0.027	0.08	0.057	0.065	0.1	0.095	0.109	0.161	0.1
Arsenic mg/L 0.0011 <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 <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 <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 <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 <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 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 </td <td>Antimony</td> <td>mg/L</td> <td>< 0.0005</td> <td>< 0.0005</td> <td>0.0005</td> <td>< 0.0005</td> <td>< 0.0005</td> <td>< 0.0005</td> <td>< 0.0005</td> <td>< 0.003</td> <td>< 0.003</td> <td>0.006</td>	Antimony	mg/L	< 0.0005	< 0.0005	0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.003	< 0.003	0.006
Bartum IngL 0.13 0.12 0.178 0.095 0.111 0.062 0.18 0.054 0.014 1.00 Beryllium mgL <0.0001	Arsenic	mg/L	0.0011	<0.001	0.001	< 0.001	< 0.001	<0.001	< 0.001	< 0.003	<0.003	0.010
Berylinm mg/L 0.0000 0.0000s 0.0000s 0.0000s 0.0000s 0.0000s 0.0001s 0.0001 0.0011 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.001 </td <td>Barium</td> <td>mg/L</td> <td>0.13</td> <td>0.12</td> <td>0.178</td> <td>0.095</td> <td>0.111</td> <td>0.062</td> <td>0.18</td> <td>0.054</td> <td>0.114</td> <td>1.00</td>	Barium	mg/L	0.13	0.12	0.178	0.095	0.111	0.062	0.18	0.054	0.114	1.00
Bismuth Ing.L <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <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 <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 <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 <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 <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 <0.001<	Beryllium	mg/L	<0.0005	<0.0005	< 0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.001	<0.001	-
Boron Ing/L 0.02 0.080 1.07 0.994 0.91 0.204 0.274 0.237 0.439 3 Cadmium mg/L <0.001	Bismuth	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	-
Cammin mgL <0.0001 <0.0001 <0.0001 <0.0001 <0.0001 <0.0001 <0.0001 <0.0001 <0.0001 <0.0001 <0.0001 <0.0001 <0.0001 <0.0001 <0.0001 <0.0001 <0.0001 <0.0001 <0.0001 <0.0001 <0.0001 <0.0001 <0.0001 <0.0001 <0.0001 <0.0001 <0.0001 <0.0001 <0.0001 <0.0001 <0.0001 <0.0001 <0.0001 <0.0001 <0.0001 <0.0001 <0.0001 <0.0001 <0.0001 <0.0001 <0.0001 <0.0001 <0.0001 <0.0001 <0.0001 <0.0001 <0.0001 <0.0001 <0.0001 <0.0001 <0.0001 <0.0001 <0.0001 <0.0001 <0.0001 <0.0001 <0.0001 <0.0001 <0.0001 <0.0001 <0.0001 <0.0001 <0.0001 <0.0001 <0.0001 <0.0001 <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	Boron	mg/L	0.62	0.68	1.07	0.394	0.31	0.264	0.527	0.239	0.489	0.005
Chroninini mg/L 6.00015 6.00071 6.0001 6.0022 6.0002 6.0002 6.0002 6.0002 6.0002 6.0002 6.0002 6.0002 6.0002 6.0002 6.0002 6.0002 6.0002 6.0002 6.0002 6.0002 6.0002 6.0002 6.0003 6.0001 6.0002 6.0003 6.0001 6.0002 6.0003 6.0001 6.0	Chromium	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.001	<0.001	0.003
Coom Img/L 0.0014 0.0024 0.0014 0.0024 0.014 0.021 0.0014 0.0014 0.0014 1 Molybdenum mg/L 0.0024 0.014 0.0036 0.0021 0.0031 0.0031 0.0031 0.0003 0.004 1 Molybdenum mg/L 0.0024 0.0162 0.0371 0.015 0.011 0.01 0.0014 <0.003	Cobalt	mg/L	0.0015	0.0071	0.013	0.002	0.001	0.002	0.002	0.011	0.027	0.05
Coppa Ing L 0.0094 0.0074 0.0004 0.0005 0.0001 0.0001 0.0014 0.0003 0.0004 Nickel mg/L 0.0025 0.052 0.037 0.015 0.011 0.01 0.0014 <0.003	Copper	mg/L	0.0024	0.014	0.0547	0.0271	0.0058	0.0034	0.0051	<0.003	0.004	1
Nickel mg/L 0.025 0.037 0.016 0.011 0.01 0.011 0.001 0.003 0.008 - Phosphate mg/L <0.0001	Molybdenum	mg/L	0.0094	0.0076	0.0048	0.0036	0.0027	0.001	0.0014	< 0.002	< 0.002	-
Image mg/L < < < < < < < < < < < < < < < <	Nickel	mg/L	0.025	0.052	0.037	0.015	0.011	0.01	0.01	< 0.003	0.008	-
Lead mg/L <0.0005 <0.0005 <0.0001 <0.0001 <0.0001 <0.0001 <0.0001 <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 <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 <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 <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 <0.001 <0.001 <0.002 <0.002 <0.002 <0.002 <0.002 <0.002 <0.002 <0.002 <0.002 <0.002 <0.002 <0.002 <0.002 <0.002 <0.002 <0.002 <0.002 <0.0	Phosphate	mg/L			< 0.0002	<0.2	<0.2	<0.2	<0.2	< 0.10	<0.20	-
Selenium mg/L <0.002 <0.002 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.004 <0.004 <0.004 <0.004 <0.004 <0.004 <0.004 <0.004 <0.004 <0.004 <0.004 <0.004 <0.004 <0.004 <0.005 <0.001 <0.001 <0.001 <0.001 <0.005 <0.005 <0.005 <0.005 <0.005 <0.005 <0.005 <0.005 <0.005 <0.005 <0.005 <0.005 <0.005 <0.005 <0.005 <0.005 <0.005 <0.005 <0.005 <0.005 <0.005 <0.005 <0.005 <0.005 <0.005 <0.005 <0.005 <0.005 <0.005 <0.005 <0.005 <0.005 <0.005 <0.005 <0.005 <0.005 <0.005 <0.005 <0.005 <0.005 <0.005 <0.005 <0.005 <0.005 <0.005 <0.005 <0.005 <0.005 <0.002 <0.002 <0.002 <0.002 <0.002 <0.002 <0.002 <0.002<	Lead	mg/L	< 0.0005	< 0.0005	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.001	< 0.001	0.01
Sillicon mg/L 6.1 2.6 3.28 3.53 4.95 3.44 3.77 3.57 5.21 - Tin mg/L <0.001	Selenium	mg/L	< 0.002	< 0.002	0.002	< 0.001	< 0.001	< 0.001	< 0.001	< 0.004	< 0.004	0.05
Tin mg/L <0.001 <0.001 <0.005 <0.005 <0.005 <0.005 <0.005 <0.005 <0.005 <0.005 <0.005 <0.005 <0.005 <0.005 <0.005 <0.005 <0.005 <0.005 <0.005 <0.005 <0.005 <0.005 <0.005 <0.005 <0.005 <0.005 <0.005 <0.005 <0.005 <0.005 <0.005 <0.005 <0.005 <0.005 <0.005 <0.005 <0.005 <0.005 <0.005 <0.005 <0.005 <0.005 <0.005 <0.005 <0.005 <0.005 <0.005 <0.005 <0.005 <0.005 <0.005 <0.005 <0.005 <0.005 <0.005 <0.005 <0.005 <0.005 <0.005 <0.005 <0.005 <0.005 <0.005 <0.005 <0.005 <0.005 <0.005 <0.005 <0.005 <0.005 <0.005 <0.002 <0.002 <0.002 <0.002 <0.002 <0.002 <0.002 <0.002 <0.002 <0.002 <0.002 <0.002	Sillicon	mg/L	6.1	2.6	3.28	3.53	4.95	3.44	3.77	3.57	5.21	-
Strontium mg/L 0.3 0.24 0.253 0.183 0.235 0.166 0.347 0.121 <0.002 - Titanium mg/L <0.005	Tin	mg/L	< 0.001	< 0.001	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.002	0.267	-
Titanium mg/L <0.005 <0.005 <0.005 <0.005 <0.005 <0.005 0.002 0.002 0.004 - Uranium mg/L 0.0025 0.00053 0.0017 0.0029 0.0024 0.0012 0.0024 <0.002	Strontium	mg/L	0.3	0.24	0.253	0.183	0.235	0.166	0.347	0.121	< 0.002	-
Uranium mg/L 0.0025 0.00053 0.0017 0.0029 0.0024 0.0012 0.0024 <0.002 <0.002 0.002	Titanium	mg/L	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	0.002	0.004	-
Vanadium mg/L 0.00088 <0.0005 0.0049 0.0009 0.0011 0.0018 <0.002 0.002 - Zinc mg/L 0.0063 0.033 0.027 0.023 0.027 0.034 0.04 0.016 0.047 5 Field Measurements - - - - - 10.9 15 - PH pH Units 6.33 6.52 5.68 6.62 6.65 7.23 7.04 6.82 6.15 6.58 Coductivity uS/cm 652 562 1014 - 0.55 0.87 339.2 591 - Oxidation Reduction Potential mV - - - - - - - - 10.9 15 - Dissolved Oxygen mg/L - - 0.55 0.87 339.2 591 -	Uranium	mg/L	0.0025	0.00053	0.0017	0.0029	0.0024	0.0012	0.0024	< 0.002	< 0.002	0.02
Zinc mg/L 0.0063 0.033 0.027 0.023 0.027 0.034 0.04 0.016 0.047 5 Field Measurements	Vanadium	mg/L	0.00088	< 0.0005	0.0049	0.0009	0.0009	0.0011	0.0018	< 0.002	0.002	-
Field Measurements Temperature oC - - - - 10.9 15 - pH pH Units 6.33 6.52 5.68 6.62 6.65 7.23 7.04 6.82 6.15 6.58.5 Coductivity uS/cm 652 562 1014 - 0.55 0.87 339.2 591 - Oxidation Reduction Potential mV - - - - - 143.4 46.6 - Dissolved Oxygen mg/L - - - - - 6.32 6.05 -	Zinc	mg/L	0.0063	0.033	0.027	0.023	0.027	0.034	0.04	0.016	0.047	5
Temperature oC - - - - - 10.9 15 - pH pH Units 6.33 6.52 5.68 6.62 6.65 7.23 7.04 6.82 6.15 6.58.5 Coductivity uS/cm 652 562 1014 - 0.55 0.87 339.2 591 - Oxidation Reduction Potential mV - - - - - 143.4 46.6 - Dissolved Oxygen mg/L - - - - - 6.32 6.05 -	Field Measurements											
pH pH Units 6.33 6.52 5.68 6.62 6.65 7.23 7.04 6.82 6.15 6.58.5 Coductivity uS/cm 652 562 1014 - - 0.55 0.87 339.2 591 - Oxidation Reduction Potential mV - - - - - 143.4 46.6 - Dissolved Oxygen mg/L - - - - - 6.32 6.05 -	Temperature	oC	-	-	-	-	-	-	-	10.9	15	-
Coductivity uS/cm 652 562 1014 - 0.55 0.87 339.2 591 - Oxidation Reduction Potential mV - - - - - 143.4 46.6 - Dissolved Oxygen mg/L - - - - - 6.32 6.05 -	рН	pH Units	6.33	6.52	5.68	6.62	6.65	7.23	7.04	6.82	6.15	6.5-8.5
Oxidation Reduction Potential mV - - - - - 143.4 46.6 - Dissolved Oxygen mg/L - - - - - 6.32 6.05 -	Coductivity	uS/cm	652	562	1014	-	-	0.55	0.87	339.2	591	
Dissolved Oxygen mg/L 6.32 6.05 -	Oxidation Reduction Potential	mV	-	-	-	-	-	-	-	143.4	46.6	-
	Dissolved Oxygen	mg/L	-	-	-	-	-	-	-	6.32	6.05	-

Ontario Drinking Water Quality Standards*

Ontario Regulation 169/03 "Ontario Drinking Water Quality Standards" under the Safe Drinking Water Act", dated 2002, and "Technical Support Document for Ontario Drinking Water Standards, Objectives and Guidelines", dated June 2003.

BOLD	Exceeds ODWQS
INSV	Insufficient volume to allow for sampling
NC	Not Calculated
CNL	Could Not Locate
LS	Limited Sample
Units	All Units in mg/L Unless Otherwise Noted.

TABLE 6 Groundwater Quality Results - BH-10 Croft Waste Disposal Site Magnetawan, Ontario											
		-			,, O						
					Samala (Sample Designa	tion				
Parameter	Units				Sample C	BH-10	mm/aa/yyyy)				ODWQS
		08/06/2015	10/22/2015	10/12/2016	05/18/2017	10/25/2017	05/02/2018	10/107/2018	06/11/2019	09/25/2019	
pH Lab	pH Units	7.47	7.46	7.4	7.2	7.5	7.1	7.3	7.81	7.6	6.5-8.5
Conductivity	uS/cm	1900	2100	1980	1.48	2010	1440	1210	1790	2680	-
Hardness	mg/L	550	610	607	513	627	426	328	507	630	80-100
Total Dissolved Solids	mg/L mg/I	1090	640	572	970 487	1190	730	656 406	954 508	272	500
Chloride	mg/L	170	180	219	185	289	143	104	246	462	250
Sodium	mg/L mg/L	120	120	164	84.8	107	66.5	71.8	129	182.0	200
Calcium	mg/L	170	190	192	177	200	136	107	169	214.0	-
Magnesium	mg/L	30	33	30.8	17.2	31.1	21.3	14.5	20.6	23.30	-
Potassium	mg/L	85	93	78.2	54.7	76.7	49.7	39.8	46.2	50.9	-
Sulphate	mg/L	49	45	82	67	46	37	42	68.6	53	500.0
Ammonia	mg/L	24	24	8.69	8	23.5	17.3	7.43	11.7	7.82	-
Nitrate as N	mg/L	0.97	14.9	15.2	0.7	1.1	<0.1	0.2	<0.5	22.6	10
Nitrite as N	mg/L	0.08	0.406	1.44	<0.05	<0.05	<0.05	0.33	<0.5	<1.0	1
Total Kjeldahl Nitrogen	mg/L	28	25	11.8	10	25.5	16.2	8.8	12.6	8.2	-
Phenolics Dissolved Organia Carbon	mg/L	<0.001 32	<0.001 34	33 3	<0.001	32	21.3	19.5	20.4	0.002	- 5
Chemical Oxygen Demand	mg/L	670	91	145	67	95	81	87	51	49	-
Iron	mg/L mg/L	7.1	0.27	<0.1	<0.1	<0.1	<0.1	<0.1	0.064	<0.010	0.3
Manganese	mg/L	3.1	2.5	0.973	0.922	5.72	6.12	4.02	2.88	4.34	0.05
Phosphorus	mg/L	4.4	0.12	0.2	0.05	0.05	0.09	0.14	0.08	0.36	-
Orthophosphate	mg/L										-
Turbidity	NTU	1600	28	147	22.9	34.6	101	175	6.6	31.0	5
Total Suspended Solids	mg/L	5800	380	516	123	90	228	312	328	132	-
BOD	mg/L	<2	<2	23	<2	3	4	4	<5	<5	-
Anion Sum		19.4	20	20.4	16.4	23.1	15.2	13.8			-
Cation Sum	0/	20.1	21.7	21.2	15.3	19.1	12.7	10.7			-
Ion Balance	% mg/I	1.7	4.09	-0.0001	-3.3	-9.4	-9.2	-12.5	<0.002	<0.002	-
Aluminum	mg/L	0.071	0.046	0.038	0.024	0.033	0.031	0.045	0.04	0.032	0.1
Antimony	mg/L	<0.0005	<0.0005	< 0.0005	<0.0005	< 0.0005	<0.0005	<0.0005	<0.003	< 0.003	0.006
Arsenic	mg/L	< 0.001	< 0.001	0.002	0.001	< 0.001	< 0.001	< 0.001	< 0.003	< 0.003	0.010
Barium	mg/L	0.3	0.33	0.276	0.183	0.262	0.122	0.146	0.225	0.279	1.00
Beryllium	mg/L	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.001	< 0.001	-
Bismuth	mg/L	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.002	< 0.002	-
Boron	mg/L	1.8	2.1	2.05	1.09	1.4	0.577	1.2	1.16	1.28	5
Cadmium	mg/L	< 0.0001	< 0.0001	0.0002	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.001	< 0.001	0.005
Chromium	mg/L	<0.005	<0.005	0.049	0.003	0.002	0.001	0.002	<0.003	< 0.003	0.05
Cobalt	mg/L	0.0096	0.0064	0.0032	0.0021	0.0044	0.0031	0.0028	0.004	0.0040	-
Copper	mg/L mg/I	0.0056	0.08	0.0300	0.0148	0.0179	0.0141	0.0168	<0.007	0.0100	1
Nickel	mg/L mg/I	0.0001	0.0003	0.0012	0.0012	0.0017	0.0014	0.0015	<0.002	0.002	-
Phosphate	mg/L mg/L	0.012	0.045	< 0.002	<0.2	<0.2	<0.2	<0.0002	<1.0	<2.0	-
Lead	mg/L	< 0.0005	< 0.0005	< 0.0001	< 0.0001	< 0.0001	< 0.0001	0.0001	< 0.001	< 0.001	0.01
Selenium	mg/L	< 0.002	< 0.002	0.004	0.003	< 0.001	< 0.001	< 0.001	< 0.004	0.006	0.05
Sillicon	mg/L	5.3	4.7	4.37	3.92	4.7	3.89	3.24	4.44	4.66	-
Tin	mg/L	< 0.001	< 0.001	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.002	1.06	-
Strontium	mg/L	0.8	0.85	0.943	0.628	0.95	0.614	0.503	0.793	< 0.002	-
Titanium	mg/L	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.002	0.002	-
Uranium	mg/L	0.0081	0.011	0.0083	0.0057	0.0072	0.0043	0.0046	0.007	0.0050	0.02
Vanadium Zina	mg/L	<0.0005	0.0005	0.0131	0.0012	0.0005	<0.0005	<0.0005	<0.002	< 0.002	-
Linc Field Measurements	mg/L	0.012	0.036	0.021	0.023	0.012	0.008	0.013	<0.005	0.006	3
Temperature	eC.								117	13.5	_
pH	pH Unite	6.25	6.43	5.71	6.88	6.86	7.18	7.28	6.49	6.58	65-85
Coductivity	uS/cm	1715	1481	1913	-	-	1.52	1.24	1935	2120	-
Oxidation Reduction Potential	mV	-	-	-	-	-	-	-	129.1	134.9	-
Dissolved Oxygen	mg/L	-	-	-	-	-	-	-	1.61	4.25	-

Notes:

Ontario Drinking Water Quality Standards* Ontario Drinking Water Quality Standards' under the Safe Drinking Water Act', dated 2002, and "Technical Support Document for Ontario Drinking Water Standards, Objectives and Guidelines", dated June 2003.

BOLD	Exceeds ODWQS
INSV	Insufficient volume to allow for sampling
NC	Not Calculated
CNL	Could Not Locate
LS	Limited Sample
Units	All Units in mg/L Unless Otherwise Noted.

TABLE 7													
Groundwater Quality Results - BH-11													
Croft Waste Disposal Site													
Magnetawan, Ontario													
Sample Designation													
					Sample Col	llection Date (n	m/dd/vvvv)						
Parameter	Units		BH-11										
		08/06/2015	10/22/2015	10/12/2016	05/18/2017	10/25/2017	05/02/18	10/17/2018	06/11/2019	09/25/2019			
pH Lab	pH Units	6.81	6.97	5	5.2	6.2	6.3	6.4	7.32	7.32	6.5-8.5		
Conductivity	uS/cm	550	600	1590	1130	1500	1880	825	1730	1620	-		
Hardness	mg/L	140	190	171	77	211	250	140	245	225	80-100		
Total Dissolved Solids	mg/L	340	330	928	700	926	1010	466	1000	828	500		
Alkalinity	mg/L	50	82	7	18	79	498	58	439	294	30-500		
Chloride	mg/L	63	67	286	242	275	168	67	200	123	250		
Sodium	mg/L	41	30	215	160	192	187	63.4	184	136	200		
Calcium	mg/L mg/I	40	58	52.4	22.9	33.1 21.2	59.7 24.6	32.6	65.3	64.6	-		
Rotessium	mg/L	0.0 5.6	11	9.73	4.93	51.5 79.4	24.0	20.1	19.90 67.90	56.5	-		
Sulphate	mg/L	86	91	258	165	243	213	194	115	83.7	500.0		
Ammonia	mg/L	< 0.05	0.06	6.37	4.55	17.5	48	3.58	32.30	28.40	-		
Nitrate as N	mg/L	4.58	2.06	18.5	1.6	3.2	0.1	8.7	< 0.5	42.0	10		
Nitrite as N	mg/L	0.031	0.019	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	<0.5	< 0.25	1		
Total Kjeldahl Nitrogen	mg/L	0.85	0.6	8.4	6.7	22.8	44.9	5	41.5	32.80	-		
Phenolics	mg/L	< 0.001	< 0.001	0.013	< 0.001	0.011	0.011	< 0.001	0.005	0.006	-		
Dissolved Organic Carbon	mg/L	4.8	3.8	23.1	20.8	40.6	90.2	8.5	78.3	58.8	5		
Chemical Oxygen Demand	mg/L	32	23	98	114	129	266	54	224	152	-		
Iron	mg/L	<0.1	<0.1	<0.1	<0.1	< 0.1	0.78	< 0.1	1.42	0.079	0.3		
Manganese	mg/L	0.39	0.38	6.1	2.1	5.68	5.03	2.09	3.230	1.880	0.05		
Phosphorus	mg/L	0.98	1	0.2	0.19	0.08	0.21	0.02	0.10	0.07	-		
Orthophosphate	mg/L NTU	1100	270	712	64.4	120	110	20.1	00.4	41.7	- 5		
Turbidity Total Suspended Solids	mg/I	600	1600	846	170	216	345	29.1 50	164	103	5		
BOD	mg/L mg/L	<2	<2	ND (12)	<20	<20	<20	50	<5	-5	_		
Anion Sum	g/ 12	4.9	5.58	14.9	10.7	14.6	19.1	7			-		
Cation Sum		4.69	5.24	13.8	9.07	14.6	14.7	6.3			-		
Ion Balance	%	2.15	3.1	-3.8	-8.3	< 0.1	-13.1	-9.9			-		
Silver	mg/L	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	0.0001	< 0.0001	< 0.002	< 0.002	-		
Aluminum	mg/L	0.13	0.1	1.9	2.07	0.036	0.563	0.18	0.459	0.236	0.1		
Antimony	mg/L	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.003	< 0.003	0.006		
Arsenic	mg/L	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	0.003	< 0.001	< 0.003	< 0.003	0.010		
Barium	mg/L	0.12	0.11	0.093	207	0.269	0.053	0.034	0.106	0.067	1.00		
Beryllium	mg/L mg/I	<0.0005	<0.0005	0.0008	0.0006	<0.0005	<0.0005	<0.0005	<0.001	<0.001	-		
Bisliuti	mg/L	0.48	0.37	2 32	1.1	1.44	1.63	1 71	3.15	2.41	- 5		
Cadmium	mg/L	0.43	0.00018	0.0005	0.0009	<0.001	0.0004	0.0002	<0.001	<0.001	0.005		
Chromium	mg/L	< 0.005	< 0.005	0.016	0.003	0.002	0.004	0.001	0.005	0.004	0.05		
Cobalt	mg/L	0.00062	< 0.0005	0.0444	0.0167	0.0044	0.0374	0.0039	0.021	0.006	-		
Copper	mg/L	0.0041	0.0044	0.0137	0.0064	0.0174	0.0114	0.004	0.012	0.024	1		
Molybdenum	mg/L	0.001	0.0032	< 0.0005	< 0.0005	0.0017	0.0016	0.0005	< 0.002	0.004	-		
Nickel	mg/L	0.0056	0.0021	0.012	0.011	0.005	0.011	0.003	0.007	0.007	-		
Phosphate	mg/L			< 0.0002	< 0.2	<0.2	< 0.2	<0.2	<1.0	< 0.50	-		
Lead	mg/L	< 0.0005	< 0.0005	0.0001	0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.001	< 0.001	0.01		
Selenium	mg/L	<0.002	<0.002	0.001	<0.001	<0.001	0.004	0.002	<0.004	<0.004	0.05		
Sillicon	mg/L	5.3	5./	4.42	3.42	4.76	1.32	1.24	2	1	-		
1 in Stars a time	mg/L mg/I	<0.001	<0.001	<0.005	<0.005	<0.005	<0.005	<0.005	<0.002	<0.002	-		
Titonium	mg/L	<0.005	<0.005	<0.007	<0.089	<0.005	0.008	<0.084	0.177	0.002	-		
Uranium	mg/L	0.0015	0.0034	0.0024	0.0012	0.0072	0.0034	0.0005	0.006	0.003	0.02		
Vanadium	mg/L	<0.0005	< 0.0005	0.0038	0.0012	0.0005	0.0009	<0.0005	< 0.002	< 0.002	-		
Zinc	mg/L	0.0059	0.0076	0.022	0.062	0.007	0.024	0.009	0.010	0.012	5		
Field Measurements	6												
Temperature	oC	-	-	-	-	-	-	-	11.1	15	-		
рН	pH Units	6.01	5.22	5.43	5.09	5.85	6.8	8.06	6.6	6.3	6.5-8.5		
Coductivity	uS/cm	473	233	1475	-	-	1.35	0.85	1972	1305	-		
Oxidation Reduction Potential	mV	-	-	-	-	-	-	-	129.2	83.7	-		
Dissolved Oxygen	mg/L	-	-	-	-	-	-	-	1.96	1.26	-		

Notes:

Ontario Drinking Water Quality Standards*

BOLD	Exceeds ODWQS
INSV	Insufficient volume to allow for sampling
NC	Not Calculated
CNL	Could Not Locate
LS	Limited Sample
Units	All Units in mg/L Unless Otherwise Noted.

TABLE 8												
Groundwater Quality Results - DP-7												
Croft Waste Disposal Site												
Magnetawan, Ontario												
				Sa	mple Designation	on						
Doromotor	Unito			Sample Col	lection Date (m	m/dd/yyyy)			ODWOS			
i arancter	Onits	DP-7										
		08/06/2015	10/22/2015	10/12/2016	05/18/2017	10/25/2017	06/11/2019	09/25/2019				
pH Lab	pH Units	DRY	DRY	DRY	DRY	DRY	6.49	6.71	6.5-8.5			
Conductivity	uS/cm						41	122	-			
Hardness	mg/L						15.2	48	80-100			
Total Dissolved Solids	mg/L						114	78	500			
Alkalinity	mg/L						9	36	30-500			
Chloride	mg/L						2.06	0.6	250			
Sodium	mg/L						1.68	2.8	200			
Calcium	mg/L						4.6	13.5	-			
Magnesium	mg/L						0.90	3.47	-			
Potassium	mg/L						0.16	0.27	-			
Sulphate	mg/L						7.5	15.9	500			
Ammonia	mg/L						0.48	< 0.02	-			
Nitrate as N	mg/L						0.06	0.07	10			
Nitrite as N	mg/L						< 0.05	< 0.05	1			
Total Kjeldahl Nitrogen	mg/L						1.14	1.69	-			
Phenolics	mg/L						0.004	0.001	-			
Dissolved Organic Carbon	mg/L						8.5	5.3	5			
Chemical Oxygen Demand	mg/L						33	156	-			
Iron	mg/L						7.26	0.342	0.3			
Manganese	mg/L						0.549	0.082	0.05			
Phosphorus	mg/L						0.54	3.78	-			
Orthophosphate	mg/L								-			
Turbidity	NTU						1100	6240	5			
Total Suspended Solids	mg/L						7060	3780	-			
BOD	mg/L						7	<5	-			
Anion Sum									-			
Cation Sum									-			
Ion Balance	%						0.000	0.000	-			
Silver	mg/L						< 0.002	<0.002	-			
Aluminum	mg/L						0.325	0.392	0.1			
Antimony	mg/L						< 0.003	<0.003	0.006			
Arsenic	mg/L						<0.003	<0.003	0.010			
Barium	mg/L						0.011	0.010	1			
Beryllium	mg/L						<0.001	<0.001	-			
Bismuth	mg/L						<0.002	<0.002	-			
Boron	mg/L						0.129	0.086	5			
Cadmium	mg/L						<0.001	<0.001	0.005			
Chromium	mg/L						<0.003	<0.003	0.05			
Cobalt	mg/L						0.004	<0.001	-			
Copper	mg/L						<0.003	<0.003	1			
Niolybdenum	mg/L						<0.002	<0.002	-			
INICKEI Dhaanhata	mg/L						0.004	<0.003	-			
Phosphate	mg/L						<0.10	<0.10	-			
Lead	IIIg/L						<0.001	<0.001	0.01			
Selenium	mg/L						<0.004	<0.004	0.05			
Sillicon	mg/L						4.36	5.43	-			
1 m	mg/L						<0.002	0.056	-			
Titonium	mg/L						0.031	<0.002	-			
1 näillulli Usenium	mg/L						<0.004	0.014	0.02			
Vanadium	mg/L	ł					<0.002	<0.002	0.02			
v anadium Zina	mg/L	ł					0.004	0.004	-			
Eigld Maggurements	mg/L		1	1		1	0.015	0.008	5			
Temporatura		r					12.1	14.0				
nH	OU DU Unit						13.1	14.8	6595			
Pri Coductivity	pri Units						0.48	0.35	0.3-8.5			
Ovidation Reduction Detertion	us/cm						02.9	/0./	-			
Dissolved Oxygen	шү т	<u> </u>					147.3	7 21	-			
Sissoffed Oxygen	mg/L		i i	1	1	1	1.13	1.51	-			

Notes:

Ontario Drinking Water Quality Standards* under the Safe Drinking Water Act*, dated 2002, and "Technical Support Document for Ontario Drinking Water Standards, Objectives and Guidelines", dated June 2003.

BOLD

Units

BOLD Exceeds ODWQS
INSV Insufficient volume to allow for sampling

NC Not Calculated

CNL Could Not Locate

LS Limited Sample

All Units in mg/L Unless Otherwise Noted.

TABLE 9 B-7 Guideline Calculations - Spring 2019 Croft Waste Disposal Site Magnetawan, Ontario											
			Guideline B-	7 Calculation							
Parameter	Units		Sample C	ollection Date (dd	/mm/yyyy)		ODWQS	Cm = Cb + x (Cr - Cb)			
		DP7	BH8	BH9	BH10	BH11		Ch	v	Cr	Cm
		06/11/2019	06/11/2019	06/11/2019	06/11/2019	06/11/2019		Co	л	CI	Cin
Chloride	mg/L	2.06	0.5	6.0	246	200	250	6.8	0.5	250	128.4
Sulphate	mg/L	7.45	5	38	69	115	500	8.16	0.5	500	254.1
Sodium	mg/L	1.68	3	11	129	184	200	5	0.5	200	102.5
Boron	mg/L	0.129	< 0.010	0.26	1.16	3.15	5	0.02	0.25	5	1.27
Nitrate	mg/L	0.06	< 0.05	< 0.05	<0.5	<0.5	10	0.05	0.25	10	2.54
Alkalinity	mg/L	9	11	97	508	439	30-500	33	0.5	30-500	31.3 - 266.3
Dissolved Organic Carbon	mg/L	8.5	3	17	20	78.3	5	12	0.5	5	NC
Total Dissolved Solids	mg/L	114	50.0	174	954	1000	500	111.07	0.5	500	305.5
Iron	mg/L	7.26	0.1	11.1	0.064	1.420	0.3	5.11	0.5	0.3	NC
Manganese	mg/L	0.549	0.011	1.64	2.88	3.23	0.05	0.867	0.5	0.05	NC

Notes:

Ontario Drinking Water Quality Standards*

ity Ontario Regulation 169/03 "Ontario Drinking Water Quality Standards" under the Safe Drinking Water Act", dated 2002, and "Technical Support Document for Ontario Drinking Water Standards, Objectives and Guidelines", dated June 2003.

BOLD	Exceeds Cm value.
INSV	Insufficient volume to allow for sampling
NC	Not Calculated due to the background concentration being in exceedance of the ODWQS.
CNL	Could Not Locate
LS	Limited Sample
Units	All Units in mg/L Unless Otherwise Noted.
Cb	Background Concentration
Cr	Maximum Acceptable Contaminant Concentration
х	Reduction Constant
Cm	Maximum Off-Site Acceptable Contaminant Concentration

TABLE 10 B-7 Guideline Calculations - Fall 2019 Croft Waste Disposal Site Magnetawan, Ontario											
			2	Sample Designation	on				Guideline B-	7 Calculation	
Parameter	Units		Sample Collection Date (dd/mm/yyyy)					Cm = Cb + x (Cr - Cb)			
		DP7	BH8	BH9	BH10	BH11	1	Ch	v	C.	Cm
		09/25/2019	09/25/2019	09/25/2019	09/25/2019	09/25/2019		Cb	х	CI	CIII
Chloride	mg/L	0.59	0.4	22.6	462	123.0	250	6.6	0.5	250	128.3
Sulphate	mg/L	15.9	9	96	53	84	500	8.39	0.5	500	254.2
Sodium	mg/L	2.76	3	24	182	136	200	5.32	0.5	200	102.7
Boron	mg/L	0.086	< 0.010	0.49	1.28	2.41	5	0.02	0.25	5	1.27
Nitrate	mg/L	0.07	0.060	< 0.10	22.6	42	10	0.05	0.25	10	2.53
Alkalinity	mg/L	36	23	181	372	294	30-500	33	0.5	30-500	31.7 - 266.7
Dissolved Organic Carbon	mg/L	5.3	3	24	16	58.8	5	12	0.5	5	NC
Total Dissolved Solids	mg/L	78	68.0	398	1540	828	500	108	0.5	500	304.1
Iron	mg/L	0.342	< 0.010	25.1	< 0.010	0.079	0.3	5.35	0.5	0.3	NC
Manganese	mg/L	0.082	0.022	4.16	4.34	1.88	0.05	0.866	0.5	0.05	NC

Notes:

Ontario Drinking Water Quality Standards*

Ontario Regulation 169/03 "Ontario Drinking Water Quality Standards" under the Safe Drinking Water Act", dated 2002, and "Technical Support Document for Ontario Drinking Water Standards, Objectives and Guidelines", dated June 2003.

BOLD	Exceeds Cm value.
INSV	Insufficient volume to allow for sampling
NC	Not Calculated due to the background concentration being in exceedance of the ODWQS.
CNL	Could Not Locate
LS	Limited Sample
Units	All Units in mg/L Unless Otherwise Noted.
Cb	Background Concentration
Cr	Maximum Acceptable Contaminant Concentration
х	Reduction Constant
Cm	Maximum Off-Site Acceptable Contaminant Concentration

					~	TAB	LE 11								
Groundwater Quality Results - SW-1 Croft Waste Disposal Site															
						Magnetaw	an, Ontario	~							
	1					San	ple Designation	n							
Parameter	Unite		Sample Collection Date (mm/dd/yyyy)												CWOG
r ut uniteer	ems														engo
		04/08/2014	10/30/2014	05/13/2015	10/22/2015	10/12/2016	05/18/2017	10/25/2017	05/02/2018	10/17/2018	06/11/2019	09/25/2019	6595		65.0.0
pH Lab Conductivity	uS/cm	23	23	27	400	186	27	<u>0.1</u> 45	20	72	478	<u>2</u> 89	0.3-8.3		0.3-9.0
Hardness	mg/L	10	11	11	150	56	12	22	7	27	80	22			
Total Dissolved Solids	mg/L	42	76	48	270	184	154	84	24	84	432	80			
Alkalinity	mg/L	5.5	5.9	3.8	7.8	12	7	10	6	7	4	-5			
Chloride	mg/L	<1	<1	3	100	41	2	5	1	10	149	17		180	120
Sodium	mg/L	0.63	0.65	0.9	6.6	3.7	1.44	0.885	0.781	1.18	14	3		180	
Magnesium	mg/L	0.52	0.59	0.47	13	4 53	0.58	1.33	0.394	1.99	32 14	2			
Potassium	mg/L mg/L	0.27	0.31	0.38	6.5	1.23	0.34	1.47	0.468	1.37	2	1		0.039	
Sulphate	mg/L	<1	<1	<1	15	2	1	<1	2	6	4	3			
Ammonia	mg/L	< 0.05	< 0.05	< 0.05	0.058	0.06	0.01	< 0.01	0.02	0.05	0.18	0.15			
Nitrate as N	mg/L	<0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	<0.1	<0.1	< 0.05	< 0.05			13
Nitrite as N	mg/L	< 0.01	< 0.01	< 0.01	< 0.01	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05			0.06
Total Kjeldahl Nitrogen	mg/L	1	0.55	0.49	0.67	0.8	0.6	0.9	0.3	1	0.41	2	0.004	0.071	0.004
Phenolics Dissolved Organic Carbon	mg/L mg/I	<0.001	21	<0.001	<0.001	24.1	<0.001	27.5	<0.001	<0.001	0.001	<u>0.01</u> 12	0.001	0.961	0.004
Chemical Oxygen Demand	mg/L	27	56	47	38	81	55	77	28	85	8	37			
Iron	mg/L	0.12	0.29	0.15	0.65	0.981	0.167	0.888	0.2	0.794	2	0.42	0.3		0.3
Manganese	mg/L	0.0094	0.028	0.019	0.23	0.038	0.072	0.152	0.022	0.079	1	0.10			
Phosphorus	mg/L	0.01	0.009	0.008	0.026	< 0.01	< 0.01	0.03	< 0.01	0.04	0.04	0.05	0.03		
Orthophosphate	mg/L	< 0.01	< 0.01	< 0.01	< 0.01						< 0.10				
Turbidity	NTU	0.2	0.3	0.4	2.5	1.5	0.7	1.4	2.1	0.9	6	3			
Total Suspended Solids	mg/L	<10	<10	<1	<10	4	<2	4	2	<2	38	<10			
Anion Sum	ing/L	0.109	0.117	0.175	3.28	1.41	0.23	0.35	0.19	0.54	0	0			
Cation Sum	1	0.272	0.281	0.339	3.58	1.31	0.32	0.51	0.18	0.63					
Ion Balance	%	NC	NC	NC	4.34	-3.9			-1.5	8.1					
Silver	mg/L	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0005	< 0.0001	< 0.0001	< 0.0001	<u>1.18</u>	< 0.0001	< 0.0001	0.0001	0.00012	0.00025
Aluminum	mg/L	0.26	<u>0.34</u>	0.26	0.22	0.167	0.228	0.265	0.133	0.375	0.72	0.28	0.075		0.1
Antimony	mg/L	<0.0005	<0.0005	<0.0005	<0.0005	<0.0025	<0.0005	<0.0005	<0.0005	<0.0005	<0.001	<0.001	0.02	1.6	0.005
Arsenic Barium	mg/L	<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.001	< 0.001	<0.001	<0.005	<0.005	0.1	2.3	0.005
Bervllium	mg/L	< 0.0005	< 0.0005	< 0.0012	<0.0005	< 0.0025	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	1.1	0.0053	
Bismuth	mg/L	< 0.001	< 0.001	< 0.001	< 0.001	< 0.005	< 0.001	< 0.001	< 0.001	< 0.001	< 0.002	< 0.002			
Boron	mg/L	< 0.01	< 0.01	< 0.01	0.015	< 0.05	0.049	< 0.01	0.011	< 0.01	< 0.010	0.093	0.2	3.55	1.5
Cadmium	mg/L	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0005	< 0.0001	< 0.0001	< 0.0001	< 0.0001	0.0002	0.0001	0.0002	0.00021	0.00026
Chromium	mg/L	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.001	< 0.001	< 0.001	0.001	< 0.003	< 0.003	0.0089	0.064	0.001
Cobalt	mg/L	<0.0005	<0.0005	<0.0005	0.0023	<0.0025	0.0013	<0.0022	<0.0005	0.0013	0.007	0.001	0.0009	0.0052	0.004
Molybdenum	mg/L	< 0.0018	<0.001	<0.0012	< 0.0005	<0.0025	< 0.0005	<0.0005	< 0.0005	<0.0025	<0.001	< 0.002	0.005	0.0009	0.004
Nickel	mg/L	0.0017	0.0025	0.002	0.0025	< 0.005	0.002	0.002	< 0.001	0.004	0.003	< 0.003	0.025	0.039	0.15
Phosphate	mg/L					< 0.0002	<0.2	< 0.0002	< 0.0002	< 0.2		< 0.10			
Lead	mg/L	0.00055	0.00066	0.00071	< 0.0005	< 0.0005	0.0007	0.0005	0.0001	0.0008	< 0.001	< 0.001	0.005	0.002	0.01
Selenium	mg/L	< 0.002	< 0.002	< 0.002	< 0.002	< 0.005	< 0.001	< 0.001	< 0.001	< 0.001	< 0.004	< 0.004	0.1	0.005	0.001
Sillicon	mg/L	0.77	3.3	0.94	1.7	1.54	0.856	3.27	1.99	1.8	2	2			
Tin	mg/L	<0.001	<0.001	<0.001	<0.001	<0.025	<0.005	<0.005	<0.005	<0.005	<0.002	<0.002			
Titanium	mg/L	<0.007	<0.017	<0.016	0.24	<0.025	<0.014	0.043	<0.015	0.039	0.00	0.07			
Uranium	mg/L	0.00017	< 0.0001	< 0.0001	0.00012	<0.0005	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.002	<0.002	0.005	0.033	0.02
Vanadium	mg/L	< 0.0005	< 0.0005	< 0.0005	0.00058	< 0.0025	0.0005	< 0.0005	< 0.0005	0.0007	< 0.002	< 0.002	0.006	0.02	
Zinc	mg/L	0.0061	0.016	0.0066	0.02	< 0.025	0.012	0.013	0.009	0.021	0.12	0.05	0.03	0.089	0.093
Field Measurements															
Temperature	oC								L		14.7	15.6			
pH	pH Units	7.36	6.92	6.53	6.25	6.45	5.81		7.37	6.64	6.9	4.5			
Coductivity Oxidation Reduction Potential	uS/cm	41	21	19.2	503	1975			0.03	0.08	172	83			
Dissolved Oxygen	ma/I								-	-	1/4.9	3.6			
a consiger	mg/L	1	1	1	1	1	1	1	1	1	1.20	5.0	L	l	l

PWQO	Provincial Water Quality Objective
APV	Aquatic Protection Values
CWQG	Canadian Water Quality Guidelines
BOLD	Exceeds PWQO
ITALICS	Exceeds APV
UNDERLINED	Exceeds CWQG
INSV	Insufficient volume to allow for sampling
NC	Not Calculated
CNL	Could Not Locate
LS	Limited Sample
Units	All Units in mg/L Unless Otherwise Noted.

TABLE 12 Groundwater Quality Results - SW-2 Croft Waste Disposal Site Magnetawan, Ontario															
		r					C I D								
		Sample Designation Sample Collection Date (mm/dd/yyyy) SW-2													
Parameter	Units												PWQO	APV	CWQG
		05/08/2014	10/30/14	05/13/2015	10/22/2015	10/12/2016	05/18/2017	10/25/2017	05/02/2018	10/17/2018	06/11/2019	09/25/2019			
pH Lab	pH units	<u>5.79</u>	<u>5.83</u>	<u>5.88</u>	6.6	6.6	4.1	<u>5.6</u>	<u>5.9</u>	<u>6</u>	5.82	<u>5.16</u>	6.5-8.5		6.5-9.0
Conductivity	uS/cm mg/I	15	18	15	32	2/	45	16	13	19	21	35 11.3			
Total Dissolved Solids	mg/L mg/L	24	52	<10	26	34	132	16	14	20	42	94			
Alkalinity	mg/L	1.2	2.1	1.8	9.3	9	<5	<5	<5	6	<5	<5			
Chloride	mg/L	<1	1	1	<1	1	<1	<1	1	<1	2.05	0.6		180	120
Sodium	mg/L	0.8	1.1	0.89	0.85	1	0.711	0.706	0.811	0.701	1.7	1.1		180	
Calcium	mg/L	1.2	1.6	1.3	3.2	2.74	1.51	1.36	0.798	2.03	1.6	3.0			
Magnesium	mg/L mg/I	0.3	0.43	0.34	1.1	<1	0.085	0.368	0.211	0.442	0.40	0.93		0.020	
Sulphate	mg/L mg/L	2.	<1	<1	<1	3	3	<1	0.598	2.	0.7	3.9		0.039	
Ammonia	mg/L	0.059	< 0.05	< 0.05	< 0.05	0.04	0.02	0.02	0.03	0.03	0.14	0.18			
Nitrate as N	mg/L	< 0.1	<0.1	<0.1	< 0.1	< 0.1	1.8	<0.1	< 0.1	<0.1	< 0.05	0.10			13
Nitrite as N	mg/L	< 0.01	< 0.01	< 0.01	< 0.01	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05			0.06
Total Kjeldahl Nitrogen	mg/L	0.001	0.42	0.44	< 0.5	0.3	0.9	0.5	0.4	0.5	1.07	1.67			
Phenolics	mg/L	<0.001	0.0043		<0.001	0.002	<0.001	0.004	<0.001	<0.001	0.002	0.012	0.001	0.961	0.004
Chemical Oxygen Demand	mg/L	0.4	35	26	28	36	63	30	4.5	21	44	125			
Iron	mg/L	0.38	1	1	2.5	0.738	0.632	1.09	0.364	0.596	1.31	2.73	0.3		0.3
Manganese	mg/L	0.034	0.046	0.049	0.31	0.032	0.085	0.055	0.035	0.041	0.122	0.305			
Phosphorus	mg/L	0.006	0.013	0.017	0.027	< 0.01	0.05	0.04	0.01	0.02	0.07	0.15	0.03		
Orthophosphate	mg/L	< 0.01	< 0.01	< 0.01	< 0.01						< 0.10				
Turbidity	NTU	0.4	1.2	1.2	5	1.1	8.6	2.4	2.2	1.9	8.1	9.2			
Total Suspended Solids	mg/L mg/I	1/	<10	1	<10	3	15	2	- 2	<2	26	<10			
Anion Sum	ing/L	0.056	0.081	0.077	0.186	0.28	0.21	0.13	0.14	0.2	0	0			
Cation Sum		0.167	0.201	0.191	0.379	0.21	0.14	0.14	0.1	0.18					
Ion Balance	%	NC	NC	NC	NC	-13.6				-6.2					
Silver	mg/L	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0005	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	0.0001	0.00012	0.00025
Aluminum	mg/L	0.18	<u>0.3</u>	0.25	0.13	0.037	0.192	0.216	0.005	0.135	0.176	0.577	0.075		0.1
Antimony	mg/L mg/I	<0.0005	<0.0005	<0.0005	<0.0005	<0.0025	<0.0005	<0.0005	<0.0005	<0.0005	<0.001	<0.001	0.02	1.6	0.01
Barium	mg/L mg/L	0.008	0.0091	0.0087	0.01	0.008	0.012	0.009	0.003	0.009	0.012	0.030	0.1	2.3	0.01
Beryllium	mg/L	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0025	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	1.1	0.0053	
Bismuth	mg/L	< 0.001	< 0.001	< 0.001	< 0.001	< 0.005	< 0.001	< 0.001	< 0.001	< 0.001	< 0.002	< 0.002			
Boron	mg/L	< 0.01	< 0.01	< 0.01	< 0.01	< 0.05	0.023	< 0.01	0.011	< 0.01	0.012	< 0.010	0.2	3.55	1.5
Cadmium	mg/L	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0005	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	0.0001	0.0002	0.00021	0.00026
Chromium	mg/L	< 0.005	<0.005	< 0.005	< 0.005	< 0.005	< 0.001	< 0.001	< 0.001	<0.001	< 0.003	< 0.003	0.0089	0.064	0.001
Copper	mg/L mg/I	< 0.0005	<0.0005	<0.0005	<0.001	<0.0025	0.0007	<0.0005	<0.0005	<0.0005	<0.0009	0.0028	0.0009	0.0052	0.004
Molvbdenum	mg/L mg/L	< 0.0001	< 0.0005	< 0.0005	< 0.0005	<0.0025	< 0.0005	< 0.0005	<0.0005	< 0.0005	<0.002	< 0.002	0.04	0.73	0.073
Nickel	mg/L	0.0012	0.001	< 0.001	< 0.001	< 0.005	0.001	< 0.001	< 0.001	< 0.001	< 0.003	< 0.003	0.025	0.039	0.15
Phosphate	mg/L					< 0.0002	< 0.0002	< 0.0002	< 0.2	<0.2		< 0.10			
Lead	mg/L	< 0.0005	< 0.0005	< 0.0005	< 0.0005	0.0008	0.0003	0.0002	0.0001	0.0002	< 0.001	0.001	0.005	0.002	0.01
Selenium	mg/L	< 0.002	< 0.002	< 0.002	< 0.002	< 0.005	< 0.001	< 0.0001	< 0.001	< 0.001	< 0.004	< 0.004	0.1	0.005	0.001
Sillicon	mg/L	0.6	2.1	0.59	3.1	<0.05	0.306	2.15	1.14	1.27	0.45	4.6			
Strontium	mg/L	< 0.001	<0.001	< 0.001	0.022	<0.025	<0.005	< 0.005	<0.005	<0.005	<0.002	<0.002			
Titanium	mg/L mg/L	< 0.005	<0.005	< 0.005	< 0.005	<0.025	< 0.005	< 0.005	< 0.005	< 0.010	0.003	0.008			
Uranium	mg/L	0.00012	< 0.0001	< 0.0001	< 0.0001	< 0.0005	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.002	< 0.002	0.005	0.033	0.02
Vanadium	mg/L	< 0.0005	< 0.0005	0.00058	0.00082	< 0.0025	0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.002	0.002	0.006	0.02	
Zinc	mg/L	0.0075	0.0085	0.0069	< 0.005	< 0.025	0.022	0.008	0.007	0.01	0.012	0.021	0.03	0.089	0.09
Field Measurements			1							1					1
1 emperature	oC	9.2	6.1	13.1	7.69	17.6	21.4	L	6.50	7.3	17.8	14.4			
Coductivity	pH Units	5.95 34	/	9.26	0.08	1.03	0.03	5.6	0.52 5.9	/.1	0.8	4.5			
Oxidation Reduction Potential	mV		1044	13	+0	0.0	4.1	5.0	3.9	0	139.5	205.9			
Dissolved Oxygen	mg/L	6.86	4.4	8.17	7.36						2.73	1.57			
Notes:		•	•							-	-			•	•

PWQO APV CWQG Provincial Water Quality Objective Aquatic Protection Values Canadian Water Quality Guidelines CWQG BOLD TTALICS UNDERLINED INSV NC CNL LS Units Exceeds PWQO Exceeds APV Exceeds CWQG Insufficient volume to allow for sampling Not Calculated Could Not Locate Limited Sample All Units in mg/L Unless Otherwise Noted.

					TA	BLE 13							
Groundwater Quality Results - SW-3													
Croft Waste Disposal Site Mometawan Ontorio													
					Magneta	wan, Ontari	0						
					Sa	nnle Designatio	n						1
					Sample Coll	ection Date (mr	n/dd/yyyy)						
Parameter	Units		SW-3										
		05/08/2014	05/08/2014 10/30/2014 05/13/2015 10/22/2015 10/12/2016 05/18/2017 10/25/2017 06/11/2019 09/25/2014										
pH Lab	pH units	7.73	7.09	<u>6.38</u>	7.59	7.9	DRY	DRY	7.54	7.41	6.5-8.5		6.5-9.0
Conductivity	uS/cm	820	510	210	1400	2060			193	241			
Hardness	mg/L	250	170	77	410	460			64.7	56.7			
Total Dissolved Solids	mg/L	552	276	158	820	1380			112	124			
Alkalinity Chlarida	mg/L mg/I	190	120	17	190	242			/8	69 14.20		180	120
Sodium	mg/L	60	31	8	99	242			7 49	14.20		180	120
Calcium	mg/L mg/L	83	55	22	120	146			25.90	18.90		100	
Magnesium	mg/L	11	8.6	3.3	17	23.1			2.69	2.31			
Potassium	mg/L	33	13	3.3	33	66.7			4.77	9.13		0.039	
Sulphate	mg/L	110	73	58	160	159			6.96	6.96			
Ammonia	mg/L	4.6	1.1	0.48	0.1	4.54			0.05	0.66			
Nitrate as N	mg/L	4.57	1.22	0.31	11.3	3.7			0.10	0.40			13
Nitrite as N	mg/L	0.171	0.045	<0.01	0.12	<0.05			<0.05	0.08			0.06
Total Kjeldahl Nitrogen	mg/L mg/I	0.0027	0.0053	<0.93	1.6	9			0.003	1.52	0.001	0.061	0.004
Dissolved Organic Carbon	mg/L	30	17	7.1	30	90.2			13.7	11.2	0.001	0.961	0.004
Chemical Oxygen Demand	mg/L mg/L	81	47	16	80	270			44	53			
Iron	mg/L	0.76	2.4	0.21	0.16	0.854			1.35	1.65	0.3		0.3
Manganese	mg/L	0.067	0.18	0.042	0.25	1.07			0.351	0.138			
Phosphorus	mg/L	0.052	0.062	0.014	0.045	0.17			0.06	0.21	0.03		
Orthophosphate	mg/L	< 0.01	< 0.01	< 0.01	< 0.01				< 0.10				
Turbidity	NTU	49	1.5	0.6	2.4	8.1			15.7	71			
Total Suspended Solids	mg/L	160	<10	1	<10	19			16	52			-
BOD	mg/L	3	<2	<2	<2	32			<>	<>			
Anion Sum		8.83	4.99	2.1	12.0	23.3							
Ion Balance	%	5.4	1.1	NC	4.85	-6.2							
Silver	mg/L	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0005			< 0.0001	< 0.0001	0.0001	0.00012	0.00025
Aluminum	mg/L	0.81	0.08	0.087	<u>0.073</u>	<u>0.038</u>			0.032	<u>0.062</u>	0.075		0.1
Antimony	mg/L	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0025			< 0.001	< 0.001	0.02	1.6	
Arsenic	mg/L	< 0.001	< 0.001	< 0.001	< 0.001	< 0.005			< 0.003	< 0.003	0.1	0.15	0.01
Barium	mg/L	0.077	0.063	0.052	0.11	0.119			0.026	0.029		2.3	
Beryllium	mg/L	<0.0005	<0.0005	<0.0005	<0.0005	<0.0025			<0.0005	<0.0005	1.1	0.0053	
Bismuui	mg/L	1	0.51	0.15	<0.001	2 29			0.219	<0.002	0.2	3 55	15
Cadmium	mg/L mg/L	0.00014	< 0.0001	<0.0001	0.0002	<0.0005			<0.0001	<0.0001	0.0002	0.00021	0.00026
Chromium	mg/L	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005			< 0.003	< 0.003	0.0089	0.064	0.001
Cobalt	mg/L	0.0012	0.0012	< 0.0005	0.0016	0.005			0.0012	0.001	0.0009	0.0052	
Copper	mg/L	0.0071	0.0018	< 0.001	0.0062	0.008			0.004	0.008	0.005	0.0069	0.004
Molybdenum	mg/L	0.001	< 0.0005	< 0.0005	0.0014	0.0035			< 0.002	< 0.002	0.04	0.73	0.073
Nickel	mg/L	0.0018	0.0017	< 0.001	0.0025	0.01			< 0.003	< 0.003	0.025	0.039	0.15
Phosphate	mg/L	0.0012	-0.0005	-0.0005	.0.0005	<0.0002			0.001	<0.10	0.005	0.002	0.01
Lead	mg/L mg/I	<0.0013	<0.0005	<0.0005	<0.0005	<0.005			<0.001	<0.003	0.005	0.002	0.01
Sillicon	mg/L	2.3	3	2.2	1.4	1.04			0.99	1.01	0.1	0.005	0.001
Tin	mg/L mg/L	< 0.001	<0.001	< 0.001	< 0.001	<0.025			< 0.002	< 0.002			
Strontium	mg/L	0.3	0.19	0.084	0.38	0.523			0.095	0.076			
Titanium	mg/L	0.047	< 0.005	< 0.005	< 0.005	< 0.025			0.013	0.038			
Uranium	mg/L	0.0026	0.00072	0.00011	0.0018	0.0059			< 0.002	< 0.002	0.005	0.033	0.02
Vanadium	mg/L	0.0017	< 0.0005	< 0.0005	0.00068	< 0.0025			< 0.002	0.002	0.006	0.02	
Zinc	mg/L	0.0082	< 0.005	< 0.005	0.009	0.055			0.009	0.013	0.03	0.089	0.09
Field Measurements			2 -		0.5	10-			10.2	16.5		1	-
n emperature	oC	16	6.7	14.1	8.2	18.9			19.2	16.5			
P11 Coductivity	uS/cm	2/10	0.07	0.43	2.33 860	0./3			215.1	6.25			<u> </u>
Oxidation Reduction Potential	mV	247	1.5	770	000	1/7			116.3	112.6			
Dissolved Oxygen	mg/L	5.05	11.12	6.56	4.98				6.05	6.43		1	
Notes:	<i>a</i>					1	0	0			1		

PWQO Provincial Water Quality Objective APV Aquatic Protection Values CWQG Canadian Water Quality Guidelines BOLD Exceeds PWQO ITALICS Exceeds APV Exceeds CWQG UNDERLINED INSV Insufficient volume to allow for sampling NC Not Calculated CNL Could Not Locate LS Limited Sample

Units All Units in mg/L Unless Otherwise Noted.

TABLE 14 Groundwater Duplicate Data Croft Waste Disposal Site Magnetawan, Ontario											
Peremotor	Unite	PDI	POI		11-5	Jun-19	25-Sep-19				
i aranetei	Onits	KDL	TQL	BH9	GW DUP	Relative Percent Difference (%)	BH11	GW DUP	Relative Percent Difference (%)		
pH Lab	pH Units	NA		7.27	7.28	0.14	7.32	7.41	1.22		
Conductivity	uS/cm	2	10	289	288	0.35	1620	1510	7.03		
Hardness	mg/L	0.5	2.5	104	104	0.00	225	201	11.27		
Total Dissolved Solids	mg/L	20	100	174	184	5.59	828	676	20.21		
Alkalinity	mg/L	5	25	97	96	1.04	294	272	7.77		
Chloride	mg/L	0.10	0.5	6.04	5.83	3.54	123	105	15.79		
Sodium	mg/L	0.05	0.25	10.8	10.6	1.87	136	122	10.85		
Calcium	mg/L	0.05	0.25	34.5	34.4	0.29	64.6	58	10.77		
Magnesium	mg/L	0.05	0.25	4.41	4.46	1.13	15.5	13.7	12.33		
Potassium	mg/L	0.05	0.25	6.08	6.08	0.00	56.5	53.5	5.45		
Sulphate	mg/L	0.10	0.5	37.7	37.5	0.53	83.7	80.8	3.53		
Ammonia	mg/L	0.02	0.1	1.04	1.01	2.93	28.4	27.2	4.32		
Nitrate as N	mg/L	0.05	0.25	< 0.05	0.05	NC	42	37	12.66		
Nitrite as N	mg/L	0.05	0.25	< 0.05	< 0.05	NC	< 0.25	< 0.25	NC		
Total Kjeldahl Nitrogen	mg/L	0.10	0.5	1.7	1.49	13.17	32.8	29.8	9.58		
Phenolics	mg/L	0.001	0.005	< 0.001	< 0.001	NC	0.006	0.007	15.38		
Dissolved Organic Carbon	mg/L	0.5	2.5	16.7	16.7	0.00	58.8	58.2	1.03		
Chemical Oxygen Demand	mg/L	5	25	36	38	5.41	152	155	1.95		
Iron	mg/L	0.010	0.05	11.1	10.7	3.67	0.079	0.067	16.44		
Manganese	mg/L	0.002	0.01	1.64	1.62	1.23	1.88	1.87	0.53		
Phosphorus	mg/L	0.02	0.1	0.1	0.12	18.18	0.07	0.07	NC		
Turbidity	NTU	0.5	2.5	151	137	9.72	41.7	39.2	6.18		
Total Suspended Solids	mg/L	10	50	212	338	45.82	103	55	60.76		
BOD	mg/L	5	25	<5	<5	NC	<5	<5	NC		
Silver	mg/L	0.002	0.01	< 0.002	< 0.002	NC	< 0.002	< 0.002	NC		
Aluminum	mg/L	0.004	0.02	0.109	0.117	7.08	0.236	0.236	0.00		
Antimony	mg/L	0.003	0.015	< 0.003	< 0.003	NC	< 0.003	< 0.003	NC		
Arsenic	mg/L	0.003	0.015	< 0.003	< 0.003	NC	< 0.003	< 0.003	NC		
Barium	mg/L	0.002	0.01	0.054	0.055	1.83	0.067	0.066	1.50		
Beryllium	mg/L	0.001	0.005	< 0.001	< 0.001	NC	< 0.001	< 0.001	NC		
Bismuth	mg/L	0.002	0.01	< 0.002	< 0.002	NC	< 0.002	< 0.002	NC		
Boron	mg/L	0.010	0.05	0.259	0.318	20.45	2.41	2.39	0.83		
Cadmium	mg/L	0.001	0.005	< 0.001	< 0.001	NC	< 0.001	< 0.001	NC		
Chromium	mg/L	0.003	0.015	< 0.003	< 0.003	NC	0.004	0.004	NC		
Cobalt	mg/L	0.001	0.005	0.011	0.01	9.52	0.006	0.006	0.00		
Copper	mg/L	0.003	0.015	< 0.003	< 0.003	NC	0.024	0.012	NC		
Molybdenum	mg/L	0.002	0.01	< 0.002	< 0.002	NC	0.004	0.004	NC		
Nickel	mg/L	0.003	0.015	< 0.003	< 0.003	NC	0.007	0.007	NC		
Phosphate	mg/L	0.10	0.5	< 0.10	< 0.10	NC	< 0.50	< 0.50	NC		
Lead	mg/L	0.001	0.005	< 0.001	< 0.001	NC	< 0.001	< 0.001	NC		
Selenium	mg/L	0.004	0.02	< 0.004	< 0.004	NC	< 0.004	< 0.004	NC		
Sillicon	mg/L	0.05	0.25	3.57	3.62	1.39	1.4	1.39	0.72		
Tin	mg/L	0.002	0.01	< 0.002	< 0.002	NC	< 0.002	< 0.002	NC		
Strontium	mg/L	0.005	0.025	0.121	0.116	4.22	0.127	0.13	2.33		
Titanium	mg/L	0.002	0.01	0.002	0.002	NC	0.005	0.005	NC		
Uranium	mg/L	0.002	0.01	< 0.002	< 0.002	NC	0.003	0.003	NC		
Vanadium	mg/L	0.002	0.01	< 0.002	< 0.002	NC	< 0.002	< 0.002	NC		
Zinc	mg/L	0.005	0.025	0.016	0.018	NC	0.012	0.005	NC		
Notes:											

NC BOLD

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Not calculable due to one or more of the concentrations being quantified over the reasonable detection limit (RDL) or the practical quantification limit (PQL).
Bolded and shaded entries indicates that the relative percent difference (RPD) exceeds the industry standard of 50%.

TABLE 15 Surface Water Duplicate Data Croft Waste Disposal Site Magnetawan, Ontario											
Daramatar	Unite	PDI	POI		11-	Jun-19	25-Sep-19				
i aranieter	Onits	KDL	TQL	SW1	SW DUP	Relative Percent Difference (%)	SW2	SW DUP	Relative Percent Difference (%)		
pH Lab	pH units	NA		4.1	4.3	4.76	5.16	5.43	5.10		
Conductivity	uS/cm	2	10	478	459	4.06	33	33	0.00		
Hardness	mg/L	0.5	2.5	79.90	77.70	2.79	11.30	11.70	3.48		
Total Dissolved Solids	mg/L	20	100	432	316	31.02	94	96	NC		
Alkalinity	mg/L	5	25	<5	<5	NC	<5	<5	NC		
Chloride	mg/L	0.50	2.5	149	135	9.86	0.56	0.51	NC		
Sodium	mg/L	0.05	0.25	14.1	13.7	2.88	1.13	1.14	0.88		
Calcium	mg/L	0.05	0.25	32	31.1	2.85	2.99	3.1	3.61		
Magnesium	mg/L	0.05	0.25	14.2	13.6	4.32	0.93	0.95	2.13		
Potassium	mg/L	0.05	0.25	2.25	2.38	5.62	0.71	0.7	1.42		
Sulphate	mg/L	0.10	0.5	4.45	4.21	5.54	3.85	3.6	6.71		
Ammonia	mg/L	0.02	0.1	0.18	0.16	11.76	0.18	0.2	10.53		
Nitrate as N	mg/L	0.05	0.25	< 0.05	< 0.05	NC	0.1	0.1	NC		
Nitrite as N	mg/L	0.05	0.25	< 0.05	0.44	NC	< 0.05	< 0.05	NC		
Total Kjeldahl Nitrogen	mg/L	0.10	0.5	0.41	0.55	NC	1.67	1.55	7.45		
Phenolics	mg/L	0.001	0.005	0.001	0.001	NC	0.012	0.012	0.00		
Dissolved Organic Carbon	mg/L	0.5	2.5	3.5	2.4	NC	38.3	39.3	2.58		
Chemical Oxygen Demand	mg/L	5	25	8	17	NC	125	133	6.20		
Iron	mg/L	0.010	0.05	2	3.1	43.14	2.73	3	9.42		
Manganese	mg/L	0.002	0.01	0.605	0.895	38.67	0.305	0.314	2.91		
Phosphorus	mg/L	0.02	0.1	0.04	0.06	40.00	0.15	0.13	14.29		
Orthophosphate	mg/L	0.10	0.5	< 0.10	< 0.10	NC	< 0.10	< 0.10	NC		
Turbidity	NTU	0.5	2.5	5.7	3.2	56.18	9.2	9.1	1.09		
Total Suspended Solids	mg/L	10	50	38	<10	NC	<10	<10	NC		
BOD	mg/L	5	25	<5	<5	NC	<5	<5	NC		
Silver	mg/L	0.0001	0.0005	< 0.0001	< 0.0001	NC	< 0.0001	< 0.0001	NC		
Aluminum	mg/L	0.004	0.02	0.717	1.03	35.83	0.577	0.582	0.86		
Antimony	mg/L	0.001	0.005	< 0.001	< 0.001	NC	< 0.001	< 0.001	NC		
Arsenic	mg/L	0.003	0.015	< 0.003	< 0.003	NC	< 0.003	< 0.003	NC		
Barium	mg/L	0.002	0.01	0.088	0.099	11.76	0.03	0.032	6.45		
Beryllium	mg/L	0.0005	0.0025	< 0.0005	< 0.0005	NC	< 0.0005	< 0.0005	NC		
Bismuth	mg/L	0.002	0.01	< 0.002	< 0.002	NC	< 0.002	< 0.002	NC		
Boron	mg/L	0.010	0.05	< 0.010	0.012	NC	< 0.010	< 0.010	NC		
Cadmium	mg/L	0.0001	0.0005	0.0002	0.0002	NC	0.0001	< 0.0001	NC		
Chromium	mg/L	0.003	0.015	< 0.003	< 0.003	NC	< 0.003	< 0.003	NC		
Cobalt	mg/L	0.0005	0.0025	0.0074	0.0104	33.71	0.0028	0.0031	10.17		
Copper	mg/L	0.001	0.005	0.001	0.001	NC	0.003	0.003	NC		
Molybdenum	mg/L	0.002	0.01	< 0.002	< 0.002	NC	< 0.002	< 0.002	NC		
Nickel	mg/L	0.003	0.015	0.003	0.004	NC	< 0.003	< 0.003	NC		
Lead	mg/L	0.001	0.005	< 0.001	< 0.001	NC	0.001	0.001	NC		
Selenium	mg/L	0.004	0.02	< 0.004	< 0.004	NC	<0.004	< 0.004	NC		
Sillicon	mg/L	0.05	0.25	2.01	2.24	10.82	4.6	4.62	0.43		
Tin	mg/L	0.002	0.01	< 0.002	< 0.002	NC	< 0.002	< 0.002	NC		
Strontium	mg/L	0.005	0.025	0.31	0.324	4.42	0.025	0.027	7.69		
Titanium	mg/L	0.002	0.01	0.002	0.002	NC	0.008	0.009	NC		
Uranium	mg/L	0.002	0.01	< 0.002	< 0.002	NC	< 0.002	< 0.002	NC		
Vanadium	mg/L	0.002	0.01	< 0.002	< 0.002	NC	0.002	0.002	NC		
Zinc	mg/L	0.005	0.025	0.116	0.12	3.39	0.021	0.021	NC		

Not calculable due to one or more of the concentrations being quantified over the reasonable detection limit (RDL) or the practical quantification limit (PQL).

Bolded and shaded entries indicates that the relative percent difference (RPD) exceeds the industry standard of 50%.

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APPENDIX IV Photoplates










December 12, 2019 Pinchin File: 225335.002 DRAFT











December 12, 2019 Pinchin File: 225335.002 DRAFT





















APPENDIX V Laboratory Certificates of Analysis



CLIENT NAME: PINCHIN LTD. 957 CAMBRIAN HEIGHTS DRIVE, UNIT 203 SUDBURY, ON P3C 5S5 (705) 521-0560

ATTENTION TO: Ryan Lawrence

PROJECT: 225335 Croft Landfill - SW

AGAT WORK ORDER: 19T479315

WATER ANALYSIS REVIEWED BY: Nivine Basily, Inorganics Report Writer

DATE REPORTED: Jun 21, 2019

PAGES (INCLUDING COVER): 9

VERSION*: 1

Should you require any information regarding this analysis please contact your client services representative at (905) 712-5100

*NOTES		

All samples will be disposed of within 30 days following analysis. Please contact the lab if you require additional sample storage time.

AGAT Laboratories (V1) Member of: Association of Professional Engineers and Geoscientists of Alberta

(APEGA) Western Enviro-Agricultural Laboratory Association (WEALA) Environmental Services Association of Alberta (ESAA) AGAT Laboratories is accredited to ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA) and/or Standards Council of Canada (SCC) for specific tests listed on the scope of accreditation. AGAT Laboratories (Mississauga) is also accredited by the Canadian Association for Laboratory Accreditation Inc. (CALA) for specific drinking water tests. Accreditations are location and parameter specific. A complete listing of parameters for each location is available from www.cala.ca and/or www.scc.ca. The tests in this report may not necessarily be included in the scope of accreditation. Measurement Uncertainty is not taken into consideration when stating conformity with a specified requirement.

Page 1 of 9

Results relate only to the items tested. Results apply to samples as received. All reportable information as specified by ISO 17025:2017 is available from AGAT Laboratories upon request



AGAT WORK ORDER: 19T479315 PROJECT: 225335 Croft Landfill - SW 5835 COOPERS AVENUE MISSISSAUGA, ONTARIO CANADA L4Z 1Y2 TEL (905)712-5100 FAX (905)712-5122 http://www.agatlabs.com

ATTENTION TO: Ryan Lawrence

SAMPLING SITE:

CLIENT NAME: PINCHIN LTD.

SAMPLED BY:

			C	Croft Landfill	- Surface \	Water Parame	eters				
DATE RECEIVED: 2019-06-13								D	ATE REPORT	ED: 2019-06-21	
Parameter	SUnit	AMPLE DES SAM DATE G / S	CRIPTION: PLE TYPE: SAMPLED: RDL	SW-1 Water 2019-06-11 274458	RDL	SW-2 Water 2019-06-11 274463	RDL	SW-3 Water 2019-06-11 274464	RDL	SW-DUP Water 2019-06-11 274465	
BOD (5)	mg/L		5	<5	5	<5	5	<5	5	<5	
pH	pH Units	6.5-8.5	NA	4.10	NA	5.82	NA	7.54	NA	4.30	
Total Hardness (as CaCO3)	mg/L		0.5	79.9	0.5	4.0	0.5	64.7	0.5	77.7	
Alkalinity (as CaCO3)	mg/L		5	<5	5	<5	5	78	5	<5	
Bicarbonate (as CaCO3)	mg/L		5	<5	5	<5	5	78	5	<5	
Total Dissolved Solids	mg/L		20	432	20	42	20	112	20	316	
Chloride	mg/L		0.50	149	0.10	2.05	0.10	6.38	0.50	135	
Nitrate as N	mg/L		0.05	<0.05	0.05	<0.05	0.05	0.10	0.05	<0.05	
Nitrite as N	mg/L		0.05	<0.05	0.05	<0.05	0.05	<0.05	0.05	0.44	
Sulphate	mg/L		0.10	4.45	0.10	0.73	0.10	6.96	0.10	4.21	
Chemical Oxygen Demand	mg/L		5	8	5	44	5	44	5	17	
Dissolved Organic Carbon	mg/L		0.5	3.5	0.5	11.8	0.5	13.7	0.5	2.4	
Electrical Conductivity	μS/cm		2	478	2	21	2	193	2	459	
Ortho Phosphate as P	mg/L		0.10	<0.10	0.10	<0.10	0.10	<0.10	0.10	<0.10	
Ammonia as N	mg/L		0.02	0.18	0.04	0.14	0.02	0.05	0.02	0.16	
Calcium	mg/L		0.05	32.0	0.05	1.59	0.05	25.9	0.05	31.1	
Magnesium	mg/L		0.05	14.2	0.05	0.40	0.05	2.69	0.05	13.6	
Sodium	mg/L		0.05	14.1	0.05	1.68	0.05	7.49	0.05	13.7	
Phenols	mg/L	0.001	0.001	0.001	0.001	0.002	0.001	0.003	0.001	0.001	
Total Suspended Solids	mg/L		10	38	10	26	10	16	10	<10	
Total Kjeldahl Nitrogen	mg/L		0.10	0.41	0.10	1.07	0.10	1.22	0.10	0.55	
Total Phosphorus	mg/L	0.030	0.02	0.04	0.02	0.07	0.02	0.06	0.02	0.06	
Turbidity	NTU		0.5	5.7	0.5	8.1	0.5	15.7	0.5	3.2	
Potassium	mg/L		0.05	2.25	0.05	0.33	0.05	4.77	0.05	2.38	
Aluminum-dissolved	mg/L	0.075	0.004	0.717	0.004	0.176	0.004	0.032	0.004	1.03	
Antimony	mg/L	0.020	0.001	<0.001	0.001	<0.001	0.001	<0.001	0.001	<0.001	
Arsenic	mg/L	0.1	0.003	<0.003	0.003	< 0.003	0.003	< 0.003	0.003	<0.003	
Barium	mg/L		0.002	0.088	0.002	0.012	0.002	0.026	0.002	0.099	
Beryllium	mg/L	0.011	0.0005	<0.0005	0.0005	<0.0005	0.0005	<0.0005	0.0005	<0.0005	
Bismuth	mg/L		0.002	<0.002	0.002	< 0.002	0.002	< 0.002	0.002	<0.002	

Certified By:

Nivine Basily



AGAT WORK ORDER: 19T479315 PROJECT: 225335 Croft Landfill - SW 5835 COOPERS AVENUE MISSISSAUGA, ONTARIO CANADA L4Z 1Y2 TEL (905)712-5100 FAX (905)712-5122 http://www.aqatlabs.com

CLIENT NAME: PINCHIN LTD.

SAMPLING SITE:

ATTENTION TO: Ryan Lawrence

SAMPLED BY:

Croft Landfill - Surface Water Parameters											
DATE RECEIVED: 2019-06-13								D	ATE REPORT	ED: 2019-06-21	
		SAMPLE DESC SAMP	CRIPTION: PLE TYPE:	SW-1 Water		SW-2 Water		SW-3 Water		SW-DUP Water	
Parameter	Unit	DATE S G / S	SAMPLED: RDL	2019-06-11 274458	RDL	2019-06-11 274463	RDL	2019-06-11 274464	RDL	2019-06-11 274465	
Boron	mg/L	0.20	0.010	<0.010	0.010	0.012	0.010	0.219	0.010	0.012	
Cadmium	mg/L	0.0002	0.0001	0.0002	0.0001	<0.0001	0.0001	<0.0001	0.0001	0.0002	
Chromium	mg/L		0.003	< 0.003	0.003	<0.003	0.003	< 0.003	0.003	<0.003	
Cobalt	mg/L	0.0009	0.0005	0.0074	0.0005	0.0009	0.0005	0.0012	0.0005	0.0104	
Copper	mg/L	0.005	0.001	0.001	0.001	<0.001	0.001	0.004	0.001	0.001	
Iron	mg/L	0.3	0.010	2.00	0.010	1.31	0.010	1.35	0.010	3.10	
Lead	mg/L	**	0.001	<0.001	0.001	<0.001	0.001	0.001	0.001	<0.001	
Manganese	mg/L		0.002	0.605	0.002	0.122	0.002	0.351	0.002	0.895	
Molybdenum	mg/L	0.04	0.002	< 0.002	0.002	<0.002	0.002	< 0.002	0.002	<0.002	
Nickel	mg/L	0.025	0.003	0.003	0.003	< 0.003	0.003	< 0.003	0.003	0.004	
Selenium	mg/L	0.1	0.004	<0.004	0.004	<0.004	0.004	< 0.004	0.004	<0.004	
Silicon	mg/L		0.05	2.01	0.05	0.45	0.05	0.99	0.05	2.24	
Silver	mg/L	0.0001	0.0001	<0.0001	0.0001	<0.0001	0.0001	<0.0001	0.0001	<0.0001	
Strontium	mg/L		0.005	0.310	0.005	0.011	0.005	0.095	0.005	0.324	
Tin	mg/L		0.002	<0.002	0.002	<0.002	0.002	< 0.002	0.002	<0.002	
Titanium	mg/L		0.002	0.002	0.002	0.003	0.002	0.013	0.002	0.002	
Uranium	mg/L	0.005	0.002	<0.002	0.002	<0.002	0.002	< 0.002	0.002	<0.002	
Vanadium	mg/L	0.006	0.002	<0.002	0.002	<0.002	0.002	< 0.002	0.002	<0.002	
Zinc	mg/L	0.03	0.005	0.116	0.005	0.012	0.005	0.009	0.005	0.120	

Comments:

RDL - Reported Detection Limit; G / S - Guideline / Standard: Refers to PWQO (mg/L) **Dependent on alkalinity

Guideline values are for general reference only. The guidelines provided may or may not be relevant for the intended use. Refer directly to the applicable standard for regulatory interpretation. Elevated RDL indicates the degree of sample dilution prior to the analysis in order to keep analytes within the calibration range of the instrument and to reduce matrix interference.

Total Hardness (as CaCO3) is a calculated parameter.

274464 Total Hardness (as CaCO3) is a calculated parameter.

274465

Elevated RDL indicates the degree of sample dilution prior to the analysis in order to keep analytes within the calibration range of the instrument and to reduce matrix interference.

Total Hardness (as CaCO3) is a calculated parameter.

Analysis performed at AGAT Toronto (unless marked by *)

Nivine Basily

Certified By:



Guideline Violation

AGAT WORK ORDER: 19T479315 PROJECT: 225335 Croft Landfill - SW 5835 COOPERS AVENUE MISSISSAUGA, ONTARIO CANADA L4Z 1Y2 TEL (905)712-5100 FAX (905)712-5122 http://www.agatlabs.com

CLIENT NAME: PINCHIN LTD.

ATTENTION TO: Ryan Lawrence

SAMPLEID	SAMPLE TITLE	GUIDELINE	ANALYSIS PACKAGE	PARAMETER	UNIT	GUIDEVALUE	RESULT
274458	SW-1	ON PWQO 2015 (mg/L)	Croft Landfill - Surface Water Parameters	Aluminum-dissolved	mg/L	0.075	0.717
274458	SW-1	ON PWQO 2015 (mg/L)	Croft Landfill - Surface Water Parameters	Cobalt	mg/L	0.0009	0.0074
274458	SW-1	ON PWQO 2015 (mg/L)	Croft Landfill - Surface Water Parameters	Iron	mg/L	0.3	2.00
274458	SW-1	ON PWQO 2015 (mg/L)	Croft Landfill - Surface Water Parameters	Total Phosphorus	mg/L	0.030	0.04
274458	SW-1	ON PWQO 2015 (mg/L)	Croft Landfill - Surface Water Parameters	Zinc	mg/L	0.03	0.116
274458	SW-1	ON PWQO 2015 (mg/L)	Croft Landfill - Surface Water Parameters	pH	pH Units	6.5-8.5	4.10
274463	SW-2	ON PWQO 2015 (mg/L)	Croft Landfill - Surface Water Parameters	Aluminum-dissolved	mg/L	0.075	0.176
274463	SW-2	ON PWQO 2015 (mg/L)	Croft Landfill - Surface Water Parameters	Iron	mg/L	0.3	1.31
274463	SW-2	ON PWQO 2015 (mg/L)	Croft Landfill - Surface Water Parameters	Phenols	mg/L	0.001	0.002
274463	SW-2	ON PWQO 2015 (mg/L)	Croft Landfill - Surface Water Parameters	Total Phosphorus	mg/L	0.030	0.07
274463	SW-2	ON PWQO 2015 (mg/L)	Croft Landfill - Surface Water Parameters	pН	pH Units	6.5-8.5	5.82
274464	SW-3	ON PWQO 2015 (mg/L)	Croft Landfill - Surface Water Parameters	Boron	mg/L	0.20	0.219
274464	SW-3	ON PWQO 2015 (mg/L)	Croft Landfill - Surface Water Parameters	Cobalt	mg/L	0.0009	0.0012
274464	SW-3	ON PWQO 2015 (mg/L)	Croft Landfill - Surface Water Parameters	Iron	mg/L	0.3	1.35
274464	SW-3	ON PWQO 2015 (mg/L)	Croft Landfill - Surface Water Parameters	Phenols	mg/L	0.001	0.003
274464	SW-3	ON PWQO 2015 (mg/L)	Croft Landfill - Surface Water Parameters	Total Phosphorus	mg/L	0.030	0.06
274465	SW-DUP	ON PWQO 2015 (mg/L)	Croft Landfill - Surface Water Parameters	Aluminum-dissolved	mg/L	0.075	1.03
274465	SW-DUP	ON PWQO 2015 (mg/L)	Croft Landfill - Surface Water Parameters	Cobalt	mg/L	0.0009	0.0104
274465	SW-DUP	ON PWQO 2015 (mg/L)	Croft Landfill - Surface Water Parameters	Iron	mg/L	0.3	3.10
274465	SW-DUP	ON PWQO 2015 (mg/L)	Croft Landfill - Surface Water Parameters	Total Phosphorus	mg/L	0.030	0.06
274465	SW-DUP	ON PWQO 2015 (mg/L)	Croft Landfill - Surface Water Parameters	Zinc	mg/L	0.03	0.120
274465	SW-DUP	ON PWQO 2015 (mg/L)	Croft Landfill - Surface Water Parameters	pH	pH Units	6.5-8.5	4.30



Page 5 of 9

Quality Assurance

CLIENT NAME: PINCHIN LTD.

PROJECT: 225335 Croft Landfill - SW

SAMPLING SITE:

AGAT WORK ORDER: 19T479315 ATTENTION TO: Ryan Lawrence

SAMPLED BY:

				Wate	er An	alysis	6								
RPT Date: Jun 21, 2019	RPT Date: Jun 21, 2019						REFEREN	NCE MA	TERIAL	METHOD BLANK SPIKE			MATRIX SPIKE		KE
PARAMETER	Batch	Sample	Dup #1	Dun #2	RPD	Method Blank	Measured	Acce Lin	ptable nits	Recovery	Acce Lin	ptable nits	Recovery	Acce Lin	ptable nits
I TO UNE LER	Baton	ld	Dap // I	Dup #2			Value	Lower	Upper		Lower	Upper		Lower	Upper
Croft Landfill - Surface Water Parame	eters														
BOD (5)	274458	274458	<5	<5	NA	< 5	101%	75%	125%						
рН	274671		7.46	7.42	0.5%	NA	100%	90%	110%						
Alkalinity (as CaCO3)	274671		191	190	0.5%	< 5	98%	80%	120%						
Bicarbonate (as CaCO3)	274671		191	190	0.5%	< 5	NA								
Total Dissolved Solids	267768		136	142	4.3%	< 20	100%	80%	120%						
Chloride	271846		168	156	7.4%	< 0.10	91%	90%	110%	99%	90%	110%	97%	80%	120%
Nitrate as N	271846		5.37	4.94	8.3%	< 0.05	93%	90%	110%	100%	90%	110%	105%	80%	120%
Nitrite as N	271846		<0.25	<0.25	NA	< 0.05	NA	90%	110%	96%	90%	110%	117%	80%	120%
Sulphate	271846		26.3	24.2	8.3%	< 0.10	92%	90%	110%	97%	90%	110%	106%	80%	120%
Chemical Oxygen Demand	275210		<5	<5	NA	< 5	92%	80%	120%	106%	90%	110%	102%	70%	130%
Dissolved Organic Carbon	274458	274458	3.5	3.6	2.8%	< 0.5	96%	90%	110%	96%	90%	110%	98%	80%	120%
Electrical Conductivity	274671		768	769	0.1%	< 2	101%	80%	120%						
Ortho Phosphate as P	271846		<0.50	<0.50	NA	< 0.10	110%	90%	110%	94%	90%	110%	118%	80%	120%
Ammonia as N	268468		<0.02	<0.02	NA	< 0.02	104%	90%	110%	98%	90%	110%	89%	80%	120%
Calcium	274458	274458	32.0	31.9	0.3%	< 0.05	96%	90%	110%	96%	90%	110%	98%	70%	130%
Magnesium	274458	274458	14.2	14.1	0.7%	< 0.05	92%	90%	110%	92%	90%	110%	94%	70%	130%
Sodium	274458	274458	14.1	14.1	0.0%	< 0.05	95%	90%	110%	95%	90%	110%	97%	70%	130%
Phenols	274458	274458	0.001	0.001	NA	< 0.001	104%	90%	110%	98%	90%	110%	101%	80%	120%
Total Suspended Solids	276256		<10	<10	NA	< 10	100%	80%	120%						
Total Kjeldahl Nitrogen	274243		2.07	2.05	1.0%	< 0.10	95%	80%	120%	97%	80%	120%	97%	70%	130%
Total Phosphorus	274458	274458	0.03	0.02	NA	< 0.02	96%	90%	110%	101%	90%	110%	103%	80%	120%
Turbidity	274647		1.9	1.8	NA	< 0.5	101%	90%	110%						
Potassium	274458	274458	2.25	2.23	0.9%	< 0.05	99%	90%	110%	98%	90%	110%	100%	70%	130%
Aluminum-dissolved	274458	274458	0.717	0.696	3.0%	< 0.004	96%	90%	110%	102%	90%	110%	95%	70%	130%
Antimony	274458	274458	<0.001	<0.001	NA	< 0.001	106%	90%	110%	98%	90%	110%	99%	70%	130%
Arsenic	274458	274458	<0.003	<0.003	NA	< 0.003	104%	90%	110%	104%	90%	110%	106%	70%	130%
Barium	274458	274458	0.088	0.088	0.0%	< 0.002	105%	90%	110%	102%	90%	110%	102%	70%	130%
Beryllium	274458	274458	<0.0005	<0.0005	NA	< 0.0005	102%	90%	110%	99%	90%	110%	99%	70%	130%
Bismuth	274458	274458	<0.002	<0.002	NA	< 0.002	104%	90%	110%	104%	90%	110%	103%	70%	130%
Boron	274458	274458	<0.010	<0.010	NA	< 0.010	100%	90%	110%	100%	90%	110%	93%	70%	130%
Cadmium	274458	274458	0.0002	0.0002	NA	< 0.0001	105%	90%	110%	106%	90%	110%	105%	70%	130%
Chromium	274458	274458	<0.003	<0.003	NA	< 0.003	104%	90%	110%	103%	90%	110%	102%	70%	130%
Cobalt	274458	274458	0.0074	0.0075	1.3%	< 0.0005	104%	90%	110%	103%	90%	110%	100%	70%	130%
Copper	274458	274458	0.001	0.001	NA	< 0.001	103%	90%	110%	102%	90%	110%	101%	70%	130%
Iron	274458	274458	2.00	2.02	1.0%	< 0.010	107%	90%	110%	99%	90%	110%	107%	70%	130%
Lead	274458	274458	<0.001	<0.001	NA	< 0.001	108%	90%	110%	104%	90%	110%	105%	70%	130%
Manganese	274458	274458	0.605	0.615	1.6%	< 0.002	108%	90%	110%	105%	90%	110%	106%	70%	130%
Molybdenum	274458	274458	<0.002	<0.002	NA	< 0.002	104%	90%	110%	100%	90%	110%	104%	70%	130%
Nickel	274458	274458	0.003	0.003	NA	< 0.003	103%	90%	110%	103%	90%	110%	100%	70%	130%

AGAT QUALITY ASSURANCE REPORT (V1)

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Quality Assurance

CLIENT NAME: PINCHIN LTD.

PROJECT: 225335 Croft Landfill - SW

SAMPLING SITE:

AGAT WORK ORDER: 19T479315 ATTENTION TO: Ryan Lawrence SAMPLED BY:

Water Analysis (Continued)

	-			-											
RPT Date: Jun 21, 2019			DUPLICATE				REFERENCE MATERIAL			METHOD BLANK SPIKE			MATRIX SPIKE		
PARAMETER	Batch	Sample	Dup #1	Dup #2	RPD	Method Blank	Measured	Acce Lin	ptable nits	Recovery	Acce Lin	ptable nits	Recovery	Acceptable Limits	
		Ia					value	Lower	Upper		Lower	Upper		Lower	Upper
Selenium	274458	274458	<0.004	<0.004	NA	< 0.004	95%	90%	110%	96%	90%	110%	103%	70%	130%
Silicon	274458	274458	2.01	1.99	1.0%	< 0.05	99%	90%	110%	104%	90%	110%	86%	70%	130%
Silver	274458	274458	<0.0001	<0.0001	NA	< 0.0001	103%	90%	110%	106%	90%	110%	104%	70%	130%
Strontium	274458	274458	0.310	0.309	0.3%	< 0.005	101%	90%	110%	100%	90%	110%	99%	70%	130%
Tin	274458	274458	<0.002	<0.002	NA	< 0.002	99%	90%	110%	101%	90%	110%	101%	70%	130%
Titanium	274458	274458	0.002	0.002	NA	< 0.002	106%	90%	110%	101%	90%	110%	100%	70%	130%
Uranium	274458	274458	<0.002	<0.002	NA	< 0.002	106%	90%	110%	102%	90%	110%	106%	70%	130%
Vanadium	274458	274458	<0.002	<0.002	NA	< 0.002	104%	90%	110%	101%	90%	110%	101%	70%	130%
Zinc	274458	274458	0.116	0.115	0.9%	< 0.005	105%	90%	110%	108%	90%	110%	107%	70%	130%

Comments: NA signifies Not Applicable.

Duplicate Qualifier: As the measured result approaches the RL, the uncertainty associated with the value increases dramatically, thus duplicate acceptance limits apply only where the average of the two duplicates is greater than five times the RL.

Certified By:

Nivine Basily

AGAT QUALITY ASSURANCE REPORT (V1)

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Page 6 of 9



Method Summary

CLIENT NAME: PINCHIN LTD. PROJECT: 225335 Croft Landfill - SW

AGAT WORK ORDER: 19T479315 ATTENTION TO: Ryan Lawrence

PROJECT. 225555 Croit Lanuilli - 5	vv	ATTENTION TO. F	kyan Lawrence
SAMPLING SITE:		SAMPLED BY:	
PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
Water Analysis			
BOD (5)	INOR-93-6006	SM 5210 B	DO METER
pН	INOR-93-6000	SM 4500-H+ B	PC TITRATE
Total Hardness (as CaCO3)	MET-93-6105	EPA SW-846 6010C & 200.7 & SM 2340 B	CALCULATION
Alkalinity (as CaCO3)	INOR-93-6000	SM 2320 B	PC TITRATE
Bicarbonate (as CaCO3)	INOR-93-6000	SM 2320 B	PC TITRATE
Total Dissolved Solids	INOR-93-6028	SM 2540 C	BALANCE
Chloride	INOR-93-6004	SM 4110 B	ION CHROMATOGRAPH
Nitrate as N	INOR-93-6004	SM 4110 B	ION CHROMATOGRAPH
Nitrite as N	INOR-93-6004	SM 4110 B	ION CHROMATOGRAPH
Sulphate	INOR-93-6004	SM 4110 B	ION CHROMATOGRAPH
Chemical Oxygen Demand	INOR-93-6042	SM 5220 D	SPECTROPHOTOMETER
Dissolved Organic Carbon	INOR-93-6049	EPA 415.1 & SM 5310 B	SHIMADZU CARBON ANALYZER
Electrical Conductivity	INOR-93-6000	SM 2510 B	PC TITRATE
Ortho Phosphate as P	INOR-93-6004	SM 4110 B	ION CHROMATOGRAPH
Ammonia as N	INOR-93-6059	QuikChem 10-107-06-1-J & SM 4500 NH3-F	LACHAT FIA
Calcium	MET-93-6105	EPA SW-846 6010C & 200.7	ICP/OES
Magnesium	MET-93-6105	EPA SW-846 6010C & 200.7	ICP/OES
Sodium	MET-93-6105	EPA SW-846 6010C & 200.7	ICP/OES
Phenols	INOR-93-6050	MOE ROPHEN-E 3179 & SM 5530 D	TECHNICON AUTO ANALYZER
Total Suspended Solids	INOR-93-6028	SM 2540 D	BALANCE
Total Kjeldahl Nitrogen	INOR-93-6048	QuikChem 10-107-06-2-I & SM 4500-Norg D	LACHAT FIA
Total Phosphorus	INOR-93-6022	SM 4500-P B&E	SPECTROPHOTOMETER
Turbidity	INOR-93-6044	SM 2130 B	NEPHELOMETER
Potassium	MET-93-6105	EPA SW-846 6010C & 200.7	ICP/OES
Aluminum-dissolved	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Antimony	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Arsenic	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Barium	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Beryllium	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Bismuth	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Boron	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Cadmium	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Chromium	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Cobalt	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Copper	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Iron	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Lead	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Manganese	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Molybdenum	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Nickel	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Selenium	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Silicon	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Silver	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Strontium	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Tin	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Titanium	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Uranium	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS



Method Summary

CLIENT NAME: PINCHIN LTD. PROJECT: 225335 Croft Landfill - SW AGAT WORK ORDER: 19T479315

ATTENTION TO: Ryan Lawrence

SAMPLING SITE:		SAMPLED BY:	
PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
Vanadium	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Zinc	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS

CHAIN OF CUSTODY RECORD	5835 Coopers Avenue Mississauga, Ontario; L4Z 1Y2 Phone: 905-712-5100; Fax: 905-712-5122	Arrival Arrival AGAT Notes:	JRA I Condit I Tempe Job Nui	ion: erature mber:	USE (Good	19 19	P00/ 	(comp 9.0 793 TED	lete " 8 5	Notes") S·S	
Client Information Company: Pinchin Ltd, Contact: Ryan Lawrence Address: 957 Cambrian Heights, Unit # 203 Sudbury ON P3C 555 957 Phone: 705-521-0560 Fax: PO#: 225335 Croft Landfill AGAT Quotation #: 267698	Report Information 1. Name: Ryan Lawrence Email: rlawrence@Pinchir 2. Name:			epor orma lease "; lose that apply) Single sample page Multipl sample per pa Result: Fax	t at x" at e per le es ge s by	T (F R/ D	(Please "x" the applicable box below) Regular TAT: x 5 to 7 working days Rush TAT (Rush Surcharges Apply): 3 to 5 days 48 to 72 hours 24 to 48 hours Date Required (Rush surcharges may app						
Regulatory Guideline Required: (Please "x" those that application of the second se	ply Is this a drinking water sample (potable water intended for human consumption)? Yes No If "Yes" please use the Drinking Water Chain of Custody Record	Phos-P, Suiphate Cations (K, Na, Mg, Ca)	Metals (see quote for list) Alkalinity, Bicarbonate	Ammonia, BOD, COD	DOC, Conductivity	Phenols	Total Phosphorous	TDS, TSS, TKN Turbidity	Dissolved Aluminum				
Sample Identification Date Sampled Time Sampled Sample Matrix	# of Comments - Site/Sample ontainers Info, Sample Containment												
SW-1 June 1119 8:30 A.M Water	8 ×	x x	x x	x	x	x	x	x x	×				T
SW-2 water	8 ×	x	x x	x	x	x	x	x x	x			1	
sw-3 water	8 ×	x	x x	×	x	x	x	x x	×			1	
SW-DUP	8 X	x	x x	×	x	x	x	x x	x		-	- 44	
									1				
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							1						
									-				
				1-3									
									1				
		3									-		1
TOTAL # OF CONTAINERS	32 * Samples received after 2:00	PM will be	logged in	for the	next bus	siness o	lay. TAT	T is exclus	sive of v	weekends	s and sta	atutory ho	olidays
TOTAL # OF CONTAINERS Sample Relinquished By (print name & sign) Date/Time	32 * Samples received after 2:00 Samples Received By (print name	PM will be me and s	logged in ign)	for the	next bus	siness o	Jay. TAT	T is exclus	sive of v	veekends	s and sta		oliday
TOTAL # OF CONTAINERS Sample Relinquished By (print name & sign) Date/Time Kathleen Most Mm June II, june II, june II, june II, june II, june III, june IIII, june III, june IIII, june III, june IIII, june IIII, june III, june III, june III, june III, june IIII, june IIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIII	32 * Samples received after 2:00 Samples Received By (print nai 9 MANOT JOHN Samples Received By (print nai	PM will be ime and s	logged in ign)	for the	Dat	siness of te/Tim NE 1	lay. TAT	T is exclus pecial : _EASE FII	sive of v Instru LTER fo	veekends Ictions or Diss. A	s and sta	atutory ho	oliday



CLIENT NAME: PINCHIN LTD. 957 CAMBRIAN HEIGHTS DRIVE, UNIT 203 SUDBURY, ON P3C 5S5 (705) 521-0560

ATTENTION TO: Ryan Lawrence

PROJECT: 225335 Croft Landfill - GW

AGAT WORK ORDER: 19T479887

WATER ANALYSIS REVIEWED BY: Nivine Basily, Inorganics Report Writer

DATE REPORTED: Jun 26, 2019

PAGES (INCLUDING COVER): 12

VERSION*: 1

Should you require any information regarding this analysis please contact your client services representative at (905) 712-5100

*NOTES				
	*NOTEC			
	INDIES			
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All samples will be disposed of within 30 days following analysis. Please contact the lab if you require additional sample storage time.

 AGAT Laboratories (V1)
 Page 1 of 12

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Results relate only to the items tested. Results apply to samples as received. All reportable information as specified by ISO 17025:2017 is available from AGAT Laboratories upon request



AGAT WORK ORDER: 19T479887 PROJECT: 225335 Croft Landfill - GW

ATTENTION TO: Ryan Lawrence

SAMPLED BY:

5835 COOPERS AVENUE MISSISSAUGA, ONTARIO CANADA L4Z 1Y2 TEL (905)712-5100 FAX (905)712-5122 http://www.agatlabs.com

SAMPLING SITE:

CLIENT NAME: PINCHIN LTD.

			Cr	oft Landfill	l - Groundw	ater Parame	eters				
DATE RECEIVED: 2019-06-14	Ļ								DATE REPORTE	D: 2019-06-20	3
Parameter	Unit	G / S: A	SAMPLE DE SA DAT G / S: B	ESCRIPTION: MPLE TYPE: E SAMPLED: RDL	BH1 Water 2019-06-11 277579	BH8 Water 2019-06-11 277629	BH9 Water 2019-06-11 277630	RDL	BH10 Water 2019-06-11 277631	RDL	BH11 Water 2019-06-11 277632
BOD (5)	mg/L			5	<5	<5	<5	5	<5	5	<5
Electrical Conductivity	μS/cm			2	57	35	289	2	1790	2	1730
pH	pH Units		6.5-8.5	NA	6.67	6.62	7.27	NA	7.81	NA	7.32
Total Hardness (as CaCO3)	mg/L		80-100	0.5	17.2	9.8	104	0.5	507	0.5	245
Total Dissolved Solids	mg/L		500	20	76[<b]< td=""><td>50[<b]< td=""><td>174[<b]< td=""><td>20</td><td>954[>B]</td><td>20</td><td>1000[>B]</td></b]<></td></b]<></td></b]<>	50[<b]< td=""><td>174[<b]< td=""><td>20</td><td>954[>B]</td><td>20</td><td>1000[>B]</td></b]<></td></b]<>	174[<b]< td=""><td>20</td><td>954[>B]</td><td>20</td><td>1000[>B]</td></b]<>	20	954[>B]	20	1000[>B]
Total Suspended Solids	mg/L			10	150	154	212	10	328	10	164
Alkalinity (as CaCO3)	mg/L		30-500	5	24	11	97	5	508	5	439
Chloride	mg/L		250	0.10	1.85[<b]< td=""><td>0.49[<b]< td=""><td>6.04[<b]< td=""><td>1.0</td><td>246[<b]< td=""><td>1.0</td><td>200[<b]< td=""></b]<></td></b]<></td></b]<></td></b]<></td></b]<>	0.49[<b]< td=""><td>6.04[<b]< td=""><td>1.0</td><td>246[<b]< td=""><td>1.0</td><td>200[<b]< td=""></b]<></td></b]<></td></b]<></td></b]<>	6.04[<b]< td=""><td>1.0</td><td>246[<b]< td=""><td>1.0</td><td>200[<b]< td=""></b]<></td></b]<></td></b]<>	1.0	246[<b]< td=""><td>1.0</td><td>200[<b]< td=""></b]<></td></b]<>	1.0	200[<b]< td=""></b]<>
Nitrate as N	mg/L	10.0		0.05	<0.05[<a]< td=""><td><0.05[<a]< td=""><td><0.05[<a]< td=""><td>0.5</td><td><0.5[<a]< td=""><td>0.5</td><td><0.5[<a]< td=""></a]<></td></a]<></td></a]<></td></a]<></td></a]<>	<0.05[<a]< td=""><td><0.05[<a]< td=""><td>0.5</td><td><0.5[<a]< td=""><td>0.5</td><td><0.5[<a]< td=""></a]<></td></a]<></td></a]<></td></a]<>	<0.05[<a]< td=""><td>0.5</td><td><0.5[<a]< td=""><td>0.5</td><td><0.5[<a]< td=""></a]<></td></a]<></td></a]<>	0.5	<0.5[<a]< td=""><td>0.5</td><td><0.5[<a]< td=""></a]<></td></a]<>	0.5	<0.5[<a]< td=""></a]<>
Nitrite as N	mg/L	1.0		0.05	<0.05[<a]< td=""><td><0.05[<a]< td=""><td><0.05[<a]< td=""><td>0.5</td><td><0.5[<a]< td=""><td>0.5</td><td><0.5[<a]< td=""></a]<></td></a]<></td></a]<></td></a]<></td></a]<>	<0.05[<a]< td=""><td><0.05[<a]< td=""><td>0.5</td><td><0.5[<a]< td=""><td>0.5</td><td><0.5[<a]< td=""></a]<></td></a]<></td></a]<></td></a]<>	<0.05[<a]< td=""><td>0.5</td><td><0.5[<a]< td=""><td>0.5</td><td><0.5[<a]< td=""></a]<></td></a]<></td></a]<>	0.5	<0.5[<a]< td=""><td>0.5</td><td><0.5[<a]< td=""></a]<></td></a]<>	0.5	<0.5[<a]< td=""></a]<>
Sulphate	mg/L		500	0.10	2.13[<b]< td=""><td>5.11[<b]< td=""><td>37.7[<b]< td=""><td>1.0</td><td>68.6[<b]< td=""><td>1.0</td><td>115[<b]< td=""></b]<></td></b]<></td></b]<></td></b]<></td></b]<>	5.11[<b]< td=""><td>37.7[<b]< td=""><td>1.0</td><td>68.6[<b]< td=""><td>1.0</td><td>115[<b]< td=""></b]<></td></b]<></td></b]<></td></b]<>	37.7[<b]< td=""><td>1.0</td><td>68.6[<b]< td=""><td>1.0</td><td>115[<b]< td=""></b]<></td></b]<></td></b]<>	1.0	68.6[<b]< td=""><td>1.0</td><td>115[<b]< td=""></b]<></td></b]<>	1.0	115[<b]< td=""></b]<>
Phosphate as P	mg/L			0.10	<0.10	<0.10	<0.10	1.0	<1.0	1.0	<1.0
Ammonia as N	mg/L			0.02	0.41	0.11	1.04	0.4	11.7	1.0	32.3
Total Kjeldahl Nitrogen	mg/L			0.10	0.77	0.36	1.70	0.10	12.6	0.50	41.5
Total Phosphorus	mg/L			0.02	0.22	0.13	0.10	0.02	0.08	0.02	0.10
Chemical Oxygen Demand	mg/L			5	28	<5	36	5	51	25	224
Dissolved Organic Carbon	mg/L		5	0.5	10.6[>B]	2.6[<b]< td=""><td>16.7[>B]</td><td>1.0</td><td>20.4[>B]</td><td>1.0</td><td>78.3[>B]</td></b]<>	16.7[>B]	1.0	20.4[>B]	1.0	78.3[>B]
Phenols	mg/L			0.001	<0.001	<0.001	<0.001	0.001	0.001	0.001	0.005
Turbidity	NTU		5	0.5	58.4[>B]	162[>B]	151[>B]	0.5	6.6[>B]	0.5	88.4[>B]
Calcium	mg/L			0.05	5.47	2.85	34.5	0.25	169	0.25	65.3
Magnesium	mg/L			0.05	0.86	0.66	4.41	0.25	20.6	0.25	19.9
Sodium	mg/L	20	200	0.05	3.85[<a]< td=""><td>2.79[<a]< td=""><td>10.8[<a]< td=""><td>0.25</td><td>129[A-B]</td><td>0.25</td><td>184[A-B]</td></a]<></td></a]<></td></a]<>	2.79[<a]< td=""><td>10.8[<a]< td=""><td>0.25</td><td>129[A-B]</td><td>0.25</td><td>184[A-B]</td></a]<></td></a]<>	10.8[<a]< td=""><td>0.25</td><td>129[A-B]</td><td>0.25</td><td>184[A-B]</td></a]<>	0.25	129[A-B]	0.25	184[A-B]
Potassium	mg/L			0.05	1.22	0.77	6.08	0.25	46.2	0.25	67.9
Aluminum	mg/L		0.1	0.004	0.537[>B]	0.101[>B]	0.109[>B]	0.004	0.040[<b]< td=""><td>0.004</td><td>0.459[>B]</td></b]<>	0.004	0.459[>B]
Antimony	mg/L	0.006		0.003	<0.003[<a]< td=""><td><0.003[<a]< td=""><td><0.003[<a]< td=""><td>0.003</td><td><0.003[<a]< td=""><td>0.003</td><td><0.003[<a]< td=""></a]<></td></a]<></td></a]<></td></a]<></td></a]<>	<0.003[<a]< td=""><td><0.003[<a]< td=""><td>0.003</td><td><0.003[<a]< td=""><td>0.003</td><td><0.003[<a]< td=""></a]<></td></a]<></td></a]<></td></a]<>	<0.003[<a]< td=""><td>0.003</td><td><0.003[<a]< td=""><td>0.003</td><td><0.003[<a]< td=""></a]<></td></a]<></td></a]<>	0.003	<0.003[<a]< td=""><td>0.003</td><td><0.003[<a]< td=""></a]<></td></a]<>	0.003	<0.003[<a]< td=""></a]<>
Arsenic	mg/L	0.010		0.003	<0.003[<a]< td=""><td><0.003[<a]< td=""><td><0.003[<a]< td=""><td>0.003</td><td><0.003[<a]< td=""><td>0.003</td><td><0.003[<a]< td=""></a]<></td></a]<></td></a]<></td></a]<></td></a]<>	<0.003[<a]< td=""><td><0.003[<a]< td=""><td>0.003</td><td><0.003[<a]< td=""><td>0.003</td><td><0.003[<a]< td=""></a]<></td></a]<></td></a]<></td></a]<>	<0.003[<a]< td=""><td>0.003</td><td><0.003[<a]< td=""><td>0.003</td><td><0.003[<a]< td=""></a]<></td></a]<></td></a]<>	0.003	<0.003[<a]< td=""><td>0.003</td><td><0.003[<a]< td=""></a]<></td></a]<>	0.003	<0.003[<a]< td=""></a]<>
Barium	mg/L	1		0.002	0.024[<a]< td=""><td>0.019[<a]< td=""><td>0.054[<a]< td=""><td>0.002</td><td>0.225[<a]< td=""><td>0.002</td><td>0.106[<a]< td=""></a]<></td></a]<></td></a]<></td></a]<></td></a]<>	0.019[<a]< td=""><td>0.054[<a]< td=""><td>0.002</td><td>0.225[<a]< td=""><td>0.002</td><td>0.106[<a]< td=""></a]<></td></a]<></td></a]<></td></a]<>	0.054[<a]< td=""><td>0.002</td><td>0.225[<a]< td=""><td>0.002</td><td>0.106[<a]< td=""></a]<></td></a]<></td></a]<>	0.002	0.225[<a]< td=""><td>0.002</td><td>0.106[<a]< td=""></a]<></td></a]<>	0.002	0.106[<a]< td=""></a]<>
Beryllium	mg/L			0.001	<0.001	<0.001	<0.001	0.001	<0.001	0.001	<0.001
Bismuth	mg/L			0.002	<0.002	<0.002	<0.002	0.002	<0.002	0.002	<0.002
Boron	mg/L	5		0.010	0.017[<a]< td=""><td><0.010[<a]< td=""><td>0.259[<a]< td=""><td>0.010</td><td>1.16[<a]< td=""><td>0.010</td><td>3.15[<a]< td=""></a]<></td></a]<></td></a]<></td></a]<></td></a]<>	<0.010[<a]< td=""><td>0.259[<a]< td=""><td>0.010</td><td>1.16[<a]< td=""><td>0.010</td><td>3.15[<a]< td=""></a]<></td></a]<></td></a]<></td></a]<>	0.259[<a]< td=""><td>0.010</td><td>1.16[<a]< td=""><td>0.010</td><td>3.15[<a]< td=""></a]<></td></a]<></td></a]<>	0.010	1.16[<a]< td=""><td>0.010</td><td>3.15[<a]< td=""></a]<></td></a]<>	0.010	3.15[<a]< td=""></a]<>

Certified By:

Nivine Basily



AGAT WORK ORDER: 19T479887 PROJECT: 225335 Croft Landfill - GW

ATTENTION TO: Ryan Lawrence

SAMPLED BY:

5835 COOPERS AVENUE MISSISSAUGA, ONTARIO CANADA L4Z 1Y2 TEL (905)712-5100 FAX (905)712-5122 http://www.agatlabs.com

CLIENT NAME: PINCHIN LTD.

SAMPLING SITE:

			Cr	oft Landfil	l - Groundw	ater Parame	eters				
DATE RECEIVED: 2019-06-14									DATE REPORTE	D: 2019-06-26	3
			SAMPLE DE SA	SCRIPTION: MPLE TYPE:	BH1 Water	BH8 Water	BH9 Water		BH10 Water		BH11 Water
Parameter	Unit	G / S: A	G / S: B	E SAMPLED: RDL	2019-06-11 277579	2019-06-11 277629	2019-06-11 277630	RDL	2019-06-11	RDL	2019-06-11
Cadmium	mg/L	0.005		0.001	<0.001[<a]< td=""><td><0.001[<a]< td=""><td><0.001[<a]< td=""><td>0.001</td><td><0.001[<a]< td=""><td>0.001</td><td><0.001[<a]< td=""></a]<></td></a]<></td></a]<></td></a]<></td></a]<>	<0.001[<a]< td=""><td><0.001[<a]< td=""><td>0.001</td><td><0.001[<a]< td=""><td>0.001</td><td><0.001[<a]< td=""></a]<></td></a]<></td></a]<></td></a]<>	<0.001[<a]< td=""><td>0.001</td><td><0.001[<a]< td=""><td>0.001</td><td><0.001[<a]< td=""></a]<></td></a]<></td></a]<>	0.001	<0.001[<a]< td=""><td>0.001</td><td><0.001[<a]< td=""></a]<></td></a]<>	0.001	<0.001[<a]< td=""></a]<>
Chromium	mg/L	0.05		0.003	<0.003[<a]< td=""><td><0.003[<a]< td=""><td><0.003[<a]< td=""><td>0.003</td><td><0.003[<a]< td=""><td>0.003</td><td>0.005[<a]< td=""></a]<></td></a]<></td></a]<></td></a]<></td></a]<>	<0.003[<a]< td=""><td><0.003[<a]< td=""><td>0.003</td><td><0.003[<a]< td=""><td>0.003</td><td>0.005[<a]< td=""></a]<></td></a]<></td></a]<></td></a]<>	<0.003[<a]< td=""><td>0.003</td><td><0.003[<a]< td=""><td>0.003</td><td>0.005[<a]< td=""></a]<></td></a]<></td></a]<>	0.003	<0.003[<a]< td=""><td>0.003</td><td>0.005[<a]< td=""></a]<></td></a]<>	0.003	0.005[<a]< td=""></a]<>
Cobalt	mg/L			0.001	0.005	<0.001	0.011	0.001	0.004	0.001	0.021
Copper	mg/L		1	0.003	0.007[<b]< td=""><td>0.011[<b]< td=""><td><0.003[<b]< td=""><td>0.003</td><td>0.007[<b]< td=""><td>0.003</td><td>0.012[<b]< td=""></b]<></td></b]<></td></b]<></td></b]<></td></b]<>	0.011[<b]< td=""><td><0.003[<b]< td=""><td>0.003</td><td>0.007[<b]< td=""><td>0.003</td><td>0.012[<b]< td=""></b]<></td></b]<></td></b]<></td></b]<>	<0.003[<b]< td=""><td>0.003</td><td>0.007[<b]< td=""><td>0.003</td><td>0.012[<b]< td=""></b]<></td></b]<></td></b]<>	0.003	0.007[<b]< td=""><td>0.003</td><td>0.012[<b]< td=""></b]<></td></b]<>	0.003	0.012[<b]< td=""></b]<>
Iron	mg/L		0.3	0.010	4.35[>B]	0.051[<b]< td=""><td>11.1[>B]</td><td>0.010</td><td>0.064[<b]< td=""><td>0.010</td><td>1.42[>B]</td></b]<></td></b]<>	11.1[>B]	0.010	0.064[<b]< td=""><td>0.010</td><td>1.42[>B]</td></b]<>	0.010	1.42[>B]
Lead	mg/L	0.01		0.001	0.001[<a]< td=""><td><0.001[<a]< td=""><td><0.001[<a]< td=""><td>0.001</td><td><0.001[<a]< td=""><td>0.001</td><td><0.001[<a]< td=""></a]<></td></a]<></td></a]<></td></a]<></td></a]<>	<0.001[<a]< td=""><td><0.001[<a]< td=""><td>0.001</td><td><0.001[<a]< td=""><td>0.001</td><td><0.001[<a]< td=""></a]<></td></a]<></td></a]<></td></a]<>	<0.001[<a]< td=""><td>0.001</td><td><0.001[<a]< td=""><td>0.001</td><td><0.001[<a]< td=""></a]<></td></a]<></td></a]<>	0.001	<0.001[<a]< td=""><td>0.001</td><td><0.001[<a]< td=""></a]<></td></a]<>	0.001	<0.001[<a]< td=""></a]<>
Manganese	mg/L		0.05	0.002	0.458[>B]	0.011[<b]< td=""><td>1.64[>B]</td><td>0.002</td><td>2.88[>B]</td><td>0.002</td><td>3.23[>B]</td></b]<>	1.64[>B]	0.002	2.88[>B]	0.002	3.23[>B]
Molybdenum	mg/L			0.002	<0.002	<0.002	<0.002	0.002	<0.002	0.002	<0.002
Nickel	mg/L			0.003	< 0.003	0.005	<0.003	0.003	< 0.003	0.003	0.007
Selenium	mg/L	0.05		0.004	<0.004[<a]< td=""><td><0.004[<a]< td=""><td><0.004[<a]< td=""><td>0.004</td><td><0.004[<a]< td=""><td>0.004</td><td><0.004[<a]< td=""></a]<></td></a]<></td></a]<></td></a]<></td></a]<>	<0.004[<a]< td=""><td><0.004[<a]< td=""><td>0.004</td><td><0.004[<a]< td=""><td>0.004</td><td><0.004[<a]< td=""></a]<></td></a]<></td></a]<></td></a]<>	<0.004[<a]< td=""><td>0.004</td><td><0.004[<a]< td=""><td>0.004</td><td><0.004[<a]< td=""></a]<></td></a]<></td></a]<>	0.004	<0.004[<a]< td=""><td>0.004</td><td><0.004[<a]< td=""></a]<></td></a]<>	0.004	<0.004[<a]< td=""></a]<>
Silicon	mg/L			0.05	3.22	3.17	3.57	0.05	4.44	0.05	2.34
Silver	mg/L			0.002	<0.002	<0.002	<0.002	0.002	<0.002	0.002	<0.002
Strontium	mg/L			0.005	0.031	0.015	0.121	0.005	0.793	0.005	0.177
Tin	mg/L			0.002	<0.002	<0.002	<0.002	0.002	<0.002	0.002	<0.002
Titanium	mg/L			0.002	0.056	0.005	0.002	0.002	<0.002	0.002	0.006
Uranium	mg/L	0.02		0.002	<0.002[<a]< td=""><td><0.002[<a]< td=""><td><0.002[<a]< td=""><td>0.002</td><td>0.007[<a]< td=""><td>0.002</td><td>0.006[<a]< td=""></a]<></td></a]<></td></a]<></td></a]<></td></a]<>	<0.002[<a]< td=""><td><0.002[<a]< td=""><td>0.002</td><td>0.007[<a]< td=""><td>0.002</td><td>0.006[<a]< td=""></a]<></td></a]<></td></a]<></td></a]<>	<0.002[<a]< td=""><td>0.002</td><td>0.007[<a]< td=""><td>0.002</td><td>0.006[<a]< td=""></a]<></td></a]<></td></a]<>	0.002	0.007[<a]< td=""><td>0.002</td><td>0.006[<a]< td=""></a]<></td></a]<>	0.002	0.006[<a]< td=""></a]<>
Vanadium	mg/L			0.002	0.004	<0.002	<0.002	0.002	<0.002	0.002	<0.002
Zinc	mg/L		5	0.005	<0.005[<b]< td=""><td>0.017[<b]< td=""><td>0.016[<b]< td=""><td>0.005</td><td><0.005[<b]< td=""><td>0.005</td><td>0.010[<b]< td=""></b]<></td></b]<></td></b]<></td></b]<></td></b]<>	0.017[<b]< td=""><td>0.016[<b]< td=""><td>0.005</td><td><0.005[<b]< td=""><td>0.005</td><td>0.010[<b]< td=""></b]<></td></b]<></td></b]<></td></b]<>	0.016[<b]< td=""><td>0.005</td><td><0.005[<b]< td=""><td>0.005</td><td>0.010[<b]< td=""></b]<></td></b]<></td></b]<>	0.005	<0.005[<b]< td=""><td>0.005</td><td>0.010[<b]< td=""></b]<></td></b]<>	0.005	0.010[<b]< td=""></b]<>

Certified By:

Nivine Basily

Page 3 of 12



AGAT WORK ORDER: 19T479887 PROJECT: 225335 Croft Landfill - GW

ATTENTION TO: Ryan Lawrence

SAMPLED BY:

5835 COOPERS AVENUE MISSISSAUGA, ONTARIO CANADA L4Z 1Y2 TEL (905)712-5100 FAX (905)712-5122 http://www.agatlabs.com

CLIENT NAME: PINCHIN LTD.

SAMPLING SITE:

	Croft Landfill - Groundwater Parameters							
DATE RECEIVED: 2019-06-14	DATE RECEIVED: 2019-06-14 DATE REPORTED: 2019-06-26							
			SAMPLE DE SAI DATE	SCRIPTION: MPLE TYPE: SAMPLED:	DP7 Water 2019-06-11	BH-DUP Water 2019-06-12		
Parameter	Unit	G / S: A	G / S: B	RDL	277635	277636		
BOD (5)	mg/L			5	7	<5		
Electrical Conductivity	μS/cm			2	41	288		
рН	pH Units		6.5-8.5	NA	6.49	7.28		
Total Hardness (as CaCO3)	mg/L		80-100	0.5	15.2	104		
Total Dissolved Solids	mg/L		500	20	114[<b]< td=""><td>184[<b]< td=""><td></td></b]<></td></b]<>	184[<b]< td=""><td></td></b]<>		
Total Suspended Solids	mg/L			10	7060	338		
Alkalinity (as CaCO3)	mg/L		30-500	5	9	96		
Chloride	mg/L		250	0.10	2.06[<b]< td=""><td>5.83[<b]< td=""><td></td></b]<></td></b]<>	5.83[<b]< td=""><td></td></b]<>		
Nitrate as N	mg/L	10.0		0.05	0.06[<a]< td=""><td>0.05[<a]< td=""><td></td></a]<></td></a]<>	0.05[<a]< td=""><td></td></a]<>		
Nitrite as N	mg/L	1.0		0.05	<0.05[<a]< td=""><td><0.05[<a]< td=""><td></td></a]<></td></a]<>	<0.05[<a]< td=""><td></td></a]<>		
Sulphate	mg/L		500	0.10	7.45[<b]< td=""><td>37.5[<b]< td=""><td></td></b]<></td></b]<>	37.5[<b]< td=""><td></td></b]<>		
Phosphate as P	mg/L			0.10	<0.10	<0.10		
Ammonia as N	mg/L			0.02	0.48	1.01		
Total Kjeldahl Nitrogen	mg/L			0.10	1.14	1.49		
Total Phosphorus	mg/L			0.02	0.54	0.12		
Chemical Oxygen Demand	mg/L			5	33	38		
Dissolved Organic Carbon	mg/L		5	0.5	8.5[>B]	16.7[>B]		
Phenols	mg/L			0.001	0.004	<0.001		
Turbidity	NTU		5	0.5	1100[>B]	137[>B]		
Calcium	mg/L			0.05	4.59	34.4		
Magnesium	mg/L			0.05	0.90	4.46		
Sodium	mg/L	20	200	0.05	1.68[<a]< td=""><td>10.6[<a]< td=""><td></td></a]<></td></a]<>	10.6[<a]< td=""><td></td></a]<>		
Potassium	mg/L			0.05	0.16	6.08		
Aluminum	mg/L		0.1	0.004	0.325[>B]	0.117[>B]		
Antimony	mg/L	0.006		0.003	<0.003[<a]< td=""><td><0.003[<a]< td=""><td></td></a]<></td></a]<>	<0.003[<a]< td=""><td></td></a]<>		
Arsenic	mg/L	0.010		0.003	<0.003[<a]< td=""><td><0.003[<a]< td=""><td></td></a]<></td></a]<>	<0.003[<a]< td=""><td></td></a]<>		
Barium	mg/L	1		0.002	0.011[<a]< td=""><td>0.055[<a]< td=""><td></td></a]<></td></a]<>	0.055[<a]< td=""><td></td></a]<>		
Beryllium	mg/L			0.001	<0.001	<0.001		
Bismuth	mg/L			0.002	<0.002	<0.002		
Boron	mg/L	5		0.010	0.129[<a]< td=""><td>0.318[<a]< td=""><td></td></a]<></td></a]<>	0.318[<a]< td=""><td></td></a]<>		

Certified By:

Page 4 of 12

Nivine Basily



AGAT WORK ORDER: 19T479887 PROJECT: 225335 Croft Landfill - GW

ATTENTION TO: Ryan Lawrence

SAMPLED BY:

5835 COOPERS AVENUE MISSISSAUGA, ONTARIO CANADA L4Z 1Y2 TEL (905)712-5100 FAX (905)712-5122 http://www.agatlabs.com

CLIENT NAME: PINCHIN LTD.

SAMPLING SITE:

Croft Landfill - Groundwater Parameters								
DATE RECEIVED: 2019-06-14							DATE REPORTED: 2019-06-26	
			SAMPLE DE	SCRIPTION:	DP7	BH-DUP		
			SAM	MPLE TYPE:	Water	Water		
			DATE	SAMPLED:	2019-06-11	2019-06-12		
Parameter	Unit	G / S: A	G / S: B	RDL	277635	277636		
Cadmium	mg/L	0.005		0.001	<0.001[<a]< td=""><td><0.001[<a]< td=""><td></td></a]<></td></a]<>	<0.001[<a]< td=""><td></td></a]<>		
Chromium	mg/L	0.05		0.003	<0.003[<a]< td=""><td><0.003[<a]< td=""><td></td></a]<></td></a]<>	<0.003[<a]< td=""><td></td></a]<>		
Cobalt	mg/L			0.001	0.004	0.010		
Copper	mg/L		1	0.003	<0.003[<b]< td=""><td><0.003[<b]< td=""><td></td></b]<></td></b]<>	<0.003[<b]< td=""><td></td></b]<>		
Iron	mg/L		0.3	0.010	7.26[>B]	10.7[>B]		
Lead	mg/L	0.01		0.001	<0.001[<a]< td=""><td><0.001[<a]< td=""><td></td></a]<></td></a]<>	<0.001[<a]< td=""><td></td></a]<>		
Manganese	mg/L		0.05	0.002	0.549[>B]	1.62[>B]		
Molybdenum	mg/L			0.002	<0.002	<0.002		
Nickel	mg/L			0.003	0.004	< 0.003		
Selenium	mg/L	0.05		0.004	<0.004[<a]< td=""><td><0.004[<a]< td=""><td></td></a]<></td></a]<>	<0.004[<a]< td=""><td></td></a]<>		
Silicon	mg/L			0.05	4.36	3.62		
Silver	mg/L			0.002	<0.002	<0.002		
Strontium	mg/L			0.005	0.031	0.116		
Tin	mg/L			0.002	<0.002	<0.002		
Titanium	mg/L			0.002	0.004	0.002		
Uranium	mg/L	0.02		0.002	<0.002[<a]< td=""><td><0.002[<a]< td=""><td></td></a]<></td></a]<>	<0.002[<a]< td=""><td></td></a]<>		
Vanadium	mg/L			0.002	0.004	<0.002		
Zinc	mg/L		5	0.005	0.013[<b]< td=""><td>0.018[<b]< td=""><td></td></b]<></td></b]<>	0.018[<b]< td=""><td></td></b]<>		
Comments: RDL - Reported Det Standards - Aesthet	ection Limit; ic Objectives a	G / S - Guidel and Operationa	ine / Standard: A I Guidelines	A Refers to On	tario Drinking Wa	ater Quality Standa	ards. Na value is derived from O. Reg. 248, B Refers to Ontario Drinking Water Quality	

Guideline values are for general reference only. The guidelines provided may or may not be relevant for the intended use. Refer directly to the applicable standard for regulatory interpretation

277579-277630 Total Hardness (as CaCO3) is a calculated parameter.

277631-277632 Elevated RDL indicates the degree of sample dilution prior to the analysis in order to keep analytes within the calibration range of the instrument and to reduce matrix interference.

Total Hardness (as CaCO3) is a calculated parameter.

277635-277636 Total Hardness (as CaCO3) is a calculated parameter.

Analysis performed at AGAT Toronto (unless marked by *)

Nivine Basily

Certified By:

	agai	Laboratories	AGAT WORK ORDER: 19147 PROJECT: 225335 Croft Land	ÍON 79887 dfill - GW		Mi Mi	SSISSAUGA, ONTARIO CANADA L4Z 1Y2 TEL (905)712-5100 FAX (905)712-5122 tttp://www.agatlabs.com
				ATTENTION TO: Ryan La			
SAMPLEID	SAMPLE IIILE	GUIDELINE	ANALYSIS PACKAGE	PARAMETER		GUIDEVALUE	RESULT
277579	BH1	O.Reg. 169(mg/L)AO&OG	Croft Landfill - Groundwater Parameters	Alkalinity (as CaCO3)	mg/L	30-500	24
277579	BH1	O.Reg. 169(mg/L)AO&OG	Croft Landfill - Groundwater Parameters	Aluminum	mg/L	0.1	0.537
277579	BH1	O.Reg. 169(mg/L)AO&OG	Croft Landfill - Groundwater Parameters	Dissolved Organic Carbon	mg/L	5	10.6
277579	BH1	O.Reg. 169(mg/L)AO&OG	Croft Landfill - Groundwater Parameters	Iron	mg/L	0.3	4.35
277579	BH1	O.Reg. 169(mg/L)AO&OG	Croft Landfill - Groundwater Parameters	Manganese	mg/L	0.05	0.458
277579	BH1	O.Reg. 169(mg/L)AO&OG	Croft Landfill - Groundwater Parameters	Total Hardness (as CaCO3)	mg/L	80-100	17.2
277579	BH1	O.Reg. 169(mg/L)AO&OG	Croft Landfill - Groundwater Parameters	Turbidity	NTU	5	58.4
277629	BH8	O.Reg. 169(mg/L)AO&OG	Croft Landfill - Groundwater Parameters	Alkalinity (as CaCO3)	mg/L	30-500	11
277629	BH8	O.Reg. 169(mg/L)AO&OG	Croft Landfill - Groundwater Parameters	Aluminum	mg/L	0.1	0.101
277629	BH8	O.Reg. 169(mg/L)AO&OG	Croft Landfill - Groundwater Parameters	Total Hardness (as CaCO3)	mg/L	80-100	9.8
277629	BH8	O.Reg. 169(mg/L)AO&OG	Croft Landfill - Groundwater Parameters	Turbidity	NTU	5	162
277630	BH9	O.Reg. 169(mg/L)AO&OG	Croft Landfill - Groundwater Parameters	Aluminum	mg/L	0.1	0.109
277630	BH9	O.Reg. 169(mg/L)AO&OG	Croft Landfill - Groundwater Parameters	Dissolved Organic Carbon	mg/L	5	16.7
277630	BH9	O.Reg. 169(mg/L)AO&OG	Croft Landfill - Groundwater Parameters	Iron	mg/L	0.3	11.1
277630	BH9	O.Reg. 169(mg/L)AO&OG	Croft Landfill - Groundwater Parameters	Manganese	mg/L	0.05	1.64
277630	BH9	O.Reg. 169(mg/L)AO&OG	Croft Landfill - Groundwater Parameters	Total Hardness (as CaCO3)	mg/L	80-100	104
277630	BH9	O.Reg. 169(mg/L)AO&OG	Croft Landfill - Groundwater Parameters	Turbidity	NTU	5	151
277631	BH10	O.Reg. 169(mg/L)AO&OG	Croft Landfill - Groundwater Parameters	Alkalinity (as CaCO3)	mg/L	30-500	508
277631	BH10	O.Reg. 169(mg/L)AO&OG	Croft Landfill - Groundwater Parameters	Dissolved Organic Carbon	mg/L	5	20.4
277631	BH10	O.Reg. 169(mg/L)AO&OG	Croft Landfill - Groundwater Parameters	Manganese	mg/L	0.05	2.88
277631	BH10	O.Reg. 169(mg/L)AO&OG	Croft Landfill - Groundwater Parameters	Total Dissolved Solids	mg/L	500	954
277631	BH10	O.Reg. 169(mg/L)AO&OG	Croft Landfill - Groundwater Parameters	Total Hardness (as CaCO3)	mg/L	80-100	507
277631	BH10	O.Reg. 169(mg/L)AO&OG	Croft Landfill - Groundwater Parameters	Turbidity	NTU	5	6.6
277631	BH10	O.Reg.169/03(mg/L)	Croft Landfill - Groundwater Parameters	Sodium	mg/L	20	129

Guideline Violation

5835 COOPERS AVENUE

COGAT Laboratories

CLIENT NAME: PINCHIN LTD.

Guideline Violation

AGAT WORK ORDER: 19T479887 PROJECT: 225335 Croft Landfill - GW 5835 COOPERS AVENUE MISSISSAUGA, ONTARIO CANADA L4Z 1Y2 TEL (905)712-5100 FAX (905)712-5122 http://www.agatlabs.com

ATTENTION TO: Ryan Lawrence

SAMPLEID	SAMPLE TITLE	GUIDELINE	ANALYSIS PACKAGE	PARAMETER	UNIT	GUIDEVALUE	RESULT
277632	BH11	O.Reg. 169(mg/L)AO&OG	Croft Landfill - Groundwater Parameters	Aluminum	mg/L	0.1	0.459
277632	BH11	O.Reg. 169(mg/L)AO&OG	Croft Landfill - Groundwater Parameters	Dissolved Organic Carbon	mg/L	5	78.3
277632	BH11	O.Reg. 169(mg/L)AO&OG	Croft Landfill - Groundwater Parameters	Iron	mg/L	0.3	1.42
277632	BH11	O.Reg. 169(mg/L)AO&OG	Croft Landfill - Groundwater Parameters	Manganese	mg/L	0.05	3.23
277632	BH11	O.Reg. 169(mg/L)AO&OG	Croft Landfill - Groundwater Parameters	Total Dissolved Solids	mg/L	500	1000
277632	BH11	O.Reg. 169(mg/L)AO&OG	Croft Landfill - Groundwater Parameters	Total Hardness (as CaCO3)	mg/L	80-100	245
277632	BH11	O.Reg. 169(mg/L)AO&OG	Croft Landfill - Groundwater Parameters	Turbidity	NTU	5	88.4
277632	BH11	O.Reg.169/03(mg/L)	Croft Landfill - Groundwater Parameters	Sodium	mg/L	20	184
277635	DP7	O.Reg. 169(mg/L)AO&OG	Croft Landfill - Groundwater Parameters	Alkalinity (as CaCO3)	mg/L	30-500	9
277635	DP7	O.Reg. 169(mg/L)AO&OG	Croft Landfill - Groundwater Parameters	Aluminum	mg/L	0.1	0.325
277635	DP7	O.Reg. 169(mg/L)AO&OG	Croft Landfill - Groundwater Parameters	Dissolved Organic Carbon	mg/L	5	8.5
277635	DP7	O.Reg. 169(mg/L)AO&OG	Croft Landfill - Groundwater Parameters	Iron	mg/L	0.3	7.26
277635	DP7	O.Reg. 169(mg/L)AO&OG	Croft Landfill - Groundwater Parameters	Manganese	mg/L	0.05	0.549
277635	DP7	O.Reg. 169(mg/L)AO&OG	Croft Landfill - Groundwater Parameters	Total Hardness (as CaCO3)	mg/L	80-100	15.2
277635	DP7	O.Reg. 169(mg/L)AO&OG	Croft Landfill - Groundwater Parameters	Turbidity	NTU	5	1100
277635	DP7	O.Reg. 169(mg/L)AO&OG	Croft Landfill - Groundwater Parameters	рН	pH Units	6.5-8.5	6.49
277636	BH-DUP	O.Reg. 169(mg/L)AO&OG	Croft Landfill - Groundwater Parameters	Aluminum	mg/L	0.1	0.117
277636	BH-DUP	O.Reg. 169(mg/L)AO&OG	Croft Landfill - Groundwater Parameters	Dissolved Organic Carbon	mg/L	5	16.7
277636	BH-DUP	O.Reg. 169(mg/L)AO&OG	Croft Landfill - Groundwater Parameters	Iron	mg/L	0.3	10.7
277636	BH-DUP	O.Reg. 169(mg/L)AO&OG	Croft Landfill - Groundwater Parameters	Manganese	mg/L	0.05	1.62
277636	BH-DUP	O.Reg. 169(mg/L)AO&OG	Croft Landfill - Groundwater Parameters	Total Hardness (as CaCO3)	mg/L	80-100	104
277636	BH-DUP	O.Reg. 169(mg/L)AO&OG	Croft Landfill - Groundwater Parameters	Turbidity	NTU	5	137



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Quality Assurance

CLIENT NAME: PINCHIN LTD.

PROJECT: 225335 Croft Landfill - GW

SAMPLING SITE:

AGAT WORK ORDER: 19T479887 ATTENTION TO: Ryan Lawrence

SAMPLED BY:

				Wate	er An	alysis	5								
RPT Date: Jun 26, 2019			C	UPLICATE	Ξ		REFERENCE MATERIAL		METHOD BLANK SPIKE			MATRIX SPIKE		IKE	
PARAMETER	Batch	Sample	Dup #1	Dun #2	RPD	Method Blank	Accept Measured Limi		ptable nits	Recovery	Acceptable Limits		Recovery	Acce Lir	ptable nits
	Baton	ld	Dup // 1	Bup #2	TU D		Value	Lower	Upper		Lower	Upper		Lower	Upper
Croft Landfill - Groundwater Parame	eters														
BOD (5)	277579	277579	<5	<5	NA	< 5	101%	75%	125%						
Electrical Conductivity	287397		1820	1820	0.3%	< 2	101%	80%	120%						
рН	287397		7.88	7.84	0.5%	NA	100%	90%	110%						
Total Dissolved Solids	280878		1250	1320	5.1%	< 20	98%	80%	120%						
Total Suspended Solids	281693		<10	<10	NA	< 10	100%	80%	120%						
Alkalinity (as CaCO3)	287397		219	218	0.3%	< 5	105%	80%	120%						
Chloride	277631	277631	246	247	0.4%	< 0.10	92%	90%	110%	102%	90%	110%	108%	80%	120%
Nitrate as N	277631	277631	<0.5	<0.5	NA	< 0.05	95%	90%	110%	101%	90%	110%	106%	80%	120%
Nitrite as N	277631	277631	<0.5	<0.5	NA	< 0.05	NA	90%	110%	106%	90%	110%	104%	80%	120%
Sulphate	277631	277631	68.6	68.2	0.5%	< 0.10	93%	90%	110%	101%	90%	110%	104%	80%	120%
Phosphate as P	277631	277631	<1.0	<1.0	NA	< 0.10	109%	90%	110%	101%	90%	110%	107%	80%	120%
Ammonia as N	274671		0.54	0.52	3.8%	< 0.02	100%	90%	110%	106%	90%	110%	102%	80%	120%
Total Kjeldahl Nitrogen	275027		1.69	1.71	1.2%	< 0.10	103%	80%	120%	96%	80%	120%	97%	70%	130%
Total Phosphorus	274647		0.02	<0.02	NA	< 0.02	97%	80%	120%	102%	90%	110%	105%	70%	130%
Chemical Oxygen Demand	274996		<5	<5	NA	< 5	99%	80%	120%	99%	90%	110%	99%	70%	130%
Dissolved Organic Carbon	275821		8.6	8.9	2.7%	< 0.5	95%	90%	110%	105%	90%	110%	96%	80%	120%
Phenols	290201		<0.001	<0.001	NA	< 0.001	102%	90%	110%	102%	90%	110%	100%	80%	120%
Turbidity	277579	277579	58.4	59.2	1.4%	< 0.5	98%	90%	110%						
Calcium	274458		32.0	31.9	0.2%	< 0.05	96%	90%	110%	96%	90%	110%	98%	70%	130%
Magnesium	274458		14.2	14.1	1.0%	< 0.05	92%	90%	110%	92%	90%	110%	94%	70%	130%
Sodium	274458		14.1	14.1	0.2%	< 0.05	95%	90%	110%	95%	90%	110%	97%	70%	130%
Potassium	274458		2.25	2.23	1.1%	< 0.05	99%	90%	110%	98%	90%	110%	100%	70%	130%
Aluminum	275209		0.011	0.009	NA	< 0.004	93%	90%	110%	102%	90%	110%	105%	70%	130%
Antimony	275209		<0.003	<0.003	NA	< 0.003	102%	90%	110%	102%	90%	110%	103%	70%	130%
Arsenic	275209		<0.003	<0.003	NA	< 0.003	108%	90%	110%	106%	90%	110%	108%	70%	130%
Barium	275209		0.037	0.036	1.6%	< 0.002	100%	90%	110%	100%	90%	110%	108%	70%	130%
Beryllium	275209		<0.001	<0.001	NA	< 0.001	103%	90%	110%	105%	90%	110%	121%	70%	130%
Bismuth	275209		<0.002	<0.002	NA	< 0.002	97%	90%	110%	105%	90%	110%	102%	70%	130%
Boron	275209		<0.010	<0.010	NA	< 0.010	95%	90%	110%	99%	90%	110%	106%	70%	130%
Cadmium	275209		<0.001	<0.001	NA	< 0.001	100%	90%	110%	104%	90%	110%	108%	70%	130%
Chromium	275209		<0.003	<0.003	NA	< 0.003	100%	90%	110%	103%	90%	110%	102%	70%	130%
Cobalt	275209		<0.001	<0.001	NA	< 0.001	99%	90%	110%	103%	90%	110%	101%	70%	130%
Copper	275209		<0.003	<0.003	NA	< 0.003	104%	90%	110%	109%	90%	110%	106%	70%	130%
Iron	275209		<0.010	<0.010	NA	< 0.010	103%	90%	110%	102%	90%	110%	95%	70%	130%
Lead	275209		<0.001	<0.001	NA	< 0.001	101%	90%	110%	107%	90%	110%	107%	70%	130%
Manganese	275209		<0.002	<0.002	NA	< 0.002	98%	90%	110%	101%	90%	110%	99%	70%	130%
Molybdenum	275209		<0.002	<0.002	NA	< 0.002	100%	90%	110%	101%	90%	110%	105%	70%	130%
Nickel	275209		<0.003	<0.003	NA	< 0.003	107%	90%	110%	108%	90%	110%	104%	70%	130%
Selenium	275209		<0.004	<0.004	NA	< 0.004	107%	90%	110%	110%	90%	110%	111%	70%	130%

AGAT QUALITY ASSURANCE REPORT (V1)

AGAT Laboratories is accredited to ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA) and/or Standards Council of Canada (SCC) for specific tests listed on the scope of accreditation. AGAT Laboratories (Mississauga) is also accredited by the Canadian Association for Laboratory Accreditation Inc. (CALA) for specific drinking water tests. Accreditations are location and parameter specific. A complete listing of parameters for each location is available from www.cala.ca and/or www.scc.ca. The tests in this report may not necessarily be included in the scope of accreditation. RPDs calculated using raw data. The RPD may not be reflective of duplicate values shown, due to rounding of final results.



Quality Assurance

CLIENT NAME: PINCHIN LTD.

PROJECT: 225335 Croft Landfill - GW

SAMPLING SITE:

AGAT WORK ORDER: 19T479887 ATTENTION TO: Ryan Lawrence SAMPLED BY:

Water Analysis (Continued)

					-	-		-							
RPT Date: Jun 26, 2019		DUPLICATE				REFERENCE MATERIAL			METHOD BLANK SPIKE			MATRIX SPIKE			
PARAMETER	Batch	Sample	Dup #1	Dup #2	RPD	Method Blank	Measured	Acceptable Limits		Recovery	Acceptable Limits		Recovery	Acce Lin	ptable nits
		Ia					value	Lower	Upper		Lower	Upper		Lower	Upper
Silicon	275209		5.04	5.02	0.4%	< 0.05	101%	90%	110%	97%	90%	110%	103%	70%	130%
Silver	275209		<0.002	<0.002	NA	< 0.002	96%	90%	110%	108%	90%	110%	112%	70%	130%
Strontium	275209		0.063	0.063	1.2%	< 0.005	101%	90%	110%	106%	90%	110%	76%	70%	130%
Tin	275209		<0.002	<0.002	NA	< 0.002	98%	90%	110%	101%	90%	110%	106%	70%	130%
Titanium	275209		<0.002	<0.002	NA	< 0.002	96%	90%	110%	100%	90%	110%	101%	70%	130%
Uranium	275209		<0.002	<0.002	NA	< 0.002	96%	90%	110%	104%	90%	110%	108%	70%	130%
Vanadium	275209		<0.002	<0.002	NA	< 0.002	99%	90%	110%	103%	90%	110%	103%	70%	130%
Zinc	275209		0.006	<0.005	NA	< 0.005	105%	90%	110%	107%	90%	110%	107%	70%	130%

Comments: NA signifies Not Applicable.

Duplicate Qualifier: As the measured result approaches the RL, the uncertainty associated with the value increases dramatically, thus duplicate acceptance limits apply only where the average of the two duplicates is greater than five times the RL.

Certified By:

Nivine Basily

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AGAT QUALITY ASSURANCE REPORT (V1)

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Method Summary

CLIENT NAME: PINCHIN LTD.

PROJECT: 225335 Croft Landfill - GW

AGAT WORK ORDER: 19T479887 ATTENTION TO: Ryan Lawrence

PARAMETERGAGAT SO.PILTERATURE REFERENCEWALVITICAL TECHNIQUEWoller JouisUNCR-35-6000SM 2019 BDO METERBOD (M)NOR-35-6000SM 2019 BCTITRATEBOL Handness (ac GaCO3)MET 33-6105EPA SW-446 6010C & 20.7 X SMCALULATONTotal Insolved SolidsNOR-35-6002SM 2404 CBALANCETotal Suspende SolidsNOR-35-6004SM 2209 BCALULATONAtalanty (ac GaCO3)NOR-35-6004SM 2401 CBALANCEAtalanty (ac GaCO3)NOR-35-6004SM 4110 BNOC HAROMATOGRAPHNirate as NNOR-35-6004SM 4110 BNOC HAROMATOGRAPHNirate as NNOR-35-6004SM 4110 BNOC HAROMATOGRAPHSulphataNOR-35-6004SM 4110 BNOR-35-6004SulphataNOR-35-6004SM 410 BNOR-35-6004Sulphata </th <th>SAMPLING SITE:</th> <th></th> <th>SAMPLED BY:</th> <th></th>	SAMPLING SITE:		SAMPLED BY:	
Water Analysis UNCR-33-0005 SM 5210 B D0 METER Electrical Conductivity INOR-33-0000 SM 2310 B PC TITRATE Del (5) INOR-33-0000 SM 4300-H+ B PC TITRATE Total Diasolved Solids INOR-33-0028 SM 4300-H+ B PC TITRATE Total Diasolved Solids INOR-33-0028 SM 2340 C BALANCE Total Diasolved Solids INOR-33-0028 SM 2340 C BALANCE Alualinity (as CaCO3) INOR-33-0024 SM 4110 B ION CHROMATOGRAPH Nirds as N INOR-33-0034 SM 4110 B ION CHROMATOGRAPH Nirds as N INOR-33-0034 SM 4110 B ION CHROMATOGRAPH Nore-33-0034 SM 410 B ION CHROMATOGRAPH Nore-33-0034 SM 4100 B ION CHROMATOGRAPH	PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
BOD (5) INOR-39-6000 SM 2510 B PC TTTRATE pH INOR-39-6000 SM 4500.H+ B PC TTTRATE pH INOR-39-6000 SM 4500.H+ B PC TTTRATE Total Hardness (as CaC03) INET-93-6105 2240 B CALCULATION Total Dissoved Solids INOR-39-6028 SM 2540 C BALANCE Total Dissoved Solids INOR-39-6028 SM 2540 D BALANCE Atalanity (as CaC03) INOR-39-6004 SM 4110 B ION CHROMATOGRAPH Nataanity (as CaC03) INOR-39-6004 SM 4110 B ION CHROMATOGRAPH Natta as N INOR-39-6004 SM 4110 B ION CHROMATOGRAPH Sulphale INOR-39-6004 SM 4110 B ION CHROMATOGRAPH Sulphale INOR-39-6048 SM 4110 B ION CHROMATOGRAPH Atmonala as N INOR-39-6049 SM 4110 B IACHAT FIA Total Phosphorus INOR-39-6049 SM 4500 S SMD2010 Diselved Organic Carbon INOR-39-6049 SM 2500 S SECTOPHOTOMETER Diselved Organic Carbon INOR-39-6049 SM 2500 S <td>Water Analysis</td> <td></td> <td></td> <td></td>	Water Analysis			
Electrical Conductivity NOR-83-6000 SM 2510 B PC TITRATE pH NOR-83-6000 SM 4500-LH B PC TITRATE Total Disorberd Solids NOR-83-6028 SM 2540 C BALANCE Total Disorberd Solids NOR-83-6028 SM 2540 D BALANCE Alkalinity (as CaCO3) NOR-83-6028 SM 2540 D BALANCE Chiorido NOR-83-6024 SM 4110 B NO CHROMATOGRAPH Nirate as N NOR-83-6004 SM 4110 B NO CHROMATOGRAPH Nirate as N NOR-83-6004 SM 4110 B NO CHROMATOGRAPH Nirate as N NOR-83-6004 SM 4110 B NO CHROMATOGRAPH Ammonia as N NOR-93-6059 Quik/Chem 10-107-06-1.8 SM 4500 LACHAT FIA Affidiah Nirogen NOR-93-6048 Guik/Chem 10-107-06-1.8 SM 4500 LACHAT FIA Chemical Oxygen Demand NOR-93-6049 EPA 4151 4 SM 5310 B SM 520 D SPECTROPHOTOMETER Disoved Organic Carbon NOR-93-6049 EPA 4151 4 SM 5310 B SMHAD2U CARBON ANALYZER Disoved Organic Carbon NOR-93-6059 Guik/Chem 10-107-07.9 SM 5350 D <td< td=""><td>BOD (5)</td><td>INOR-93-6006</td><td>SM 5210 B</td><td>DO METER</td></td<>	BOD (5)	INOR-93-6006	SM 5210 B	DO METER
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Total Suspended Solids INOR-93-6008 SM 2540 D BALANCE Akalanity (as CaCO3) INOR-93-6000 SM 2320 B PC TITRATE Chiorido INOR-93-6004 SM 4110 B ION CHROMATOGRAPH Nitrate as N INOR-93-6004 SM 4110 B ION CHROMATOGRAPH Sulphate INOR-93-6004 SM 4110 B ION CHROMATOGRAPH Phosphate as P INOR-93-6059 QuikChem 10:107-06:-1.3 & SM 4500 IACHAT FIA Ammonia as N INOR-93-6057 QuikChem 10:107-06:-1.3 & SM 4500 IACHAT FIA Total Kjeldahl Nitrogen INOR-93-6042 SM 5220 D SPECTROPHOTMETER Dissolved Organic Carbon INOR-93-6050 MOE ROPHEN-E 3179 & SM 5530 TECHNICON AUTO ANALYZER Phonols INOR-93-6050 IPA SW-486 6010C & 200.7 ICPICES Caldum MET-93-6105 IPA SW-486 6010C & 200.7 ICPICES Caldum MET-93-6105 IPA SW-486 6010C & 200.7 ICPICES Solidum MET-93-6103 IPA SW-486 6010C & 200.7 ICPICES Auminum MET-93-6103 IPA SW-486 6010C & 200.7 ICPICES	Total Dissolved Solids	INOR-93-6028	SM 2540 C	BALANCE
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Nitrate as N INOR 493-6004 SM 4110 B ION CHROMATOGRAPH Nitrite as N INOR 493-6004 SM 4110 B ION CHROMATOGRAPH Sulphate INOR 493-6004 SM 4110 B ION CHROMATOGRAPH Phosphate as P INOR 493-6004 SM 4110 B ION CHROMATOGRAPH Ammonia as N INOR 493-6004 SM (Chem 10-107-06-1-3 & SM 4500-Norg D LCHAT FIA Total Kjeldah Nitrogen INOR 493-6057 SM (Chem 10-117-06-1-3 & SM 4500-P1 LCHAT FIA Total Phosphorus INOR 493-6050 SM 5220 D SPECTROPHOTOMETER Disolved Organic Carbon INOR 493-6044 M 2010 B SM 5300 D TECHNICON AUTO ANALYZER Phenols INOR 493-6050 MCR CPHENE 3179 & SM 540 D TECHNICON AUTO ANALYZER Phospistim MET 493-6105 EPA SW-486 6010C & 200.7 ICPIOES Calcium MET 493-6105 EPA SW-486 6010C & 200.7 ICPIOES Sodium MET 493-6103 EPA SW-486 6010C & 200.7 ICPIOES Autimum MET 493-6103 EPA SW-486 6010C & 200.7 ICPIOES Sodium MET 493-6103 EPA SW-486 6	Chloride	INOR-93-6004	SM 4110 B	ION CHROMATOGRAPH
Nitrile as N INOR-33-6004 SM 4110 B ION CHROMATOGRAPH Sulphate INOR-33-6004 SM 4110 B ION CHROMATOGRAPH Phosphate as P INOR-33-6004 SM 4110 B ION CHROMATOGRAPH Ammonia as N INOR-33-6059 QuikChem 10-107-06-1J & SM 4500 LACHAT FIA Total Kjeldahl Nitrogen INOR-33-6048 QuikChem 10-115-01-3-A & SM LACHAT FIA Total Kjeldahl Nitrogen INOR-33-6047 QuikChem 10-115-01-3-A & SM LACHAT FIA Total Phosphorus INOR-33-6042 SM 5200 D SPECTROPHOTOMETER Dissolved Organic Carbon INOR-33-6044 SM 2130 B SPECTROPHOTOMETER Dissolved Organic Carbon INOR-33-6044 SM 2130 B NEPHELOMETER Calcilum INOR-33-6044 SM 2130 B NEPHELOMETER Dissolved Organic Carbon INOR-33-6044 SM 2130 B NEPHELOMETER Calcilum INOR-33-6044 SM 2130 B NEPHELOMETER Dissolved Organic Carbon INOR-33-6044 SM 2130 B NEPHELOMETER Calcilum MET-33-6105 EPA SW-4466 6010C & 200.7 ICP/OES	Nitrate as N	INOR-93-6004	SM 4110 B	ION CHROMATOGRAPH
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Dissolved Organic Carbon INOR-93-6049 EPA 415.1 & S10 B SHIMAD2U CARBON ANALYZER Phenols INOR-93-6044 MOE ROPHENE 3179 & SM 5530 TECHNICON AUTO ANALYZER Calcium INOR-93-6044 SM 210 B NEPHELONGETER Calcium MET-93-6105 EPA SW-846 6010C & 200.7 ICP/OES Sodium MET-93-6105 EPA SW-846 6010C & 200.7 ICP/OES Potassium MET-93-6105 EPA SW-846 6010C & 200.7 ICP/OES Sodium MET-93-6103 EPA SW-846 6020A & 200.8 ICP-MS Atiminum MET-93-6103 EPA SW-846 6020A & 200.8 ICP-MS Arsenic MET-93-6103 EPA SW-846 6020A & 200.8 ICP-MS BaryIm MET-93-6103 EPA SW-846 6020A & 200.8 ICP-MS BeryIliam MET-93-6103 EPA SW-846 6020A & 200.8 ICP-MS Boron MET-93-6103 EPA SW-846 6020A & 200.8 ICP-MS Cadmium MET-93-6103 EPA SW-846 6020A & 200.8 ICP-MS Cobalt MET-93-6103 EPA SW-846 6020A & 200.8 ICP-MS Cobalt MET-93-610	Chemical Oxygen Demand	INOR-93-6042	SM 5220 D	SPECTROPHOTOMETER
Phenols INOR-93-6050 MOE ROPHEN-E 3179 & SM 5530 D TECHNICON AUTO ANALYZER Turbidity INOR-93-6044 SM 2130 B NEPHELOMETER Calcium MET-93-6105 EPA SW-846 6010C & 200.7 ICP/OES Sodium MET-93-6105 EPA SW-846 6010C & 200.7 ICP/OES Potassium MET-93-6103 EPA SW-846 6010C & 200.7 ICP/OES Auminum MET-93-6103 EPA SW-846 6020A & 200.8 ICP-MS Antimony MET-93-6103 EPA SW-846 6020A & 200.8 ICP-MS Arsenic MET-93-6103 EPA SW-846 6020A & 200.8 ICP-MS Barjum MET-93-6103 EPA SW-846 6020A & 200.8 ICP-MS Barjum MET-93-6103 EPA SW-846 6020A & 200.8 ICP-MS Barjum MET-93-6103 EPA SW-846 6020A & 200.8 ICP-MS Boron MET-93-6103 EPA SW-846 6020A & 200.8 ICP-MS Cobati MET-93-6103 EPA SW-846 6020A & 200.8 ICP-MS Copper MET-93-6103 EPA SW-846 6020A & 200.8 ICP-MS Iron MET-93-6103 EPA SW-846	Dissolved Organic Carbon	INOR-93-6049	EPA 415.1 & SM 5310 B	SHIMADZU CARBON ANALYZER
Turbidity INOR-93-6044 SM 2130 B NEPHELOMETER Calcium MET-93-6105 EPA SW-846 6010C & 200.7 ICP/OES Magnesium MET-93-6105 EPA SW-846 6010C & 200.7 ICP/OES Sodium MET-93-6105 EPA SW-846 6010C & 200.7 ICP/OES Potassium MET-93-6103 EPA SW-846 6020A & 200.8 ICP-MS Aturninum MET-93-6103 EPA SW-846 6020A & 200.8 ICP-MS Arsenic MET-93-6103 EPA SW-846 6020A & 200.8 ICP-MS Bary MET-93-6103 EPA SW-846 6020A & 200.8 ICP-MS Boron MET-93-6103 EPA SW-846 6020A & 200.8 ICP-MS Cadmium MET-93-6103 EPA SW-846 6020A & 200.8 ICP-MS Copper MET-93-6103 EPA SW-846 6020A & 200.8 ICP-MS Iron MET-93-6103 EPA SW-846 6020A & 200.8 <	Phenols	INOR-93-6050	MOE ROPHEN-E 3179 & SM 5530 D	TECHNICON AUTO ANALYZER
Calcium MET-93-6105 EPA SW-846 6010C & 200.7 ICP/OES Magnesium MET-93-6105 EPA SW-846 6010C & 200.7 ICP/OES Sodium MET-93-6105 EPA SW-846 6010C & 200.7 ICP/OES Potassium MET-93-6103 EPA SW-846 6020A & 200.8 ICP-MS Autimony MET-93-6103 EPA SW-846 6020A & 200.8 ICP-MS Artimony MET-93-6103 EPA SW-846 6020A & 200.8 ICP-MS Barium MET-93-6103 EPA SW-846 6020A & 200.8 ICP-MS Baryum MET-93-6103 EPA SW-846 6020A & 200.8 ICP-MS Baryum MET-93-6103 EPA SW-846 6020A & 200.8 ICP-MS Baryuth MET-93-6103 EPA SW-846 6020A & 200.8 ICP-MS Cadmium MET-93-6103 EPA SW-846 6020A & 200.8 ICP-MS Cadmium MET-93-6103 EPA SW-846 6020A & 200.8 ICP-MS Cobalt MET-93-6103 EPA SW-846 6020A & 200.8 ICP-MS Cobalt MET-93-6103 EPA SW-846 6020A & 200.8 ICP-MS Iron MET-93-6103 EPA SW-846 6020A & 200.	Turbidity	INOR-93-6044	SM 2130 B	NEPHELOMETER
Magnesium MET-93-6105 EPA SW-846 6010C & 200.7 ICP/OES Sodium MET-93-6105 EPA SW-846 6010C & 200.7 ICP/OES Potassium MET-93-6103 EPA SW-846 6020A & 200.8 ICP-MS Auminony MET-93-6103 EPA SW-846 6020A & 200.8 ICP-MS Arsenic MET-93-6103 EPA SW-846 6020A & 200.8 ICP-MS Barium MET-93-6103 EPA SW-846 6020A & 200.8 ICP-MS Barium MET-93-6103 EPA SW-846 6020A & 200.8 ICP-MS Barium MET-93-6103 EPA SW-846 6020A & 200.8 ICP-MS Boron MET-93-6103 EPA SW-846 6020A & 200.8 ICP-MS Cadmium MET-93-6103 EPA SW-846 6020A & 200.8 ICP-MS Cobalt MET-93-6103 EPA SW-846 6020A & 200.8 ICP-MS Cobalt MET-93-6103 EPA SW-846 6020A & 200.8 ICP-MS Copper MET-93-6103 EPA SW-846 6020A & 200.8 ICP-MS Iron MET-93-6103 EPA SW-846 6020A & 200.8 ICP-MS Marganese MET-93-6103 EPA SW-846 6020A & 200.8 </td <td>Calcium</td> <td>MET-93-6105</td> <td>EPA SW-846 6010C & 200.7</td> <td>ICP/OES</td>	Calcium	MET-93-6105	EPA SW-846 6010C & 200.7	ICP/OES
Sodium MET-93-6105 EPA SW-846 6010C & 200.7 ICP/OES Potassium MET-93-6103 EPA SW-846 6010C & 200.7 ICP/OES Aluminum MET-93-6103 EPA SW-846 6020A & 200.8 ICP-MS Antimony MET-93-6103 EPA SW-846 6020A & 200.8 ICP-MS Arsenic MET-93-6103 EPA SW-846 6020A & 200.8 ICP-MS Barium MET-93-6103 EPA SW-846 6020A & 200.8 ICP-MS Beryllium MET-93-6103 EPA SW-846 6020A & 200.8 ICP-MS Born MET-93-6103 EPA SW-846 6020A & 200.8 ICP-MS Born MET-93-6103 EPA SW-846 6020A & 200.8 ICP-MS Cadmium MET-93-6103 EPA SW-846 6020A & 200.8 ICP-MS Cohart MET-93-6103 EPA SW-846 6020A & 200.8 ICP-MS Copper MET-93-6103 EPA SW-846 6020A & 200.8 ICP-MS Iron MET-93-6103 EPA SW-846 6020A & 200.8 ICP-MS Ikad MET-93-6103 EPA SW-846 6020A & 200.8 ICP-MS Ikad MET-93-6103 EPA SW-846 6020A & 200.8	Magnesium	MET-93-6105	EPA SW-846 6010C & 200.7	ICP/OES
Potassium MET-93-6105 EPA SW-846 6010C & 200.7 ICP/OES Aluminum MET-93-6103 EPA SW-846 6020A & 200.8 ICP-MS Antimony MET-93-6103 EPA SW-846 6020A & 200.8 ICP-MS Arsenic MET-93-6103 EPA SW-846 6020A & 200.8 ICP-MS Barium MET-93-6103 EPA SW-846 6020A & 200.8 ICP-MS Beryllium MET-93-6103 EPA SW-846 6020A & 200.8 ICP-MS Boron MET-93-6103 EPA SW-846 6020A & 200.8 ICP-MS Cadmium MET-93-6103 EPA SW-846 6020A & 200.8 ICP-MS Coron MET-93-6103 EPA SW-846 6020A & 200.8 ICP-MS Codamium MET-93-6103 EPA SW-846 6020A & 200.8 ICP-MS Cobalt MET-93-6103 EPA SW-846 6020A & 200.8 ICP-MS Copper MET-93-6103 EPA SW-846 6020A & 200.8 ICP-MS Iron MET-93-6103 EPA SW-846 6020A & 200.8 ICP-MS Manganese MET-93-6103 EPA SW-846 6020A & 200.8 ICP-MS Molydehum MET-93-6103 EPA SW-846 6020A & 20	Sodium	MET-93-6105	EPA SW-846 6010C & 200.7	ICP/OES
AluminumMET-93-6103EPA SW-846 6020A & 200.8ICP-MSAntimonyMET-93-6103EPA SW-846 6020A & 200.8ICP-MSArsenicMET-93-6103EPA SW-846 6020A & 200.8ICP-MSBariumMET-93-6103EPA SW-846 6020A & 200.8ICP-MSBismuthMET-93-6103EPA SW-846 6020A & 200.8ICP-MSBismuthMET-93-6103EPA SW-846 6020A & 200.8ICP-MSBoronMET-93-6103EPA SW-846 6020A & 200.8ICP-MSCadmiumMET-93-6103EPA SW-846 6020A & 200.8ICP-MSChromiumMET-93-6103EPA SW-846 6020A & 200.8ICP-MSCobaltMET-93-6103EPA SW-846 6020A & 200.8ICP-MSCopperMET-93-6103EPA SW-846 6020A & 200.8ICP-MSIronMET-93-6103EPA SW-846 6020A & 200.8ICP-MSIronMET-93-6103EPA SW-846 6020A & 200.8ICP-MSManganeseMET-93-6103EPA SW-846 6020A & 200.8ICP-MSMolybdenumMET-93-6103EPA SW-846 6020A & 200.8ICP-MSSilconMET-93-6103EPA SW-846 6020A & 200.8ICP-MS <t< td=""><td>Potassium</td><td>MET-93-6105</td><td>EPA SW-846 6010C & 200.7</td><td>ICP/OES</td></t<>	Potassium	MET-93-6105	EPA SW-846 6010C & 200.7	ICP/OES
Antimony MET-93-6103 EPA SW-846 6020A & 200.8 ICP-MS Arsenic MET-93-6103 EPA SW-846 6020A & 200.8 ICP-MS Barium MET-93-6103 EPA SW-846 6020A & 200.8 ICP-MS Beryllium MET-93-6103 EPA SW-846 6020A & 200.8 ICP-MS Bismuth MET-93-6103 EPA SW-846 6020A & 200.8 ICP-MS Boron MET-93-6103 EPA SW-846 6020A & 200.8 ICP-MS Cadmium MET-93-6103 EPA SW-846 6020A & 200.8 ICP-MS Cadmium MET-93-6103 EPA SW-846 6020A & 200.8 ICP-MS Cobalt MET-93-6103 EPA SW-846 6020A & 200.8 ICP-MS Cobalt MET-93-6103 EPA SW-846 6020A & 200.8 ICP-MS Copper MET-93-6103 EPA SW-846 6020A & 200.8 ICP-MS Iron MET-93-6103 EPA SW-846 6020A & 200.8 ICP-MS Maganese MET-93-6103 EPA SW-846 6020A & 200.8 ICP-MS Molybdenum MET-93-6103 EPA SW-846 6020A & 200.8 ICP-MS Silcon MET-93-6103 EPA SW-846 6020A & 200.8 </td <td>Aluminum</td> <td>MET-93-6103</td> <td>EPA SW-846 6020A & 200.8</td> <td>ICP-MS</td>	Aluminum	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Arsenic MET-93-6103 EPA SW-846 6020A & 200.8 ICP-MS Barium MET-93-6103 EPA SW-846 6020A & 200.8 ICP-MS Beryllium MET-93-6103 EPA SW-846 6020A & 200.8 ICP-MS Bismuth MET-93-6103 EPA SW-846 6020A & 200.8 ICP-MS Boron MET-93-6103 EPA SW-846 6020A & 200.8 ICP-MS Cadmium MET-93-6103 EPA SW-846 6020A & 200.8 ICP-MS Chromium MET-93-6103 EPA SW-846 6020A & 200.8 ICP-MS Cobalt MET-93-6103 EPA SW-846 6020A & 200.8 ICP-MS Cobalt MET-93-6103 EPA SW-846 6020A & 200.8 ICP-MS Copper MET-93-6103 EPA SW-846 6020A & 200.8 ICP-MS Iron MET-93-6103 EPA SW-846 6020A & 200.8 ICP-MS Lead MET-93-6103 EPA SW-846 6020A & 200.8 ICP-MS Molybdenum MET-93-6103 EPA SW-846 6020A & 200.8 ICP-MS Silcon MET-93-6103 EPA SW-846 6020A & 200.8 ICP-MS Silver MET-93-6103 EPA SW-846 6020A & 200.8	Antimony	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Barium MET-93-6103 EPA SW-846 6020A & 200.8 ICP-MS Beryllium MET-93-6103 EPA SW-846 6020A & 200.8 ICP-MS Bismuth MET-93-6103 EPA SW-846 6020A & 200.8 ICP-MS Boron MET-93-6103 EPA SW-846 6020A & 200.8 ICP-MS Cadmium MET-93-6103 EPA SW-846 6020A & 200.8 ICP-MS Chromium MET-93-6103 EPA SW-846 6020A & 200.8 ICP-MS Cobalt MET-93-6103 EPA SW-846 6020A & 200.8 ICP-MS Cobalt MET-93-6103 EPA SW-846 6020A & 200.8 ICP-MS Copper MET-93-6103 EPA SW-846 6020A & 200.8 ICP-MS Iron MET-93-6103 EPA SW-846 6020A & 200.8 ICP-MS Lead MET-93-6103 EPA SW-846 6020A & 200.8 ICP-MS Manganese MET-93-6103 EPA SW-846 6020A & 200.8 ICP-MS Nickel MET-93-6103 EPA SW-846 6020A & 200.8 ICP-MS Silver MET-93-6103 EPA SW-846 6020A & 200.8 ICP-MS Silver MET-93-6103 EPA SW-846 6020A & 200.8	Arsenic	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Beryllium MET-93-6103 EPA SW-846 6020A & 200.8 ICP-MS Bismuth MET-93-6103 EPA SW-846 6020A & 200.8 ICP-MS Boron MET-93-6103 EPA SW-846 6020A & 200.8 ICP-MS Cadmium MET-93-6103 EPA SW-846 6020A & 200.8 ICP-MS Cadmium MET-93-6103 EPA SW-846 6020A & 200.8 ICP-MS Chromium MET-93-6103 EPA SW-846 6020A & 200.8 ICP-MS Cobalt MET-93-6103 EPA SW-846 6020A & 200.8 ICP-MS Copper MET-93-6103 EPA SW-846 6020A & 200.8 ICP-MS Iron MET-93-6103 EPA SW-846 6020A & 200.8 ICP-MS Lead MET-93-6103 EPA SW-846 6020A & 200.8 ICP-MS Molybdenum MET-93-6103 EPA SW-846 6020A & 200.8 ICP-MS Nickel MET-93-6103 EPA SW-846 6020A & 200.8 ICP-MS Selenium MET-93-6103 EPA SW-846 6020A & 200.8 ICP-MS Silicon MET-93-6103 EPA SW-846 6020A & 200.8 ICP-MS Siliver MET-93-6103 EPA SW-846 6020A & 200.8 <td>Barium</td> <td>MET-93-6103</td> <td>EPA SW-846 6020A & 200.8</td> <td>ICP-MS</td>	Barium	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Bismuth MET-93-6103 EPA SW-846 6020A & 200.8 ICP-MS Boron MET-93-6103 EPA SW-846 6020A & 200.8 ICP-MS Cadmium MET-93-6103 EPA SW-846 6020A & 200.8 ICP-MS Chromium MET-93-6103 EPA SW-846 6020A & 200.8 ICP-MS Cobalt MET-93-6103 EPA SW-846 6020A & 200.8 ICP-MS Copper MET-93-6103 EPA SW-846 6020A & 200.8 ICP-MS Iron MET-93-6103 EPA SW-846 6020A & 200.8 ICP-MS Lead MET-93-6103 EPA SW-846 6020A & 200.8 ICP-MS Manganese MET-93-6103 EPA SW-846 6020A & 200.8 ICP-MS Molybdenum MET-93-6103 EPA SW-846 6020A & 200.8 ICP-MS Nickel MET-93-6103 EPA SW-846 6020A & 200.8 ICP-MS Silicon MET-93-6103 EPA SW-846 6020A & 200.8 <td>Beryllium</td> <td>MET-93-6103</td> <td>EPA SW-846 6020A & 200.8</td> <td>ICP-MS</td>	Beryllium	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Boron MET-93-6103 EPA SW-846 6020A & 200.8 ICP-MS Cadmium MET-93-6103 EPA SW-846 6020A & 200.8 ICP-MS Chromium MET-93-6103 EPA SW-846 6020A & 200.8 ICP-MS Cobalt MET-93-6103 EPA SW-846 6020A & 200.8 ICP-MS Copper MET-93-6103 EPA SW-846 6020A & 200.8 ICP-MS Iron MET-93-6103 EPA SW-846 6020A & 200.8 ICP-MS Lead MET-93-6103 EPA SW-846 6020A & 200.8 ICP-MS Manganese MET-93-6103 EPA SW-846 6020A & 200.8 ICP-MS Molybdenum MET-93-6103 EPA SW-846 6020A & 200.8 ICP-MS Nickel MET-93-6103 EPA SW-846 6020A & 200.8 ICP-MS Selenium MET-93-6103 EPA SW-846 6020A & 200.8 ICP-MS Silicon MET-93-6103 EPA SW-846 6020A & 200.8 <td>Bismuth</td> <td>MET-93-6103</td> <td>EPA SW-846 6020A & 200.8</td> <td>ICP-MS</td>	Bismuth	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
CadmiumMET-93-6103EPA SW-846 6020A & 200.8ICP-MSChromiumMET-93-6103EPA SW-846 6020A & 200.8ICP-MSCobaltMET-93-6103EPA SW-846 6020A & 200.8ICP-MSCopperMET-93-6103EPA SW-846 6020A & 200.8ICP-MSIronMET-93-6103EPA SW-846 6020A & 200.8ICP-MSLeadMET-93-6103EPA SW-846 6020A & 200.8ICP-MSManganeseMET-93-6103EPA SW-846 6020A & 200.8ICP-MSMolybdenumMET-93-6103EPA SW-846 6020A & 200.8ICP-MSNickelMET-93-6103EPA SW-846 6020A & 200.8ICP-MSSeleniumMET-93-6103EPA SW-846 6020A & 200.8ICP-MSSiliconMET-93-6103EPA SW-846 6020A & 200.8ICP-MSSiliconMET-93-6103EPA SW-846 6020A & 200.8ICP-MSSilverMET-93-6103EPA SW-846 6020A & 200.8ICP-MSSilverMET-93-6103EPA SW-846 6020A & 200.8ICP-MSSilverMET-93-6103EPA SW-846 6020A & 200.8ICP-MSSilverMET-93-6103EPA SW-846 6020A & 200.8ICP-MSTinMET-93-6103EPA SW-846 6020A & 200.8ICP-MSTinMET-93-6103EPA SW-846 6020A & 200.8ICP-MSTitaniumMET-93-6103EPA SW-846 6020A & 200.8ICP-MSUraniumMET-93-6103EPA SW-846 6020A & 200.8ICP-MSTitaniumMET-93-6103EPA SW-846 6020A & 200.8ICP-MS	Boron	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Chromium MET-93-6103 EPA SW-846 6020A & 200.8 ICP-MS Cobalt MET-93-6103 EPA SW-846 6020A & 200.8 ICP-MS Copper MET-93-6103 EPA SW-846 6020A & 200.8 ICP-MS Iron MET-93-6103 EPA SW-846 6020A & 200.8 ICP-MS Lead MET-93-6103 EPA SW-846 6020A & 200.8 ICP-MS Manganese MET-93-6103 EPA SW-846 6020A & 200.8 ICP-MS Molybdenum MET-93-6103 EPA SW-846 6020A & 200.8 ICP-MS Nickel MET-93-6103 EPA SW-846 6020A & 200.8 ICP-MS Selenium MET-93-6103 EPA SW-846 6020A & 200.8 ICP-MS Silicon MET-93-6103 EPA SW-846 6020A & 200.8 ICP-MS Silicon MET-93-6103 EPA SW-846 6020A & 200.8 ICP-MS Silver MET-93-6103 EPA SW-846 6020A & 200.8 ICP-MS Silver MET-93-6103 EPA SW-846 6020A & 200.8 ICP-MS Silver MET-93-6103 EPA SW-846 6020A & 200.8 ICP-MS Tin MET-93-6103 EPA SW-846 6020A & 200.8	Cadmium	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Cobalt MET-93-6103 EPA SW-846 6020A & 200.8 ICP-MS Copper MET-93-6103 EPA SW-846 6020A & 200.8 ICP-MS Iron MET-93-6103 EPA SW-846 6020A & 200.8 ICP-MS Lead MET-93-6103 EPA SW-846 6020A & 200.8 ICP-MS Manganese MET-93-6103 EPA SW-846 6020A & 200.8 ICP-MS Molybdenum MET-93-6103 EPA SW-846 6020A & 200.8 ICP-MS Nickel MET-93-6103 EPA SW-846 6020A & 200.8 ICP-MS Selenium MET-93-6103 EPA SW-846 6020A & 200.8 ICP-MS Silicon MET-93-6103 EPA SW-846 6020A & 200.8 ICP-MS Silver MET-93-6103 EPA SW-846 6020A & 200.8 ICP-MS Silver MET-93-6103 EPA SW-846 6020A & 200.8 ICP-MS Strontium MET-93-6103 EPA SW-846 6020A & 200.8 ICP-MS Tin MET-93-6103 EPA SW-846 6020A & 200.8 ICP-MS Tin MET-93-6103 EPA SW-846 6020A & 200.8 ICP-MS Titanium MET-93-6103 EPA SW-846 6020A & 200.8	Chromium	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Copper MET-93-6103 EPA SW-846 6020A & 200.8 ICP-MS Iron MET-93-6103 EPA SW-846 6020A & 200.8 ICP-MS Lead MET-93-6103 EPA SW-846 6020A & 200.8 ICP-MS Manganese MET-93-6103 EPA SW-846 6020A & 200.8 ICP-MS Molybdenum MET-93-6103 EPA SW-846 6020A & 200.8 ICP-MS Nickel MET-93-6103 EPA SW-846 6020A & 200.8 ICP-MS Selenium MET-93-6103 EPA SW-846 6020A & 200.8 ICP-MS Silicon MET-93-6103 EPA SW-846 6020A & 200.8 ICP-MS Silver MET-93-6103 EPA SW-846 6020A & 200.8 ICP-MS Strontium MET-93-6103 EPA SW-846 6020A & 200.8 ICP-MS Tin MET-93-6103 EPA SW-846 6020A & 200.8 ICP-MS Tin MET-93-6103 EPA SW-846 6020A & 200.8 ICP-MS Titanium MET-93-6103 EPA SW-846 6020A & 200.8 ICP-MS Uranium MET-93-6103 EPA SW-846 6020A & 200.8 ICP-MS	Cobalt	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
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LeadMET-93-6103EPA SW-846 6020A & 200.8ICP-MSManganeseMET-93-6103EPA SW-846 6020A & 200.8ICP-MSMolybdenumMET-93-6103EPA SW-846 6020A & 200.8ICP-MSNickelMET-93-6103EPA SW-846 6020A & 200.8ICP-MSSeleniumMET-93-6103EPA SW-846 6020A & 200.8ICP-MSSiliconMET-93-6103EPA SW-846 6020A & 200.8ICP-MSSiliconMET-93-6103EPA SW-846 6020A & 200.8ICP-MSSilverMET-93-6103EPA SW-846 6020A & 200.8ICP-MSStrontiumMET-93-6103EPA SW-846 6020A & 200.8ICP-MSTinMET-93-6103EPA SW-846 6020A & 200.8ICP-MSTitaniumMET-93-6103EPA SW-846 6020A & 200.8ICP-MSUraniumMET-93-6103EPA SW-846 6020A & 200.8ICP-MS	Iron	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Manganese MET-93-6103 EPA SW-846 6020A & 200.8 ICP-MS Molybdenum MET-93-6103 EPA SW-846 6020A & 200.8 ICP-MS Nickel MET-93-6103 EPA SW-846 6020A & 200.8 ICP-MS Selenium MET-93-6103 EPA SW-846 6020A & 200.8 ICP-MS Silicon MET-93-6103 EPA SW-846 6020A & 200.8 ICP-MS Siliver MET-93-6103 EPA SW-846 6020A & 200.8 ICP-MS Strontium MET-93-6103 EPA SW-846 6020A & 200.8 ICP-MS Tin MET-93-6103 EPA SW-846 6020A & 200.8 ICP-MS Titanium MET-93-6103 EPA SW-846 6020A & 200.8 ICP-MS Uranium MET-93-6103 EPA SW-846 6020A & 200.8 ICP-MS	Lead	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Molybdenum MET-93-6103 EPA SW-846 6020A & 200.8 ICP-MS Nickel MET-93-6103 EPA SW-846 6020A & 200.8 ICP-MS Selenium MET-93-6103 EPA SW-846 6020A & 200.8 ICP-MS Silicon MET-93-6103 EPA SW-846 6020A & 200.8 ICP-MS Silver MET-93-6103 EPA SW-846 6020A & 200.8 ICP-MS Strontium MET-93-6103 EPA SW-846 6020A & 200.8 ICP-MS Tin MET-93-6103 EPA SW-846 6020A & 200.8 ICP-MS Titanium MET-93-6103 EPA SW-846 6020A & 200.8 ICP-MS Uranium MET-93-6103 EPA SW-846 6020A & 200.8 ICP-MS	Manganese	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Nickel MET-93-6103 EPA SW-846 6020A & 200.8 ICP-MS Selenium MET-93-6103 EPA SW-846 6020A & 200.8 ICP-MS Silicon MET-93-6103 EPA SW-846 6020A & 200.8 ICP-MS Silver MET-93-6103 EPA SW-846 6020A & 200.8 ICP-MS Strontium MET-93-6103 EPA SW-846 6020A & 200.8 ICP-MS Tin MET-93-6103 EPA SW-846 6020A & 200.8 ICP-MS Titanium MET-93-6103 EPA SW-846 6020A & 200.8 ICP-MS Uranium MET-93-6103 EPA SW-846 6020A & 200.8 ICP-MS	Molybdenum	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Selenium MET-93-6103 EPA SW-846 6020A & 200.8 ICP-MS Silicon MET-93-6103 EPA SW-846 6020A & 200.8 ICP-MS Silver MET-93-6103 EPA SW-846 6020A & 200.8 ICP-MS Strontium MET-93-6103 EPA SW-846 6020A & 200.8 ICP-MS Tin MET-93-6103 EPA SW-846 6020A & 200.8 ICP-MS Titanium MET-93-6103 EPA SW-846 6020A & 200.8 ICP-MS Uranium MET-93-6103 EPA SW-846 6020A & 200.8 ICP-MS	Nickel	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Silicon MET-93-6103 EPA SW-846 6020A & 200.8 ICP-MS Silver MET-93-6103 EPA SW-846 6020A & 200.8 ICP-MS Strontium MET-93-6103 EPA SW-846 6020A & 200.8 ICP-MS Tin MET-93-6103 EPA SW-846 6020A & 200.8 ICP-MS Titanium MET-93-6103 EPA SW-846 6020A & 200.8 ICP-MS Uranium MET-93-6103 EPA SW-846 6020A & 200.8 ICP-MS	Selenium	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Silver MET-93-6103 EPA SW-846 6020A & 200.8 ICP-MS Strontium MET-93-6103 EPA SW-846 6020A & 200.8 ICP-MS Tin MET-93-6103 EPA SW-846 6020A & 200.8 ICP-MS Titanium MET-93-6103 EPA SW-846 6020A & 200.8 ICP-MS Uranium MET-93-6103 EPA SW-846 6020A & 200.8 ICP-MS	Silicon	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Strontium MET-93-6103 EPA SW-846 6020A & 200.8 ICP-MS Tin MET-93-6103 EPA SW-846 6020A & 200.8 ICP-MS Titanium MET-93-6103 EPA SW-846 6020A & 200.8 ICP-MS Uranium MET-93-6103 EPA SW-846 6020A & 200.8 ICP-MS	Silver	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Tin MET-93-6103 EPA SW-846 6020A & 200.8 ICP-MS Titanium MET-93-6103 EPA SW-846 6020A & 200.8 ICP-MS Uranium MET-93-6103 EPA SW-846 6020A & 200.8 ICP-MS	Strontium	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Titanium MET-93-6103 EPA SW-846 6020A & 200.8 ICP-MS Uranium MET-93-6103 EPA SW-846 6020A & 200.8 ICP-MS	Tin	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Uranium MET-93-6103 EPA SW-846 6020A & 200.8 ICP-MS	Titanium	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
	Uranium	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS



Method Summary

CLIENT NAME: PINCHIN LTD. PROJECT: 225335 Croft Landfill - GW AGAT WORK ORDER: 19T479887

ATTENTION TO: Ryan Lawrence

SAMPLING SITE:		SAMPLED BY:	
PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
Vanadium	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Zinc	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS

CHAIN OF CUSTODY RECORD	TUEBIDITY	5835 Coopers Avenue Mississauga, Ontario; L4Z 1Y2 Phone: 905-712-5100; Fax: 905-712-5122 ストマ	LA Arri Arri AGA Note	BOR ival Col val Ter AT Job es:	ATOR ndition nperat Numbe	YUS : ure; er:		G 76	00d [7469	Poor	(comp 3 7	lete "No B 64	tes")
Client Information Company: Pinchin Ltd Contact: Ryan Lawrence Address: 957 Cambrian Heights, Unit # 203 Sudbury ON P3C 5S5 957 Phone; 705-521-0560 Fax: PO#: 225335 Croft Landfill AGAT Quotation #: Point in the second seco	R 1. 2. 3. 267698	Report Information 1. Name: Ryan Lawrence Email: rlawrence@Pinchin.com 2. Name:						Report Format (Please "x" those that apply) Single sample per page Multiple samples per page Results by Fax		Turnaround Time (TAT)* (Please "x" the applicable box below) Regular TAT: x 5 to 7 working days Rush TAT (Rush Surcharges Apply): 3 to 5 days 48 to 72 hours 24 to 48 hours Date Required (Rush surcharges may apple)			
Regulatory Guideline Required: (Please Reg 153 Table Sewer Use (Indicate one) Region Ind/Com (Indicate one) Res/Park Sanitary Ag Storm Med/Fine Coarse Sample Identification Date Sampled Time Sampled	e "x" those that apply: Is t PWQO Reg 558 CCME Other (indicate) GW - ODWS	this a drinking water sample potable water intended for human consumption)? Yes X No Yes" please use the Drinking ter Chain of Custody Record	Cations (K, Na, Mg, Ca)	Metals (see quote for list)	BOD, COD, DOC	Conductivity, Phenols	Total Phosphorous	TDS, TSS	TKN, Turbidity				
H1 Ture UII House water	Containers	Info, Sample Containment									-	1	
H8 water	7	X	x	x x	×	X	x	x	×	T	1		-
H9 water		X	X	x x	X	×	x	x	x		-		
110 water		x	x	x x	x	x	x	x	x		1		
111 water		X	x	x x	x	x	x	x	x		-		
7 Water		X	x	x x	x	X	x	x	x	-			
8 V Water		x	x	x x	×	x	x	x	x				-
in the second se	7	X	x	x -x	×	x	X	x					-
1-DUP	7		×	x x		×	×	x	×	-	-		-
SH) the set T	7	x	x)	x x	X	x	×	~	X		L		-
CUBBROU DURG 1 15 P.M WRITE	er 7				1			^	^	-		1	
							-	-			1-1		
mple Relinquished By (print name & ciac)	TAINERS 10 1350	* Samples received after 2:00 PM	vill be lo	gaed in f	or the n	ext bus	inner	1				1	
mple Relinquished By (print name & sign)	Date/Time Samp Date/Time Samp Date/Time Samp	Sime Z	and sig	n) 19/6	/14	Date 9	e/Tim	e S	pecial In LEASE FILT	e of weeke structio ER DOC A	nds and s ns T SAMPL	E RECEP	nolidays TION

-24



CLIENT NAME: PINCHIN LTD. 957 CAMBRIAN HEIGHTS DRIVE, UNIT 203 SUDBURY, ON P3C 5S5 (705) 521-0560

ATTENTION TO: Tim McBride

PROJECT: 225335 Croft Landfill GW & SW

AGAT WORK ORDER: 19T523307

WATER ANALYSIS REVIEWED BY: Nivine Basily, Inorganics Report Writer

DATE REPORTED: Oct 09, 2019

PAGES (INCLUDING COVER): 15

VERSION*: 1

Should you require any information regarding this analysis please contact your client services representative at (905) 712-5100

*NOTES		

All samples will be disposed of within 30 days following analysis. Please contact the lab if you require additional sample storage time.

AGAT Laboratories (V1)

Page 1 of 15

Member of	of: Association of Professional Engineers and Geoscientists of Alberta (APEGA) Western Enviro-Agricultural Laboratory Association (WEALA) Environmental Services Association of Alberta (ESAA)	AGAT Laboratories is accredited to ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA) and/or Standards Council of Canada (SCC) for specific tests listed on the scope of accreditation. AGAT Laboratories (Mississauga) is also accredited by the Canadian Association for Laboratory Accreditation Inc. (CALA) for specific drinking water tests. Accreditations are location and parameter specific. A complete listing of parameters for each location is available from www.cala.ca and/or www.scc.ca. The tests in this report may not necessarily be included in the scope of accreditation. Measurement Uncertainty is not taken into consideration when stating conformity with a specified requirement.

Results relate only to the items tested. Results apply to samples as received. All reportable information as specified by ISO 17025:2017 is available from AGAT Laboratories upon request



AGAT WORK ORDER: 19T523307 PROJECT: 225335 Croft Landfill GW & SW

ATTENTION TO: Tim McBride

SAMPLED BY:

5835 COOPERS AVENUE MISSISSAUGA, ONTARIO CANADA L4Z 1Y2 TEL (905)712-5100 FAX (905)712-5122 http://www.agatlabs.com

CLIENT NAME: PINCHIN LTD.

SAMPLING SITE:

				erent Earran	ereanane							
DATE RECEIVED: 2019-09-27							DATE REPORTED: 2019-10-09					
Parameter	S	AMPLE DES SAM DATE	CRIPTION: PLE TYPE: SAMPLED:	BH1 Water 2019-09-25	BH8 Water 2019-09-25	וחפ	BH9 Water 2019-09-25	וחפ	B10 Water 2019-09-25		B11 Water 2019-09-25	
ROD (5)	ma/l	0/0	5	-5	-5	5	-5	5	-5	5	-5	
Electrical Conductivity	Ing/L		2	146	< <u>-</u> 70	2	< <u>5</u>	3	2680	2	1620	
nH	nH Units		NA	6.54	6.72	NA	7 04	NA	7 61	NA	7.32	
Total Hardness (as CaCO3) (Calculated)	mg/L		0.5	31.6	22.8	0.5	235	0.5	630	0.5	225	
Total Dissolved Solids	mg/L		20	90	68	20	398	20	1540	20	828	
Total Suspended Solids	mg/L		10	61	227	10	100	10	132	10	103	
Alkalinity (as CaCO3)	mg/L		5	39	23	5	181	5	372	5	294	
Chloride	mg/L		0.10	5.34	0.38	0.20	22.6	2.0	462	0.50	123	
Nitrate as N	mg/L	10.0	0.05	<0.05	0.06	0.10	<0.10	1.0	22.6	0.25	42.0	
Nitrite as N	mg/L	1.0	0.05	<0.05	<0.05	0.10	<0.10	1.0	<1.0	0.25	<0.25	
Sulphate	mg/L		0.10	10.2	8.77	0.20	95.8	2.0	52.8	0.50	83.7	
Phosphate as P	mg/L		0.10	<0.10	<0.10	0.20	<0.20	2.0	<2.0	0.50	<0.50	
Ammonia as N	mg/L		0.02	0.21	<0.02	0.02	1.47	0.04	7.82	0.2	28.4	
Total Kjeldahl Nitrogen	mg/L		0.10	0.68	0.86	0.10	2.73	0.10	8.23	0.50	32.8	
Total Phosphorus	mg/L		0.02	0.06	0.21	0.02	0.32	0.02	0.36	0.02	0.07	
Chemical Oxygen Demand	mg/L		5	31	12	5	69	5	49	25	152	
Dissolved Organic Carbon	mg/L		0.5	8.5	3.1	0.5	24.1	0.5	15.9	1.0	58.8	
Phenols	mg/L		0.001	<0.001	NA	0.001	0.003	0.001	0.002	0.001	0.006	
Turbidity	NTU		0.5	44.2	192	0.5	196	0.5	31.0	0.5	41.7	
Calcium	mg/L		0.05	9.62	6.19	0.05	76.5	0.25	214	0.10	64.6	
Magnesium	mg/L		0.05	1.84	1.79	0.05	10.7	0.25	23.3	0.10	15.5	
Sodium	mg/L	20	0.05	7.55	2.50	0.05	23.9	0.25	182	0.10	136	
Potassium	mg/L		0.05	1.82	1.70	0.05	9.87	0.25	50.9	0.10	56.5	
Aluminum	mg/L		0.004	0.435	0.065	0.004	0.161	0.004	0.032	0.004	0.236	
Antimony	mg/L	0.006	0.003	< 0.003	<0.003	0.003	<0.003	0.003	< 0.003	0.003	< 0.003	
Arsenic	mg/L	0.025	0.003	< 0.003	<0.003	0.003	<0.003	0.003	< 0.003	0.003	< 0.003	
Barium	mg/L	1	0.002	0.043	0.033	0.002	0.114	0.002	0.279	0.002	0.067	
Beryllium	mg/L		0.001	<0.001	<0.001	0.001	<0.001	0.001	<0.001	0.001	<0.001	
Bismuth	mg/L		0.002	<0.002	<0.002	0.002	<0.002	0.002	<0.002	0.002	<0.002	

Croft Landfill - Groundwater Parameters

Certified By:

Nivine Basily



AGAT WORK ORDER: 19T523307 PROJECT: 225335 Croft Landfill GW & SW

ATTENTION TO: Tim McBride

SAMPLED BY:

5835 COOPERS AVENUE MISSISSAUGA, ONTARIO CANADA L4Z 1Y2 TEL (905)712-5100 FAX (905)712-5122 http://www.agatlabs.com

CLIENT NAME: PINCHIN LTD.

SAMPLING SITE:

DATE RECEIVED: 2019-09-27									DATE REPORTE	D: 2019-10-0	9
Parameter	Unit	SAMPLE DES SAM DATE G/S	CRIPTION: PLE TYPE: SAMPLED: RDL	BH1 Water 2019-09-25 567026	BH8 Water 2019-09-25 567028	RDL	BH9 Water 2019-09-25 567029	RDL	B10 Water 2019-09-25 567030	RDL	B11 Water 2019-09-25 567031
Boron	mg/L	5	0.010	0.029	<0.010	0.010	0.489	0.010	1.28	0.010	2.41
Cadmium	mg/L	0.005	0.001	<0.001	<0.001	0.001	<0.001	0.001	<0.001	0.001	<0.001
Chromium	mg/L	0.05	0.003	< 0.003	<0.003	0.003	< 0.003	0.003	< 0.003	0.003	0.004
Cobalt	mg/L		0.001	0.013	0.001	0.001	0.027	0.001	0.004	0.001	0.006
Copper	mg/L		0.003	0.009	0.008	0.003	0.004	0.003	0.010	0.003	0.024
Iron	mg/L		0.010	7.32	<0.010	0.010	25.1	0.010	<0.010	0.010	0.079
Lead	mg/L	0.01	0.001	0.002	<0.001	0.001	<0.001	0.001	<0.001	0.001	<0.001
Manganese	mg/L		0.002	0.863	0.022	0.002	4.16	0.002	4.34	0.002	1.88
Molybdenum	mg/L		0.002	<0.002	<0.002	0.002	<0.002	0.002	<0.002	0.002	0.004
Nickel	mg/L		0.003	< 0.003	0.006	0.003	0.008	0.003	0.006	0.003	0.007
Selenium	mg/L	0.05	0.004	<0.004	<0.004	0.004	<0.004	0.004	0.006	0.004	<0.004
Silicon	mg/L		0.05	5.90	4.42	0.05	5.21	0.05	4.66	0.05	1.40
Silver	mg/L		0.002	<0.002	<0.002	0.002	<0.002	0.002	<0.002	0.002	<0.002
Strontium	mg/L		0.005	0.052	0.026	0.005	0.267	0.005	1.06	0.005	0.127
Tin	mg/L		0.002	<0.002	<0.002	0.002	<0.002	0.002	<0.002	0.002	<0.002
Titanium	mg/L		0.002	0.080	0.003	0.002	0.004	0.002	0.002	0.002	0.005
Uranium	mg/L	0.02	0.002	<0.002	<0.002	0.002	<0.002	0.002	0.005	0.002	0.003
Vanadium	mg/L		0.002	0.005	<0.002	0.002	0.002	0.002	<0.002	0.002	<0.002
Zinc	mg/L		0.005	0.029	0.032	0.005	0.047	0.005	0.006	0.005	0.012

Croft Landfill - Groundwater Parameters

Certified By:

Nivine Basily

Page 3 of 15



CLIENT NAME: PINCHIN LTD.

SAMPLING SITE:

Certificate of Analysis

AGAT WORK ORDER: 19T523307 PROJECT: 225335 Croft Landfill GW & SW 5835 COOPERS AVENUE MISSISSAUGA, ONTARIO CANADA L4Z 1Y2 TEL (905)712-5100 FAX (905)712-5122 http://www.agatlabs.com

ATTENTION TO: Tim McBride

SAMPLED BY:

Croft Landfill - Groundwater Parameters DATE RECEIVED: 2019-09-27 DATE REPORTED: 2019-10-09 DP7 BH-DUP SAMPLE DESCRIPTION: SAMPLE TYPE: Water Water DATE SAMPLED: 2019-09-25 2019-09-25 G/S RDL 567032 RDL 567033 Parameter Unit 5 BOD (5) mg/L 5 <5 <5 122 Electrical Conductivity µS/cm 2 2 1510 NA pН pH Units NA 6.71 7.41 Total Hardness (as CaCO3) mg/L 0.5 48.0 0.5 201 (Calculated) Total Dissolved Solids 20 78 20 676 mg/L Total Suspended Solids mg/L 10 3780 10 55 Alkalinity (as CaCO3) 5 5 272 mg/L 36 Chloride mg/L 0.10 0.59 0.50 105 Nitrate as N mg/L 10.0 0.05 0.07 0.25 37.0 Nitrite as N 1.0 < 0.05 0.25 <0.25 mg/L 0.05 Sulphate mg/L 0.10 15.9 0.50 80.8 Phosphate as P < 0.10 0.50 <0.50 mg/L 0.10 Ammonia as N mg/L 0.02 <0.02 0.2 27.2 0.50 Total Kjeldahl Nitrogen mg/L 0.10 1.69 29.8 Total Phosphorus mg/L 0.04 3.78 0.02 0.07 Chemical Oxygen Demand mg/L 10 156 10 155 Dissolved Organic Carbon mg/L 0.5 5.3 1.0 58.2 Phenols 0.001 0.001 0.001 0.007 mg/L Turbidity NTU 0.5 6240 0.5 39.2 0.05 13.5 0.10 58.0 Calcium mg/L Magnesium 0.05 3.47 0.10 13.7 mg/L Sodium 20 0.05 2 76 0.10 122 mg/L 0.27 0.10 53.5 Potassium mg/L 0.05 Aluminum mg/L 0.004 0.392 0.004 0.236 Antimony mg/L 0.006 0.003 < 0.003 0.003 < 0.003 0.025 < 0.003 0.003 < 0.003 Arsenic mg/L 0.003 Barium 0.002 0.010 0.002 0.066 mg/L 1 Beryllium ma/L 0.001 < 0.001 0.001 < 0.001 Bismuth 0.002 < 0.002 0.002 < 0.002 mg/L

Certified By:

Page 4 of 15

Nivine Basily



CLIENT NAME: PINCHIN LTD.

SAMPLING SITE:

Certificate of Analysis

AGAT WORK ORDER: 19T523307 PROJECT: 225335 Croft Landfill GW & SW 5835 COOPERS AVENUE MISSISSAUGA, ONTARIO CANADA L4Z 1Y2 TEL (905)712-5100 FAX (905)712-5122 http://www.aqatlabs.com

ATTENTION TO: Tim McBride

SAMPLED BY:

				-	-		
DATE RECEIVED: 2019-09-27							DATE REPORTED: 2019-10-09
	:	SAMPLE DESCRIPTION:				BH-DUP	
		SAMPLE TYPE:		Water		Water	
		DATE SAMPLED:		2019-09-25		2019-09-25	
Parameter	Unit	G/S	RDL	567032	RDL	567033	
Boron	mg/L	5	0.010	0.086	0.010	2.39	
Cadmium	mg/L	0.005	0.001	<0.001	0.001	<0.001	
Chromium	mg/L	0.05	0.003	<0.003	0.003	0.004	
Cobalt	mg/L		0.001	<0.001	0.001	0.006	
Copper	mg/L		0.003	<0.003	0.003	0.012	
Iron	mg/L		0.010	0.342	0.010	0.067	
Lead	mg/L	0.01	0.001	<0.001	0.001	<0.001	
Manganese	mg/L		0.002	0.082	0.002	1.87	
Molybdenum	mg/L		0.002	<0.002	0.002	0.004	
Nickel	mg/L		0.003	< 0.003	0.003	0.007	
Selenium	mg/L	0.05	0.004	<0.004	0.004	<0.004	
Silicon	mg/L		0.05	5.43	0.05	1.39	
Silver	mg/L		0.002	<0.002	0.002	<0.002	
Strontium	mg/L		0.005	0.056	0.005	0.130	
Tin	mg/L		0.002	<0.002	0.002	<0.002	
Titanium	mg/L		0.002	0.014	0.002	0.005	
Uranium	mg/L	0.02	0.002	<0.002	0.002	0.003	
Vanadium	mg/L		0.002	0.004	0.002	<0.002	
Zinc	mg/L		0.005	0.008	0.005	0.005	

Croft Landfill - Groundwater Parameters

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard: Refers to Ontario Drinking Water Quality Standards. Na value is derived from O. Reg. 248

567028 Guideline values are for general reference only. The guidelines provided may or may not be relevant for the intended use. Refer directly to the applicable standard for regulatory interpretation. NA (Not Applicable): Phenol bottle is not received.

567029-567031 Elevated RDL indicates the degree of sample dilution prior to the analysis in order to keep analytes within the calibration range of the instrument and to reduce matrix interference.

567033 Elevated RDL indicates the degree of sample dilution prior to the analysis in order to keep analytes within the calibration range of the instrument and to reduce matrix interference. Analysis performed at AGAT Toronto (unless marked by *)

Nivine Basily

Certified By:



AGAT WORK ORDER: 19T523307 PROJECT: 225335 Croft Landfill GW & SW 5835 COOPERS AVENUE MISSISSAUGA, ONTARIO CANADA L4Z 1Y2 TEL (905)712-5100 FAX (905)712-5122 http://www.agatlabs.com

CLIENT NAME: PINCHIN LTD.

SAMPLING SITE:

ATTENTION TO: Tim McBride

SAMPLED BY:

			C	Croft Landfill	- Surface	Water Parame	eters				
ATE RECEIVED: 2019-09-27 DATE REPORTED: 2019-10-09											
Parameter	S Unit	SAMPLE DES SAM DATE S G / S	CRIPTION: PLE TYPE: SAMPLED: RDL	SW-1 Water 2019-09-25 567045	RDL	SW-2 Water 2019-09-25 567051	RDL	SW-3 Water 2019-09-25 567052	RDL	SW-DUP Water 2019-09-25 567053	
BOD (5)	mg/L		5	<5	5	<5	5	<5	5	<5	
Electrical Conductivity	μS/cm		2	89	2	33	2	241	2	33	
pH	pH Units	6.5-8.5	NA	5.38	NA	5.16	NA	7.41	NA	5.43	
Total Hardness (as CaCO3) (Calculated)	mg/L		0.5	21.6	0.5	11.3	0.5	56.7	0.5	11.7	
Total Dissolved Solids	mg/L		20	80	20	94	20	124	20	96	
Total Suspended Solids	mg/L		10	<10	10	<10	10	52	10	<10	
Alkalinity (as CaCO3)	mg/L		5	<5	5	<5	5	69	5	<5	
Bicarbonate (as CaCO3)	mg/L		5	<5	5	<5	5	69	5	<5	
Chloride	mg/L		0.10	16.7	0.10	0.56	0.10	14.2	0.10	0.51	
Nitrate as N	mg/L		0.05	<0.05	0.05	0.10	0.05	0.40	0.05	0.10	
Nitrite as N	mg/L		0.05	<0.05	0.05	<0.05	0.05	0.08	0.05	<0.05	
Sulphate	mg/L		0.10	2.90	0.10	3.85	0.10	6.96	0.10	3.60	
Phosphate as P	mg/L		0.10	<0.10	0.10	<0.10	0.10	<0.10	0.10	<0.10	
Ammonia as N	mg/L		0.02	0.15	0.02	0.18	0.02	0.66	0.02	0.20	
Total Kjeldahl Nitrogen	mg/L		0.10	1.56	0.10	1.67	0.10	1.52	0.10	1.55	
Total Phosphorus	mg/L	0.030	0.01	0.05	0.01	0.15	0.01	0.21	0.01	0.13	
Chemical Oxygen Demand	mg/L		5	37	10	125	5	53	10	133	
Dissolved Organic Carbon	mg/L		0.5	11.9	1.0	38.3	0.5	11.2	1.0	39.3	
Phenols	mg/L	0.001	0.001	0.005	0.001	0.012	0.001	0.008	0.001	0.012	
Turbidity	NTU		0.5	3.4	0.5	9.2	0.5	71.0	0.5	9.1	
Calcium	mg/L		0.05	5.20	0.05	2.99	0.05	18.9	0.05	3.10	
Magnesium	mg/L		0.05	2.09	0.05	0.93	0.05	2.31	0.05	0.95	
Sodium	mg/L		0.05	2.75	0.05	1.13	0.05	14.9	0.05	1.14	
Potassium	mg/L		0.05	1.09	0.05	0.71	0.05	9.13	0.05	0.70	
Aluminum-dissolved	mg/L	0.075	0.004	0.281	0.004	0.577	0.004	0.062	0.004	0.582	
Antimony	mg/L	0.020	0.001	<0.001	0.001	<0.001	0.001	<0.001	0.001	<0.001	
Arsenic	mg/L	0.1	0.003	< 0.003	0.003	< 0.003	0.003	< 0.003	0.003	< 0.003	
Barium	mg/L		0.002	0.023	0.002	0.030	0.002	0.029	0.002	0.032	
Beryllium	mg/L	*	0.0005	< 0.0005	0.0005	<0.0005	0.0005	< 0.0005	0.0005	< 0.0005	

Certified By:

Nivine Basily



AGAT WORK ORDER: 19T523307 PROJECT: 225335 Croft Landfill GW & SW 5835 COOPERS AVENUE MISSISSAUGA, ONTARIO CANADA L4Z 1Y2 TEL (905)712-5100 FAX (905)712-5122 http://www.aqatlabs.com

CLIENT NAME: PINCHIN LTD.

SAMPLING SITE:

ATTENTION TO: Tim McBride

SAMPLED BY:

Croft Landfill - Surface Water Parameters											
DATE RECEIVED: 2019-09-27 DATE REPORTED: 2019-10-09											
		SAMPLE DES SAM DATE S	CRIPTION: PLE TYPE: SAMPLED:	SW-1 Water 2019-09-25		SW-2 Water 2019-09-25		SW-3 Water 2019-09-25		SW-DUP Water 2019-09-25	
Parameter	Unit	G/S	RDL	567045	RDL	567051	RDL	567052	RDL	567053	
Bismuth	mg/L		0.002	<0.002	0.002	<0.002	0.002	<0.002	0.002	<0.002	
Boron	mg/L	0.20	0.010	0.093	0.010	<0.010	0.010	0.471	0.010	<0.010	
Cadmium	mg/L	0.0002	0.0001	0.0001	0.0001	0.0001	0.0001	<0.0001	0.0001	<0.0001	
Chromium	mg/L		0.003	<0.003	0.003	<0.003	0.003	<0.003	0.003	<0.003	
Cobalt	mg/L	0.0009	0.0005	0.0008	0.0005	0.0028	0.0005	0.0010	0.0005	0.0031	
Copper	mg/L	0.005	0.001	0.003	0.001	0.003	0.001	0.008	0.001	0.003	
Iron	mg/L	0.3	0.010	0.424	0.010	2.73	0.010	1.65	0.010	3.00	
Lead	mg/L	**	0.001	<0.001	0.001	0.001	0.001	0.003	0.001	0.001	
Manganese	mg/L		0.002	0.096	0.002	0.305	0.002	0.138	0.002	0.314	
Molybdenum	mg/L	0.04	0.002	< 0.002	0.002	<0.002	0.002	<0.002	0.002	<0.002	
Nickel	mg/L	0.025	0.003	< 0.003	0.003	<0.003	0.003	<0.003	0.003	<0.003	
Selenium	mg/L	0.1	0.004	< 0.004	0.004	<0.004	0.004	<0.004	0.004	<0.004	
Silicon	mg/L		0.05	2.05	0.05	4.60	0.05	1.01	0.05	4.62	
Silver	mg/L	0.0001	0.0001	< 0.0001	0.0001	<0.0001	0.0001	<0.0001	0.0001	<0.0001	
Strontium	mg/L		0.005	0.066	0.005	0.025	0.005	0.076	0.005	0.027	
Tin	mg/L		0.002	<0.002	0.002	<0.002	0.002	<0.002	0.002	<0.002	
Titanium	mg/L		0.002	0.005	0.002	0.008	0.002	0.038	0.002	0.009	
Uranium	mg/L	0.005	0.002	<0.002	0.002	<0.002	0.002	<0.002	0.002	<0.002	
Vanadium	mg/L	0.006	0.002	<0.002	0.002	0.002	0.002	0.002	0.002	0.002	
Zinc	mg/L	0.03	0.005	0.053	0.005	0.021	0.005	0.013	0.005	0.021	

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard: Refers to PWQO (mg/L) * Dependent on Hardness as CaCO3 **Dependent on alkalinity as CaCO3

Guideline values are for general reference only. The guidelines provided may or may not be relevant for the intended use. Refer directly to the applicable standard for regulatory interpretation.

567051 Elevated RDL indicates the degree of sample dilution prior to the analysis in order to keep analytes within the calibration range of the instrument and to reduce matrix interference.

567053 Elevated RDL indicates the degree of sample dilution prior to the analysis in order to keep analytes within the calibration range of the instrument and to reduce matrix interference. Analysis performed at AGAT Toronto (unless marked by *)

Certified By:

Nivine Basily


Guideline Violation

AGAT WORK ORDER: 19T523307 PROJECT: 225335 Croft Landfill GW & SW 5835 COOPERS AVENUE MISSISSAUGA, ONTARIO CANADA L4Z 1Y2 TEL (905)712-5100 FAX (905)712-5122 http://www.agatlabs.com

CLIENT NAME: PINCHIN LTD.

ATTENTION TO: Tim McBride

SAMPLEID	SAMPLE TITLE	GUIDELINE	ANALYSIS PACKAGE	PARAMETER	UNIT	GUIDEVALUE	RESULT
567029	BH9	O.Reg.169/03(mg/L)	Croft Landfill - Groundwater Parameters	Sodium	mg/L	20	23.9
567030	B10	O.Reg.169/03(mg/L)	Croft Landfill - Groundwater Parameters	Nitrate as N	mg/L	10.0	22.6
567030	B10	O.Reg.169/03(mg/L)	Croft Landfill - Groundwater Parameters	Sodium	mg/L	20	182
567031	B11	O.Reg.169/03(mg/L)	Croft Landfill - Groundwater Parameters	Nitrate as N	mg/L	10.0	42.0
567031	B11	O.Reg.169/03(mg/L)	Croft Landfill - Groundwater Parameters	Sodium	mg/L	20	136
567033	BH-DUP	O.Reg.169/03(mg/L)	Croft Landfill - Groundwater Parameters	Nitrate as N	mg/L	10.0	37.0
567033	BH-DUP	O.Reg.169/03(mg/L)	Croft Landfill - Groundwater Parameters	Sodium	mg/L	20	122
567045	SW-1	ON PWQO 2015 (mg/L)	Croft Landfill - Surface Water Parameters	Aluminum-dissolved	mg/L	0.075	0.281
567045	SW-1	ON PWQO 2015 (mg/L)	Croft Landfill - Surface Water Parameters	Iron	mg/L	0.3	0.424
567045	SW-1	ON PWQO 2015 (mg/L)	Croft Landfill - Surface Water Parameters	Phenols	mg/L	0.001	0.005
567045	SW-1	ON PWQO 2015 (mg/L)	Croft Landfill - Surface Water Parameters	Total Phosphorus	mg/L	0.030	0.05
567045	SW-1	ON PWQO 2015 (mg/L)	Croft Landfill - Surface Water Parameters	Zinc	mg/L	0.03	0.053
567045	SW-1	ON PWQO 2015 (mg/L)	Croft Landfill - Surface Water Parameters	рН	pH Units	6.5-8.5	5.38
567051	SW-2	ON PWQO 2015 (mg/L)	Croft Landfill - Surface Water Parameters	Aluminum-dissolved	mg/L	0.075	0.577
567051	SW-2	ON PWQO 2015 (mg/L)	Croft Landfill - Surface Water Parameters	Cobalt	mg/L	0.0009	0.0028
567051	SW-2	ON PWQO 2015 (mg/L)	Croft Landfill - Surface Water Parameters	Iron	mg/L	0.3	2.73
567051	SW-2	ON PWQO 2015 (mg/L)	Croft Landfill - Surface Water Parameters	Phenols	mg/L	0.001	0.012
567051	SW-2	ON PWQO 2015 (mg/L)	Croft Landfill - Surface Water Parameters	Total Phosphorus	mg/L	0.030	0.15
567051	SW-2	ON PWQO 2015 (mg/L)	Croft Landfill - Surface Water Parameters	pН	pH Units	6.5-8.5	5.16
567052	SW-3	ON PWQO 2015 (mg/L)	Croft Landfill - Surface Water Parameters	Boron	mg/L	0.20	0.471
567052	SW-3	ON PWQO 2015 (mg/L)	Croft Landfill - Surface Water Parameters	Cobalt	mg/L	0.0009	0.0010
567052	SW-3	ON PWQO 2015 (mg/L)	Croft Landfill - Surface Water Parameters	Copper	mg/L	0.005	0.008
567052	SW-3	ON PWQO 2015 (mg/L)	Croft Landfill - Surface Water Parameters	Iron	mg/L	0.3	1.65
567052	SW-3	ON PWQO 2015 (mg/L)	Croft Landfill - Surface Water Parameters	Phenols	mg/L	0.001	0.008
567052	SW-3	ON PWQO 2015 (mg/L)	Croft Landfill - Surface Water Parameters	Total Phosphorus	mg/L	0.030	0.21
567053	SW-DUP	ON PWQO 2015 (mg/L)	Croft Landfill - Surface Water Parameters	Aluminum-dissolved	mg/L	0.075	0.582
567053	SW-DUP	ON PWQO 2015 (mg/L)	Croft Landfill - Surface Water Parameters	Cobalt	mg/L	0.0009	0.0031
567053	SW-DUP	ON PWQO 2015 (mg/L)	Croft Landfill - Surface Water Parameters	Iron	mg/L	0.3	3.00
567053	SW-DUP	ON PWQO 2015 (mg/L)	Croft Landfill - Surface Water Parameters	Phenols	mg/L	0.001	0.012
567053	SW-DUP	ON PWQO 2015 (mg/L)	Croft Landfill - Surface Water Parameters	Total Phosphorus	mg/L	0.030	0.13
567053	SW-DUP	ON PWQO 2015 (mg/L)	Croft Landfill - Surface Water Parameters	pH	pH Units	6.5-8.5	5.43



5835 COOPERS AVENUE MISSISSAUGA, ONTARIO CANADA L4Z 1Y2 TEL (905)712-5100 FAX (905)712-5122 http://www.agatlabs.com

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Quality Assurance

CLIENT NAME: PINCHIN LTD.

PROJECT: 225335 Croft Landfill GW & SW

SAMPLING SITE:

AGAT WORK ORDER: 19T523307 ATTENTION TO: Tim McBride

SAMPLED BY:

				Wate	er An	alysis	6								
RPT Date: Oct 09, 2019				DUPLICATE	=		REFERE	NCE MA	TERIAL	METHOD	BLANK	SPIKE	MAT	RIX SP	KE
PARAMETER	Batch	Sample	Dup #1	Dup #2	RPD	Method Blank	Measured	Acce Lir	ptable nits	Recoverv	Acce Lin	ptable nits	Recoverv	Acce Lir	ptable nits
		Ia					value	Lower	Upper		Lower	Upper		Lower	Upper
Croft Landfill - Groundwater Para	ameters														
BOD (5)	567338		<5	<5	NA	< 5	100%	75%	125%						
Electrical Conductivity	566802		4420	4420	0.0%	< 2	104%	80%	120%						
рН	566802		7.62	7.57	0.7%	NA	100%	90%	110%						
Total Dissolved Solids	566976		174	172	1.2%	< 20	98%	80%	120%						
Total Suspended Solids	567026	567026	61	64	4.8%	< 10	102%	80%	120%						
Alkalinity (as CaCO3)	566802		277	280	0.8%	< 5	100%	80%	120%						
Chloride	567033	567033	105	101	3.3%	< 0.10	91%	90%	110%	103%	90%	110%	102%	85%	115%
Nitrate as N	567033	567033	37.0	35.9	3.0%	< 0.05	98%	90%	110%	103%	90%	110%	92%	85%	115%
Nitrite as N	567033	567033	<0.25	<0.25	NA	< 0.05	NA	90%	110%	106%	90%	110%	113%	85%	115%
Sulphate	567033	567033	80.8	77.4	4.4%	< 0.10	100%	90%	110%	99%	90%	110%	100%	85%	115%
Phosphate as P	567033	567033	<0.50	<0.50	NA	< 0.10	99%	90%	110%	100%	90%	110%	99%	85%	115%
Ammonia as N	566964		<0.02	<0.02	NA	< 0.02	100%	90%	110%	100%	90%	110%	93%	70%	130%
Total Kjeldahl Nitrogen	567026	567026	0.68	0.67	1.8%	< 0.10	100%	80%	120%	97%	80%	120%	93%	70%	130%
Total Phosphorus	567026	567026	0.06	0.06	NA	< 0.02	97%	80%	120%	105%	90%	110%	106%	70%	130%
Chemical Oxygen Demand	567030	567030	49	46	6.3%	< 5	93%	80%	120%	99%	90%	110%	92%	70%	130%
Dissolved Organic Carbon	567026	567026	8.5	8.9	4.7%	< 0.5	93%	90%	110%	103%	90%	110%	94%	80%	120%
Phenols	567026	567026	<0.001	<0.001	NA	< 0.001	106%	90%	110%	105%	90%	110%	105%	80%	120%
Turbidity	567026	567026	44.2	44.5	0.7%	< 0.5	102%	90%	110%						
Calcium	566837		67.0	66.9	0.2%	< 0.05	100%	90%	110%	99%	90%	110%	98%	70%	130%
Magnesium	566837		6.17	6.12	0.8%	< 0.05	93%	90%	110%	94%	90%	110%	93%	70%	130%
Sodium	566837		1.39	1.38	0.2%	< 0.05	97%	90%	110%	96%	90%	110%	98%	70%	130%
Potassium	566837		1.80	1.78	0.8%	< 0.05	100%	90%	110%	100%	90%	110%	99%	70%	130%
Aluminum	567026	567026	0.435	0.434	0.2%	< 0.004	107%	90%	110%	109%	90%	110%	108%	70%	130%
Antimony	567026	567026	<0.003	<0.003	NA	< 0.003	104%	90%	110%	96%	90%	110%	96%	70%	130%
Arsenic	567026	567026	<0.003	<0.003	NA	< 0.003	101%	90%	110%	101%	90%	110%	107%	70%	130%
Barium	567026	567026	0.043	0.045	4.1%	< 0.002	100%	90%	110%	99%	90%	110%	102%	70%	130%
Beryllium	567026	567026	<0.001	<0.001	NA	< 0.001	103%	90%	110%	104%	90%	110%	108%	70%	130%
Bismuth	567026	567026	<0.002	<0.002	NA	< 0.002	101%	90%	110%	103%	90%	110%	102%	70%	130%
Boron	567026	567026	0.029	0.028	NA	< 0.010	102%	90%	110%	104%	90%	110%	107%	70%	130%
Cadmium	567026	567026	<0.001	<0.001	NA	< 0.001	102%	90%	110%	102%	90%	110%	105%	70%	130%
Chromium	567026	567026	<0.003	<0.003	NA	< 0.003	102%	90%	110%	105%	90%	110%	103%	70%	130%
Cobalt	567026	567026	0.013	0.013	1.9%	< 0.001	98%	90%	110%	99%	90%	110%	101%	70%	130%
Copper	567026	567026	0.009	0.009	NA	< 0.003	103%	90%	110%	106%	90%	110%	106%	70%	130%
Iron	567026	567026	7.32	7.32	0.0%	< 0.010	99%	90%	110%	101%	90%	110%	111%	70%	130%
Lead	567026	567026	0.002	0.002	NA	< 0.001	103%	90%	110%	105%	90%	110%	104%	70%	130%
Manganese	567026	567026	0.863	0.864	0.2%	< 0.002	103%	90%	110%	106%	90%	110%	104%	70%	130%
Molybdenum	567026	567026	<0.002	<0.002	NA	< 0.002	100%	90%	110%	100%	90%	110%	100%	70%	130%
Nickel	567026	567026	<0.003	<0.003	NA	< 0.003	101%	90%	110%	103%	90%	110%	103%	70%	130%
Selenium	567026	567026	<0.004	<0.004	NA	< 0.004	97%	90%	110%	97%	90%	110%	105%	70%	130%

AGAT QUALITY ASSURANCE REPORT (V1)

AGAT Laboratories is accredited to ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA) and/or Standards Council of Canada (SCC) for specific tests listed on the scope of accreditation. AGAT Laboratories (Mississauga) is also accredited by the Canadian Association for Laboratory Accreditation Inc. (CALA) for specific drinking water tests. Accreditations are location and parameter specific. A complete listing of parameters for each location is available from www.cala.ca and/or www.scc.ca. The tests in this report may not necessarily be included in the scope of accreditation. RPDs calculated using raw data. The RPD may not be reflective of duplicate values shown, due to rounding of final results.



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Quality Assurance

CLIENT NAME: PINCHIN LTD.

PROJECT: 225335 Croft Landfill GW & SW

SAMPLING SITE:

AGAT WORK ORDER: 19T523307 ATTENTION TO: Tim McBride

SAMPLED BY:

		V	Nater	Anal	ysis ((Cont	inuec	1)								
RPT Date: Oct 09, 2019			C	UPLICATE	Ξ		REFEREN	NCE MA	TERIAL	METHOD	BLANK	SPIKE	KE MATRIX SPIKE			
PARAMETER	Batch	Sample	Dup #1	Dup #2	RPD	Method Blank	Measured	Measured Limi		Recovery	Accer Lim	otable nits	Recovery	Accer Lin	ptable nits	
		iù					value	Lower	Upper	-	Lower	Upper	-	Lower	Upper	
Silicon	567026	567026	5.90	5.80	1.8%	< 0.05	107%	90%	110%	99%	90%	110%	102%	70%	130%	
Silver	567026	567026	<0.002	<0.002	NA	< 0.002	104%	90%	110%	106%	90%	110%	103%	70%	130%	
Strontium	567026	567026	0.052	0.052	1.2%	< 0.005	99%	90%	110%	101%	90%	110%	104%	70%	130%	
Tin	567026	567026	<0.002	<0.002	NA	< 0.002	100%	90%	110%	101%	90%	110%	101%	70%	130%	
Titanium	567026	567026	0.080	0.081	0.5%	< 0.002	102%	90%	110%	102%	90%	110%	100%	70%	130%	
Uranium	567026	567026	<0.002	<0.002	NA	< 0.002	101%	90%	110%	102%	90%	110%	104%	70%	130%	
Vanadium	567026	567026	0.005	0.005	NA	< 0.002	102%	90%	110%	105%	90%	110%	102%	70%	130%	
Zinc	567026	567026	0.029	0.028	3.8%	< 0.005	103%	90%	110%	105%	90%	110%	110%	70%	130%	
Croft Landfill - Groundwater Parame	eters															
BOD (5)	574125		<5	<5	NA	< 5	101%	75%	125%							
Croft Landfill - Surface Water Param	neters															
Aluminum-dissolved	567248		0.220	0.222	1.3%	< 0.004	104%	90%	110%	102%	90%	110%	82%	70%	130%	

Comments: NA signifies Not Applicable.

Duplicate Qualifier: As the measured result approaches the RL, the uncertainty associated with the value increases dramatically, thus duplicate acceptance limits apply only where the average of the two duplicates is greater than five times the RL.

Certified By:

Nivine Basily

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5835 COOPERS AVENUE MISSISSAUGA, ONTARIO CANADA L4Z 1Y2 TEL (905)712-5100 FAX (905)712-5122 http://www.agatlabs.com

Method Summary

CLIENT NAME: PINCHIN LTD.

PROJECT: 225335 Croft Landfill GW & SW

SAMPLING SITE:

AGAT WORK ORDER: 19T523307 ATTENTION TO: Tim McBride

SAMPLING SITE.		SAWFLED BT.	
PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
Water Analysis	·	•	-
BOD (5)	INOR-93-6006	SM 5210 B	DO METER
Electrical Conductivity	INOR-93-6000	SM 2510 B	PC TITRATE
pH	INOR-93-6000	SM 4500-H+ B	PC TITRATE
Total Hardness (as CaCO3) (Calculated)	MET-93-6105	EPA SW-846 6010C & 200.7	CALCULATION
Total Dissolved Solids	INOR-93-6028	SM 2540 C	BALANCE
Total Suspended Solids	INOR-93-6028	SM 2540 D	BALANCE
Alkalinity (as CaCO3)	INOR-93-6000	SM 2320 B	PC TITRATE
Chloride	INOR-93-6004	SM 4110 B	ION CHROMATOGRAPH
Nitrate as N	INOR-93-6004	SM 4110 B	ION CHROMATOGRAPH
Nitrite as N	INOR-93-6004	SM 4110 B	ION CHROMATOGRAPH
Sulphate	INOR-93-6004	SM 4110 B	ION CHROMATOGRAPH
Phosphate as P	INOR-93-6004	SM 4110 B	ION CHROMATOGRAPH
Ammonia as N	INOR-93-6059	SM 4500-NH3 H	LACHAT FIA
Total Kjeldahl Nitrogen	INOR-93-6048	QuikChem 10-107-06-2-I & SM 4500-Norg D	LACHAT FIA
Total Phosphorus	INOR-93-6057	QuikChem 10-115-01-3-A & SM 4500-P I	LACHAT FIA
Chemical Oxygen Demand	INOR-93-6042	SM 5220 D	SPECTROPHOTOMETER
Dissolved Organic Carbon	INOR-93-6049	EPA 415.1 & SM 5310 B	SHIMADZU CARBON ANALYZER
Phenols	INOR-93-6050	MOE ROPHEN-E 3179 & SM 5530 D	TECHNICON AUTO ANALYZER
Turbidity	INOR-93-6044	SM 2130 B	NEPHELOMETER
Calcium	MET-93-6105	EPA SW-846 6010C & 200.7	ICP/OES
Magnesium	MET-93-6105	EPA SW-846 6010C & 200.7	ICP/OES
Sodium	MET-93-6105	EPA SW-846 6010C & 200.7	ICP/OES
Potassium	MET-93-6105	EPA SW-846 6010C & 200.7	ICP/OES
Aluminum	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Antimony	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Arsenic	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Barium	MET-93-6103	EPA SW-846 6020A & 200 8	ICP-MS
Beryllium	MET-93-6103	EPA SW-846 6020A & 200 8	ICP-MS
Bismuth	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Boron	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Cadmium	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Chromium	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Cobalt	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Copper	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Iron	MET-93-6103	EPA SW-846 60204 & 200.8	
Lead	MET-93-6103	EPA SW-846 6020A & 200.0	
Manganese	MET-93-6103	EPA SW-846 6020A & 200.0	
Molybdenum	MET-93-6103	EPA SW-846 6020A & 200.0	
Nickel	MET-93-6103	EPA SW-846 6020A & 200.0	
Selenium	MET-93-6103	EPA SW-846 6020A & 200.8	
Silicon	MET-93-6103	EPA SW-846 6020A & 200.8	
Silver	MET 03 6103	EDA SW 846 6020A 8 200.0	
Strontium	MET-03-0103	EPA SW-846 6020A & 200.0	
Tin	MET-03-6103	EPA SW-846 6020A & 200.0	
Titanium	MET-03-6103	EPA SW-846 6020A & 200.0	
Uranium	MET-93-6103	EPA SW-846 6020A & 200.0	
Vanadium	MET-93-6103	EPA SW-846 60204 & 200.0	
, anadium			



Method Summary

CLIENT NAME: PINCHIN LTD.

PROJECT: 225335 Croft Landfill GW & SW

AGAT WORK ORDER: 19T523307

ATTENTION TO: Tim McBride

SAMPLING SITE:		SAMPLED BY:	
PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
Zinc	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Bicarbonate (as CaCO3)	INOR-93-6000	SM 2320 B	PC TITRATE
Total Phosphorus	INOR-93-6022	SM 4500-P B&E	SPECTROPHOTOMETER
Aluminum-dissolved	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS

CHAIN OF CUSTODY RECORD	Full5835 Coopers Avenue Mississauga, Ontario; L4Z 1Y2Phone: 905-712-5100; Fax: 905-712-5122	L A A N	ABO arrival (arrival 1 GAT Jo lotes:	RATC Condition Temper Db Num	on: ature ber:	USE		Y]Good Se	e at	ad 52	or (comple ed P 330	ete "No	otes")
Client Information Company: Pinchin Ltd Contact: Tim McBride Address: 957 Cambrian Heights, Unit # 203 Sudbury ON P3C 555 Phone: Phone: 705-521-0560 Fax: PO#: End Client Project #: 225335 Croft Landfill AGAT Quotation #: End	Report Information 1. Name: Tim McBride Email: tmcbride@Pinc 2. Name: Email: 3. Name: Email: 4. Name: 267698	hin.com	<u>n</u>		R (P th X	epo orm lease ' hose th apply) Single samp page Multip samp per p Resul Fax	rt at "x" hat) e le per ble age ts by		Turna (Please Regula Rush T/	round "x" the rTAT: x 5 AT (Rus 3 48 24 equire	to 7 wor sh Surchar to 5 day to 72 h to 48 h to 48 h d (Rush st	AT)* box be fking ges Ap rs nours nours urcharg	elow) days ply): es may app
Regulatory Guideline Required: (Please 1) Reg 153 Table Sewer Use P (indicate one) Region R Ind/Com (indicate one) C Res/Park Sanitary X Ag Storm C	 ' those that apply ' those that apply IS this a drinking water sample (potable water intended for human consumption)? g 558 ME mer (indicate) / - ODWS If "Yes" please use the Drinking Water Chain of Custody Record 	Anions - Cl, NO3, NO2, Phos-P, Sulphate	Cations (K, Na, Mg, Ca) Metals (see quote for list)	Alkalinity, Ammonia	BOD, COD, DOC	Conductivity, Phenols	Total Phosphorous	TDS, TSS	TKN, Turbidity				
Sample Identification Date Sampled Time Sampled Samp	Matrix Containers Info, Sample Containment	6	1		11.								
BH1 25/09/19 20m-50m water	7	×	x x	x	x	x	x	x	x	-			
BH8 water	7 Partial Sample	x	x x	×	x	x	×	х	×	1			
BH9 water	7	x	x x	x	x	x	x	х	x	-		2	30
3H10 water	7	x	x x	x	×	x	x	x	x			3	0
BH11 water	7	×	x x	×	×	x	×	x	×	1	10	3	1
DP7 water	7	×	x x	×	×	×	×	х	×	15		1	Beck
SP8 water	7	x	x x	x	x	x	×	х	x	15			1.2.1
DPO water	7	×	x x	x	x	x	x	х	x	1			ATT ON
BH-DUP 75/09/19 water	7	×	x x	x	X	x	x	x	x	0			
C+/ V // 1				-	1					1			
				3	1		-	1.2.1		1-			10
TOTAL # OF COM	AINERS 63 * Samples received after 2	2:00 PM w	vIII be loo	gged in f	or the I	next bu	usiness	day,	TAT is exc	lusive of	f weekends a	and statu	itory holidays
Sample Relinquished By (print name & sign) Alana Valle Alaw Valle 7 Sample Relinquished By (print name & sign)	Date/Time Samples Received By (print 5/09/19 Share (print Date/Time Samples Received By (print	name a	and sig	n) >+2= n)	7/10	Da 1 Da	nte/Tir 9:0 nte/Tir	me)O me		FILTER	ructions DOC AT SA	AMPLE R	ECEPTION

CHAIN OF C	۲ USTO	DOY	ปี <mark>ใ</mark> REC		_aboratori	58 Mi Ph Fa	7 bK 35 Coopers Avenue ssissauga, Ontario; L4Z 1Y2 one: 905-712-5100; x: 905-712-5122		LAE Arriv Arriv AGA ⁻ Note	BOR val Co val Te T Job	ATO onditio mper Num	DRY on: rature ber:	USE :	ON *	LY]Goo Se	d Q (tta]Poor	(cor	iplete	"Note	95")
Client Informa Company: Contact: Address: Sudbury ON P3C 5S5 Phone: 705 PO#: Client Project #: AGAT Quotation #;	Pinchin Tim M 957 Ca -521-051 22533	n Ltd cBride ambrian H 60 35 Croft	Heights,	Unit # 2 Fax:	03	Re 1. N E 2. N E 3. N E 4. N	port Information ame: Tim McBride mail: tmcbride@Pinch ame: mail: ame: mail: ame: mail:	nin.co	<u>om</u>			R (P th	epo orm lease ose th apply Single samp page Multip samp per p Resul Fax	ort at "x" hat) e ble per bles age lts by		Tur (Plea Rega Rust	naron ase "x" ular T/ X TAT (Requ	und 1 ' the a AT:] 5 tc (Rush] 3 tc] 48 t] 24 t uired	Fime applica 5 7 w Surct 5 d to 5 d to 72 to 48 (Rush	(TAT ble bo vorki ays 2 hou 3 hou 3 surch	r)* ox belo ng da s Appi urs urs narges	w) ays y): may app
Regulatory Gu Reg 153 Table (indicate one) Ind/ Res/ Ag Med/Fine	rCom /Park Coarse	Region (indica	Sewer Sewer te one) Sanitar Storm	ed: Use y	(Please "x" those that X PWQO Reg 558 CCME Other (indica	apply Is th (pd te) If "Y Wate # of	is a drinking water sample otable water intended for human consumption)? Yes X No es" please use the Drinking er Chain of Custody Record	Anions - Cl, NO3, NO2, Phos-P, Suiphate	Cations (K, Na, Mg, Ca)	Metals (see quote for list)	Alkalinity, Bicarbonate	Ammonia, BOD, COD	DOC, Conductivity	Phenois	Total Phosphorous	TDS, TSS, TKN	Turbidity	Dissolved Aluminum				
Sample Identification	Dates	ampied	i ime Sa	ampied	Sample Matrix	Containers	Info, Sample Containment	-														3-1
SW-2	1270	5/19	2.pm	-Dein	water	8		X	X	X	X	X	х	X	X	X	×	×	1			
₩ 2	-				water	8		X	x	×	x	х	×	X	×	x	X	X				2-1
>₩-3	-			-	water	8		X	X	X	х	x	х	X	x	X	X	x		5	1	201
9W-DOP		/			Water	8		×	×	×	×	×	×	×	×	×	×	×				
					0 · · · · · · · · · · · · · · · · · · ·							SH		1 and								
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1			Samula To	122 12 2			· ·	
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# of Coolers;		7		COC	# or Work Order #:	19752	3307	*
	Arrival Temp	peratures - Bra	nch/Driver		# of Submissions:			
C	poler #1; $3 - 4$	2, 2.7	, 2.1		Arrival	Temperatures	- Laboratory	
Co	oler #2: 2-2	1 7.8	22		Cooler #1:	/	,	
Cc	oler #3: 3-7	30	21		Cooler #2:	/	*	
Co			- 9-1		Cooler #3:			
	$\frac{1}{2}$	-1-3.11	2-0		Cooler #4.	/	/	
Co	oler #5; <u>2 - (</u>	121	2.3		Gool up	/	/	
Cod	oler #6: 3.9	1_3-1,	3.3		Cooler #5:	/	/	
Cod	ler #7: 2.2	, 2.7,	201		Cooler #6:	/	1	
Coc	ler #8	/			Cooler #7:	/		
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LR Gun ID	er #10:	11_		1.4	Cooler #10:	/	/	
		8		IR Gun ID.		/	/	_

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r use of this form: 1) complete all fields of info including total # of coolers and # of submissions rec'd, 2) photocopy and place in each submission prior to giving a WO#, 3) Proceed as normal, write the WO# and scan (please make sure to scan along with the COC) Document ID; SR-78-9511.003 Date Issued: 2017-2-23

Page:

of

APPENDIX VI Groundwater Trend Analysis



















APPENDIX VII Surface Water Trend Analysis

















APPENDIX VIII Monitoring and Screening Checklist

Appendix D-Monitoring and Screening Checklist General Information and Instructions

General Information: The checklist is to be completed, and submitted with the Monitoring Report.

Instructions: A complete checklist consists of:

(a) a completed and signed checklist, including any additional pages of information which can be attached as needed to provide further details where indicated.

(b) completed contact information for the Competent Environmental Practitioner (CEP)

(c) self-declaration that CEP(s) meet(s) the qualifications as set out below and in Section 1.2 of the Technical Guidance Document.

Definition of Groundwater CEP:

For groundwater, the CEP must have expertise in hydrogeology and meet one of the following:

(a) the person holds a licence, limited licence or temporary licence under the Professional Engineers Act; or

(b) the person holds a certificate of registration under the *Professional Geoscientists Act, 2000* and is a practicing member, temporary, member or limited member of the Association of Professional Geoscientists of Ontario. O. Reg. 66/08, s. 2..

Definition of Surface water CEP:

A CEP for surface water assessments is a scientist, professional engineer or professional geoscientist as described in (a) and (b) above with demonstrated experience and post-secondary education, either a diploma or degree, in hydrology, aquatic ecology, limnology, aquatic biology, physical geography with specialization in surface water, and/or water resource management.

The type of scientific work that a CEP performs must be consistent with that person's education and experience. If an individual has appropriate training and credentials in both groundwater and surface water and is responsible for both areas of expertise, the CEP may then complete and validate both sections of the checklist.

Monitoring Report and Site Information								
Waste Disposal Site Name	Croft Waste Disposal Site							
Location (e.g. street address, lot, concession)	Lot 26, Concession 11, within the Municipality of Magnetawan, District of Parry Sound, Ontario							
GPS Location (taken within the property boundary at front gate/ front entry)	Universal Transverse Mercator (UTM) coordinates Zone 17U, 593659 meters (m) Easting and 5058398 m Northing (North American Datum 1983)							
Municipality	Magnetawan							
Client and/or Site Owner	The Corporation of the Municipality of Magnetawan							
Monitoring Period (Year)	2019							
This	Monitoring Report is being submitted under the following:							
Certificate of Approval No.:	A7034002							
Director's Order No.:	Type Here							
Provincial Officer's Order No.:	Type Here							
Other:	Type Here							

Report Submission Frequency	♠ Annual♠ Other	Specify (Type Here):
The site is:	(• (*	Active
		Closed
If closed, specify C of A, control or aut	horizing document closure date:	Select Date
Has the nature of the operations at the site changed during this monitoring period?	((Yes No
If yes, provide details:	Type Here	
Have any measurements been taken since the last reporting period that indicate landfill gas volumes have exceeded the MOE limits for subsurface or adjacent buildings? (i. e. exceeded the LEL for methane)	(Γ Yes Γ No

Sampling and Monitoring Program Status:									
 The monitoring program continues to effectively characterize site conditions and any groundwater discharges from the site. All monitoring wells are confirmed to be in good condition and are secure: 	(● Yes (^ No	Here):							
2) All groundwater, leachate and WDS gas sampling and monitoring for the monitoring period being reported on was successfully completed as required by Certificate(s) of Approval or other relevant authorizing/control document(s):	 ● Yes ○ No ○ Not Applicable 	If no, list exceptions below	or attach information.						
Groundwater Sampling Location	Description/Explanation f (change in name or locati	for change on, additions, deletions)	Date						
Type Here	Type Here		Select Date						
Type Here	Type Here		Select Date						
Type Here	Type Here		Select Date						
Гуре Here	Type Here		Select Date						

 a) Some or all groundwater, leach monitoring requirements have b outside of a ministry C of A, auth 	hate and WDS gas sampling and een established or defined orizing, or control document.	 ← Yes ● No ← Not Applicable 					
b) If yes, the sampling and monit the monitoring period being rep completed in accordance with es locations, and parameters develo Guidance Document:	oring identified under 3(a) for orted on was successfully tablished protocols, frequencies, oped as per the Technical	 ∩ Yes ∩ No (● Not Applicable 	lf no, list exceptions below or attach additional information.				
Groundwater Sampling Location	Description/Explanation for cha (change in name or location, add	Date					
Type Here	Type Here		Select Date				
Type Here	Type Here		Select Date				
Type Here	Type Here	Select Date					
Type Here	Type Here		Select Date				
4) All field work for groundwater investigations was done in accordance with standard operating procedures as established/outlined per the Technical Guidance Document (including internal/external QA/ QC requirements) (Note: A SOP can be from a published source, developed internally by the site owner's consultant, or adopted by the consultant from another organization):	(@ Yes (^ No	lf no, specify (Type Here):					

	Sampling and Monitoring Program Results/WDS Conditions and Assessment:					
5)	The site has an adequate buffer, Contaminant Attenuation Zone (CAZ) and/or contingency plan in place. Design and operational measures, including the size and configuration of any CAZ, are adequate to prevent potential human health impacts and impairment of the environment.	← Yes(• No	A CAZ boundary should be developed for the Site.			
6)	The site meets compliance and assessment criteria.	€ YesC No	If no, list and explain exceptions (Type Here):			
7)	The site continues to perform as anticipated. There have been no unusual trends/ changes in measured leachate and groundwater levels or concentrations.	(● Yes (^ No	If no, list exceptions and explain reason for increase/change (Type Here):			
1)	 Is one or more of the following risk reduction practices in place at the site: (a) There is minimal reliance on natural attenuation of leachate due to the presence of an effective waste liner and active leachate collection/treatment; or (b) There is a predictive monitoring program in-place (modeled indicator concentrations projected over time for key locations); or (c) The site meets the following two conditions (typically achieved after 15 years or longer of site operation): <i>i</i>.The site has developed stable leachate mound(s) and stable leachate plume geometry/concentrations; and <i>ii</i>.Seasonal and annual water levels and water quality fluctuations are well understood. 	(• Yes (~ No	Note which practice(s):	[(a) [(b) ▼ (c)		
9)	Have trigger values for contingency plans or site remedial actions been exceeded (where they exist):	 ← Yes ← No (● Not Applicable 	If yes, list value(s) that are/have been exceeded and follow- up action taken (Type Here):			

Groundwater CEP Declaration:

8-Dec-2019

I am a licensed professional Engineer or a registered professional geoscientist in Ontario with expertise in hydrogeology, as defined in Appendix D under Instructions. Where additional expertise was needed to evaluate the site monitoring data, I have relied on individuals who I believe to be experts in the relevant discipline, who have co-signed the compliance monitoring report or monitoring program status report, and who have provided evidence to me of their credentials.

I have examined the applicable Certificate of Approval and any other environmental authorizing or control documents that apply to the site. I have read and followed the Monitoring and Reporting for Waste Disposal Sites Groundwater and Surface Water Technical Guidance Document (MOE, 2010, or as amended), and associated monitoring and sampling guidance documents, as amended from time to time. I have reviewed all of the data collected for the above-referenced site for the monitoring period(s) identified in this checklist. Except as otherwise agreed with the ministry for certain parameters, all of the analytical work has been undertaken by a laboratory which is accredited for the parameters analysed to *ISO/IEC 17025:2005 (E)- General requirements for the competence of testing and calibration laboratories,* or as amended from time to time by the ministry.

If any exceptions or potential concerns have been noted in the questions in the checklist attached to this declaration, it is my opinion that these exceptions and concerns are minor in nature and will be rectified for the next monitoring/reporting period. Where this is not the case, the circumstances concerning the exception or potential concern and my client's proposed action have been documented in writing to the Ministry of the Environment District Manager in a letter from me dated:

Recommendations:							
Based on my technical review of the monitoring results for the waste disposal site:							
○ No changes to the monitoring program are recommended	As there are currently no downgradient groundwater monitoring wells situated directly north of the Site, it is recommended that a new monitoring well be installed to evaluate downgradient water quality in this direction.						
The following change(s) to the (• monitoring program is/are recommended:	downgradient monitoring locations (i.e., BH10 and BH11), it is recommended that an additional well be installed further downgradient in the east to evaluate the extent of the leachate impacts closer to the property boundary.						
 No Changes to site design and operation are recommended 	Type Here						
The following change(s) to the (site design and operation is/ are recommended:							

Name:	Tim McBride	Tim McBride				
Seal:	Add Image	Add Image				
Signature:	Ti ~Bil	Date:	8-Dec-2019			
CEP Contact Information:	Tim McBride	Tim McBride				
Company:	Pinchin Ltd.	Pinchin Ltd.				
Address:	957 Cambrian Heights Drive, Sudbury, Ontario P3C 5S5	957 Cambrian Heights Drive, Unit 203 Sudbury, Ontario P3C 5S5				
elephone No.:	705.521.0560 ext 3416	Fax No. :	705.521.1309			
-mail Address:	tmcbride@pinchin.com	tmcbride@pinchin.com				
o-signers for additional expert	ise provided:					
ignature:		Date:	Select Date			
ignature:		Date:	Select Date			

Surface Water WDS Verific	ation:				
Provide the name of surface water waterbody (including the nearest su	body/bodies potentially receiv rface water body/bodies to the s	ing the WDS effluent and the ite):	approximate distance to the		
Name (s)	Love Lake Unnamed tributary to Ahmic Lake				
Distance(s)	500 m north of the Site South of the Site				
Based on all available information ar	nd site knowledge, it is my opinio	on that:			
S	ampling and Monitorir	ng Program Status:			
 The current surface water monitoring program continues to effectively characterize the surface water conditions, and includes data that relates upstream/background and downstream receiving water conditions: 	€ Yes € No	es If no, identify issues (Type Here): o			
2) All surface water sampling for the monitoring period being reported was successfully completed in accordance with the Certificate(s) of Approval or relevant authorizing/control document(s) (if applicable):	 Yes No Not applicable (No C of A, authorizing / control document applies) 	If no, specify below or provide details in an attachment.			
Surface Water Sampling Location	Description/Explanation for change (change in name or location, additions, deletions)		Date		
Type Here	Type Here		Select Date		
Type Here	Type Here		Select Date		
Type Here	Type Here		Select Date		
Type Here	Type Here		Select Date		
3) a) Some or all surface water sam requirements for the monitoring outside of a ministry C of A or au	pling and monitoring program period have been established thorizing/control document.	← Yes ④ No ← Not Applicable			
--	--	--	---		
b) If yes, all surface water sampli under 3 (a) was successfully com established program from the sit frequencies, locations and param Technical Guidance Document:	ng and monitoring identified pleted in accordance with the re, including sampling protocols, neters) as developed per the	 ← Yes ← No (● Not Applicable 	If no, specify below or provide details in an attachment.		
Surface Water Sampling Location	Description/Expla (change in name or locat	anation for change ion, additions, deletions)	Date		
Type Here	Type Here		Select Date		
Type Here	Type Here		Select Date		
Type Here	Type Here		Select Date		
Type Here	Type Here		Select Date		
All field work for surface water investigations was done in accordance with standard operating procedures, including internal/external QA/QC requirements, as established/ outlined as per the Technical Guidance Document, MOE 2010, or as amended. (Note: A SOP can be from a published source, developed internally by the site owner's consultant, or adopted by the consultant from another organization):	(● Yes (^ No	lf no, specify (Type Here):			

Sampling and Monitoring Program Results/WDS Conditions and Assessment:

5)	i) The receiving water body meets surface water-related compliance criteria and assessment criteria i.e., there are no exceedances of criteria, based on MOE legislation, regulations, Water Management Policies, Guidelines and Provincial Water Quality Objectives and other assessment		(Yes	
	criteria (e.g., CWQGs, APVs), as noted in Table A or Table B in the Technical Guidance Document	(No		
	(Section 4.6):			

If no, list parameters that exceed criteria outlined above and the amount/percentage of the exceedance as per the table below or provide details in an attachment:

	-
e.g. C of A limit, PWQO, background	e.g. X% above PWQO
PWQO - 6.5 pH units CWQG - 6.5 pH units	SW2 (spring) - 5.82 pH units SW2 (fall) - 5.16 pH units
PWQO - 0.001 mg/L CWQG - 0.004 mg/L	SW2 (spring) - 0.002 mg/L SW2 (fall) - 0.012 mg/L
APV - 0.039 mg/L	SW2 (spring) - 0.33 mg/L SW2 (fall) - 0.71 mg/L
PWQO - 0.3 mg/L CWQG - 0.3 mg/L	SW2(spring) - 1.31 mg/L SW2(fall) - 2.73 mg/L
PWQO - 0.0009 mg/L	SW2(spring) - 0.0028 mg/L
PWQO - 0.03 mg/L	SW2(spring) - 0.07 mg/L SW2(fall) - 0.15 mg/L
PWQO - 0.075 mg/L CWQG - 0.1 mg/L	SW2(spring) - 0.176 mg/L SW2(fall) - 0.577 mg/L
(● Yes (^ No	Elevated background conditions
	e.g. Cor A milit, PWQO, background PWQO - 6.5 pH units CWQG - 6.5 pH units PWQO - 0.001 mg/L CWQG - 0.004 mg/L PWQO - 0.3 mg/L PWQO - 0.3 mg/L PWQO - 0.0009 mg/L PWQO - 0.03 mg/L PWQO - 0.01 mg/L PWQO - 0.03 mg/L PWQO - 0.075 mg/L CWQG - 0.1 mg/L (© Yes (`No

7)	All monitoring program surface water parameter concentrations fall within a stable or decreasing trend. The site is not characterized by historical ranges of concentrations above assessment and compliance criteria.	(● Yes ← No	If no, list parameters and stations that is outside the expected range. Identify whether parameter concentrations show an increasing trend or are within a high historical range (Type Here)
8)	For the monitoring program parameters, does the water quality in the groundwater zones adjacent to surface water receivers exceed assessment or compliance criteria (e.g. , PWQOs, CWQGs, or toxicity values for aquatic biota (APVs)):	 (Yes (No (Not Known (Not Applicable 	If yes, provide details and whether remedial measures are necessary (Type Here)
9)	Have trigger values for contingency plans or site remedial actions been exceeded (where they exist):	 ∩ Yes ∩ No (The set of the	lf yes, list value(s) that are/have been exceeded and follow- up action taken (Type Here)

Surface Water CEP Declaration:

I, the undersigned hereby declare that I am a Competent Environmental Practitioner as defined in Appendix D under Instructions, holding the necessary level of experience and education to design surface water monitoring and sampling programs, conduct appropriate surface water investigations and interpret the related data as it pertains to the site for this monitoring period.

I have examined the applicable Certificate of Approval and any other environmental authorizing or control documents that apply to the site. I have read and followed the Monitoring and Reporting for Waste Disposal Sites Groundwater and Surface Water Technical Guidance Document (MOE, 2010, or as amended) and associated monitoring and sampling guidance documents, as amended from time to time. I have reviewed all of the data collected for the above-referenced site for the monitoring period(s) identified in this checklist. Except as otherwise agreed with the ministry for certain parameters, all of the analytical work has been undertaken by a laboratory which is accredited for the parameters analysed to *ISO/IEC 17025:2005 (E)- General requirements for the competence of testing and calibration laboratories*, or as amended from time to time by the ministry.

If any exceptions or potential concerns have been noted in the questions in the checklist attached to this declaration, it is my opinion that these exceptions and concerns are minor in nature or will be rectified for future monitoring events. Where this is not the case, the circumstances concerning the exception or potential concern and my client's proposed action have been documented in writing to the Ministry of the Environment District Manager in a letter from me dated:

8-Dec-2019	
Recommendations:	
Based on my technical review of the n	nonitoring results for the waste disposal site:
 No Changes to the monitoring program are recommended 	Type Here
The following change(s) to the () monitoring program is/are recommended:	
 No changes to the site design and operation are recommended 	
The following change(s) to the site	Type Here

CEP Signature	Ti ~Bl	
Relevant Discipline	Hydrogeologist	
Date:	8-Dec-2019	
CEP Contact Information:	Tim McBride	
Company:	Pinchin Ltd.	
ddress:	957 Cambrian Heights Drive, Unit 203 Sudbury, Ontario P3C 555	
elephone No.:	705.521.0560 ext 3416	
ax No. :	705.521.1309	
-mail Address:	tmcbride@pinchin.com	
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